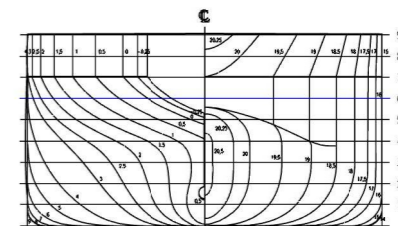
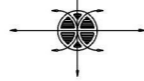
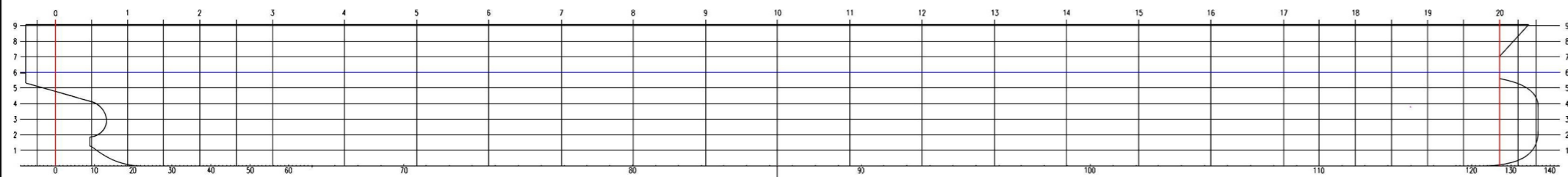


ANEXOS

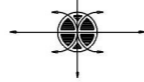
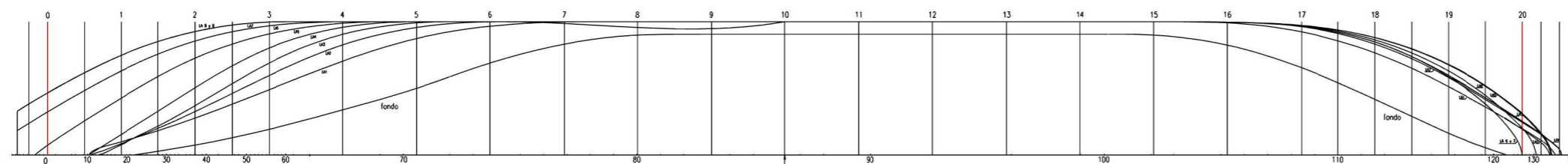
Plano de formas:



CARACTERISTICAS

ESLORA TOTAL	LOA	272.202 M
ESLORA EN LA FLOTACION	LWL(1)	265.314 M
ESLORA ENTRE PERPENDICULARES	LBP(1)	260.000 M
MANGA DE TRAZADO	B	47.000 M
PUNTA DE TRAZADO	D	24.300 M
COEFICIENTE DE BLOQUE	CB(1)	0.830 -
ABSCISA DE C. DE CARENA	LCB(2)	-8.306 M
COEFICIENTE DE SECCION MAXIMA	CM(1)	0.997 -
CALADO DE PROYECTO	T	16.800 M
COEFICIENTE DE AREA BULBO	BAC(1)	0.194 -
COEFICIENTE DE FLOTACION	CWL(1)	0.912 -
ABSCISA C.G. DE FLOTACION	LCW(2)	1.758 M

- (1) DATOS REFERIDOS AL CALADO T.
 (2) ABSISAS POSITIVAS A POPA SECCION MAXIMA.



PLANO DE FORMAS

PROYECTO FIN DE CARRERA

UPCT

FRANCISCO JAVIER ROS MORALES

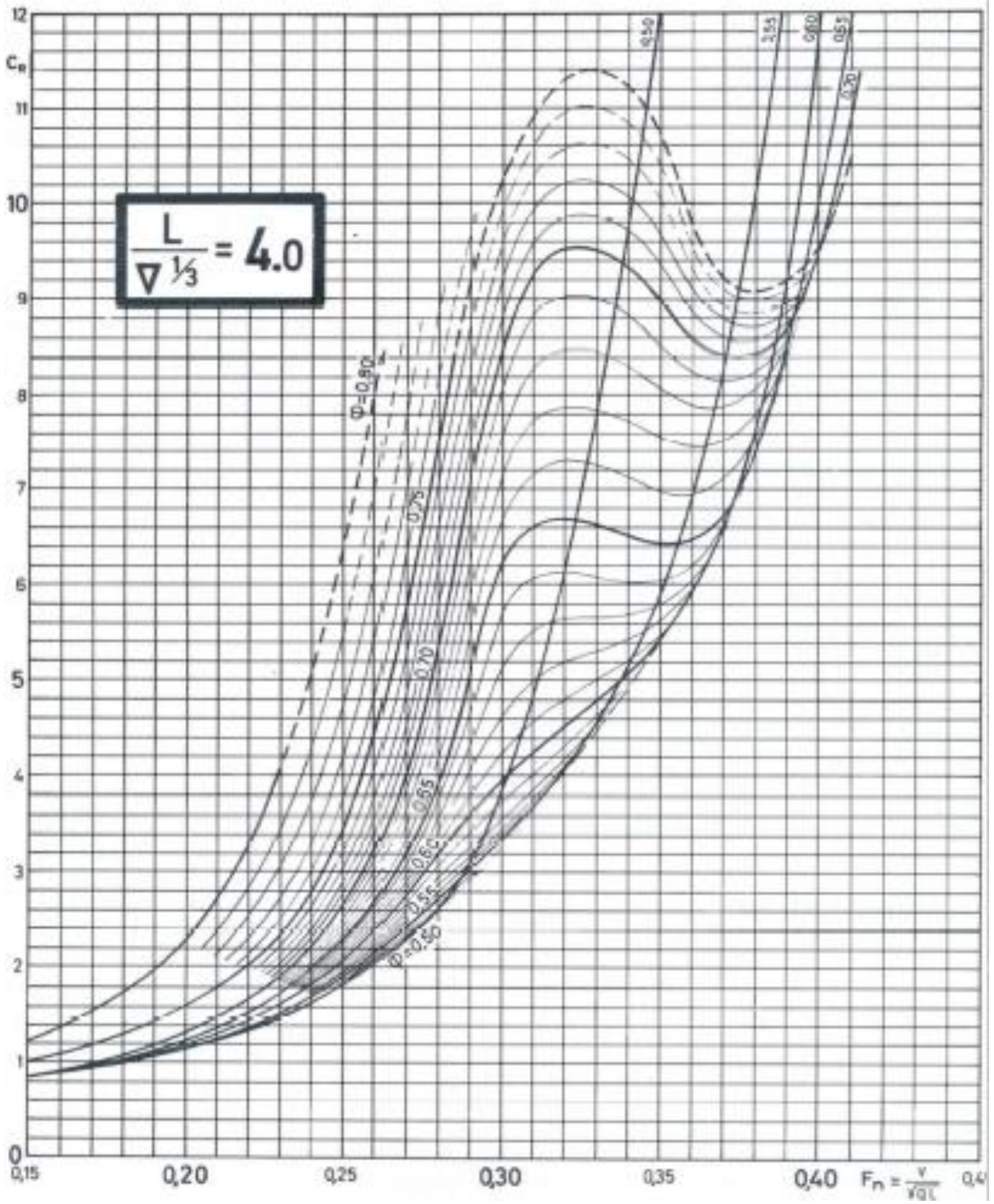
ETSINO

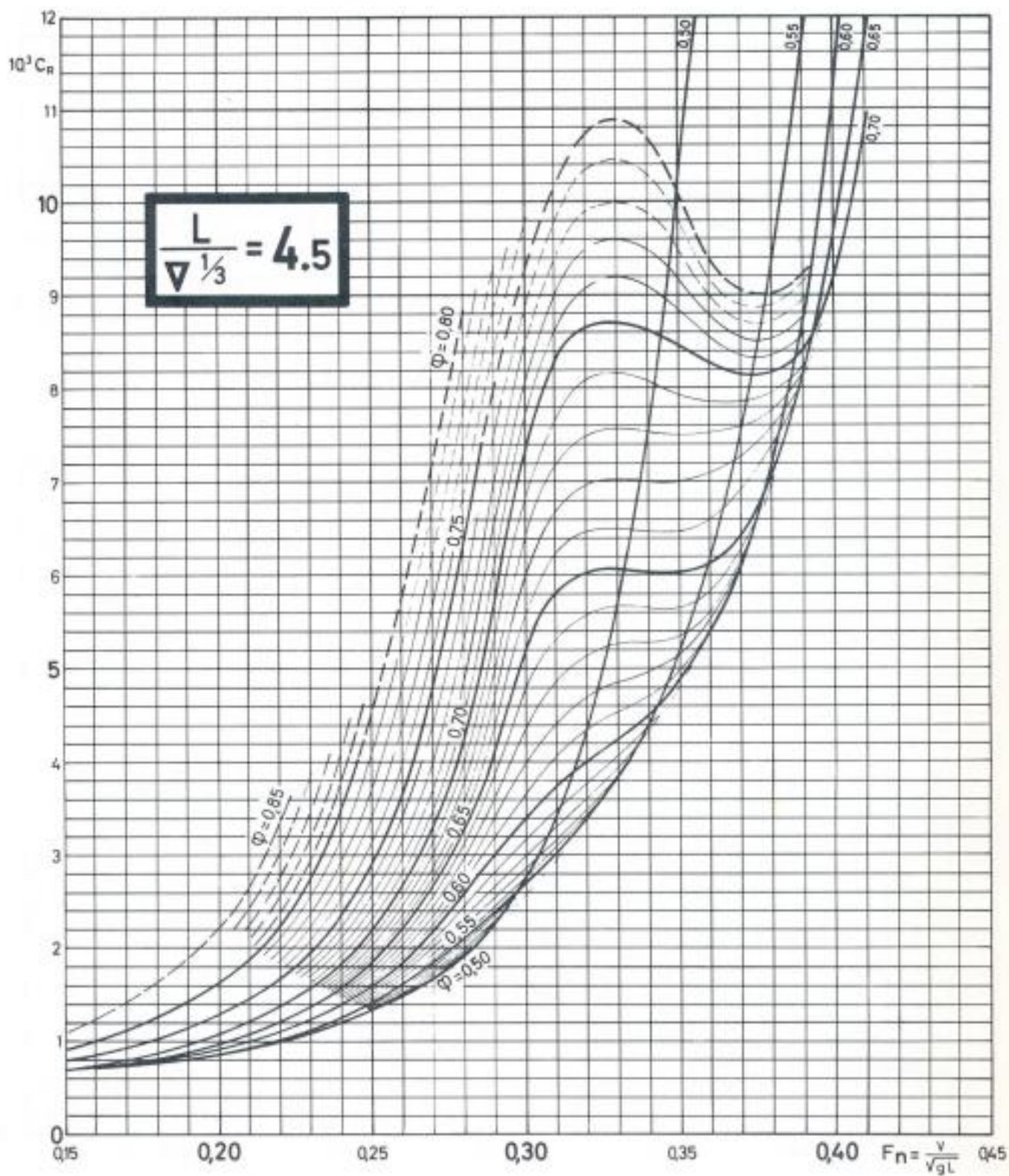
PETROLERO DE 150.000 TPM

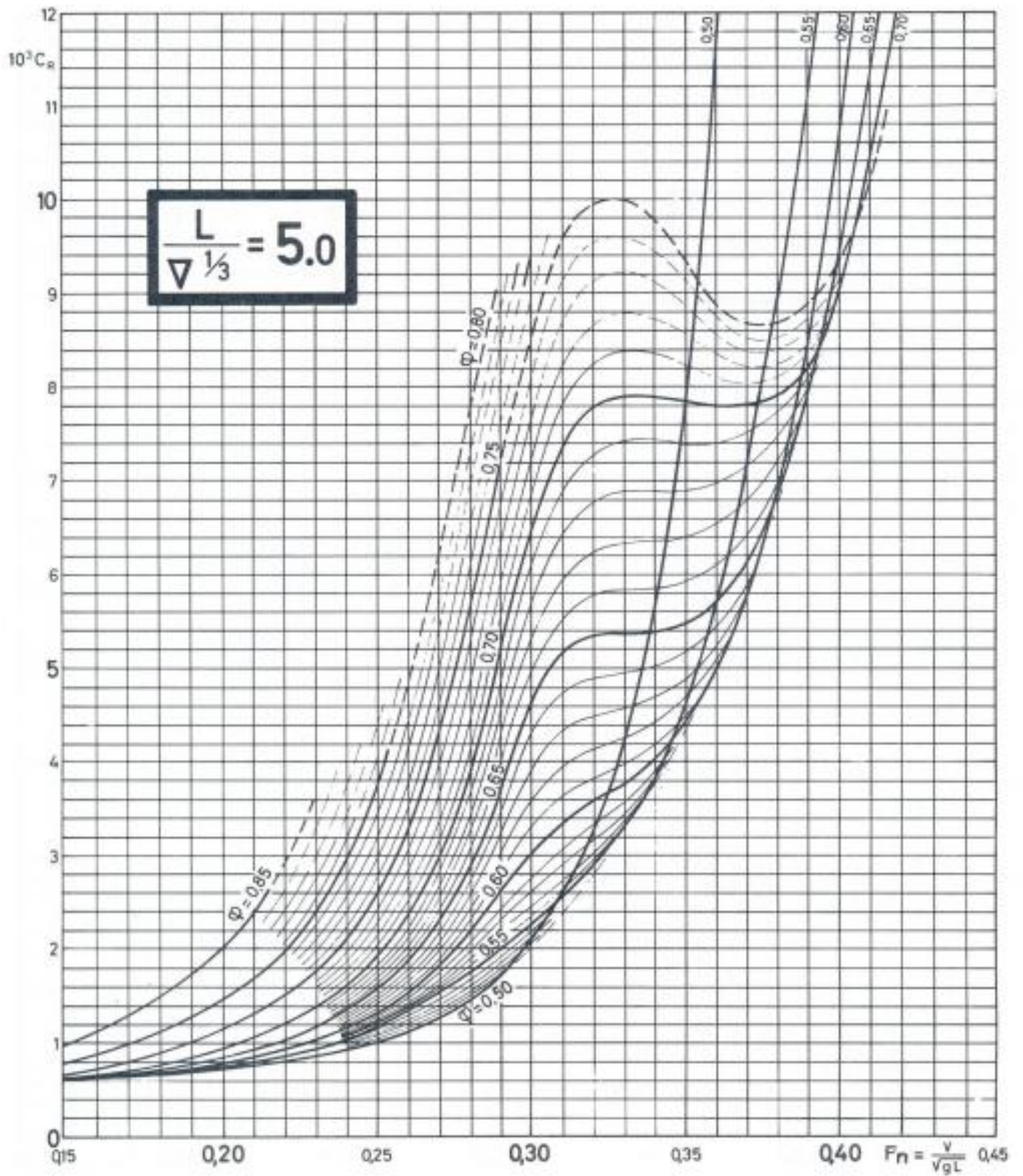
ESCALA
1:100

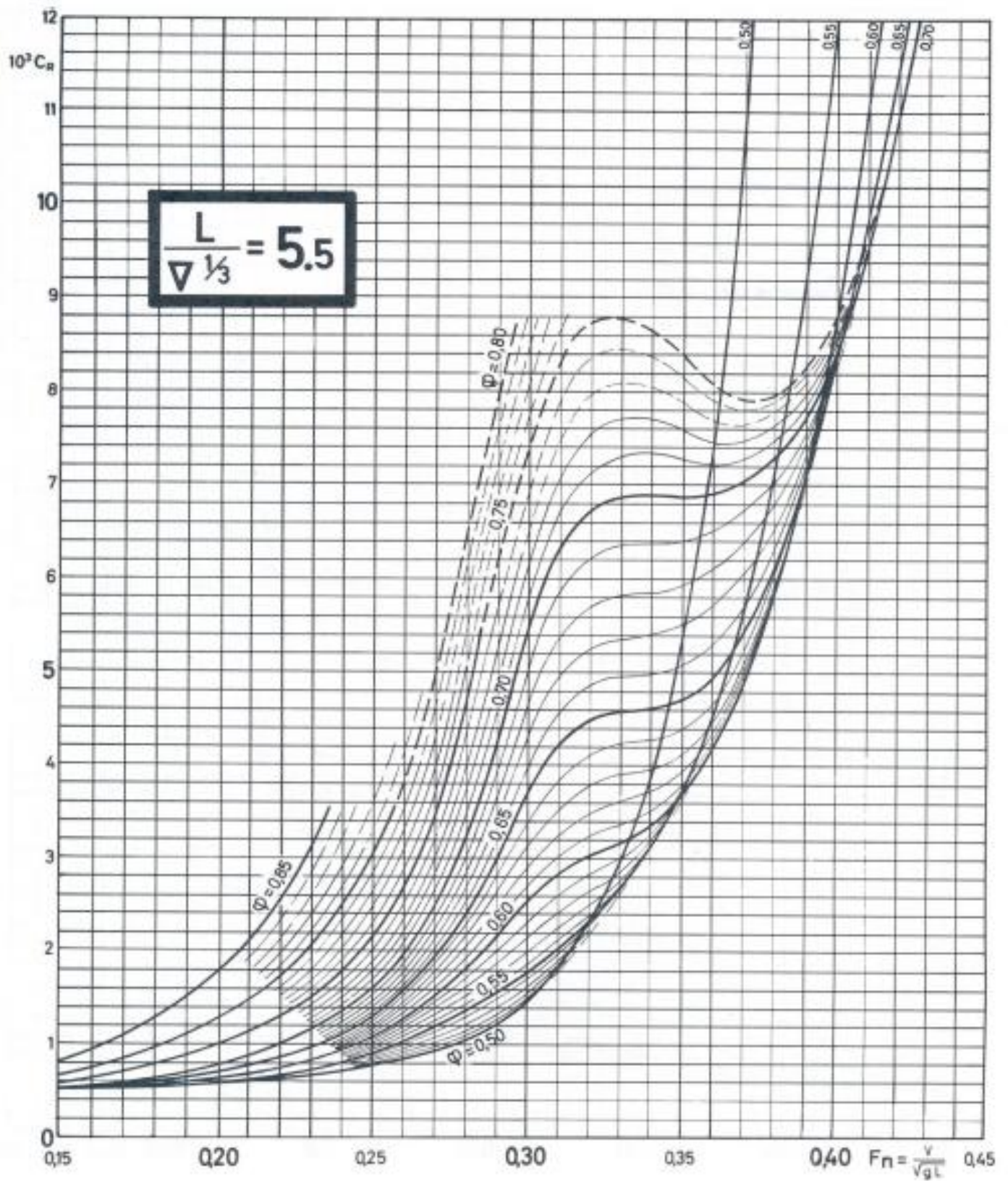
HOJAS: 1

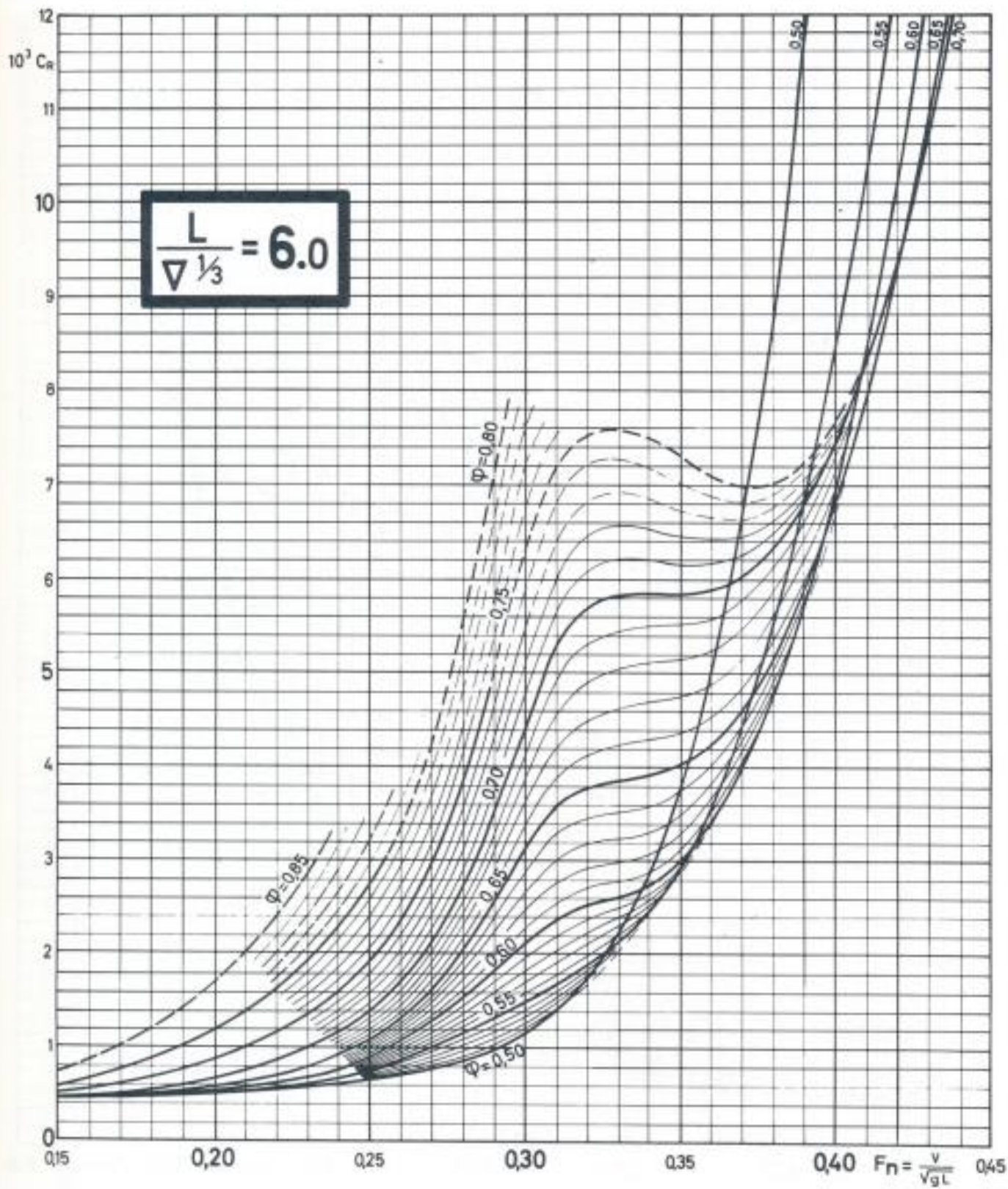
**Curvas para obtener $C_R 10^3$ del Método de
Guldhammer y Harvald.**

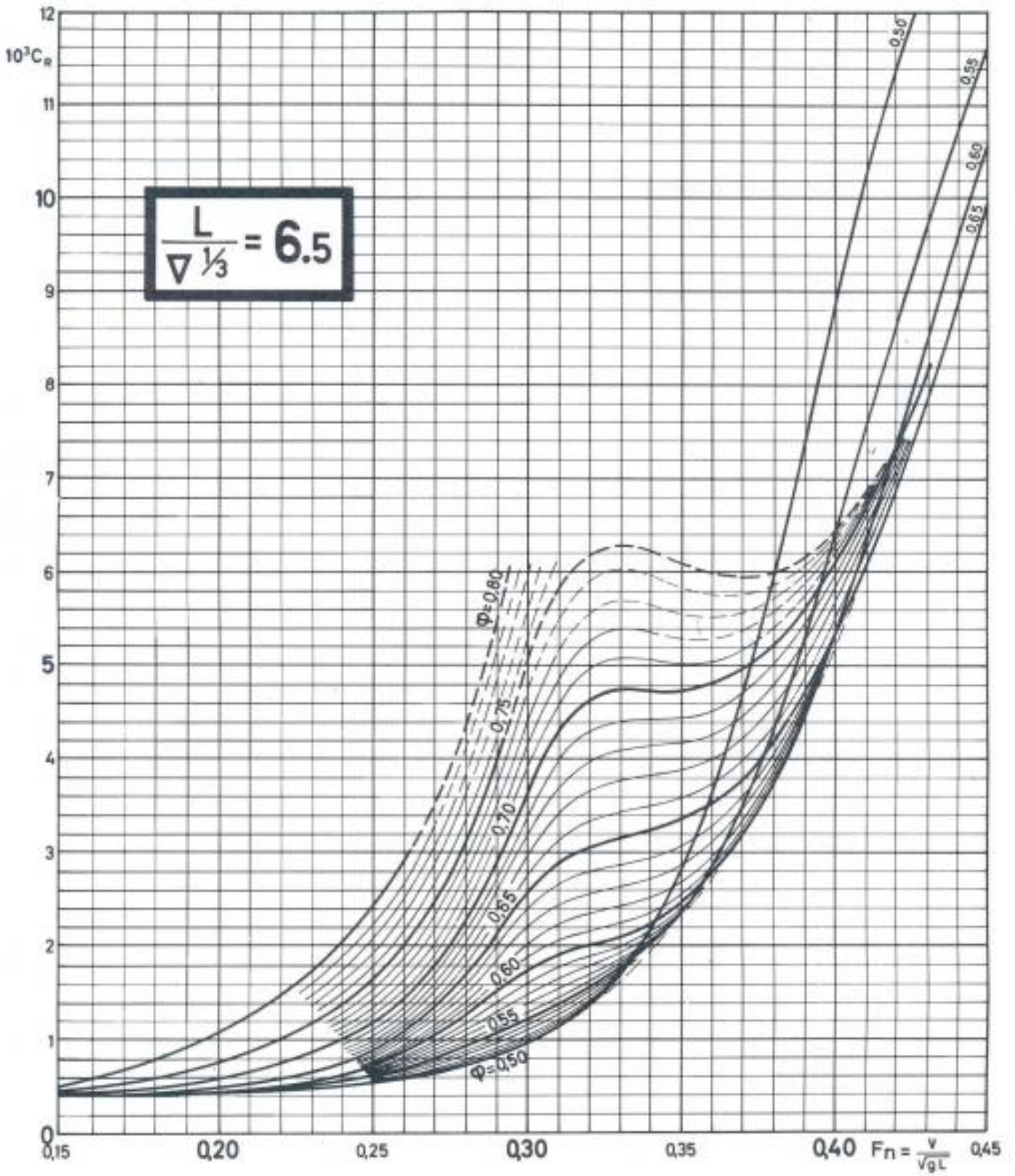


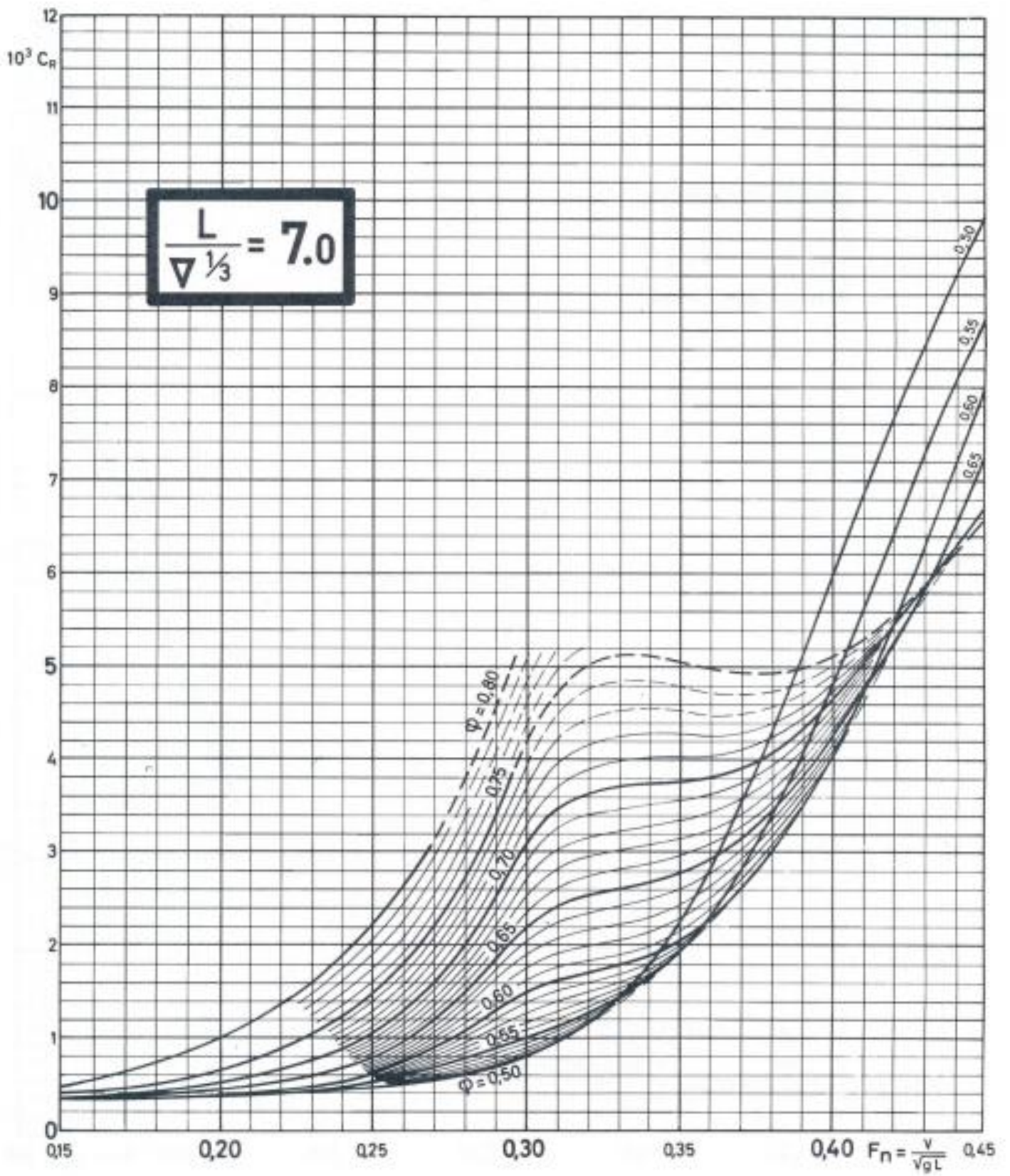


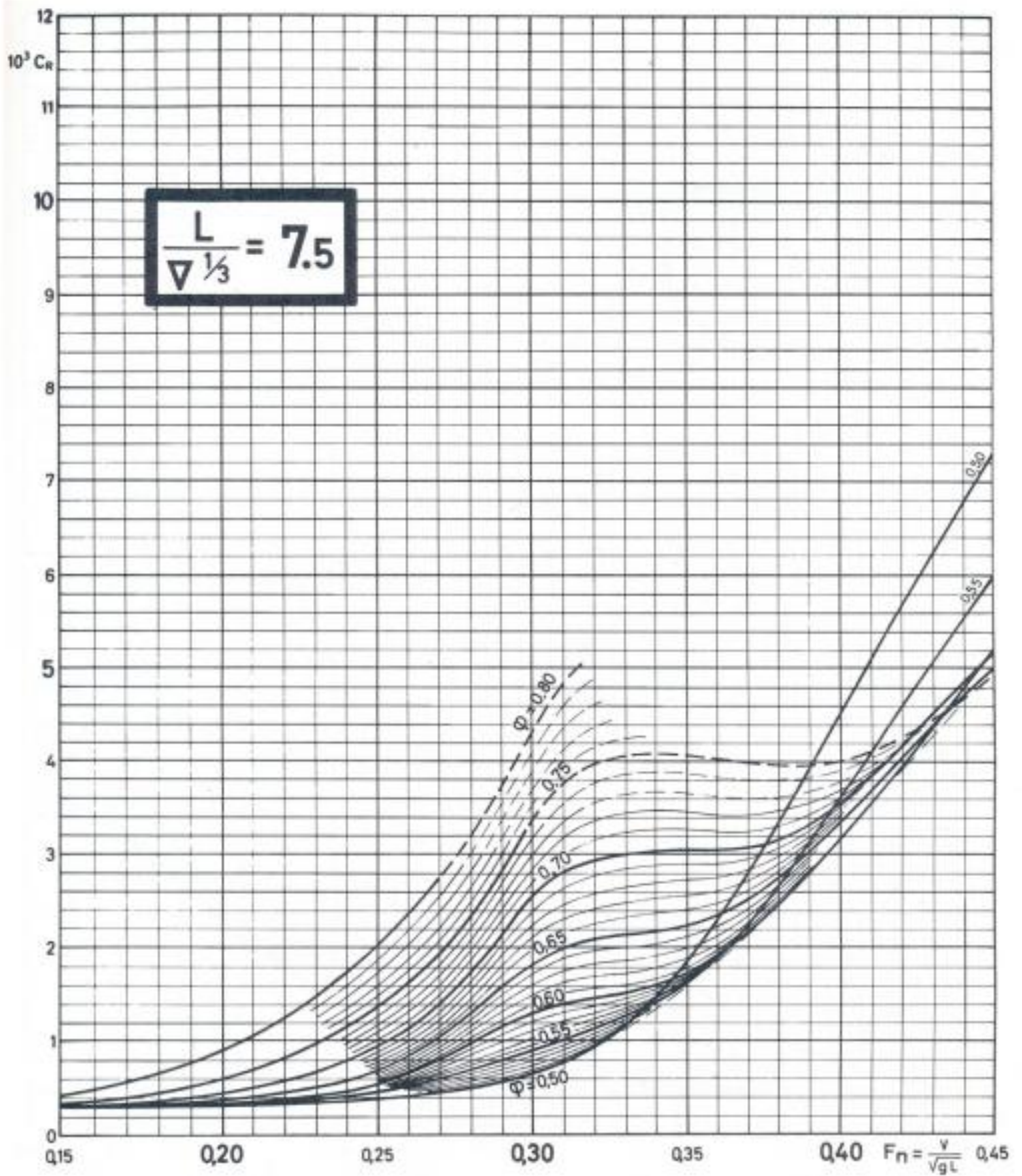


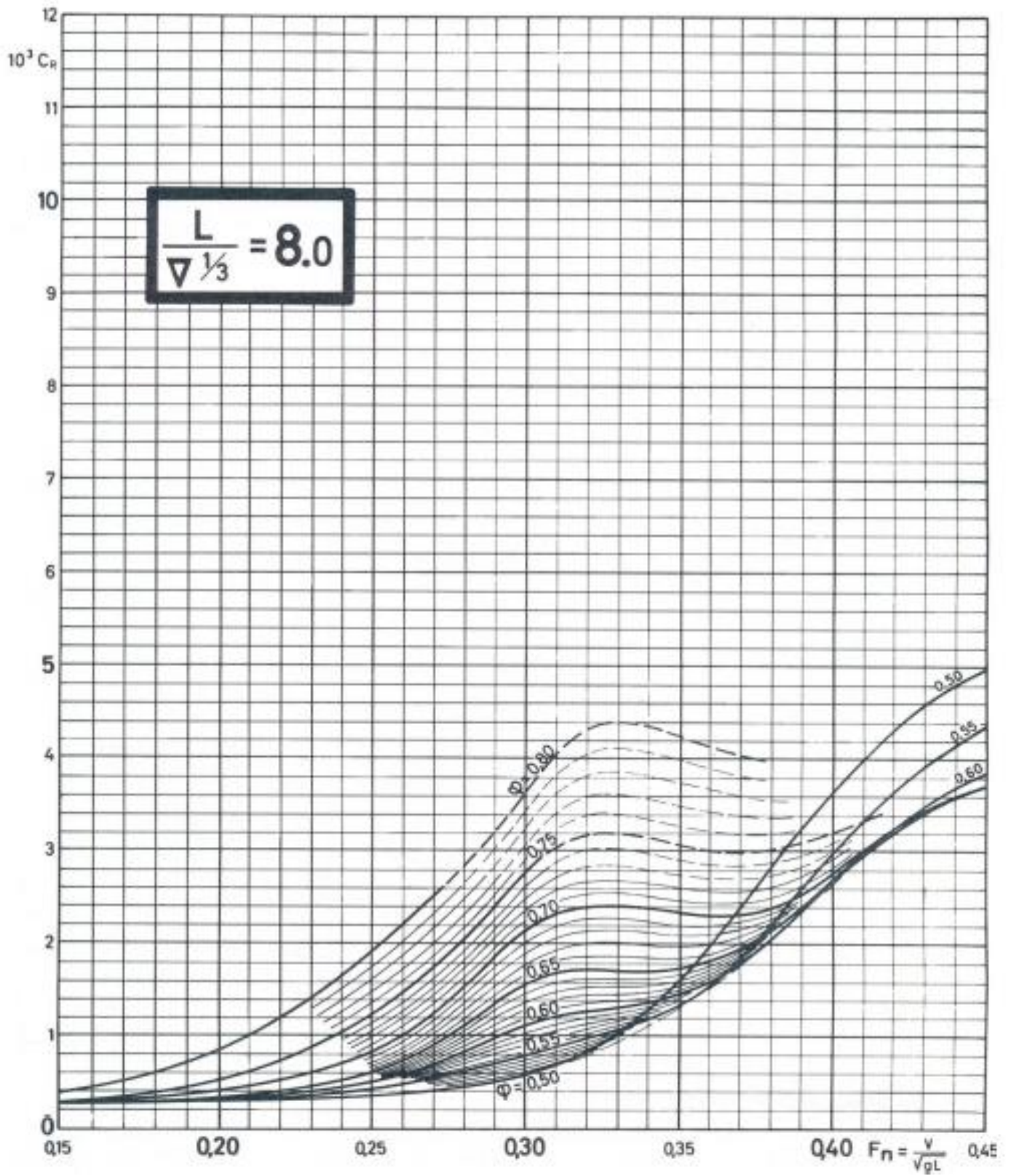












Código MATLAB

Menú inicial.

```
function varargout = Menu1(varargin)
% MENU1 MATLAB code for Menu1.fig
%   MENU1, by itself, creates a new MENU1 or raises the existing
%   singleton*.
%
%   H = MENU1 returns the handle to a new MENU1 or the handle to
%   the existing singleton*.
%
%   MENU1('CALLBACK',hObject,eventData,handles,...) calls the local
%   function named CALLBACK in MENU1.M with the given input arguments.
%
%   MENU1('Property','Value',...) creates a new MENU1 or raises the
%   existing singleton*. Starting from the left, property value
pairs are
%   applied to the GUI before Menu1_OpeningFcn gets called. An
%   unrecognized property name or invalid value makes property
application
%   stop. All inputs are passed to Menu1_OpeningFcn via varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows only
one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help Menu1

% Last Modified by GUIDE v2.5 24-Sep-2019 11:47:22

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',  gui_Singleton, ...
                  'gui_OpeningFcn', @Menu1_OpeningFcn, ...
                  'gui_OutputFcn',  @Menu1_OutputFcn, ...
                  'gui_LayoutFcn',  [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before Menu1 is made visible.
function Menu1_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to Menu1 (see VARARGIN)

% Choose default command line output for Menu1
```

```

handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
handles = guihandles;
axes(handles.axes_Menu);
imshow(imread('Menu.jpg'))
axes(handles.axes_ETSIINO);
imshow(imread('descarga.jpg'))
axes(handles.axes_UPCT);
imshow(imread('UPCT.jpg'))
% UIWAIT makes Menu1 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = Menu1_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
%varargout{1} = handles.output;

% --- Executes on button press in pushbutton_Comenzar.
function pushbutton_Comenzar_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Comenzar (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
Menu2;

% --- Executes on button press in pushbutton_Salir.
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Salir (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
close(gcf);

```

Menú de selección.

```
function varargout = Menu2(varargin)
% MENU2 MATLAB code for Menu2.fig
%     MENU2, by itself, creates a new MENU2 or raises the existing
%     singleton*.
%
%     H = MENU2 returns the handle to a new MENU2 or the handle to
%     the existing singleton*.
%
%     MENU2('CALLBACK',hObject,eventData,handles,...) calls the local
%     function named CALLBACK in MENU2.M with the given input
arguments.
%
%     MENU2('Property','Value',...) creates a new MENU2 or raises the
%     existing singleton*. Starting from the left, property value
pairs are
%     applied to the GUI before Menu2_OpeningFcn gets called. An
%     unrecognized property name or invalid value makes property
application
%     stop. All inputs are passed to Menu2_OpeningFcn via varargin.
%
%     *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
only one
%     instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help Menu2

% Last Modified by GUIDE v2.5 24-Sep-2019 11:48:05

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @Menu2_OpeningFcn, ...
                  'gui_OutputFcn',  @Menu2_OutputFcn, ...
                  'gui_LayoutFcn',   [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before Menu2 is made visible.
function Menu2_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to Menu2 (see VARARGIN)
```

```

% Choose default command line output for Menu2
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
axes(handles.axes_UPCT);
imshow(imread('UPCT2.jpg'));
axes(handles.axes_ETSINO);
imshow(imread('descarga.jpg'));
% UIWAIT makes Menu2 wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = Menu2_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on selection change in popupmenu_TipoBarco.
function popupmenu_TipoBarco_Callback(hObject, eventdata, handles)
% hObject handle to popupmenu_TipoBarco (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global tipo_barco
contents=cellstr(get(handles.popupmenu_TipoBarco, 'String'));% returns
popupmenu1 contents as cell array
tipo_barco=contents{get(handles.popupmenu_TipoBarco, 'Value')};
set(handles.pushbutton_Continuar, 'Enable', 'off');
switch tipo_barco
    case 'Carga general'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Portacontenedores'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Petrolero'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Costero'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});

```



```

        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Bulkcarrier'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Ro-Ro'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Ferry'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Pesquero'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Amadeo García', 'Van Oortmerssen'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Arrastrero'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald', 'Amadeo García', 'Van
Oortmerssen'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Remolcador'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Holtrop y Mennen', 'Guldhammer y Harvald', 'Amadeo García', 'Van
Oortmerssen'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Buque rápido'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Mercier-Savitsky', 'Ping-Zhong'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Patrullero'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Mercier-Savitsky', 'Ping-Zhong'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case 'Militar'
        set(handles.popupmenu_Metodo, 'Enable', 'on');
        set(handles.popupmenu_Metodo, 'String', {'--Selección--',
'Mercier-Savitsky', 'Ping-Zhong'});
        set(handles.popupmenu_Metodo, 'Value', 1);
    case '--Selección--'
        set(handles.popupmenu_Metodo, 'String', '--Selección--');
        set(handles.popupmenu_Metodo, 'Value', 1);
        set(handles.popupmenu_Metodo, 'Enable', 'off');
        set(handles.pushbutton_Continuar, 'Enable', 'off');
end
% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_TipoBarco contents as cell array
%     contents{get(hObject,'Value')} returns selected item from
popupmenu_TipoBarco

% --- Executes during object creation, after setting all properties.

```

```

function popupmenu_TipoBarco_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_TipoBarco (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on selection change in popupmenu_Metodo.
function popupmenu_Metodo_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Metodo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global metodo
contents=cellstr(get(handles.popupmenu_Metodo,'String'));% returns
popupmenu1 contents as cell array
metodo=contents{get(handles.popupmenu_Metodo,'Value')};
switch metodo
    case '--Selección--'
        set(handles.pushbutton_Continuar, 'Enable', 'off');
    case 'Holtrop y Mennen'
        set(handles.pushbutton_Continuar, 'Enable', 'on');
    case 'Guldhammer y Harvald'
        set(handles.pushbutton_Continuar, 'Enable', 'on');
    case 'Amadeo García'
        set(handles.pushbutton_Continuar, 'Enable', 'on');
    case 'Van Oortmerssen'
        set(handles.pushbutton_Continuar, 'Enable', 'on');
    case 'Mercier-Savitsky'
        set(handles.pushbutton_Continuar, 'Enable', 'on');
    case 'Ping-Zhong'
        set(handles.pushbutton_Continuar, 'Enable', 'on');
end
% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Metodo contents as cell array
%       contents{get(hObject,'Value')} returns selected item from
popupmenu_Metodo

% --- Executes during object creation, after setting all properties.
function popupmenu_Metodo_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Metodo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

% --- Executes on button press in pushbutton_Continuar.
function pushbutton_Continuar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Continuar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
contents=cellstr(get(handles.popupmenu_Metodo,'String'));% returns
popupmenu1 contents as cell array
metodo=contents{get(handles.popupmenu_Metodo,'Value')};
if strcmp(metodo,'Holtrop y Mennen')
    HoltropyMennen2;
    %close(gcf);
elseif strcmp(metodo,'Guldhammer y Harvald')
    GuldhammerHarvald;
    %close(gcf);
elseif strcmp(metodo,'Amadeo Garcia')
    AmadeoGarcia;
    %close(gcf);
elseif strcmp(metodo,'Van Oortmerssen')
    VanOortmerssen;
    %close(gcf);
elseif strcmp(metodo,'Mercier-Savitsky')
    MercierSavitsky;
    %close(gcf);
elseif strcmp(metodo,'Ping-Zhong')
    PingZhong;
    %close(gcf);
end
comp=0;

% --- Executes on button press in pushbutton_Atras.
function pushbutton_Atras_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Atras (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
close(gcf)

```

Método de Holtrop y Mennen.

```
function varargout = HoltropyMennen2(varargin)
% HOLTROPYMENNEN2 MATLAB code for HoltropyMennen2.fig
%     HOLTROPYMENNEN2, by itself, creates a new HOLTROPYMENNEN2 or
%     raises the existing
%     singleton*.
%
%     H = HOLTROPYMENNEN2 returns the handle to a new HOLTROPYMENNEN2
%     or the handle to
%     the existing singleton*.
%
%     HOLTROPYMENNEN2('CALLBACK',hObject,eventData,handles,...) calls
%     the local
%     function named CALLBACK in HOLTROPYMENNEN2.M with the given
%     input arguments.
%
%     HOLTROPYMENNEN2('Property','Value',...) creates a new
%     HOLTROPYMENNEN2 or raises the
%     existing singleton*. Starting from the left, property value
%     pairs are
%     applied to the GUI before HoltropyMennen2_OpeningFcn gets
%     called. An
%     unrecognized property name or invalid value makes property
%     application
%     stop. All inputs are passed to HoltropyMennen2_OpeningFcn via
%     varargin.
%
%     *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
%     only one
%     instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help HoltropyMennen2

% Last Modified by GUIDE v2.5 24-Oct-2019 09:56:58

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',  gui_Singleton, ...
                  'gui_OpeningFcn', @HoltropyMennen2_OpeningFcn, ...
                  'gui_OutputFcn',  @HoltropyMennen2_OutputFcn, ...
                  'gui_LayoutFcn',  [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before HoltropyMennen2 is made visible.
```

```

function HoltropyMennen2_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to HoltropyMennen2 (see VARARGIN)

% Choose default command line output for HoltropyMennen2
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes HoltropyMennen2 wait for user response (see UIRESUME)
% uiwait(handles.figure1);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
global tipo_barco;
axes(handles.axes_ETSINO);
imshow(imread('descarga.jpg'))
axes(handles.axes_Buque);
switch tipo_barco
    case 'Carga general'
        imshow(imread('carga general.jpg'));
        set(handles.text_TipoBuque, 'String', 'Carga general');
    case 'Portacontenedores'
        imshow(imread('portacontenedores.jpg'));
        set(handles.text_TipoBuque, 'String', 'Portacontenedores');
    case 'Petrolero'
        imshow(imread('petrolero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Petrolero');
    case 'Costero'
        imshow(imread('costero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Costero');
    case 'Bulkcarrier'
        imshow(imread('bulkcarrier.jpg'));
        set(handles.text_TipoBuque, 'String', 'Bulkcarrier');
    case 'Ro-Ro'
        imshow(imread('ro-ro.jpg'));
        set(handles.text_TipoBuque, 'String', 'Ro-Ro');
    case 'Ferry'
        imshow(imread('ferry.jpg'));
        set(handles.text_TipoBuque, 'String', 'Ferry');
    case 'Arrastrero'
        imshow(imread('arrastrero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Arrastrero');
    case 'Remolcador'
        imshow(imread('remolcador.jpg'));
        set(handles.text_TipoBuque, 'String', 'Remolcador');
end
global calc
global cancelar
cancelar=0;
calc=0;
global comp
global metodo

```

```

global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
global Am
global At
if comp==0
Lf='';
Lpp='';
B='';
T='';
Vmin='';
Vmax='';
VolCarena='';
t='';
XF='';
ATB='';
Sm='';
AGUA='';
Estacion='';
Ruta='';
CP='';
LCB='';
iE='';
SmArbotantes='';
SmHenchimientos='';
At='';
Am='';
else
switch metodo
case 'Guldhammer y Harvald'
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_Lpp, 'String', num2str(Lpp));
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_L, 'String', num2str(Lpp));
set(handles.edit_L, 'Enable', 'off');
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'String', num2str(T));
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_LCB, 'String', num2str(LCB));
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_CP, 'String', num2str(CP));
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));

```

```

set(handles.edit_Vmin,'Enable','off');
set(handles.edit_Vmax,'String',num2str(Vmax));
set(handles.edit_Vmax,'Enable','off');
if AGUA==1
Densidad=1000; %kg/m3
set(handles.radiobutton_Rio,'Value',1);
else
Densidad=1025; %kg/m3
set(handles.radiobutton_Mar,'Value',1);
end
Desp=VolCarena*Densidad;
Desp=Desp/1000;%Toneladas
set(handles.edit_Desp,'String',num2str(Desp));
set(handles.edit_ATB,'String',num2str(ATB));
if ATB==0
set(handles.edit_hb,'String',num2str(0));
else
end
if Sm==0
set(handles.radiobutton_SmNo,'Value',1);
elseif Sm~=0
set(handles.radiobutton_SmSi,'Value',1);
set(handles.edit_Sm,'String',num2str(Sm));
end
if SmArbotantes==0
else
set(handles.radiobutton_Arbotantes,'Value',1);
set(handles.edit_SmArbotantes,'String',num2str(SmArbotantes));
end
if SmHenchimientos==0
else
set(handles.radiobutton_Henchimientos1,'Value',1);
set(handles.radiobutton_Henchimientos2,'Value',1);
end
set(handles.popupmenu_Rutas,'String',Ruta);
set(handles.popupmenu_Estacion,'String',Estacion);
case 'Amadeo García'
set(handles.edit_Lf,'String',num2str(Lf));
set(handles.edit_Lf,'Enable','off');
set(handles.edit_Lpp,'String',num2str(Lpp));
set(handles.edit_Lpp,'Enable','off');
set(handles.edit_L,'String',num2str(Lpp));
set(handles.edit_L,'Enable','off');
set(handles.edit_B,'String',num2str(B));
set(handles.edit_B,'Enable','off');
set(handles.edit_T,'String',num2str(T));
set(handles.edit_T,'Enable','off');
set(handles.edit_Vmin,'String',num2str(Vmin));
set(handles.edit_Vmin,'Enable','off');
set(handles.edit_Vmax,'String',num2str(Vmax));
set(handles.edit_Vmax,'Enable','off');
set(handles.edit_ATB,'String',num2str(ATB));
if ATB==0
set(handles.edit_hb,'String',num2str(0));
else
end
if AGUA==1
Densidad=1000; %kg/m3
set(handles.radiobutton_Rio,'Value',1);
else
Densidad=1025; %kg/m3

```

```

set(handles.radiobutton_Mar, 'Value', 1);
end
Desp=VolCarena*Densidad;
Desp=Desp/1000;%Toneladas
set(handles.edit_Desp, 'String', num2str(Desp));
set(handles.edit_t, 'String', num2str(t));
set(handles.edit_XF, 'String', num2str(XF));
if Sm==0
    set(handles.radiobutton_SmNo, 'Value', 1);
else
    set(handles.radiobutton_SmSi, 'Value', 1);
    set(handles.edit_Sm, 'String', num2str(Sm));
end
set(handles.popupmenu_Rutas, 'String', Ruta);
set(handles.popupmenu_Estacion, 'String', Estacion);
case 'Van Oortmerssen'
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_Lpp, 'String', num2str(Lpp));
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_L, 'String', num2str(Lpp));
set(handles.edit_L, 'Enable', 'off');
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'String', num2str(T));
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_CP, 'String', num2str(CP));
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_LCB, 'String', num2str(LCB));
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
Densidad=1000; %kg/m3
set(handles.radiobutton_Rio, 'Value', 1);
else
Densidad=1025; %kg/m3
set(handles.radiobutton_Mar, 'Value', 1);
end
Desp=VolCarena*Densidad;
Desp=Desp/1000;%Toneladas
set(handles.edit_Desp, 'String', num2str(Desp));
if Sm==0
    set(handles.radiobutton_SmNo, 'Value', 1);
else
    set(handles.radiobutton_SmSi, 'Value', 1);
    set(handles.edit_Sm, 'String', num2str(Sm));
end
if iE==0
    set(handles.radiobutton_iENo, 'Value', 1);
else
    set(handles.radiobutton_iESi, 'Value', 1);
    set(handles.edit_iE, 'String', num2str(iE));
end
set(handles.popupmenu_Rutas, 'String', Ruta);
set(handles.popupmenu_Estacion, 'String', Estacion);
end
end

```



```

% --- Outputs from this function are returned to the command line.
function varargout = HoltropyMennen2_OutputFcn(hObject, eventdata,
handles)
% varargout    cell array for returning output args (see VARARGOUT);
% hObject      handle to figure
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on selection change in popupmenu_Rutas.
function popupmenu_Rutas_Callback(hObject, eventdata, handles)
% hObject      handle to popupmenu_Rutas (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Rutas contents as cell array
%           contents{get(hObject,'Value')} returns selected item from
popupmenu_Rutas
handles = guihandles;
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.popupmenu_Estacion,'Value',1);
else
    set(handles.popupmenu_Estacion,'Enable','on');
    set(handles.popupmenu_Estacion,'Value',1);
end

% --- Executes during object creation, after setting all properties.
function popupmenu_Rutas_CreateFcn(hObject, eventdata, handles)
% hObject      handle to popupmenu_Rutas (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%           See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on selection change in popupmenu_Estacion.
function popupmenu_Estacion_Callback(hObject, eventdata, handles)
% hObject      handle to popupmenu_Estacion (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Estacion contents as cell array
%           contents{get(hObject,'Value')} returns selected item from
popupmenu_Estacion

```

```

% --- Executes during object creation, after setting all properties.
function popupmenu_Estacion_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Calcular.
function pushbutton_Calcular_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Calcular (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
apen=0;
celdas=0;
seleccRuta=0;
seleccForma=0;
seleccConocido=0;
SA=0;
SAxr2=0;
global v
global v1
global v_RT
global v_EHP
global calc
global compplot
if get(handles.radiobutton_Timon1,'Value')==1
    if strcmp(get(handles.edit_r2Timon1,'String'),char(zeros(1,0))) |
strcmp(get(handles.edit_r2Timon1,'String'),'')
        celdas=celdas+1;
    elseif
strcmp(get(handles.edit_SmTimon1,'String'),char(zeros(1,0))) |
strcmp(get(handles.edit_SmTimon1,'String'),'')
        celdas=celdas+1;
    elseif str2num(get(handles.edit_r2Timon1,'String'))<1.3
        apen=apen+1;
    elseif str2num(get(handles.edit_r2Timon1,'String'))>1.5
        apen=apen+1;
    else
        SA=SA+(str2num(get(handles.edit_SmTimon1,'String')));

SAxr2=SAxr2+(str2num(get(handles.edit_SmTimon1,'String'))*(str2num(get
(handles.edit_r2Timon1,'String')));
    end
else
end
if get(handles.radiobutton_Timon3,'Value')==1
    if strcmp(get(handles.edit_r2Timon3,'String'),char(zeros(1,0))) |
strcmp(get(handles.edit_r2Timon3,'String'),'')
        celdas=celdas+1;
    elseif
strcmp(get(handles.edit_SmTimon3,'String'),char(zeros(1,0))) |
strcmp(get(handles.edit_SmTimon3,'String'),'')

```

```

        celdas=celdas+1;
elseif str2num(get(handles.edit_r2Timon3, 'String'))<1.5
    apen=apen+1;
elseif str2num(get(handles.edit_r2Timon3, 'String'))>2
    apen=apen+1;
else
    SA=SA+(str2num(get(handles.edit_SmTimon3, 'String')));
SAxr2=SAxr2+(str2num(get(handles.edit_SmTimon3, 'String'))*(str2num(get(handles.edit_r2Timon3, 'String'))));
end
else
end
if get(handles radiobutton_Quillote, 'Value')==1
    if strcmp(get(handles.edit_r2Quillote, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_r2Quillote, 'String'), '')
        celdas=celdas+1;
    elseif
    strcmp(get(handles.edit_SmQuillote, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmQuillote, 'String'), '')
        celdas=celdas+1;
    elseif str2num(get(handles.edit_r2Quillote, 'String'))<1.5
        apen=apen+1;
    elseif str2num(get(handles.edit_r2Quillote, 'String'))>2
        apen=apen+1;
    else
        SA=SA+(str2num(get(handles.edit_SmQuillote, 'String')));
SAxr2=SAxr2+(str2num(get(handles.edit_SmQuillote, 'String'))*(str2num(get(handles.edit_r2Quillote, 'String'))));
end
else
end
if get(handles radiobutton_Ejes, 'Value')==1
    if strcmp(get(handles.edit_r2Ejes, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_r2Ejes, 'String'), '')
        celdas=celdas+1;
    elseif strcmp(get(handles.edit_SmEjes, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmEjes, 'String'), '')
        celdas=celdas+1;
    elseif str2num(get(handles.edit_r2Ejes, 'String'))<2
        apen=apen+1;
    elseif str2num(get(handles.edit_r2Ejes, 'String'))>4
        apen=apen+1;
    else
        SA=SA+(str2num(get(handles.edit_SmEjes, 'String')));
SAxr2=SAxr2+(str2num(get(handles.edit_SmEjes, 'String'))*(str2num(get(handles.edit_r2Ejes, 'String'))));
end
else
end
if get(handles radiobutton_Timon2, 'Value')==1
    if strcmp(get(handles.edit_SmTimon2, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmTimon2, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmTimon2, 'String')));
SAxr2=SAxr2+(str2num(get(handles.edit_SmTimon2, 'String'))*(str2num(get(handles.edit_r2Timon2, 'String'))));

```

```

end
end
if get(handles.radiobutton_Arbotantes, 'Value')==1
    if strcmp(get(handles.edit_SmArbotantes, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmArbotantes, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmArbotantes, 'String')));
    SAxr2=SAxr2+(str2num(get(handles.edit_SmArbotantes, 'String'))*(str2num(
get(handles.edit_r2Arbotantes, 'String')));
    end
end
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    if
    strcmp(get(handles.edit_SmHenchimientos1, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmHenchimientos1, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmHenchimientos1, 'String')));
    SAxr2=SAxr2+(str2num(get(handles.edit_SmHenchimientos1, 'String'))*(st
r2num(get(handles.edit_r2Henchimientos1, 'String')));
    end
end
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    if
    strcmp(get(handles.edit_SmHenchimientos2, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmHenchimientos2, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmHenchimientos2, 'String')));
    SAxr2=SAxr2+(str2num(get(handles.edit_SmHenchimientos2, 'String'))*(st
r2num(get(handles.edit_r2Henchimientos2, 'String')));
    end
end
if get(handles.radiobutton_Aletas, 'Value')==1
    if strcmp(get(handles.edit_SmAletas, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmAletas, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmAletas, 'String')));
    SAxr2=SAxr2+(str2num(get(handles.edit_SmAletas, 'String'))*(str2num(ge
t(handles.edit_r2Aletas, 'String')));
    end
end
if get(handles.radiobutton_Domo, 'Value')==1
    if strcmp(get(handles.edit_SmDomo, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmDomo, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmDomo, 'String')));
    SAxr2=SAxr2+(str2num(get(handles.edit_SmDomo, 'String'))*(str2num(get(
handles.edit_r2Domo, 'String')));
    end
end
if get(handles.radiobutton_QuillaBalance, 'Value')==1

```

```

    if
    strcmp(get(handles.edit_SmQuillaBalance, 'String'), char(zeros(1,0))) |
    strcmp(get(handles.edit_SmQuillaBalance, 'String'), '')
        celdas=celdas+1;
    else
        SA=SA+(str2num(get(handles.edit_SmQuillaBalance, 'String')));
    SAxr2=SAxr2+(str2num(get(handles.edit_SmQuillaBalance, 'String'))*(str
    2num(get(handles.edit_r2QuillaBalance, 'String')));
    end
end
if strcmp(get(handles.edit_Lpp, 'String'), '') |
strcmp(get(handles.edit_Lpp, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_Desp, 'String'), '') |
strcmp(get(handles.edit_Desp, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_ATB, 'String'), '') |
strcmp(get(handles.edit_ATB, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_hb, 'String'), '') |
strcmp(get(handles.edit_hb, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_ATR, 'String'), '') |
strcmp(get(handles.edit_ATR, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_KS, 'String'), '') |
strcmp(get(handles.edit_KS, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_LCB, 'String'), '') |
strcmp(get(handles.edit_LCB, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_XF, 'String'), '') |
strcmp(get(handles.edit_XF, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if strcmp(get(handles.edit_t, 'String'), '') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
celdas=celdas+1;
else
end
if get(handles radiobutton_SmSi, 'Value')==1
    if strcmp(get(handles.edit_Sm, 'String'), '') |
    strcmp(get(handles.edit_Sm, 'String'), char(zeros(1,0)))
        celdas=celdas+1;
    else

```

```

    end
end
if get(handles radiobutton_iESi, 'Value')==1
    if strcmp(get(handles.edit_iE, 'String'), '') |
strcmp(get(handles.edit_iE, 'String'), char(zeros(1,0)))
        celdas=celdas+1;
    else
    end
end
if get(handles radiobutton_iESi, 'Value')==0 &&
get(handles radiobutton_iENo, 'Value')==0
    seleccConocido=seleccConocido+1;
elseif get(handles radiobutton_SmSi, 'Value')==0 &&
get(handles radiobutton_SmNo, 'Value')==0
    seleccConocido=seleccConocido+1;
else
end
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
contents=cellstr(get(handles.popupmenu_Estacion, 'String'));
Estacion=contents{get(handles.popupmenu_Estacion, 'Value')};
if strcmp(Ruta, '--Selección--')
    seleccRuta=seleccRuta+1;
elseif strcmp(Ruta, 'Desconocida')
else
    if strcmp(Estacion, '--Selección--')
        seleccRuta=seleccRuta+1;
    else
    end
end
contents=cellstr(get(handles.popupmenu_TipoForma, 'String'));
TipoForma=contents{get(handles.popupmenu_TipoForma, 'Value')};
if strcmp(TipoForma, '--Selección--')
    seleccForma=seleccForma+1;
else
end
if celdas~=0
msgbox('Rellene todas las celdas vacías.', 'Error', 'error');
elseif seleccConocido~=0
msgbox('Seleccione si conoce o no los valores de Sm y
iE.', 'Error', 'error');
elseif apen~=0
msgbox('Corrija los valores de (1+k2) fuera de
rango.', 'Error', 'error');
elseif seleccRuta~=0
msgbox('Asegurese de seleccionar alguna ruta y estación de
servicio.', 'Error', 'error');
elseif seleccForma~=0
msgbox('Asegurese de seleccionar algún tipo de forma de la
popa.', 'Error', 'error');
else
L=str2num(get(handles.edit_L, 'String'));
Lf=str2num(get(handles.edit_Lf, 'String'));
Lpp=str2num(get(handles.edit_Lpp, 'String'));
B=str2num(get(handles.edit_B, 'String'));
T=str2num(get(handles.edit_T, 'String'));
CP=str2num(get(handles.edit_CP, 'String'));
Vmin=str2num(get(handles.edit_Vmin, 'String'));
Vmax=str2num(get(handles.edit_Vmax, 'String'));
Desp=str2num(get(handles.edit_Desp, 'String'));
ATB=str2num(get(handles.edit_ATB, 'String'));

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hb=str2num(get(handles.edit_hb,'String'));
ATR=str2num(get(handles.edit_ATR,'String'));
KS=str2num(get(handles.edit_KS,'String'));
LCB=str2num(get(handles.edit_LCB,'String'));
XF=str2num(get(handles.edit_XF,'String'));
t=str2num(get(handles.edit_t,'String'));
if get(handles radiobutton_Rio,'Value')==1
Densidad=1000; %kg/m3
Viscdinam=1.141*10^-6; %m2/s
else
Densidad=1026; %kg/m3
Viscdinam=1.223*10^-6; %m2/s
end
v_Fn=[];
v_Rn=[];
v_RV=[];
v_RAP=[];
v_EHP=[];
v_RT=[];
v_RW=[];
v_RB=[];
v_RTR=[];
v_RA=[];
for V=Vmin:0.001:Vmax
Volcarena=Desp*1000/Densidad; %m^3
CB=Volcarena/(Lf*B*T);
lcb=100*LCB/Lf;
Rn=V*0.514444*Lf/Viscdinam;
v_Rn=[v_Rn Rn];
CM=CB/CP;
Fn=V*0.514444/((9.81*Lf)^(1/2));
v_Fn=[v_Fn Fn];
switch TipoForma
case 'Tipo góndola'
CSTERN=-25;
case 'Cuadernas en V'
CSTERN=-10;
case 'Cuadernas normales'
CSTERN=0;
case 'Cuadernas en U con popa Hogner'
CSTERN=10;
end
C14=1+0.011*CSTERN;
Lr=Lpp*(1-CP+(0.06*CP*lcb)/(4*CP-1));
r1=0.93+0.487118*C14*(B/Lf)^1.06806*(T/Lf)^0.46106*(Lf/Lr)^0.121563*(L
f^3/Volcarena)^0.36486*(1-CP)^(-0.604247);
CF=0.075/((log10(Rn)-2)^2);
if get(handles radiobutton_SmSi,'Value')==1
Sm=str2num(get(handles.edit_Sm,'String'));
else
Sm=L*(2*T+B)*CM^0.5*(0.453+0.4425*CB-0.2862*CM-
0.003467*B/7+0.3696*CF)+2.38*ATB/CB;
end
if get(handles radiobutton_iESi,'Value')==1
iE=str2num(get(handles.edit_iE,'String'));
else
iE=1+89*exp(-(Lf/B)^0.80856*(1-CF)^0.30484*(1-CP-
0.0225*lcb)^0.6367*(Lr/B)^0.34574*(100*Volcarena/Lf^3)^0.16302);
end
RV=0.5*Densidad/9.81*Sm*(V*0.514444)^2*CF*r1;
if SA==0

```

```

RAP=0;
else
  r2eq=SAxr2/SA;
  RAP=0.5*Densidad/9.81*SA*(V*0.514444)^2*CF*r2eq;
end
if B/Lf<0.11
  C7=0.229577*(B/Lf)^0.333333;
elseif 0.11<=B/Lf && B/Lf<=0.25
  C7=B/Lf;
else
  C7=0.5-0.0625*Lf/B;
end
if t==0
  TPR=T;
  TPP=T;
elseif t>0
  tPR=t/Lpp*(Lpp/2-XF);
  tPP=t-tPR;
  TPR=T+tPR;
  TPP=T-tPP;
else
  tPR=abs(t)/Lpp*(Lpp/2-XF);
  tPP=abs(t)-tPR;
  TPR=T-tPR;
  TPP=T+tPP;
end
C1=2223105*C7^3.78613*(T/B)^1.07961*(90-iE)^(-1.37565);
C3=0.56*ATB^1.5/(B*T*(ATB^0.5+TPR-hb));
C2=exp(-1.89*(C3)^0.5);
TM=(TPR+TPP)/2;
C5=1-0.8*ATR/(B*TM*CM);
if CP<=0.8
  C16=8.07981*CP-13.8673*CP^2+6.984388*CP^3;
else
  C16=1.73014-0.7067*CP;
end
m1=0.014047*Lf/T-1.75254*Volcarena^(1/3)/Lf-4.79323*B/Lf-C16;
if Lf^3/Volcarena<=512
  C15=-1.69385;
elseif 512<(Lf^3/Volcarena)<1727
  C15=-1.69385+(Lf/(Volcarena^(1/3))-8)/2.36;
else
  C15=0;
end
if Lf/B<=12
  Lambda=1.446*CP-0.03*Lf/B;
else
  Lambda=1.446*CP-0.36;
end
C17=6919.3*CM^(-1.3346)*(Volcarena/Lf^3)^2.00977*(Lf/(B-2))^1.40692;
m2=C15*CP^2*0.4*exp(-0.1*Fn^(-2));
m3=-7.2035*(B/Lf)^0.326869*(T/B)^0.605375;
m4=C15*0.4*exp(-0.034*Fn^(-3.29));
if Fn<=0.4
  RWA=Densidad/9.81*9.81*Volcarena*C1*C2*C5*exp(m1*Fn^(-
0.9)+m2*cos(Lambda*Fn^(-2)));
  RW=RWA;
elseif Fn>=0.55
  RWB=Densidad/9.81*9.81*Volcarena*C17*C2*C5*exp(m3*Fn^(-
0.9)+m4*cos(Lambda*Fn^(-2)));
  RW=RWB;

```



```

else
    RWA04=Densidad/9.81*9.81*Volcarena*C1*C2*C5*exp(m1*0.4^(-
0.9)+m4*cos(Lambda*0.4^(-2)));
    RWB055=Densidad/9.81*9.81*Volcarena*C17*C2*C5*exp(m3*0.55^(-
0.9)+m4*cos(Lambda*0.55^(-2)));
    RW=RWA04+(10*Fn-4)*(RWB055-RWA04)/1.5;
end
%%Calculamos la resistencia producida por el bulbo cerca de la
flotación RB
Fni=V*0.514444/sqrt(9.81*(TPR-hb-0.25*sqrt(ATB))+0.15*(V*0.514444)^2);
PB=0.56*sqrt(ATB)/(TPR-1.5*hb);
RB=0.11*exp(-3*PB^(-2))*Fni^3*ATB^1.5*Densidad/9.81*9.81/(1+Fni^2);
%%Calculamos la resistencia adicional debida a la inmersión del espejo
RTR
FnNT=V*0.514444/sqrt(2*9.81*ATR/(B+B*CF));
if FnNT<5
    C6=0.2*(1-0.2*FnNT);
else
    C6=0;
end
RTR=0.5*Densidad/9.81*(V*0.514444)^2*ATR*C6;
%%Calculamos la resistencia debida a la correlación modelo-buque RA
if KS<=150
    C3=1-0.8*ATR/(B*TM*CM);
    C2=exp(-1.89*sqrt(C3));
    if TPR/Lf<=0.04
        C4=TPR/Lf;
    else
        C4=0.04;
    end
    CA=0.006*(Lf+100)^(-0.16)-
0.00205+0.003*(Lf/7.5)^0.5*CB^4*C2*(0.04-C4);
else
    CA=(0.105*KS^(1/3)-0.0579)/(Lf^(1/3));
end
RA=0.5*Densidad/9.81*Sm*(V*0.514444)^2*CA;
RT=RV+RAP+RW+RB+RTR+RA;
if strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Verano')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Pacífico') & strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Pacífico') & strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Verano')
    RT=RT*1.12;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Invierno')
    RT=RT*1.18;
elseif strcmp(Ruta,'Ruta del Este Asia') & strcmp(Estacion,'Verano')
    RT=RT*1.15;

```

```

elseif strcmp(Ruta,'Ruta del Este Asia') & strcmp(Estacion,'Invierno')
    RT=RT*1.2;
else
end
EHP=RT*V*0.514444/75;
v_EHP=[v_EHP EHP];
v_RT=[v_RT RT];
v_RV=[v_RV RV];
v_RA=[v_RA RA];
v_RAP=[v_RAP RAP];
v_RW=[v_RW RW];
v_RB=[v_RB RB];
v_RTR=[v_RTR RTR];
end
v=[Vmin:0.001:Vmax];
V=[];
Fn=[];
Rn=[];
RT=[];
RV=[];
RW=[];
RA=[];
RAP=[];
RB=[];
RTR=[];
EHP=[];
for i=1:( (Vmin+1-Vmin)/0.001):( (Vmax-Vmin)/0.001+1)
    V=[V v(i)];
    Fn=[Fn v_Fn(i)];
    Rn=[Rn v_Rn(i)];
    RT=[RT v_RT(i)];
    RV=[RV v_RV(i)];
    RW=[RW v_RW(i)];
    RB=[RB v_RB(i)];
    RA=[RA v_RA(i)];
    RAP=[RAP v_RAP(i)];
    RTR=[RTR v_RTR(i)];
    EHP=[EHP v_EHP(i)];
end
T=table(V',Fn',Rn',RV',RW',RAP',RB',RTR',RA',RT',EHP');
T.Properties.VariableNames={'V_kn','Fn','Rn','RV_kg','RW_kg','RAP_kg',
'RB_kg','RTR_kg','RA_kg','RT_kg','EHP_CV'};
disp('-----Método de
Holtrop y Mennen-----')
disp(' ')
disp(T)
v1=[Vmin:1:Vmax];
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b');axis tight;hold on
set(handles.plot1,'HitTest','off');
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('RT(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r');axis tight;hold on
set(handles.plot2,'HitTest','off');
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,handles) )

```

```

xlabel('V(kn)')
ylabel('EHP(C.V.)')
calc=1;
compplot=0;
set(handles.pushbutton_Comparar,'Enable','on');
end

% --- Executes on button press in pushbutton_Borrar.
function pushbutton_Borrar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Borrar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global calc
global comp
global metodo
if comp==0
calc=0;
set(handles.pushbutton_Comparar,'Enable','off');
cla(handles.axes_Rt,'reset')
cla(handles.axes_EHP,'reset')
set(handles.edit_L,'String','');
set(handles.edit_L,'Enable','on');
set(handles.edit_Lf,'String','');
set(handles.edit_Lf,'Enable','on');
set(handles.edit_B,'String','');
set(handles.edit_B,'Enable','on');
set(handles.edit_T,'String','');
set(handles.edit_T,'Enable','on');
set(handles.edit_CP,'String','');
set(handles.edit_CP,'Enable','on');
set(handles.edit_Vmin,'String','');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'String','');
set(handles.edit_Vmax,'Enable','on');
set(handles.edit_Lpp,'String','');
set(handles.edit_Lpp,'Enable','off');
set(handles.edit_Desp,'String','');
set(handles.edit_Desp,'Enable','off');
set(handles.edit_ATB,'String','');
set(handles.edit_ATB,'Enable','off');
set(handles.edit_hb,'String','');
set(handles.edit_hb,'Enable','off');
set(handles.edit_ATR,'String','');
set(handles.edit_ATR,'Enable','off');
set(handles.edit_KS,'String','');
set(handles.edit_KS,'Enable','off');
set(handles.edit_LCB,'String','');
set(handles.edit_LCB,'Enable','off');
set(handles.edit_XF,'String','');
set(handles.edit_XF,'Enable','off');
set(handles.edit_t,'String','');
set(handles.edit_t,'Enable','off');
set(handles.edit_Sm,'Enable','off');
set(handles.edit_iE,'Enable','off');
set(handles.radiobutton_SmSi,'Enable','off');
set(handles.radiobutton_SmNo,'Enable','off');
set(handles.radiobutton_iESi,'Enable','off');
set(handles.radiobutton_iENo,'Enable','off');
set(handles.popupmenu_Rutas,'Enable','off');
set(handles.popupmenu_Rutas,'Value',1);
set(handles.popupmenu_Estacion,'Enable','off');

```

```

set(handles.popupmenu_Estacion,'Value',1);
set(handles.popupmenu_TipoForma,'Enable','off');
set(handles.popupmenu_TipoForma,'Value',1);
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Rio,'Value',0);
set(handles.radiobutton_Mar,'Enable','off');
set(handles.radiobutton_Mar,'Value',1);
set(handles.radiobutton_Timon1,'Value',0);
set(handles.radiobutton_Timon1,'Enable','off');
set(handles.edit_SmTimon1,'String','');
set(handles.edit_SmTimon1,'Enable','off');
set(handles.edit_r2Timon1,'String','');
set(handles.edit_r2Timon1,'Enable','off');
set(handles.radiobutton_Timon2,'Value',0);
set(handles.radiobutton_Timon2,'Enable','off');
set(handles.edit_SmTimon2,'String','');
set(handles.edit_SmTimon2,'Enable','off');
set(handles.edit_r2Timon2,'String','');
set(handles.edit_r2Timon2,'Enable','off');
set(handles.radiobutton_Timon3,'Value',0);
set(handles.radiobutton_Timon3,'Enable','off');
set(handles.edit_SmTimon3,'String','');
set(handles.edit_SmTimon3,'Enable','off');
set(handles.edit_r2Timon3,'String','');
set(handles.edit_r2Timon3,'Enable','off');
set(handles.radiobutton_Quillote,'Value',0);
set(handles.radiobutton_Quillote,'Enable','off');
set(handles.edit_SmQuillote,'String','');
set(handles.edit_SmQuillote,'Enable','off');
set(handles.edit_r2Quillote,'String','');
set(handles.edit_r2Quillote,'Enable','off');
set(handles.radiobutton_Arbotantes,'Value',0);
set(handles.radiobutton_Arbotantes,'Enable','off');
set(handles.edit_SmArbotantes,'String','');
set(handles.edit_SmArbotantes,'Enable','off');
set(handles.edit_r2Arbotantes,'String','');
set(handles.edit_r2Arbotantes,'Enable','off');
set(handles.radiobutton_Henchimientos1,'Value',0);
set(handles.radiobutton_Henchimientos1,'Enable','off');
set(handles.edit_SmHenchimientos1,'String','');
set(handles.edit_SmHenchimientos1,'Enable','off');
set(handles.edit_r2Henchimientos1,'String','');
set(handles.edit_r2Henchimientos1,'Enable','off');
set(handles.radiobutton_Henchimientos2,'Value',0);
set(handles.radiobutton_Henchimientos2,'Enable','off');
set(handles.edit_SmHenchimientos2,'String','');
set(handles.edit_SmHenchimientos2,'Enable','off');
set(handles.edit_r2Henchimientos2,'String','');
set(handles.edit_r2Henchimientos2,'Enable','off');
set(handles.radiobutton_Ejes,'Value',0);
set(handles.radiobutton_Ejes,'Enable','off');
set(handles.edit_SmEjes,'String','');
set(handles.edit_SmEjes,'Enable','off');
set(handles.edit_r2Ejes,'String','');
set(handles.edit_r2Ejes,'Enable','off');
set(handles.radiobutton_Aletas,'Value',0);
set(handles.radiobutton_Aletas,'Enable','off');
set(handles.edit_SmAletas,'String','');
set(handles.edit_SmAletas,'Enable','off');
set(handles.edit_r2Aletas,'String','');
set(handles.edit_r2Aletas,'Enable','off');

```

```

set(handles.radiobutton_Domo,'Value',0);
set(handles.radiobutton_Domo,'Enable','off');
set(handles.edit_SmDomo,'String','');
set(handles.edit_SmDomo,'Enable','off');
set(handles.edit_r2Domo,'String','');
set(handles.edit_r2Domo,'Enable','off');
set(handles.radiobutton_QuillaBalance,'Value',0);
set(handles.radiobutton_QuillaBalance,'Enable','off');
set(handles.edit_SmQuillaBalance,'String','');
set(handles.edit_SmQuillaBalance,'Enable','off');
set(handles.edit_r2QuillaBalance,'String','');
set(handles.edit_r2QuillaBalance,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Referencias,'Enable','off');
set(handles.pushbutton_Rangos,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
axes(handles.axes_Rt);
cla;
axes(handles.axes_EHP);
cla;
else
set(handles.edit_ATR,'String','');
set(handles.edit_ATR,'Enable','off');
set(handles.edit_KS,'String','');
set(handles.edit_KS,'Enable','off');
set(handles.pushbutton_Comparar,'Enable','off');
set(handles.radiobutton_Timon1,'Value',0);
set(handles.radiobutton_Timon1,'Enable','off');
set(handles.edit_SmTimon1,'String','');
set(handles.edit_SmTimon1,'Enable','off');
set(handles.edit_r2Timon1,'String','');
set(handles.edit_r2Timon1,'Enable','off');
set(handles.radiobutton_Timon2,'Value',0);
set(handles.radiobutton_Timon2,'Enable','off');
set(handles.edit_SmTimon2,'String','');
set(handles.edit_SmTimon2,'Enable','off');
set(handles.edit_r2Timon2,'String','');
set(handles.edit_r2Timon2,'Enable','off');
set(handles.radiobutton_Timon3,'Value',0);
set(handles.radiobutton_Timon3,'Enable','off');
set(handles.edit_SmTimon3,'String','');
set(handles.edit_SmTimon3,'Enable','off');
set(handles.edit_r2Timon3,'String','');
set(handles.edit_r2Timon3,'Enable','off');
set(handles.radiobutton_Quillote,'Value',0);
set(handles.radiobutton_Quillote,'Enable','off');
set(handles.edit_SmQuillote,'String','');
set(handles.edit_SmQuillote,'Enable','off');
set(handles.edit_r2Quillote,'String','');
set(handles.edit_r2Quillote,'Enable','off');
set(handles.radiobutton_Arbotantes,'Value',0);
set(handles.radiobutton_Arbotantes,'Enable','off');
set(handles.edit_SmArbotantes,'String','');
set(handles.edit_SmArbotantes,'Enable','off');
set(handles.edit_r2Arbotantes,'String','');
set(handles.edit_r2Arbotantes,'Enable','off');
set(handles.radiobutton_Henchimientos1,'Value',0);
set(handles.radiobutton_Henchimientos1,'Enable','off');
set(handles.edit_SmHenchimientos1,'String','');
set(handles.edit_SmHenchimientos1,'Enable','off');

```

```

set(handles.edit_r2Henchimientos1,'String','');
set(handles.edit_r2Henchimientos1,'Enable','off');
set(handles.radiobutton_Henchimientos2,'Value',0);
set(handles.radiobutton_Henchimientos2,'Enable','off');
set(handles.edit_SmHenchimientos2,'String','');
set(handles.edit_SmHenchimientos2,'Enable','off');
set(handles.edit_r2Henchimientos2,'String','');
set(handles.edit_r2Henchimientos2,'Enable','off');
set(handles.radiobutton_Ejes,'Value',0);
set(handles.radiobutton_Ejes,'Enable','off');
set(handles.edit_SmEjes,'String','');
set(handles.edit_SmEjes,'Enable','off');
set(handles.edit_r2Ejes,'String','');
set(handles.edit_r2Ejes,'Enable','off');
set(handles.radiobutton_Aletas,'Value',0);
set(handles.radiobutton_Aletas,'Enable','off');
set(handles.edit_SmAletas,'String','');
set(handles.edit_SmAletas,'Enable','off');
set(handles.edit_r2Aletas,'String','');
set(handles.edit_r2Aletas,'Enable','off');
set(handles.radiobutton_Domo,'Value',0);
set(handles.radiobutton_Domo,'Enable','off');
set(handles.edit_SmDomo,'String','');
set(handles.edit_SmDomo,'Enable','off');
set(handles.edit_r2Domo,'String','');
set(handles.edit_r2Domo,'Enable','off');
set(handles.radiobutton_QuillaBalance,'Value',0);
set(handles.radiobutton_QuillaBalance,'Enable','off');
set(handles.edit_SmQuillaBalance,'String','');
set(handles.edit_SmQuillaBalance,'Enable','off');
set(handles.edit_r2QuillaBalance,'String','');
set(handles.edit_r2QuillaBalance,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Referencias,'Enable','off');
set(handles.pushbutton_Rangos,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.popupmenu_TipoForma,'Enable','off');
set(handles.popupmenu_TipoForma,'Value',1);
axes(handles.axes_Rt);
cla;
axes(handles.axes_EHP);
cla;
switch metodo
case 'Guldhammer y Harvald'
    set(handles.edit_XF,'Enable','off');
    set(handles.edit_XF,'String','');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.radiobutton_iESi,'Value',0);
    set(handles.radiobutton_iENo,'Value',0);
    set(handles.edit_iE,'Enable','off');
    set(handles.edit_iE,'String','');
    if str2num(get(handles.edit_ATB,'String'))==0
        set(handles.edit_hb,'Enable','off');
    else
        set(handles.edit_hb,'String','');
        set(handles.edit_hb,'Enable','off');
    end
    set(handles.edit_t,'String','');
    set(handles.edit_LCB,'Enable','off');

```

```

    set(handles.edit_LCB,'String','');
    set(handles.edit_t,'Enable','off');
case 'Amadeo García'
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_LCB,'String','');
    if str2num(get(handles.edit_ATB,'String'))==0
        set(handles.edit_hb,'Enable','off');
    else
        set(handles.edit_ATB,'Enable','off');
        set(handles.edit_ATB,'String','');
        set(handles.edit_hb,'String','');
        set(handles.edit_hb,'Enable','off');
    end
end
set(handles.radiobutton_iESi,'Enable','off');
set(handles.radiobutton_iENo,'Enable','off');
set(handles.radiobutton_iESi,'Value',0);
set(handles.radiobutton_iENo,'Value',0);
set(handles.edit_iE,'Enable','off');
set(handles.edit_iE,'String','');
set(handles.edit_CP,'Enable','on');
set(handles.edit_CP,'String','');
case 'Van Oortmerssen'
    set(handles.edit_ATB,'Enable','off');
    set(handles.edit_ATB,'String','');
    set(handles.edit_hb,'Enable','off');
    set(handles.edit_XF,'Enable','off');
    set(handles.edit_t,'String','');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_XF,'String','');
end
end

function edit_Lpp_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lpp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: set(hObject,'String') returns contents of edit_Lpp as text
%        str2double(set(hObject,'String')) returns contents of
edit_Lpp as a double
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_Lpp,'String'))<=0
    msgbox('El valor de la eslora entre perpendiculares es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Desp,'Enable','off');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_ATB,'Enable','off');
    set(handles.edit_hb,'Enable','off');
    set(handles.edit_ATR,'Enable','off');
    set(handles.edit_KS,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_XF,'Enable','off');
    set(handles.pushbutton_Referencias,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');

```

```

set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else

```



```

        set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles radiobutton_SmSi, 'Enable', 'on');
    set(handles radiobutton_SmNo, 'Enable', 'on');
    set(handles radiobutton_iESi, 'Enable', 'on');
    set(handles radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles radiobutton_Rio, 'Enable', 'on');
    set(handles radiobutton_Mar, 'Enable', 'on');
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Timon1, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon1, 'Value')==1
        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
        set(handles radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles radiobutton_Henchimientos1, 'Enable', 'on');

```

```

if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lpp_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lpp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.

```

```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_Despl_Callback(hObject, eventdata, handles)
% hObject     handle to edit_Despl (see GCBO)
% eventdata   reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Despl as text
%         str2double(get(hObject,'String')) returns contents of
edit_Despl as a double
handles = guidata(hObject);
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_Despl,'String'))<=0
    msgbox('El valor del desplazamiento es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lpp,'Enable','off');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_ATB,'Enable','off');
    set(handles.edit_hb,'Enable','off');
    set(handles.edit_ATR,'Enable','off');
    set(handles.edit_KS,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_XF,'Enable','off');
    set(handles.pushbutton_Referencias,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.popupmenu_TipoForma,'Enable','off');
    set(handles.radiobutton_Rio,'Enable','off');
    set(handles.radiobutton_Mar,'Enable','off');
    set(handles.radiobutton_Timon1,'Enable','off');
    set(handles.edit_SmTimon1,'Enable','off');
    set(handles.edit_r2Timon1,'Enable','off');
    set(handles.radiobutton_Timon2,'Enable','off');
    set(handles.edit_SmTimon2,'Enable','off');
    set(handles.edit_r2Timon2,'Enable','off');
    set(handles.radiobutton_Timon3,'Enable','off');
    set(handles.edit_SmTimon3,'Enable','off');
    set(handles.edit_r2Timon3,'Enable','off');
    set(handles.radiobutton_Quillote,'Enable','off');
    set(handles.edit_SmQuillote,'Enable','off');
    set(handles.edit_r2Quillote,'Enable','off');
    set(handles.radiobutton_Arbotantes,'Enable','off');
    set(handles.edit_SmArbotantes,'Enable','off');
    set(handles.edit_r2Arbotantes,'Enable','off');
    set(handles.radiobutton_Henchimientos1,'Enable','off');
    set(handles.edit_SmHenchimientos1,'Enable','off');
    set(handles.edit_r2Henchimientos1,'Enable','off');
    set(handles.radiobutton_Henchimientos2,'Enable','off');
    set(handles.edit_SmHenchimientos2,'Enable','off');
    set(handles.edit_r2Henchimientos2,'Enable','off');
    set(handles.radiobutton_Ejes,'Enable','off');

```

```

set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else

```

```

end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end

```

```

set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Desp_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Desp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_t_Callback(hObject, eventdata, handles)
% hObject    handle to edit_t (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hints: get(hObject, 'String') returns contents of edit_t as text
%         str2double(get(hObject, 'String')) returns contents of edit_t
as a double

% --- Executes during object creation, after setting all properties.
function edit_t_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_t (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%     See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_ATB_Callback(hObject, eventdata, handles)
% hObject     handle to edit_ATB (see GCBO)
% eventdata   reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_ATB as text
%         str2double(get(hObject,'String')) returns contents of
edit_ATB as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_ATB,'String'))<0
    msgbox('El valor del área transversal del bulbo es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');

```

```

set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');

```



```

end
if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');

```

```

if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        set(handles.edit_XF, 'Enable', 'on');
        if get(handles.radiobutton_iESi, 'Value')==1
            set(handles.edit_iE, 'Enable', 'on');
        else
            set(handles.edit_iE, 'Enable', 'off');
        end
        set(handles.edit_t, 'Enable', 'on');
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if get(handles.radiobutton_iESi, 'Value')==1
                set(handles.edit_iE, 'Enable', 'on');
            else
                set(handles.edit_iE, 'Enable', 'off');
            end
            set(handles.radiobutton_iESi, 'Enable', 'on');
            set(handles.radiobutton_iENo, 'Enable', 'on');
            if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0

```

```

else
    set(handles.edit_hb, 'Enable', 'on');
end
case 'Van Oortmerssen'
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
    set(handles radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
    set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
    set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
    set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1

```

```

        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles radiobutton_Ejes, 'Enable', 'on');
    if get(handles radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles radiobutton_Aletas, 'Enable', 'on');
    if get(handles radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles radiobutton_Domo, 'Enable', 'on');
    if get(handles radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_ATB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_ATB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_hb_Callback(hObject, eventdata, handles)
% hObject    handle to edit_hb (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_hb as text
% str2double(get(hObject,'String')) returns contents of edit_hb
as a double
handles = guidata(handles);
global comp
global metodo
if str2num(get(handles.edit_hb,'String'))<0
    msgbox('El valor de hb es incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lpp,'Enable','off');
    set(handles.edit_Desp,'Enable','off');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_ATB,'Enable','off');
    set(handles.edit_ATR,'Enable','off');
    set(handles.edit_KS,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_XF,'Enable','off');
    set(handles.pushbutton_Referencias,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.popupmenu_TipoForma,'Enable','off');
    set(handles.radiobutton_Rio,'Enable','off');
    set(handles.radiobutton_Mar,'Enable','off');
    set(handles.radiobutton_Timon1,'Enable','off');
    set(handles.edit_SmTimon1,'Enable','off');
    set(handles.edit_r2Timon1,'Enable','off');
    set(handles.radiobutton_Timon2,'Enable','off');
    set(handles.edit_SmTimon2,'Enable','off');
    set(handles.edit_r2Timon2,'Enable','off');
    set(handles.radiobutton_Timon3,'Enable','off');
    set(handles.edit_SmTimon3,'Enable','off');
    set(handles.edit_r2Timon3,'Enable','off');
    set(handles.radiobutton_Quillote,'Enable','off');
    set(handles.edit_SmQuillote,'Enable','off');
    set(handles.edit_r2Quillote,'Enable','off');
    set(handles.radiobutton_Arbotantes,'Enable','off');
    set(handles.edit_SmArbotantes,'Enable','off');
    set(handles.edit_r2Arbotantes,'Enable','off');
    set(handles.radiobutton_Henchimientos1,'Enable','off');
    set(handles.edit_SmHenchimientos1,'Enable','off');
    set(handles.edit_r2Henchimientos1,'Enable','off');
    set(handles.radiobutton_Henchimientos2,'Enable','off');
    set(handles.edit_SmHenchimientos2,'Enable','off');
    set(handles.edit_r2Henchimientos2,'Enable','off');
    set(handles.radiobutton_Ejes,'Enable','off');
    set(handles.edit_SmEjes,'Enable','off');
    set(handles.edit_r2Ejes,'Enable','off');
    set(handles.radiobutton_Aletas,'Enable','off');
    set(handles.edit_SmAletas,'Enable','off');
    set(handles.edit_r2Aletas,'Enable','off');
    set(handles.radiobutton_Domo,'Enable','off');
    set(handles.edit_SmDomo,'Enable','off');
    set(handles.edit_r2Domo,'Enable','off');
    set(handles.radiobutton_QuillaBalance,'Enable','off');

```

```

set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
    if get(handles.radiobutton_iESi, 'Value')==1
      set(handles.edit_iE, 'Enable', 'on');
    else
      set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon1, 'Value')==1
      set(handles.edit_SmTimon1, 'Enable', 'on');
      set(handles.edit_r2Timon1, 'Enable', 'on');
    else
      set(handles.edit_SmTimon1, 'Enable', 'off');
      set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon2, 'Value')==1
      set(handles.edit_SmTimon2, 'Enable', 'on');
    else
      set(handles.edit_SmTimon2, 'Enable', 'off');
    end
  end

```

```

if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
else
set(handles.edit_SmDomo, 'Enable', 'off');
end
end

```

```

set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        set(handles.edit_t, 'Enable', 'on');
        set(handles.edit_XF, 'Enable', 'on');
        if get(handles.radiobutton_iESi,'Value')==1
            set(handles.edit_iE,'Enable','on');
        else
            set(handles.edit_iE,'Enable','off');
        end
        set(handles.radiobutton_iESi,'Enable','on');
        set(handles.radiobutton_iENo,'Enable','on');
    case 'Amadeo Garcia'
        set(handles.edit_LCB, 'Enable', 'on');
        if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
                set(handles.edit_ATB, 'Enable', 'on');
            end
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable','on');
            else
                set(handles.edit_iE,'Enable','off');
            end
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
        case 'Van Oortmerssen'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            set(handles.edit_t, 'Enable', 'on');
        end
        if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
            set(handles.radiobutton_Timon1, 'Enable', 'on');
        else
            end
        if get(handles.radiobutton_Timon1, 'Value')==1
            set(handles.edit_SmTimon1, 'Enable', 'on');
            set(handles.edit_r2Timon1, 'Enable', 'on');
        end
    end
end

```



```

else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
end

```

```

        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_hb_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_hb (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_ATR_Callback(hObject, eventdata, handles)
% hObject    handle to edit_ATR (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_ATR as text
%       str2double(get(hObject,'String')) returns contents of
edit_ATR as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_ATR,'String'))<0
    msgbox('El valor de ATR es incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');

```

```

set(handles.edit_hb, 'Enable', 'off');
set(handles.edit_KS, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
    if comp==0
        set(handles.pushbutton_Comparar, 'Enable', 'off');
        set(handles.edit_Desp, 'Enable', 'on');
        set(handles.edit_t, 'Enable', 'on');
        set(handles.edit_ATB, 'Enable', 'on');
        set(handles.edit_hb, 'Enable', 'on');

```

```

set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Quillote, 'Value')==1

```

```

        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
    Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');

```

```

else
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
case 'Guldhammer y Harvald'
set(handles.edit_t, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_XF, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Amadeo García'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');

```

```

else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');

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```

else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_ATR_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_ATR (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_KS_Callback(hObject, eventdata, handles)
% hObject    handle to edit_KS (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_KS as text
%         str2double(get(hObject,'String')) returns contents of edit_KS
as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_KS,'String'))<=0
    msgbox('El valor de la rugosidad del casco es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');

```



```

set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
  end
end

```

```

if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else

```

```

        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
    Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    else
        set(handles.edit_ATR, 'Enable', 'on');
        set(handles.pushbutton_Referencias, 'Enable', 'on');
        set(handles.pushbutton_Cambiar, 'Enable', 'on');
        set(handles.popupmenu_TipoForma, 'Enable', 'on');
    switch metodo
        case 'Guldhammer y Harvald'
            set(handles.edit_t, 'Enable', 'on');
            if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0

```

```

else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_XF, 'Enable', 'on');
if get(handles radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
case 'Amadeo García'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');

```

```

        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');

```

```

    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_KS_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_KS (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Lf_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Lf as text
%        str2double(get(hObject, 'String')) returns contents of edit_Lf
as a double
handles = guihandles;
if str2num(get(handles.edit_Lf, 'String')) <= 0
    msgbox('El valor de la eslora de flotación es
incorrecto.', 'Aviso.', 'error');
    set(handles.edit_L, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(hObject, 'String', '');
else
    set(handles.edit_L, 'Enable', 'on');
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_CP, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lf_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.

```

```

%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_CP_Callback(hObject, eventdata, handles)
% hObject    handle to edit_CP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_CP as text
%       str2double(get(hObject,'String')) returns contents of edit_CP
as a double
handles = guihandles;
global comp
if str2num(get(handles.edit_CP,'String'))<=0
    msgbox('El valor del coeficiente prismático es
incorrecto.','Aviso.','error');
    set(handles.edit_L,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(hObject,'String','');
else
    if comp==0
        set(handles.edit_L,'Enable','on');
        set(handles.edit_Lf,'Enable','on');
        set(handles.edit_B,'Enable','on');
        set(handles.edit_T,'Enable','on');
        set(handles.edit_Vmin,'Enable','on');
        set(handles.edit_Vmax,'Enable','on');
    else
        end
        set(handles.pushbutton_Comprobar,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_CP_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_CP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Comprobar.
function pushbutton_Comprobar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comprobar (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global tipo_barco;
global comp
global metodo
if strcmp(get(handles.edit_L,'String'),'') |
strcmp(get(handles.edit_L,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Lf,'String'),'') |
strcmp(get(handles.edit_Lf,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_B,'String'),'') |
strcmp(get(handles.edit_B,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_T,'String'),'') |
strcmp(get(handles.edit_T,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_CP,'String'),'') |
strcmp(get(handles.edit_CP,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmin,'String'),'') |
strcmp(get(handles.edit_Vmin,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmax,'String'),'') |
strcmp(get(handles.edit_Vmax,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
else
L=str2num(get(handles.edit_L,'String'));
Lf=str2num(get(handles.edit_Lf,'String'));
B=str2num(get(handles.edit_B,'String'));
T=str2num(get(handles.edit_T,'String'));
CP=str2num(get(handles.edit_CP,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
comprobarFn=0;
RANGO={'Tipo
buque','Fn_max','CP_min','CP_max','L/Bmin','L/Bmax','B/Tmin','B/Tmax';
'Carga general',0.3,0.56,0.75,5.3,8,2.4,4;
'Portacontenedores',0.45,0.55,0.67,6,9.5,3,4;
'Petrolero',0.24,0.73,0.85,5.1,7.1,2.4,3.2;
'Bulkcarrier',0.24,0.73,0.85,5.1,7.1,2.4,3.2;
'Arrastrero',0.38,0.55,0.65,3.9,6.3,2.1,3;
'Costero',0.38,0.55,0.65,3.9,6.3,2.1,3;
'Remolcador',0.38,0.55,0.65,3.9,6.3,2.1,3;
'Ro-Ro',0.35,0.55,0.67,5.3,8,3.2,4;
'Ferry',0.35,0.55,0.67,5.3,8,3.2,4};
if tipo_barco==0
    msgbox('Debe seleccionar el tipo de buque al que aplicar el método
de cálculo.','Error','error');
else
    for i=2:10
        if strcmp(RANGO{i,1},tipo_barco)
            for V=Vmin:1:Vmax
                Fn=V*0.514444/((9.81*Lf)^(1/2));

```



```

        if 0>Fn | Fn>RANGO{i,2}
            comprobarFn=1;
        else
            end
        end
    end
    if RANGO{i,3}>CP | CP>RANGO{i,4}
        msgbox('El valor del coeficiente prismático está fuera del
rango de aplicación.','Fuera de rango','error');
    elseif RANGO{i,5}>(L/B) | (L/B)>RANGO{i,6}
        msgbox('La relación L/B está fuera del rango de
aplicación.','Fuera de rango','error');
    elseif RANGO{i,7}>(B/T) | (B/T)>RANGO{i,8}
        msgbox('La relación B/T está fuera del rango de
aplicación.','Fuera de rango','error');
    elseif comprobarFn==1
        msgbox('El valor de Fn está fuera del rango de
aplicación.','Fuera de rango','error');
    else
        msgbox('Los parámetros están dentro del rango de
aplicación.','Valores correctos','help');
        if comp==0
            set(handles.edit_L,'Enable','off');
            set(handles.edit_Lf,'Enable','off');
            set(handles.edit_B,'Enable','off');
            set(handles.edit_T,'Enable','off');
            set(handles.edit_CP,'Enable','off');
            set(handles.edit_Vmin,'Enable','off');
            set(handles.edit_Vmax,'Enable','off');
            set(handles.pushbutton_Comprobar,'Enable','off');
            set(handles.pushbutton_Cambiar,'Enable','on');
            set(handles.edit_Lpp,'Enable','on');
            set(handles.edit_Desp,'Enable','on');
            set(handles.edit_t,'Enable','on');
            set(handles.edit_ATB,'Enable','on');
            set(handles.edit_hb,'Enable','on');
            set(handles.edit_ATR,'Enable','on');
            set(handles.edit_KS,'Enable','on');
            set(handles.edit_LCB,'Enable','on');
            set(handles.edit_XF,'Enable','on');
            set(handles.pushbutton_Referencias,'Enable','on');
            set(handles.radiobutton_SmSi,'Enable','on');
            set(handles.radiobutton_SmNo,'Enable','on');
            if get(handles.radiobutton_SmSi,'Value')==1
                set(handles.edit_Sm,'Enable','on');
            else
                end
            end
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable','on');
            else
                end
            end
            set(handles.popupmenu_TipoForma,'Enable','on');
            set(handles.radiobutton_Rio,'Enable','on');
            set(handles.radiobutton_Mar,'Enable','on');
            if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
                set(handles.radiobutton_Timon1,'Enable','on');
            else
                end
            end
            if get(handles.radiobutton_Timon1,'Value')==1

```

```

        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
        set(handles radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
    end
    set(handles radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
    end
    set(handles radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
    end
    set(handles radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
    end
    set(handles radiobutton_Ejes, 'Enable', 'on');
    if get(handles radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
    end
    set(handles radiobutton_Aletas, 'Enable', 'on');
    if get(handles radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');

```

```

else
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
    set(handles edit_SmDomo, 'Enable', 'on');
else
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles edit_SmQuillaBalance, 'Enable', 'on');
else
end
set(handles pushbutton_Calcular, 'Enable', 'on');
set(handles pushbutton_ComprobarRangos, 'Enable', 'off');
set(handles pushbutton_Rangos, 'Enable', 'on');
set(handles pushbutton_Borrar, 'Enable', 'on');
set(handles popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles popupmenu_Rutas, 'String'));
Ruta=contents{get(handles popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') | strcmp(Ruta, 'Desconocida')
else
    set(handles popupmenu_Estacion, 'Enable', 'on');
end
else
    set(handles pushbutton_Comprobar, 'Enable', 'off');
    set(handles pushbutton_Cambiar, 'Enable', 'on');
    set(handles popupmenu_TipoForma, 'Enable', 'on');
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Timon1, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon1, 'Value')==1
        set(handles edit_SmTimon1, 'Enable', 'on');
        set(handles edit_r2Timon1, 'Enable', 'on');
    else
        set(handles edit_SmTimon1, 'Enable', 'off');
        set(handles edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon2, 'Value')==1
        set(handles edit_SmTimon2, 'Enable', 'on');
    else
        set(handles edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
        set(handles radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon3, 'Value')==1
        set(handles edit_SmTimon3, 'Enable', 'on');
        set(handles edit_r2Timon3, 'Enable', 'on');
    else
        set(handles edit_SmTimon3, 'Enable', 'off');
        set(handles edit_r2Timon3, 'Enable', 'off');
    end
end

```

```

        if get(handles.radiobutton_Timon3, 'Value')==0
            set(handles.radiobutton_Quillote, 'Enable', 'on');
        else
            end
        end
        if get(handles.radiobutton_Quillote, 'Value')==1
            set(handles.edit_SmQuillote, 'Enable', 'on');
            set(handles.edit_r2Quillote, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_Arbotantes, 'Enable', 'on');
        if get(handles.radiobutton_Arbotantes, 'Value')==1
            set(handles.edit_SmArbotantes, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
        if get(handles.radiobutton_Henchimientos1, 'Value')==1
            set(handles.edit_SmHenchimientos1, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
        if get(handles.radiobutton_Henchimientos2, 'Value')==1
            set(handles.edit_SmHenchimientos2, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_Ejes, 'Enable', 'on');
        if get(handles.radiobutton_Ejes, 'Value')==1
            set(handles.edit_SmEjes, 'Enable', 'on');
            set(handles.edit_r2Ejes, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_Aletas, 'Enable', 'on');
        if get(handles.radiobutton_Aletas, 'Value')==1
            set(handles.edit_SmAletas, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_Domo, 'Enable', 'on');
        if get(handles.radiobutton_Domo, 'Value')==1
            set(handles.edit_SmDomo, 'Enable', 'on');
        else
            end
        end
        set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
        if get(handles.radiobutton_QuillaBalance, 'Value')==1
            set(handles.edit_SmQuillaBalance, 'Enable', 'on');
        else
            end
        end
        set(handles.pushbutton_Calcular, 'Enable', 'on');
        set(handles.pushbutton_ComprobarRangos, 'Enable',
'off');

        set(handles.pushbutton_Rangos, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        set(handles.pushbutton_Referencias, 'Enable', 'on');
        set(handles.edit_ATR, 'Enable', 'on');
        set(handles.edit_KS, 'Enable', 'on');
        switch metodo
            case 'Guldhammer y Harvald'
                set(handles.edit_XF, 'Enable', 'on');
                set(handles.edit_t, 'Enable', 'on');
                if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                    else
                        set(handles.edit_hb, 'Enable', 'on');
                    end
            end
        end
    end
end

```



```

% --- Executes during object creation, after setting all properties.
function edit_B_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_T_Callback(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_T as text
%         str2double(get(hObject,'String')) returns contents of edit_T
as a double
handles = guihandles;
if str2num(get(handles.edit_T,'String'))<=0
    msgbox('El valor del calado es incorrecto.','Aviso.','error');
    set(handles.edit_L,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(hObject,'String','');
else
    set(handles.edit_L,'Enable','on');
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_CP,'Enable','on');
    set(handles.edit_Vmin,'Enable','on');
    set(handles.edit_Vmax,'Enable','on');
    set(handles.pushbutton_Comprobar,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_T_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_L_Callback(hObject, eventdata, handles)
% hObject      handle to edit_L (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_L as text
%         str2double(get(hObject,'String')) returns contents of edit_L
as a double
handles = guidata(handles);
if str2num(get(handles.edit_L,'String'))<=0
    msgbox('El valor de la eslora es incorrecto.','Aviso.','error');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(hObject,'String','');
else
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_T,'Enable','on');
    set(handles.edit_CP,'Enable','on');
    set(handles.edit_Vmin,'Enable','on');
    set(handles.edit_Vmax,'Enable','on');
    set(handles.pushbutton_Comprobar,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_L_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit_L (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_Timon1.
function radiobutton_Timon1_Callback(hObject, eventdata, handles)
% hObject      handle to radiobutton_Timon1 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Timon1
handles = guidata(handles);
if get(hObject,'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
end

```

```

set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'String', '');
set(handles.edit_r2Timon1, 'String', '');
set(handles.radiobutton_Timon2, 'Enable', 'on');
if get(handles.radiobutton_Quillote,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
set(handles.radiobutton_Timon3, 'Enable', 'off');
end
set(handles.pushbutton_Comparar,'Enable','off');
end

% --- Executes on button press in radiobutton_Timon2.
function radiobutton_Timon2_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Timon2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Timon2
handles = guidata(handles);
if get(hObject,'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
set(handles.edit_r2Timon2, 'String', '2.8');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'String', '');
set(handles.edit_r2Timon2, 'String', '');
set(handles.radiobutton_Timon1, 'Enable', 'on');
if get(handles.radiobutton_Quillote,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
set(handles.radiobutton_Timon3, 'Enable', 'off');
end
set(handles.pushbutton_Comparar,'Enable','off');
end

% --- Executes on button press in radiobutton_Timon3.
function radiobutton_Timon3_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Timon3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Timon3
handles = guidata(handles);
if get(hObject,'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_SmTimon3, 'Enable', 'off');

```



```

set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'String', '');
set(handles.edit_r2Timon3, 'String', '');
set(handles radiobutton_Timon2, 'Enable', 'on');
set(handles radiobutton_Timon1, 'Enable', 'on');
set(handles radiobutton_Quillote, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes on button press in radiobutton_Quillote.
function radiobutton_Quillote_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Quillote (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Quillote
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
set(handles radiobutton_Timon3, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'String', '');
set(handles.edit_r2Quillote, 'String', '');
set(handles radiobutton_Timon3, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes on button press in radiobutton_Arbotantes.
function radiobutton_Arbotantes_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Arbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Arbotantes
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
set(handles.edit_r2Arbotantes, 'String', '3');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'String', '');
set(handles.edit_r2Arbotantes, 'String', '');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes on button press in radiobutton_Henchimientos1.
function radiobutton_Henchimientos1_Callback(hObject, eventdata,
handles)
% hObject    handle to radiobutton_Henchimientos1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

```

```

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Henchimientos1
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
set(handles.edit_r2Henchimientos1, 'String', '3');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'String', '');
set(handles.edit_r2Henchimientos1, 'String', '');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes on button press in radiobutton_Henchimientos2.
function radiobutton_Henchimientos2_Callback(hObject, eventdata,
handles)
% hObject    handle to radiobutton_Henchimientos2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Henchimientos2
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
set(handles.edit_r2Henchimientos2, 'String', '2');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'String', '');
set(handles.edit_r2Henchimientos2, 'String', '');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes on button press in radiobutton_Ejes.
function radiobutton_Ejes_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Ejes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Ejes
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'String', '');
set(handles.edit_r2Ejes, 'String', '');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes on button press in radiobutton_Aletas.
function radiobutton_Aletas_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Aletas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

```

```

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Aletas
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
set(handles.edit_r2Aletas, 'String', '2.8');
set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'String', '');
set(handles.edit_r2Aletas, 'String', '');
set(handles.pushbutton_Comparar,'Enable','off');
end
% --- Executes on button press in radiobutton_Domo.
function radiobutton_Domo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Domo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Domo
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
set(handles.edit_r2Domo, 'String', '2.7');
set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_SmDomo, 'String', '');
set(handles.edit_r2Domo, 'String', '');
set(handles.pushbutton_Comparar,'Enable','off');
end

% --- Executes on button press in radiobutton_QuillaBalance.
function radiobutton_QuillaBalance_Callback(hObject, eventdata,
handles)
% hObject    handle to radiobutton_QuillaBalance (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_QuillaBalance
handles = guihandles;
if get(hObject,'Value')==1
set(handles.edit_SmQuillaBalance, 'Enable', 'on');
set(handles.edit_r2QuillaBalance, 'String', '1.4');
set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'String', '');
set(handles.edit_r2QuillaBalance, 'String', '');
set(handles.pushbutton_Comparar,'Enable','off');
end

function edit_SmTimon1_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmTimon1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

```

```

% Hints: get(hObject,'String') returns contents of edit_SmTimon1 as
text
%         str2double(get(hObject,'String')) returns contents of
edit_SmTimon1 as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmTimon1,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    set(handles.edit_r2Henchimientos2, 'Enable', 'off');
    set(handles.radiobutton_Ejes, 'Enable', 'off');
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
    set(handles.radiobutton_Aletas, 'Enable', 'off');
    set(handles.edit_SmAletas, 'Enable', 'off');
    set(handles.edit_r2Aletas, 'Enable', 'off');
    set(handles.radiobutton_Domo, 'Enable', 'off');
    set(handles.edit_SmDomo, 'Enable', 'off');
    set(handles.edit_r2Domo, 'Enable', 'off');
    set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');

```

```

set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0

```

```

set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles edit_SmTimon3, 'Enable', 'on');
set(handles edit_r2Timon3, 'Enable', 'on');
else
set(handles edit_SmTimon3, 'Enable', 'off');
set(handles edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
set(handles edit_SmQuillote, 'Enable', 'on');
set(handles edit_r2Quillote, 'Enable', 'on');
else
set(handles edit_SmQuillote, 'Enable', 'off');
set(handles edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
set(handles edit_SmArbotantes, 'Enable', 'on');
else
set(handles edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
set(handles edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
set(handles edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
set(handles edit_SmEjes, 'Enable', 'on');
set(handles edit_r2Ejes, 'Enable', 'on');
else
set(handles edit_SmEjes, 'Enable', 'off');
set(handles edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
set(handles edit_SmAletas, 'Enable', 'on');
else
set(handles edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
set(handles edit_SmDomo, 'Enable', 'on');
else
set(handles edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1

```

```

        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable', 'on');
            else
                set(handles.edit_iE,'Enable', 'off');
            end
            set(handles.radiobutton_iESi,'Enable', 'on');
            set(handles.radiobutton_iENo,'Enable', 'on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
                else
                    set(handles.edit_hb, 'Enable', 'on');
                    set(handles.edit_ATB, 'Enable', 'on');
                end
                if get(handles.radiobutton_iESi,'Value')==1
                    set(handles.edit_iE,'Enable', 'on');
                else
                    set(handles.edit_iE,'Enable', 'off');
                end
                set(handles.radiobutton_iESi,'Enable', 'on');
                set(handles.radiobutton_iENo,'Enable', 'on');
            case 'Van Oortmerssen'
                set(handles.edit_hb, 'Enable', 'on');
                set(handles.edit_ATB, 'Enable', 'on');
                set(handles.edit_XF, 'Enable', 'on');
                set(handles.edit_t, 'Enable', 'on');
        end
        if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0

```

```

set(handles radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
    set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
    set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
    set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
end

```



```

set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmTimon1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmTimon1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmTimon2_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmTimon2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmTimon2 as
text
%       str2double(get(hObject,'String')) returns contents of
edit_SmTimon2 as a double
handles = guihandles;
global comp
global metodo

```

```

if str2num(get(handles.edit_SmTimon2,'String'))<0
msgbox('El valor de la superficie mojada del apéndice es
incorrecto.','Aviso.','error');
set(hObject,'String','');
set(handles.edit_Lpp,'Enable','off');
set(handles.edit_Desp,'Enable','off');
set(handles.edit_t,'Enable','off');
set(handles.edit_ATB,'Enable','off');
set(handles.edit_hb,'Enable','off');
set(handles.edit_ATR,'Enable','off');
set(handles.edit_KS,'Enable','off');
set(handles.edit_LCB,'Enable','off');
set(handles.edit_XF,'Enable','off');
set(handles.pushbutton_Referencias,'Enable','off');
set(handles.edit_Sm,'Enable','off');
set(handles.edit_iE,'Enable','off');
set(handles.radiobutton_SmSi,'Enable','off');
set(handles.radiobutton_SmNo,'Enable','off');
set(handles.radiobutton_iESi,'Enable','off');
set(handles.radiobutton_iENo,'Enable','off');
set(handles.popupmenu_TipoForma,'Enable','off');
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Mar,'Enable','off');
set(handles.radiobutton_Timon1,'Enable','off');
set(handles.edit_SmTimon1,'Enable','off');
set(handles.edit_r2Timon1,'Enable','off');
set(handles.radiobutton_Timon2,'Enable','off');
set(handles.edit_r2Timon2,'Enable','off');
set(handles.radiobutton_Timon3,'Enable','off');
set(handles.edit_SmTimon3,'Enable','off');
set(handles.edit_r2Timon3,'Enable','off');
set(handles.radiobutton_Quillote,'Enable','off');
set(handles.edit_SmQuillote,'Enable','off');
set(handles.edit_r2Quillote,'Enable','off');
set(handles.radiobutton_Arbotantes,'Enable','off');
set(handles.edit_SmArbotantes,'Enable','off');
set(handles.edit_r2Arbotantes,'Enable','off');
set(handles.radiobutton_Henchimientos1,'Enable','off');
set(handles.edit_SmHenchimientos1,'Enable','off');
set(handles.edit_r2Henchimientos1,'Enable','off');
set(handles.radiobutton_Henchimientos2,'Enable','off');
set(handles.edit_SmHenchimientos2,'Enable','off');
set(handles.edit_r2Henchimientos2,'Enable','off');
set(handles.radiobutton_Ejes,'Enable','off');
set(handles.edit_SmEjes,'Enable','off');
set(handles.edit_r2Ejes,'Enable','off');
set(handles.radiobutton_Aletas,'Enable','off');
set(handles.edit_SmAletas,'Enable','off');
set(handles.edit_r2Aletas,'Enable','off');
set(handles.radiobutton_Domo,'Enable','off');
set(handles.edit_SmDomo,'Enable','off');
set(handles.edit_r2Domo,'Enable','off');
set(handles.radiobutton_QuillaBalance,'Enable','off');
set(handles.edit_SmQuillaBalance,'Enable','off');
set(handles.edit_r2QuillaBalance,'Enable','off');
set(handles.pushbutton_Calcular,'Enable','on');
set(handles.pushbutton_Rangos,'Enable','off');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Borrar,'Enable','off');
set(handles.popupmenu_Rutas,'Enable','off');
set(handles.popupmenu_Estacion,'Enable','off');

```

```

set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');

```

```

else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
else
set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');

```

```

set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
case 'Guldhammer y Harvald'
set(handles.edit_t, 'Enable', 'on');
if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_XF, 'Enable', 'on');
if get(handles.radiobutton_iESi,'Value')==1
set(handles.edit_iE,'Enable', 'on');
else
set(handles.edit_iE,'Enable', 'off');
end
set(handles.radiobutton_iESi,'Enable', 'on');
set(handles.radiobutton_iENo,'Enable', 'on');
case 'Amadeo García'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles.radiobutton_iESi,'Value')==1
set(handles.edit_iE,'Enable', 'on');
else
set(handles.edit_iE,'Enable', 'off');
end
set(handles.radiobutton_iESi,'Enable', 'on');
set(handles.radiobutton_iENo,'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');

```

```

        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
        set(handles.radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else

```

```

        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmTimon2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmTimon2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmTimon3_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmTimon3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmTimon3 as
text
%       str2double(get(hObject,'String')) returns contents of
edit_SmTimon3 as a double
handles = guidata(hObject);
global comp
global metodo
if str2num(get(handles.edit_SmTimon3,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
end

```

```

set(handles.edit_Desp, 'Enable', 'off');
set(handles.edit_t, 'Enable', 'off');
set(handles.edit_ATB, 'Enable', 'off');
set(handles.edit_hb, 'Enable', 'off');
set(handles.edit_ATR, 'Enable', 'off');
set(handles.edit_KS, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');

```



```

set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
    end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');

```

```

else
end
if get(handles radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else

```

```

set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi, 'Value')==1
                set(handles.edit_iE, 'Enable', 'on');
            else
                set(handles.edit_iE, 'Enable', 'off');
            end
            set(handles.radiobutton_iESi, 'Enable', 'on');
            set(handles.radiobutton_iENo, 'Enable', 'on');
            case 'Amadeo Garcia'
                set(handles.edit_LCB, 'Enable', 'on');
                if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                    else
                        set(handles.edit_hb, 'Enable', 'on');
                        set(handles.edit_ATB, 'Enable', 'on');
                    end
                    if get(handles.radiobutton_iESi, 'Value')==1
                        set(handles.edit_iE, 'Enable', 'on');
                    else
                        set(handles.edit_iE, 'Enable', 'off');
                    end
                    set(handles.radiobutton_iESi, 'Enable', 'on');
                    set(handles.radiobutton_iENo, 'Enable', 'on');
                    case 'Van Oortmerssen'
                        set(handles.edit_ATB, 'Enable', 'on');
                        set(handles.edit_hb, 'Enable', 'on');
                        set(handles.edit_XF, 'Enable', 'on');
                        set(handles.edit_t, 'Enable', 'on');
                    end
                end
            if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
                set(handles.radiobutton_Timon1, 'Enable', 'on');
            else
                end
            if get(handles.radiobutton_Timon1, 'Value')==1
                set(handles.edit_SmTimon1, 'Enable', 'on');
                set(handles.edit_r2Timon1, 'Enable', 'on');
            else
                set(handles.edit_SmTimon1, 'Enable', 'off');
                set(handles.edit_r2Timon1, 'Enable', 'off');
            end
            end
            if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0

```

```

set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
set(handles edit_SmTimon2, 'Enable', 'on');
else
set(handles edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles edit_SmTimon3, 'Enable', 'on');
set(handles edit_r2Timon3, 'Enable', 'on');
else
set(handles edit_SmTimon3, 'Enable', 'off');
set(handles edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
set(handles edit_SmQuillote, 'Enable', 'on');
set(handles edit_r2Quillote, 'Enable', 'on');
else
set(handles edit_SmQuillote, 'Enable', 'off');
set(handles edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
set(handles edit_SmArbotantes, 'Enable', 'on');
else
set(handles edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
set(handles edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
set(handles edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
set(handles edit_SmEjes, 'Enable', 'on');
set(handles edit_r2Ejes, 'Enable', 'on');
else
set(handles edit_SmEjes, 'Enable', 'off');
set(handles edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
set(handles edit_SmAletas, 'Enable', 'on');
else

```

```

        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmTimon3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmTimon3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmQuillote_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmQuillote (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmQuillote as
text
% str2double(get(hObject,'String')) returns contents of
edit_SmQuillote as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmQuillote,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');

```

```

set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');

```

```

set(handles.pushButton_Referencias, 'Enable', 'on');
if get(handles.radioButton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radioButton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radioButton_SmSi, 'Enable', 'on');
set(handles.radioButton_SmNo, 'Enable', 'on');
set(handles.radioButton_iESi, 'Enable', 'on');
set(handles.radioButton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radioButton_Rio, 'Enable', 'on');
set(handles.radioButton_Mar, 'Enable', 'on');
if get(handles.radioButton_Timon2, 'Value')==0 &
get(handles.radioButton_Timon3, 'Value')==0
    set(handles.radioButton_Timon1, 'Enable', 'on');
else
    end
if get(handles.radioButton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radioButton_Timon1, 'Value')==0 &
get(handles.radioButton_Timon3, 'Value')==0
    set(handles.radioButton_Timon2, 'Enable', 'on');
else
    end
if get(handles.radioButton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radioButton_Timon2, 'Value')==0 &
get(handles.radioButton_Timon1, 'Value')==0
    set(handles.radioButton_Timon3, 'Enable', 'on');
else
    end
if get(handles.radioButton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radioButton_Timon3, 'Value')==0
    set(handles.radioButton_Quillote, 'Enable', 'on');
else
    end
if get(handles.radioButton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');

```

```

        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
    Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    else
        set(handles.edit_ATR, 'Enable', 'on');
        set(handles.edit_KS, 'Enable', 'on');
    end
end

```



```

set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi, 'Value')==1
                set(handles.edit_iE, 'Enable', 'on');
            else
                set(handles.edit_iE, 'Enable', 'off');
            end
            set(handles.radiobutton_iESi, 'Enable', 'on');
            set(handles.radiobutton_iENo, 'Enable', 'on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                else
                    set(handles.edit_hb, 'Enable', 'on');
                    set(handles.edit_ATB, 'Enable', 'on');
                end
                if get(handles.radiobutton_iESi, 'Value')==1
                    set(handles.edit_iE, 'Enable', 'on');
                else
                    set(handles.edit_iE, 'Enable', 'off');
                end
                set(handles.radiobutton_iESi, 'Enable', 'on');
                set(handles.radiobutton_iENo, 'Enable', 'on');
        case 'Van Oortmerssen'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles.edit_hb, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            set(handles.edit_t, 'Enable', 'on');
        end
        if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
            set(handles.radiobutton_Timon1, 'Enable', 'on');
        else
            end
        if get(handles.radiobutton_Timon1, 'Value')==1
            set(handles.edit_SmTimon1, 'Enable', 'on');
            set(handles.edit_r2Timon1, 'Enable', 'on');
        else
            set(handles.edit_SmTimon1, 'Enable', 'off');
            set(handles.edit_r2Timon1, 'Enable', 'off');
        end
        if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
            set(handles.radiobutton_Timon2, 'Enable', 'on');
        else
            end
        if get(handles.radiobutton_Timon2, 'Value')==1
            set(handles.edit_SmTimon2, 'Enable', 'on');
        else
            set(handles.edit_SmTimon2, 'Enable', 'off');
        end

```

```

end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
else
set(handles.edit_SmDomo, 'Enable', 'off');

```

```

end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmQuillote_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmQuillote (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmArbotantes_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmArbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmArbotantes
as text
%       str2double(get(hObject,'String')) returns contents of
edit_SmArbotantes as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmArbotantes,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');

```

```

set(handles.radiobutton_iENo,'Enable','off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp,'Enable','on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi,'Value')==1
      set(handles.edit_Sm,'Enable','on');
    else
      set(handles.edit_Sm,'Enable','off');
    end
  end
  if get(handles.radiobutton_iESi,'Value')==1

```

```

        set(handles.edit_iE, 'Enable', 'on');
    else
        set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon1, 'Value')==1
        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
        set(handles.radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end

```

```

end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0

```

```

else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
if get(handles radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
case 'Amadeo García'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1

```

```

        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
end

```



```

    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmArbotantes_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmArbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmHenchimientos1_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmHenchimientos1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit_SmHenchimientos1 as text
%         str2double(get(hObject,'String')) returns contents of
edit_SmHenchimientos1 as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmHenchimientos1,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');

```

```

set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
    if get(handles.radiobutton_iESi, 'Value')==1
      set(handles.edit_iE, 'Enable', 'on');
    else
      set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
  end
end

```

```

set(handles radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles radiobutton_Rio, 'Enable', 'on');
set(handles radiobutton_Mar, 'Enable', 'on');
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end

```

```

set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
        else
            set(handles.edit_hb, 'Enable', 'on');
        end
        set(handles.edit_t, 'Enable', 'on');
        set(handles.edit_XF, 'Enable', 'on');
        if get(handles.radiobutton_iESi, 'Value')==1
            set(handles.edit_iE, 'Enable', 'on');
        end
    end
end

```

```

else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
case 'Amadeo García'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0

```

```

set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end
end

% --- Executes during object creation, after setting all properties.

```

```

function edit_SmHenchimientos1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmHenchimientos1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmHenchimientos2_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmHenchimientos2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit_SmHenchimientos2 as text
%         str2double(get(hObject,'String')) returns contents of
edit_SmHenchimientos2 as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmHenchimientos2,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');

```

```

set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
    if get(handles.radiobutton_iESi, 'Value')==1
      set(handles.edit_iE, 'Enable', 'on');
    else
      set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon1, 'Value')==1

```



```

        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
        set(handles.radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');

```

```

else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi, 'Value')==1
                set(handles.edit_iE, 'Enable', 'on');
            else
                set(handles.edit_iE, 'Enable', 'off');
            end
            set(handles.radiobutton_iESi, 'Enable', 'on');
            set(handles.radiobutton_iENo, 'Enable', 'on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                else

```

```

    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
end

```

```

set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
    set(handles edit_SmArbotantes, 'Enable', 'on');
else
    set(handles edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
    set(handles edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
    set(handles edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
    set(handles edit_SmEjes, 'Enable', 'on');
    set(handles edit_r2Ejes, 'Enable', 'on');
else
    set(handles edit_SmEjes, 'Enable', 'off');
    set(handles edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
    set(handles edit_SmAletas, 'Enable', 'on');
else
    set(handles edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
    set(handles edit_SmDomo, 'Enable', 'on');
else
    set(handles edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles pushbutton_Calcular, 'Enable', 'on');
set(handles pushbutton_Rangos, 'Enable', 'on');
set(handles pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmHenchimientos2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmHenchimientos2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))

```

```

        set(hObject,'BackgroundColor','white');
end

```

```

function edit_SmAletas_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmAletas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmAletas as
text
%          str2double(get(hObject,'String')) returns contents of
edit_SmAletas as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmAletas,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    set(handles.edit_r2Henchimientos2, 'Enable', 'off');

```

```

set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
    if get(handles.radiobutton_iESi, 'Value')==1
      set(handles.edit_iE, 'Enable', 'on');
    else
      set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon1, 'Value')==1
      set(handles.edit_SmTimon1, 'Enable', 'on');
      set(handles.edit_r2Timon1, 'Enable', 'on');
    else
      set(handles.edit_SmTimon1, 'Enable', 'off');
      set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0

```

```

set(handles radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon2, 'Value')==1
set(handles edit_SmTimon2, 'Enable', 'on');
else
set(handles edit_SmTimon2, 'Enable', 'off');
end
if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
set(handles radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles radiobutton_Timon3, 'Value')==1
set(handles edit_SmTimon3, 'Enable', 'on');
set(handles edit_r2Timon3, 'Enable', 'on');
else
set(handles edit_SmTimon3, 'Enable', 'off');
set(handles edit_r2Timon3, 'Enable', 'off');
end
if get(handles radiobutton_Timon3, 'Value')==0
set(handles radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles radiobutton_Quillote, 'Value')==1
set(handles edit_SmQuillote, 'Enable', 'on');
set(handles edit_r2Quillote, 'Enable', 'on');
else
set(handles edit_SmQuillote, 'Enable', 'off');
set(handles edit_r2Quillote, 'Enable', 'off');
end
set(handles radiobutton_Arbotantes, 'Enable', 'on');
if get(handles radiobutton_Arbotantes, 'Value')==1
set(handles edit_SmArbotantes, 'Enable', 'on');
else
set(handles edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
set(handles edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
set(handles edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
set(handles edit_SmEjes, 'Enable', 'on');
set(handles edit_r2Ejes, 'Enable', 'on');
else
set(handles edit_SmEjes, 'Enable', 'off');
set(handles edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
set(handles edit_SmAletas, 'Enable', 'on');
else

```

```

        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
    Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    else
        set(handles.edit_ATR, 'Enable', 'on');
        set(handles.edit_KS, 'Enable', 'on');
        set(handles.pushbutton_Referencias, 'Enable', 'on');
        set(handles.pushbutton_Cambiar, 'Enable', 'on');
        set(handles.popupmenu_TipoForma, 'Enable', 'on');
        switch metodo
            case 'Guldhammer y Harvald'
                if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                    else
                        set(handles.edit_hb, 'Enable', 'on');
                    end
                set(handles.edit_t, 'Enable', 'on');
                set(handles.edit_XF, 'Enable', 'on');
                if get(handles.radiobutton_iESi, 'Value')==1
                    set(handles.edit_iE, 'Enable', 'on');
                else
                    set(handles.edit_iE, 'Enable', 'off');
                end
                set(handles.radiobutton_iESi, 'Enable', 'on');
                set(handles.radiobutton_iENo, 'Enable', 'on');
            case 'Amadeo García'
                set(handles.edit_LCB, 'Enable', 'on');
                if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                    else
                        set(handles.edit_hb, 'Enable', 'on');
                        set(handles.edit_ATB, 'Enable', 'on');
                    end
                if get(handles.radiobutton_iESi, 'Value')==1
                    set(handles.edit_iE, 'Enable', 'on');
                else
                    set(handles.edit_iE, 'Enable', 'off');
                end
            end
        end
    end
end

```



```

        set(handles.radioButton_iESi, 'Enable', 'on');
        set(handles.radioButton_iENo, 'Enable', 'on');
        case 'Van Oortmerssen'
        set(handles.edit_ATB, 'Enable', 'on');
        set(handles.edit_hb, 'Enable', 'on');
        set(handles.edit_XF, 'Enable', 'on');
        set(handles.edit_t, 'Enable', 'on');
    end
    if get(handles.radioButton_Timon2, 'Value')==0 &
get(handles.radioButton_Timon3, 'Value')==0
        set(handles.radioButton_Timon1, 'Enable', 'on');
    else
    end
    if get(handles.radioButton_Timon1, 'Value')==1
        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radioButton_Timon1, 'Value')==0 &
get(handles.radioButton_Timon3, 'Value')==0
        set(handles.radioButton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles.radioButton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles.radioButton_Timon2, 'Value')==0 &
get(handles.radioButton_Timon1, 'Value')==0
        set(handles.radioButton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles.radioButton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radioButton_Timon3, 'Value')==0
        set(handles.radioButton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radioButton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radioButton_Arbotantes, 'Enable', 'on');
    if get(handles.radioButton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radioButton_Henchimientos1, 'Enable', 'on');
    if get(handles.radioButton_Henchimientos1, 'Value')==1

```

```

        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmAletas_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmAletas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmQuillaBalance_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmQuillaBalance (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit_SmQuillaBalance as text
% str2double(get(hObject,'String')) returns contents of
edit_SmQuillaBalance as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmQuillaBalance,'String'))<0
msgbox('El valor de la superficie mojada del apéndice es
incorrecto.','Aviso.','error');
set(hObject, 'String', '');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_Desp, 'Enable', 'off');
set(handles.edit_t, 'Enable', 'off');
set(handles.edit_ATB, 'Enable', 'off');
set(handles.edit_hb, 'Enable', 'off');
set(handles.edit_ATR, 'Enable', 'off');
set(handles.edit_KS, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');

```

```

set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
    if get(handles.radiobutton_iESi, 'Value')==1
      set(handles.edit_iE, 'Enable', 'on');
    else
      set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon1, 'Value')==1
      set(handles.edit_SmTimon1, 'Enable', 'on');
      set(handles.edit_r2Timon1, 'Enable', 'on');
    else
      set(handles.edit_SmTimon1, 'Enable', 'off');
      set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon2, 'Value')==1
      set(handles.edit_SmTimon2, 'Enable', 'on');
    else
      set(handles.edit_SmTimon2, 'Enable', 'off');

```

```

end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
else
set(handles.edit_SmDomo, 'Enable', 'off');

```

```

end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable', 'on');
            else
                set(handles.edit_iE,'Enable','off');
            end
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
                else
                    set(handles.edit_hb, 'Enable', 'on');
                    set(handles.edit_ATB, 'Enable', 'on');
                end
                if get(handles.radiobutton_iESi,'Value')==1
                    set(handles.edit_iE,'Enable', 'on');
                else
                    set(handles.edit_iE,'Enable', 'off');
                end
                set(handles.radiobutton_iESi,'Enable','on');
                set(handles.radiobutton_iENo,'Enable','on');
            case 'Van Oortmerssen'
                set(handles.edit_ATB, 'Enable', 'on');
                set(handles.edit_hb, 'Enable', 'on');
                set(handles.edit_XF, 'Enable', 'on');
                set(handles.edit_t, 'Enable', 'on');

```

```

end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');

```

```

else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmQuillaBalance_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmQuillaBalance (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmEjes_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmEjes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmEjes as text
%       str2double(get(hObject,'String')) returns contents of
edit_SmEjes as a double
handles = guihandles;

```



```

global comp
global metodo
if str2num(get(handles.edit_SmEjes,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    set(handles.edit_r2Henchimientos2, 'Enable', 'off');
    set(handles.radiobutton_Ejes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
    set(handles.radiobutton_Aletas, 'Enable', 'off');
    set(handles.edit_SmAletas, 'Enable', 'off');
    set(handles.edit_r2Aletas, 'Enable', 'off');
    set(handles.radiobutton_Domo, 'Enable', 'off');
    set(handles.edit_SmDomo, 'Enable', 'off');
    set(handles.edit_r2Domo, 'Enable', 'off');
    set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    set(handles.edit_r2QuillaBalance, 'Enable', 'off');
    set(handles.pushbutton_Rangos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.popupmenu_Rutas, 'Enable', 'off');

```

```

set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');

```

```

        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');

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```

set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar,'Enable','off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
case 'Guldhammer y Harvald'
if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
if get(handles.radiobutton_iESi,'Value')==1
set(handles.edit_iE,'Enable','on');
else
set(handles.edit_iE,'Enable','off');
end
set(handles.radiobutton_iESi,'Enable','on');
set(handles.radiobutton_iENo,'Enable','on');
case 'Amadeo Garcia'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles.radiobutton_iESi,'Value')==1
set(handles.edit_iE,'Enable','on');
else
set(handles.edit_iE,'Enable','off');
end
set(handles.radiobutton_iESi,'Enable','on');
set(handles.radiobutton_iENo,'Enable','on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');

```

```

        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
        set(handles radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon3, 'Value')==0
        set(handles radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles radiobutton_Ejes, 'Enable', 'on');
    if get(handles radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else

```

```

        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmEjes_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmEjes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_SmDomo_Callback(hObject, eventdata, handles)
% hObject    handle to edit_SmDomo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_SmDomo as text
%       str2double(get(hObject,'String')) returns contents of
edit_SmDomo as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_SmDomo,'String'))<0
    msgbox('El valor de la superficie mojada del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');

```

```

set(handles.edit_t, 'Enable', 'off');
set(handles.edit_ATB, 'Enable', 'off');
set(handles.edit_hb, 'Enable', 'off');
set(handles.edit_ATR, 'Enable', 'off');
set(handles.edit_KS, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');

```

```

set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else

```



```

end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');

```

```

end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Amadeo Garcia'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');

```

```

else
end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');

```

```

end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_SmDomo_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_SmDomo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Timon1_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Timon1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Timon1 as
text
%         str2double(get(hObject,'String')) returns contents of
edit_r2Timon1 as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_r2Timon1,'String'))<=0
    msgbox('El valor de (1+k2) del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');

```

```

set(handles.pushButton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.edit_r2Timon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.edit_r2Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.edit_r2Henchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.edit_r2Henchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushButton_Rangos, 'Enable', 'off');
set(handles.pushButton_Calcular, 'Enable', 'off');
set(handles.pushButton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushButton_Cambiar, 'Enable', 'off');
set(handles.pushButton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushButton_Referencias, 'Enable', 'on');

```

```

if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
    set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end

```

```

end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');

```

```

set(handles.pushButton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi, 'Value')==1
                set(handles.edit_iE, 'Enable', 'on');
            else
                set(handles.edit_iE, 'Enable', 'off');
            end
            set(handles.radiobutton_iESi, 'Enable', 'on');
            set(handles.radiobutton_iENo, 'Enable', 'on');
        case 'Amadeo Garcia'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
                else
                    set(handles.edit_hb, 'Enable', 'on');
                    set(handles.edit_ATB, 'Enable', 'on');
                end
                if get(handles.radiobutton_iESi, 'Value')==1
                    set(handles.edit_iE, 'Enable', 'on');
                else
                    set(handles.edit_iE, 'Enable', 'off');
                end
                set(handles.radiobutton_iESi, 'Enable', 'on');
                set(handles.radiobutton_iENo, 'Enable', 'on');
            case 'Van Oortmerssen'
                set(handles.edit_ATB, 'Enable', 'on');
                set(handles.edit_hb, 'Enable', 'on');
                set(handles.edit_XF, 'Enable', 'on');
                set(handles.edit_t, 'Enable', 'on');
            end
            if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
                set(handles.radiobutton_Timon1, 'Enable', 'on');
            else
                end
            if get(handles.radiobutton_Timon1, 'Value')==1
                set(handles.edit_SmTimon1, 'Enable', 'on');
                set(handles.edit_r2Timon1, 'Enable', 'on');
            else
                set(handles.edit_SmTimon1, 'Enable', 'off');
                set(handles.edit_r2Timon1, 'Enable', 'off');
            end
            if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
                set(handles.radiobutton_Timon2, 'Enable', 'on');
            else
                end
            if get(handles.radiobutton_Timon2, 'Value')==1
                set(handles.edit_SmTimon2, 'Enable', 'on');
            else
                set(handles.edit_SmTimon2, 'Enable', 'off');
            end
end

```



```

if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
else
set(handles.edit_SmDomo, 'Enable', 'off');
end

```

```

set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_r2Timon1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Timon1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Timon2_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Timon2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Timon2 as
text
%       str2double(get(hObject,'String')) returns contents of
edit_r2Timon2 as a double

% --- Executes during object creation, after setting all properties.
function edit_r2Timon2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Timon2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Timon3_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Timon3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Timon3 as
text
%           str2double(get(hObject,'String')) returns contents of
edit_r2Timon3 as a double
handles = guidata(handles);
global comp
global metodo
if str2num(get(handles.edit_r2Timon3,'String'))<=0
    msgbox('El valor de (1+k2) del apéndice es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    set(handles.edit_r2Henchimientos2, 'Enable', 'off');
    set(handles.radiobutton_Ejes, 'Enable', 'off');
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
    set(handles.radiobutton_Aletas, 'Enable', 'off');
    set(handles.edit_SmAletas, 'Enable', 'off');
    set(handles.edit_r2Aletas, 'Enable', 'off');
    set(handles.radiobutton_Domo, 'Enable', 'off');
    set(handles.edit_SmDomo, 'Enable', 'off');
    set(handles.edit_r2Domo, 'Enable', 'off');

```

```

set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
      set(handles.edit_Sm, 'Enable', 'on');
    else
      set(handles.edit_Sm, 'Enable', 'off');
    end
    if get(handles.radiobutton_iESi, 'Value')==1
      set(handles.edit_iE, 'Enable', 'on');
    else
      set(handles.edit_iE, 'Enable', 'off');
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon1, 'Value')==1
      set(handles.edit_SmTimon1, 'Enable', 'on');
      set(handles.edit_r2Timon1, 'Enable', 'on');
    else
      set(handles.edit_SmTimon1, 'Enable', 'off');
      set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
      set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
      end
    if get(handles.radiobutton_Timon2, 'Value')==1
      set(handles.edit_SmTimon2, 'Enable', 'on');
    else
      set(handles.edit_SmTimon2, 'Enable', 'off');
    end
  end

```

```

if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
set(handles.edit_SmEjes, 'Enable', 'on');
set(handles.edit_r2Ejes, 'Enable', 'on');
else
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
set(handles.edit_SmAletas, 'Enable', 'on');
else
set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
set(handles.edit_SmDomo, 'Enable', 'on');
else
set(handles.edit_SmDomo, 'Enable', 'off');
end

```

```

set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable', 'on');
            else
                set(handles.edit_iE,'Enable', 'off');
            end
            set(handles.radiobutton_iESi,'Enable', 'on');
            set(handles.radiobutton_iENo,'Enable', 'on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
                else
                    set(handles.edit_hb, 'Enable', 'on');
                    set(handles.edit_ATB, 'Enable', 'on');
                end
                if get(handles.radiobutton_iESi,'Value')==1
                    set(handles.edit_iE,'Enable', 'on');
                else
                    set(handles.edit_iE,'Enable', 'off');
                end
                set(handles.radiobutton_iESi,'Enable', 'on');
                set(handles.radiobutton_iENo,'Enable', 'on');
            case 'Van Oortmerssen'
                set(handles.edit_ATB, 'Enable', 'on');
                set(handles.edit_hb, 'Enable', 'on');
                set(handles.edit_XF, 'Enable', 'on');
                set(handles.edit_t, 'Enable', 'on');
        end
end

```

```

    if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
    set(handles.radiobutton_Timon1, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon1, 'Value')==1
        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3,'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else

```

```

        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles radiobutton_Ejes, 'Enable', 'on');
    if get(handles radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles radiobutton_Aletas, 'Enable', 'on');
    if get(handles radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles radiobutton_Domo, 'Enable', 'on');
    if get(handles radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_r2Timon3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Timon3 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Quillote_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Quillote (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Quillote as
text
%       str2double(get(hObject,'String')) returns contents of
edit_r2Quillote as a double

```



```

handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_r2Quillote,'String'))<=0
    msgbox('El valor de (1+k2) del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    set(handles.edit_r2Henchimientos2, 'Enable', 'off');
    set(handles.radiobutton_Ejes, 'Enable', 'off');
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
    set(handles.radiobutton_Aletas, 'Enable', 'off');
    set(handles.edit_SmAletas, 'Enable', 'off');
    set(handles.edit_r2Aletas, 'Enable', 'off');
    set(handles.radiobutton_Domo, 'Enable', 'off');
    set(handles.edit_SmDomo, 'Enable', 'off');
    set(handles.edit_r2Domo, 'Enable', 'off');
    set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    set(handles.edit_r2QuillaBalance, 'Enable', 'off');
    set(handles.pushbutton_Rangos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');

```

```

set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
set(handles.edit_Sm, 'Enable', 'off');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1

```

```

        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
end

```

```

set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
case 'Guldhammer y Harvald'
set(handles.edit_t, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
end
set(handles.edit_XF, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Amadeo Garcia'
set(handles.edit_LCB, 'Enable', 'on');
if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
else
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
end
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
case 'Van Oortmerssen'
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1

```

```

        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
    else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
        set(handles.radiobutton_Timon3, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    if get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Quillote, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');

```

```

else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_r2Quillote_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Quillote (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Arbotantes_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Arbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Arbotantes
as text
%       str2double(get(hObject,'String')) returns contents of
edit_r2Arbotantes as a double

% --- Executes during object creation, after setting all properties.
function edit_r2Arbotantes_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Arbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%      See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Henchimientos1_Callback(hObject, eventdata, handles)
% hObject      handle to edit_r2Henchimientos1 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit_r2Henchimientos1 as text
%      str2double(get(hObject,'String')) returns contents of
edit_r2Henchimientos1 as a double

% --- Executes during object creation, after setting all properties.
function edit_r2Henchimientos1_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit_r2Henchimientos1 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%      See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Henchimientos2_Callback(hObject, eventdata, handles)
% hObject      handle to edit_r2Henchimientos2 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit_r2Henchimientos2 as text
%      str2double(get(hObject,'String')) returns contents of
edit_r2Henchimientos2 as a double

% --- Executes during object creation, after setting all properties.
function edit_r2Henchimientos2_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit_r2Henchimientos2 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.

```

```

%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Aletas_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Aletas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Aletas as text
%       str2double(get(hObject,'String')) returns contents of
edit_r2Aletas as a double

% --- Executes during object creation, after setting all properties.
function edit_r2Aletas_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Aletas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2QuillaBalance_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2QuillaBalance (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of
edit_r2QuillaBalance as text
%       str2double(get(hObject,'String')) returns contents of
edit_r2QuillaBalance as a double

% --- Executes during object creation, after setting all properties.
function edit_r2QuillaBalance_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2QuillaBalance (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```



```

function edit_r2Ejes_Callback(hObject, eventdata, handles)
% hObject      handle to edit_r2Ejes (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Ejes as text
%          str2double(get(hObject,'String')) returns contents of
edit_r2Ejes as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_r2Ejes,'String'))<=0
    msgbox('El valor de (1+k2) del apéndice es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
    set(handles.radiobutton_Timon2, 'Enable', 'off');
    set(handles.edit_SmTimon2, 'Enable', 'off');
    set(handles.edit_r2Timon2, 'Enable', 'off');
    set(handles.radiobutton_Timon3, 'Enable', 'off');
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
    set(handles.radiobutton_Quillote, 'Enable', 'off');
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_SmArbotantes, 'Enable', 'off');
    set(handles.edit_r2Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    set(handles.edit_r2Henchimientos1, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    set(handles.radiobutton_Ejes, 'Enable', 'off');
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.radiobutton_Aletas, 'Enable', 'off');
    set(handles.edit_SmAletas, 'Enable', 'off');

```

```

set(handles.edit_r2Aletas, 'Enable', 'off');
set(handles radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.edit_r2Domo, 'Enable', 'off');
set(handles radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.edit_r2QuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
  if comp==0
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Desp, 'Enable', 'on');
    set(handles.edit_t, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_hb, 'Enable', 'on');
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_XF, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    set(handles.edit_Sm, 'Enable', 'on');
    set(handles.edit_iE, 'Enable', 'on');
    set(handles radiobutton_SmSi, 'Enable', 'on');
    set(handles radiobutton_SmNo, 'Enable', 'on');
    set(handles radiobutton_iESi, 'Enable', 'on');
    set(handles radiobutton_iENo, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    set(handles radiobutton_Rio, 'Enable', 'on');
    set(handles radiobutton_Mar, 'Enable', 'on');
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
      set(handles radiobutton_Timon1, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon1, 'Value')==1
      set(handles.edit_SmTimon1, 'Enable', 'on');
      set(handles.edit_r2Timon1, 'Enable', 'on');
    else
      set(handles.edit_SmTimon1, 'Enable', 'off');
      set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon1, 'Value')==0 &
get(handles radiobutton_Timon3, 'Value')==0
      set(handles radiobutton_Timon2, 'Enable', 'on');
    else
    end
    if get(handles radiobutton_Timon2, 'Value')==1
      set(handles.edit_SmTimon2, 'Enable', 'on');
    else
      set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    if get(handles radiobutton_Timon2, 'Value')==0 &
get(handles radiobutton_Timon1, 'Value')==0
      set(handles radiobutton_Timon3, 'Enable', 'on');
    else
  end
end

```

```

end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else

```

```

        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas,'String'));
    Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
    if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Comparar,'Enable','off');
    else
    set(handles.edit_ATR, 'Enable', 'on');
    set(handles.edit_KS, 'Enable', 'on');
    set(handles.pushbutton_Referencias, 'Enable', 'on');
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.popupmenu_TipoForma, 'Enable', 'on');
    switch metodo
        case 'Guldhammer y Harvald'
            if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
            set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi,'Value')==1
            set(handles.edit_iE,'Enable','on');
            else
            set(handles.edit_iE,'Enable','off');
            end
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
            case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
            set(handles.edit_hb, 'Enable', 'on');
            set(handles.edit_ATB, 'Enable', 'on');
            end
            if get(handles.radiobutton_iESi,'Value')==1
            set(handles.edit_iE,'Enable','on');
            else
            set(handles.edit_iE,'Enable','off');
            end
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
            case 'Van Oortmerssen'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles.edit_hb, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            set(handles.edit_t, 'Enable', 'on');
        end
        if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
        set(handles.radiobutton_Timon1, 'Enable', 'on');
    else

```

```

end
if get(handles.radiobutton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
    set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
    set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1

```

```

        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end
    set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
    if get(handles.radiobutton_QuillaBalance, 'Value')==1
        set(handles.edit_SmQuillaBalance, 'Enable', 'on');
    else
        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_r2Ejes_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Ejes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_r2Domo_Callback(hObject, eventdata, handles)
% hObject    handle to edit_r2Domo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_r2Domo as text
%       str2double(get(hObject,'String')) returns contents of
edit_r2Domo as a double
% --- Executes during object creation, after setting all properties.

function edit_r2Domo_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_r2Domo (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Rangos.
function pushbutton_Rangos_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Rangos (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
msgbox({'
                Apéndices                (1+k2)
'
'          Timón(1 hélice)                1.3 - 1.5
'
'          Timón(2 hélices)                2.8
'
'          Timón y quillote                1.5 - 2.0
'
'          Quillote solo                    1.5 - 2.0
'
'          Arbotantes                       3.0
'
'          Henchimientos protectores        3.0
'          Henchimientos integrados        2.0
'          Ejes                             2.0 - 4.0
'
'          Aletas estabilizadoras          2.8
'
'          Domo                             3.0
'
'          Quillas de balance              3.0
'}, 'Rangos (1+k2)', 'help');
% --- Executes on selection change in popupmenu_TipoForma.
function popupmenu_TipoForma_Callback(hObject, eventdata, handles)
% hObject handle to popupmenu_TipoForma (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_TipoForma contents as cell array
% contents{get(hObject,'Value')} returns selected item from
popupmenu_TipoForma
set(handles.pushbutton_Comparar, 'Enable', 'off');

% --- Executes during object creation, after setting all properties.
function popupmenu_TipoForma_CreateFcn(hObject, eventdata, handles)
% hObject handle to popupmenu_TipoForma (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
% See ISPC and COMPUTER.

```

```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmin_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmin as text
%         str2double(get(hObject,'String')) returns contents of
edit_Vmin as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmin,'String'))>0
    msgbox('El valor de la velocidad mínima debe ser menor al de la
máxima.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_L,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
elseif str2num(get(handles.edit_Vmin,'String'))<0
    msgbox('El valor de la velocidad mínima es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_L,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
else
    set(handles.edit_L,'Enable','on');
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_T,'Enable','on');
    set(handles.edit_CP,'Enable','on');
    set(handles.edit_Vmax,'Enable','on');
    set(handles.pushbutton_Comprobar,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmin_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.

```



```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmax_Callback(hObject, eventdata, handles)
% hObject     handle to edit_Vmax (see GCBO)
% eventdata   reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmax as text
%         str2double(get(hObject,'String')) returns contents of
edit_Vmax as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmax,'String'))>0
    msgbox('El valor de la velocidad máxima debe ser mayor al de la
mínima.','Aviso.','error');
    set(handles.edit_L,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(hObject,'String','');
elseif str2num(get(handles.edit_Vmax,'String'))<=0
    msgbox('El valor de la velocidad máxima es
incorrecto.','Aviso.','error');
    set(handles.edit_L,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(hObject,'String','');
else
    set(handles.edit_L,'Enable','on');
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_T,'Enable','on');
    set(handles.edit_CP,'Enable','on');
    set(handles.edit_Vmin,'Enable','on');
    set(handles.pushbutton_Comprobar,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmax_CreateFcn(hObject, eventdata, handles)
% hObject     handle to edit_Vmax (see GCBO)
% eventdata   reserved - to be defined in a future version of MATLAB
% handles     empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.

```

```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_XF_Callback(hObject, eventdata, handles)
% hObject    handle to edit_XF (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_XF as text
%         str2double(get(hObject,'String')) returns contents of edit_XF
as a double
set(handles.pushbutton_Comparar,'Enable','off');

% --- Executes during object creation, after setting all properties.
function edit_XF_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_XF (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_LCB_Callback(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_LCB as text
%         str2double(get(hObject,'String')) returns contents of
edit_LCB as a double
set(handles.pushbutton_Comparar,'Enable','off');

% --- Executes during object creation, after setting all properties.
function edit_LCB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

% --- Executes on button press in pushbutton_Referencias.
function pushbutton_Referencias_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Referencias (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
msgbox({'Referencia de las coordenadas (LCB,XF):' ' -Positivo: a proa
de la sección media.' ' -Negativo: a popa de la sección media.'
'Sentido de referencia del trimado:' ' -Positivo: trimado a proa.' '
-Negativo: trimado a popa.'},'Referencia de coordenadas y del
trimado.','help');

```

```

% --- Executes on button press in radiobutton_Rio.
function radiobutton_Rio_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Rio (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% Hint: get(hObject,'Value') returns toggle state of radiobutton_Rio
set(handles.pushbutton_Comparar,'Enable','off');

```

```

% --- Executes on button press in radiobutton_Mar.
function radiobutton_Mar_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Mar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% Hint: get(hObject,'Value') returns toggle state of radiobutton_Mar
set(handles.pushbutton_Comparar,'Enable','off');

```

```

% --- Executes on button press in pushbutton_Cambiar.
function pushbutton_Cambiar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Cambiar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
global comp
if comp==0
set(handles.edit_L,'Enable','on');
set(handles.edit_Lf,'Enable','on');
set(handles.edit_B,'Enable','on');
set(handles.edit_T,'Enable','on');
set(handles.edit_CP,'Enable','on');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'Enable','on');
else
end
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_ComprobarRangos,'Enable','on');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_Desp, 'Enable', 'off');
set(handles.edit_t, 'Enable', 'off');
set(handles.edit_ATB, 'Enable', 'off');
set(handles.edit_hb, 'Enable', 'off');
set(handles.edit_ATR, 'Enable', 'off');
set(handles.edit_KS, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');

```

```

set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');

```

```

function edit_iE_Callback(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_iE as text
%        str2double(get(hObject,'String')) returns contents of edit_iE
as a double
handles = guidata(hObject);
global comp
global metodo
if str2num(get(handles.edit_iE,'String'))<=0
    msgbox('El valor del semiángulo de la flotación es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');

```

```

set(handles.edit_Desp, 'Enable', 'off');
set(handles.edit_t, 'Enable', 'off');
set(handles.edit_ATB, 'Enable', 'off');
set(handles.edit_hb, 'Enable', 'off');
set(handles.edit_ATR, 'Enable', 'off');
set(handles.edit_KS, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_XF, 'Enable', 'off');
set(handles.pushbutton_Referencias, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_TipoForma, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Timon1, 'Enable', 'off');
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');

```

```

set(handles.pushButton_Referencias, 'Enable', 'on');
if get(handles.radioButton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
set(handles.radioButton_SmSi, 'Enable', 'on');
set(handles.radioButton_SmNo, 'Enable', 'on');
set(handles.radioButton_iESi, 'Enable', 'on');
set(handles.radioButton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radioButton_Rio, 'Enable', 'on');
set(handles.radioButton_Mar, 'Enable', 'on');
if get(handles.radioButton_Timon2, 'Value')==0 &
get(handles.radioButton_Timon3, 'Value')==0
    set(handles.radioButton_Timon1, 'Enable', 'on');
else
end
if get(handles.radioButton_Timon1, 'Value')==1
    set(handles.edit_SmTimon1, 'Enable', 'on');
    set(handles.edit_r2Timon1, 'Enable', 'on');
else
    set(handles.edit_SmTimon1, 'Enable', 'off');
    set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radioButton_Timon1, 'Value')==0 &
get(handles.radioButton_Timon3, 'Value')==0
    set(handles.radioButton_Timon2, 'Enable', 'on');
else
end
if get(handles.radioButton_Timon2, 'Value')==1
    set(handles.edit_SmTimon2, 'Enable', 'on');
else
    set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radioButton_Timon2, 'Value')==0 &
get(handles.radioButton_Timon1, 'Value')==0
    set(handles.radioButton_Timon3, 'Enable', 'on');
else
end
if get(handles.radioButton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radioButton_Timon3, 'Value')==0
    set(handles.radioButton_Quillote, 'Enable', 'on');
else
end
if get(handles.radioButton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radioButton_Arbotantes, 'Enable', 'on');
if get(handles.radioButton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');

```

```

else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'

```

```

        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
        else
        set(handles.edit_hb, 'Enable', 'on');
        end
        set(handles.edit_t, 'Enable', 'on');
        set(handles.edit_XF, 'Enable', 'on');
        if get(handles.radiobutton_iESi, 'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
        else
        set(handles.edit_iE, 'Enable', 'off');
        end
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        case 'Amadeo García'
        set(handles.edit_LCB, 'Enable', 'on');
        if str2num(get(handles.edit_hb, 'String'))==0 &
str2num(get(handles.edit_ATB, 'String'))==0
        else
        set(handles.edit_hb, 'Enable', 'on');
        set(handles.edit_ATB, 'Enable', 'on');
        end
        if get(handles.radiobutton_iESi, 'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
        else
        set(handles.edit_iE, 'Enable', 'off');
        end
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        case 'Van Oortmerssen'
        set(handles.edit_ATB, 'Enable', 'on');
        set(handles.edit_hb, 'Enable', 'on');
        set(handles.edit_XF, 'Enable', 'on');
        set(handles.edit_t, 'Enable', 'on');
        end
        if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Timon1, 'Enable', 'on');
        else
        end
        if get(handles.radiobutton_Timon1, 'Value')==1
        set(handles.edit_SmTimon1, 'Enable', 'on');
        set(handles.edit_r2Timon1, 'Enable', 'on');
        else
        set(handles.edit_SmTimon1, 'Enable', 'off');
        set(handles.edit_r2Timon1, 'Enable', 'off');
        end
        if get(handles.radiobutton_Timon1, 'Value')==0 &
get(handles.radiobutton_Timon3, 'Value')==0
        set(handles.radiobutton_Timon2, 'Enable', 'on');
        else
        end
        if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
        else
        set(handles.edit_SmTimon2, 'Enable', 'off');
        end
        if get(handles.radiobutton_Timon2, 'Value')==0 &
get(handles.radiobutton_Timon1, 'Value')==0
        set(handles.radiobutton_Timon3, 'Enable', 'on');
        else

```



```

end
if get(handles.radiobutton_Timon3, 'Value')==1
    set(handles.edit_SmTimon3, 'Enable', 'on');
    set(handles.edit_r2Timon3, 'Enable', 'on');
else
    set(handles.edit_SmTimon3, 'Enable', 'off');
    set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3, 'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
    set(handles.edit_SmQuillote, 'Enable', 'on');
    set(handles.edit_r2Quillote, 'Enable', 'on');
else
    set(handles.edit_SmQuillote, 'Enable', 'off');
    set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_SmArbotantes, 'Enable', 'on');
else
    set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
    set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
    set(handles.edit_SmHenchimientos2, 'Enable', 'on');
else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles.radiobutton_Ejes, 'Enable', 'on');
if get(handles.radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles.radiobutton_Aletas, 'Enable', 'on');
if get(handles.radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles.radiobutton_Domo, 'Enable', 'on');
if get(handles.radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else

```

```

        set(handles.edit_SmQuillaBalance, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Rangos, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_iE_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Sm_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Sm as text
%       str2double(get(hObject,'String')) returns contents of edit_Sm
as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_Sm,'String'))<=0
    msgbox('El valor de la superficie mojada es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Desp, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_hb, 'Enable', 'off');
    set(handles.edit_ATR, 'Enable', 'off');
    set(handles.edit_KS, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.pushbutton_Referencias, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.popupmenu_TipoForma, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Timon1, 'Enable', 'off');
    set(handles.edit_SmTimon1, 'Enable', 'off');

```

```

set(handles.edit_r2Timon1, 'Enable', 'off');
set(handles.radiobutton_Timon2, 'Enable', 'off');
set(handles.edit_SmTimon2, 'Enable', 'off');
set(handles.radiobutton_Timon3, 'Enable', 'off');
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
set(handles.radiobutton_Quillote, 'Enable', 'off');
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_SmArbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos1, 'Enable', 'off');
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
set(handles.radiobutton_Henchimientos2, 'Enable', 'off');
set(handles.edit_SmHenchimientos2, 'Enable', 'off');
set(handles.radiobutton_Ejes, 'Enable', 'off');
set(handles.edit_SmEjes, 'Enable', 'off');
set(handles.edit_r2Ejes, 'Enable', 'off');
set(handles.radiobutton_Aletas, 'Enable', 'off');
set(handles.edit_SmAletas, 'Enable', 'off');
set(handles.radiobutton_Domo, 'Enable', 'off');
set(handles.edit_SmDomo, 'Enable', 'off');
set(handles.radiobutton_QuillaBalance, 'Enable', 'off');
set(handles.edit_SmQuillaBalance, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Desp, 'Enable', 'on');
set(handles.edit_t, 'Enable', 'on');
set(handles.edit_ATB, 'Enable', 'on');
set(handles.edit_hb, 'Enable', 'on');
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_XF, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
set(handles.edit_iE, 'Enable', 'off');
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_Timon1, 'Enable', 'on');
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');

```

```

        set(handles.edit_r2Timon1, 'Enable', 'off');
    end
    set(handles.radiobutton_Timon2, 'Enable', 'on');
    if get(handles.radiobutton_Timon2, 'Value')==1
        set(handles.edit_SmTimon2, 'Enable', 'on');
    else
        set(handles.edit_SmTimon2, 'Enable', 'off');
    end
    set(handles.radiobutton_Timon3, 'Enable', 'on');
    if get(handles.radiobutton_Timon3, 'Value')==1
        set(handles.edit_SmTimon3, 'Enable', 'on');
        set(handles.edit_r2Timon3, 'Enable', 'on');
    else
        set(handles.edit_SmTimon3, 'Enable', 'off');
        set(handles.edit_r2Timon3, 'Enable', 'off');
    end
    set(handles.radiobutton_Quillote, 'Enable', 'on');
    if get(handles.radiobutton_Quillote, 'Value')==1
        set(handles.edit_SmQuillote, 'Enable', 'on');
        set(handles.edit_r2Quillote, 'Enable', 'on');
    else
        set(handles.edit_SmQuillote, 'Enable', 'off');
        set(handles.edit_r2Quillote, 'Enable', 'off');
    end
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_SmArbotantes, 'Enable', 'on');
    else
        set(handles.edit_SmArbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos1, 'Value')==1
        set(handles.edit_SmHenchimientos1, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos1, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos2, 'Value')==1
        set(handles.edit_SmHenchimientos2, 'Enable', 'on');
    else
        set(handles.edit_SmHenchimientos2, 'Enable', 'off');
    end
    set(handles.radiobutton_Ejes, 'Enable', 'on');
    if get(handles.radiobutton_Ejes, 'Value')==1
        set(handles.edit_SmEjes, 'Enable', 'on');
        set(handles.edit_r2Ejes, 'Enable', 'on');
    else
        set(handles.edit_SmEjes, 'Enable', 'off');
        set(handles.edit_r2Ejes, 'Enable', 'off');
    end
    set(handles.radiobutton_Aletas, 'Enable', 'on');
    if get(handles.radiobutton_Aletas, 'Value')==1
        set(handles.edit_SmAletas, 'Enable', 'on');
    else
        set(handles.edit_SmAletas, 'Enable', 'off');
    end
    set(handles.radiobutton_Domo, 'Enable', 'on');
    if get(handles.radiobutton_Domo, 'Value')==1
        set(handles.edit_SmDomo, 'Enable', 'on');
    else
        set(handles.edit_SmDomo, 'Enable', 'off');
    end

```

```

end
set(handles.radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles.radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.edit_ATR, 'Enable', 'on');
set(handles.edit_KS, 'Enable', 'on');
set(handles.pushbutton_Referencias, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.popupmenu_TipoForma, 'Enable', 'on');
switch metodo
    case 'Guldhammer y Harvald'
        if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
            else
                set(handles.edit_hb, 'Enable', 'on');
            end
            set(handles.edit_t, 'Enable', 'on');
            set(handles.edit_XF, 'Enable', 'on');
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable', 'on');
            else
                set(handles.edit_iE,'Enable','off');
            end
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            if str2num(get(handles.edit_hb,'String'))==0 &
str2num(get(handles.edit_ATB,'String'))==0
                else
                    set(handles.edit_hb, 'Enable', 'on');
                    set(handles.edit_ATB, 'Enable', 'on');
                end
                if get(handles.radiobutton_iESi,'Value')==1
                    set(handles.edit_iE,'Enable', 'on');
                else
                    set(handles.edit_iE,'Enable', 'off');
                end
                set(handles.radiobutton_iESi,'Enable','on');
                set(handles.radiobutton_iENo,'Enable','on');
            case 'Van Oortmerssen'
                set(handles.edit_ATB, 'Enable', 'on');
                set(handles.edit_hb, 'Enable', 'on');
                set(handles.edit_XF, 'Enable', 'on');
                set(handles.edit_t, 'Enable', 'on');

```

```

end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon1, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon1, 'Value')==1
set(handles.edit_SmTimon1, 'Enable', 'on');
set(handles.edit_r2Timon1, 'Enable', 'on');
else
set(handles.edit_SmTimon1, 'Enable', 'off');
set(handles.edit_r2Timon1, 'Enable', 'off');
end
if get(handles.radiobutton_Timon1,'Value')==0 &
get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Timon2, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon2, 'Value')==1
set(handles.edit_SmTimon2, 'Enable', 'on');
else
set(handles.edit_SmTimon2, 'Enable', 'off');
end
if get(handles.radiobutton_Timon2,'Value')==0 &
get(handles.radiobutton_Timon1,'Value')==0
set(handles.radiobutton_Timon3, 'Enable', 'on');
else
end
if get(handles.radiobutton_Timon3, 'Value')==1
set(handles.edit_SmTimon3, 'Enable', 'on');
set(handles.edit_r2Timon3, 'Enable', 'on');
else
set(handles.edit_SmTimon3, 'Enable', 'off');
set(handles.edit_r2Timon3, 'Enable', 'off');
end
if get(handles.radiobutton_Timon3,'Value')==0
set(handles.radiobutton_Quillote, 'Enable', 'on');
else
end
if get(handles.radiobutton_Quillote, 'Value')==1
set(handles.edit_SmQuillote, 'Enable', 'on');
set(handles.edit_r2Quillote, 'Enable', 'on');
else
set(handles.edit_SmQuillote, 'Enable', 'off');
set(handles.edit_r2Quillote, 'Enable', 'off');
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_SmArbotantes, 'Enable', 'on');
else
set(handles.edit_SmArbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos1, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos1, 'Value')==1
set(handles.edit_SmHenchimientos1, 'Enable', 'on');
else
set(handles.edit_SmHenchimientos1, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos2, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos2, 'Value')==1
set(handles.edit_SmHenchimientos2, 'Enable', 'on');

```

```

else
    set(handles.edit_SmHenchimientos2, 'Enable', 'off');
end
set(handles radiobutton_Ejes, 'Enable', 'on');
if get(handles radiobutton_Ejes, 'Value')==1
    set(handles.edit_SmEjes, 'Enable', 'on');
    set(handles.edit_r2Ejes, 'Enable', 'on');
else
    set(handles.edit_SmEjes, 'Enable', 'off');
    set(handles.edit_r2Ejes, 'Enable', 'off');
end
set(handles radiobutton_Aletas, 'Enable', 'on');
if get(handles radiobutton_Aletas, 'Value')==1
    set(handles.edit_SmAletas, 'Enable', 'on');
else
    set(handles.edit_SmAletas, 'Enable', 'off');
end
set(handles radiobutton_Domo, 'Enable', 'on');
if get(handles radiobutton_Domo, 'Value')==1
    set(handles.edit_SmDomo, 'Enable', 'on');
else
    set(handles.edit_SmDomo, 'Enable', 'off');
end
set(handles radiobutton_QuillaBalance, 'Enable', 'on');
if get(handles radiobutton_QuillaBalance, 'Value')==1
    set(handles.edit_SmQuillaBalance, 'Enable', 'on');
else
    set(handles.edit_SmQuillaBalance, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_Sm_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in radiobutton_SmSi.
function radiobutton_SmSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject, 'Value') returns toggle state of radiobutton_SmSi
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject, 'Value')==1

```

```

        set(handles.edit_Sm,'Enable','on');
        set(handles.radiobutton_SmNo,'Value',0);
else
    set(handles.edit_Sm,'Enable','off');
end
% --- Executes on button press in radiobutton_iESi.
function radiobutton_iESi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_iESi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iESi
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.edit_iE,'Enable','on');
    set(handles.radiobutton_iENo,'Value',0);
else
    set(handles.edit_iE,'Enable','off');
end

% --- Executes on button press in radiobutton_SmNo.
function radiobutton_SmNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_SmNo
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.edit_Sm,'Enable','off');
    set(handles.radiobutton_SmSi,'Value',0);
    set(handles.edit_Sm,'String','');
else
end

% --- Executes on button press in radiobutton_iENo.
function radiobutton_iENo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_iENo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iENo
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_iESi,'Value',0);
    set(handles.edit_iE,'String','');
else
end

% --- Executes during object creation, after setting all properties.
function axes_Rt_CreateFcn(hObject, eventdata, handles)
% hObject    handle to axes_Rt (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```



```
% Hint: place code in OpeningFcn to populate axes_Rt
% --- Executes during object creation, after setting all properties.
```

```
function figure1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to figure1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called
```

```
% Hint: place code in OpeningFcn to populate figure1
```

```
% --- Executes during object creation, after setting all properties.
```

```
function axes_ETSINO_CreateFcn(hObject, eventdata, handles)
% hObject    handle to axes_ETSINO (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called
```

```
% Hint: place code in OpeningFcn to populate axes_ETSINO
```

```
% --- Executes during object creation, after setting all properties.
```

```
function axes_Buque_CreateFcn(hObject, eventdata, handles)
% hObject    handle to axes_Buque (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called
```

```
% Hint: place code in OpeningFcn to populate axes_Buque
```

```
% --- Executes during object creation, after setting all properties.
```

```
function axes_EHP_CreateFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called
```

```
% Hint: place code in OpeningFcn to populate axes_EHP
```

```
% --- Executes on button press in pushbutton_ComprobarRangos.
```

```
function pushbutton_ComprobarRangos_Callback(hObject, eventdata,
handles)
% hObject    handle to pushbutton_ComprobarRangos (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global rangometodo
rangometodo='Holtrop y Mennen';
rangos(rangometodo);
```

```
% --- Executes on button press in pushbutton_Salir.
```

```
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Salir (see GCBO)
```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
close(gcf)
global comp
global metodo
global v
global v_EHP
global v_RT
comp=0;
switch metodo
    case 'Guldhammer y Harvald'
        global vGuld
        global v_RTGuld
        global v_EHPGuld
        v=vGuld;
        v_RT=v_RTGuld;
        v_EHP=v_EHPGuld;
    case 'Amadeo Garcia'
        global vAmd
        global v_RTAMD
        global v_EHPAMD
        v=vAmd;
        v_RT=v_RTAMD;
        v_EHP=v_EHPAMD;
    case 'Van Oortmerssen'
        global vVan
        global v_RTVan
        global v_EHPVan
        v=vVan;
        v_RT=v_RTVan;
        v_EHP=v_EHPVan;
end

% --- Executes on mouse press over axes background.
function axes_Rt_ButtonDownFcn(hObject, eventdata, handles)
% hObject handle to axes_Rt (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global v
global v_RT
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_RT);
v_RT1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_RT1=[v_RT1 v_RT(j)];
        else
            end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on

```

```

set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Guldhammer y Harvald'
            global vGuld
            global v1Guld
            global v_RTGuld
            n=length(v1Guld);
            m=length(v_RTGuld);
            v_RT1Guld=[];
            for i=1:n
                for j=1:m
                    if v1Guld(i)==vGuld(j)
                        v_RT1Guld=[v_RT1Guld v_RTGuld(j)];
                    else
                        end
                end
            end
            vcomp=vGuld;
            v1comp=v1Guld;
            v_RTcomp=v_RTGuld;
            v_RT1comp=v_RT1Guld;
            leyenda='Guldhammer y Harvald';
        case 'Amadeo García'
            global vAmd
            global v1Amd
            global v_RTAMD
            n=length(v1Amd);
            m=length(v_RTAMD);
            v_RT1Amd=[];
            for i=1:n
                for j=1:m
                    if v1Amd(i)==vAmd(j)
                        v_RT1Amd=[v_RT1Amd v_RTAMD(j)];
                    else
                        end
                end
            end
            vcomp=vAmd;
            v1comp=v1Amd;
            v_RTcomp=v_RTAMD;
            v_RT1comp=v_RT1Amd;
            leyenda='Amadeo García';
        case 'Van Oortmerssen'
            global vVan
            global v1Van
            global v_RTVan
            n=length(v1Van);
            m=length(v_RTVan);
            v_RT1Van=[];
            for i=1:n
                for j=1:m
                    if v1Van(i)==vVan(j)

```

```

        v_RT1Van=[v_RT1Van v_RTVan(j)];
    else
    end
end
end
vcomp=vVan;
v1comp=v1Van;
v_RTcomp=v_RTVan;
v_RT1comp=v_RT1Van;
leyenda='Van Oortmerssen';
end
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(vcomp,v_RTcomp,'y-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
plot(v1comp,v_RT1comp,'ro','LineWidth',2);axis tight;hold on
lgd=legend({'Holtrop y Mennen',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
end
else
end

% --- Executes on mouse press over axes background.
function axes_EHP_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_EHP
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_EHP);
v_EHP1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_EHP1=[v_EHP1 v_EHP(j)];
        else
        end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');

```

```

position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Guldhammer y Harvald'
            global vGuld
            global v1Guld
            global v_EHPGuld
            n=length(v1Guld);
            m=length(v_EHPGuld);
            v_EHP1Guld=[];
            for i=1:n
                for j=1:m
                    if v1Guld(i)==vGuld(j)
                        v_EHP1Guld=[v_EHP1Guld v_EHPGuld(j)];
                    else
                        end
                end
            end
            vcomp=vGuld;
            v1comp=v1Guld;
            v_EHPcomp=v_EHPGuld;
            v_EHP1comp=v_EHP1Guld;
            leyenda='Guldhammer y Harvald';
        case 'Amadeo García'
            global vAmd
            global v1Amd
            global v_EHPAmd
            n=length(v1Amd);
            m=length(v_EHPAmd);
            v_EHP1Amd=[];
            for i=1:n
                for j=1:m
                    if v1Amd(i)==vAmd(j)
                        v_EHP1Amd=[v_EHP1Amd v_EHPAmd(j)];
                    else
                        end
                end
            end
            vcomp=vAmd;
            v1comp=v1Amd;
            v_EHPcomp=v_EHPAmd;
            v_EHP1comp=v_EHP1Amd;
            leyenda='Amadeo García';
        case 'Holtrop y Mennen'
            global vHolt
            global v1Holt
            global v_EHPHolt
            n=length(v1Holt);
            m=length(v_EHPHolt);
            v_EHP1Holt=[];
            for i=1:n
                for j=1:m
                    if v1Holt(i)==vHolt(j)
                        v_EHP1Holt=[v_EHP1Holt v_EHPHolt(j)];
                    else

```

```

        end
    end
    end
    vcomp=vHolt;
    vlcomp=vlHolt;
    v_EHPcomp=v_EHPHolt;
    v_EHP1comp=v_EHP1Holt;
    leyenda='Holtrop y Mennen';
end
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vcomp,v_EHPcomp,'k-','LineWidth',2);axis tight;hold on
plot(vl,v_EHP1,'bo','LineWidth',2);axis tight;hold on
plot(vlcomp,v_EHP1comp,'bo','LineWidth',2);axis tight;hold on
lgd=legend({'Holtrop y Mennen',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
end
else
end
end

% --- Executes on button press in pushbutton_Comparar.
function pushbutton_Comparar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comparar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
global tipo_barco
global metodo
global v
global vl
global v_EHP
global v_RT
global vHolt
global vlHolt
global v_EHPHolt
global v_RTHolt
global compplot
global cancelar
if comp==0 | cancelar==1
switch tipo_barco
case 'Carga general'
    pop={'--Selección--','Guldhammer y Harvald'};
case 'Portacontenedores'
    pop={'--Selección--','Guldhammer y Harvald'};
case 'Petrolero'
    pop={'--Selección--','Guldhammer y Harvald'};
case 'Costero'
    pop={'--Selección--','Guldhammer y Harvald'};
case 'Bulkcarrier'
    pop={'--Selección--','Guldhammer y Harvald'};
case 'Ro-Ro'
    pop={'--Selección--','Guldhammer y Harvald'};

```

```

    case 'Ferry'
        pop={'--Selección--', 'Guldhammer y Harvald'};
    case 'Arrastrero'
        pop={'--Selección--', 'Guldhammer y Harvald', 'Amadeo
García', 'Van Oortmerssen'};
    case 'Remolcador'
        pop={'--Selección--', 'Guldhammer y Harvald', 'Amadeo
García', 'Van Oortmerssen'};
end
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
Lf=str2num(get(handles.edit_Lf, 'String'));
Lpp=str2num(get(handles.edit_Lpp, 'String'));
B=str2num(get(handles.edit_B, 'String'));
T=str2num(get(handles.edit_T, 'String'));
CP=str2num(get(handles.edit_CP, 'String'));
Vmin=str2num(get(handles.edit_Vmin, 'String'));
Vmax=str2num(get(handles.edit_Vmax, 'String'));
Desp=str2num(get(handles.edit_Desp, 'String'));
if get(handles radiobutton_Rio, 'Value')==1
    Densidad=1.000; %Tm3
    AGUA=1;
else
    Densidad=1.025; %T/m3
    AGUA=0;
end
VolCarena=Desp/Densidad;
ATB=str2num(get(handles.edit_ATB, 'String'));
LCB=str2num(get(handles.edit_LCB, 'String'));
XF=str2num(get(handles.edit_XF, 'String'));
t=str2num(get(handles.edit_t, 'String'));
if get(handles radiobutton_SmSi, 'Value')==1
    Sm=str2num(get(handles.edit_Sm, 'String'));
else
    Sm=0;
end
if get(handles radiobutton_iESi, 'Value')==1
    iE=str2num(get(handles.edit_iE, 'String'));
else
    iE=0;
end
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
contents=cellstr(get(handles.popupmenu_Estacion, 'String'));

```

```

Estacion=contents(get(handles.popupmenu_Estacion, 'Value'));
if get(handles.radiobutton_Arbotantes, 'Value')==1
    SmArbotantes=str2num(get(handles.edit_SmArbotantes, 'String'));
else
    SmArbotantes=0;
end
SmHenchimientos=0;
if get(handles.radiobutton_Henchimientos1, 'Value')==1

SmHenchimientos=SmHenchimientos+str2num(get(handles.edit_SmHenchimientos1, 'String'));
else
end
if get(handles.radiobutton_Henchimientos2, 'Value')==1

SmHenchimientos=SmHenchimientos+str2num(get(handles.edit_SmHenchimientos2, 'String'));
else
end
vHolt=v;
v1Holt=v1;
v_EHPHolt=v_EHP;
v_RTHolt=v_RT;
[comp]=comparar(pop);
cancelar=1;
else
compplot=1;
switch metodo
    case 'Guldhammer y Harvald'
        global vGuld
        global v_RTGuld
        global v_EHPGuld
        vcomp=vGuld;
        v_RTcomp=v_RTGuld;
        v_EHPcomp=v_EHPGuld;
        leyenda='Guldhammer y Harvald';
    case 'Amadeo Garcia'
        global vAmd
        global v_RTAMD
        global v_EHPAMD
        vcomp=vAmd;
        v_RTcomp=v_RTAMD;
        v_EHPcomp=v_EHPAMD;
        leyenda='Amadeo Garcia';
    case 'Van Oortmerssen'
        global vVan
        global v_RTVan
        global v_EHPVan
        vcomp=vVan;
        v_RTcomp=v_RTVan;
        v_EHPcomp=v_EHPVan;
        leyenda='Van Oortmerssen';
end
axes(handles.axes_Rt);
cla(handles.axes_Rt, 'reset');
handles.plot1=plot(v, v_RT, '-b', vcomp, v_RTcomp, 'y-'); axis tight; hold on
lgd=legend({'Holtrop y Mennen', leyenda});
set(handles.plot1, 'HitTest', 'off') ;
set(handles.axes_Rt, 'ButtonDownFcn', @(s,e) axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')

```



```

ylabel('Rt (kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r',vcomp,v_EHPcomp,'k-');axis tight;hold
on
lgd=legend({'Holtrop y Mennen',leyenda});
set(handles.plot2,'HitTest','off') ;
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,
handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
cancelar=0;
end

```

Método de Guldhammer y Harvald.

```
function varargout = GuldhammerHarvald(varargin)
% GULDHAMMERYHARVALD MATLAB code for GuldhammerHarvald.fig
%   GULDHAMMERYHARVALD, by itself, creates a new GULDHAMMERYHARVALD
or raises the existing
%   singleton*.
%
%   H = GULDHAMMERYHARVALD returns the handle to a new
GULDHAMMERYHARVALD or the handle to
%   the existing singleton*.
%
%   GULDHAMMERYHARVALD('CALLBACK',hObject,eventData,handles,...)
calls the local
%   function named CALLBACK in GULDHAMMERYHARVALD.M with the given
input arguments.
%
%   GULDHAMMERYHARVALD('Property','Value',...) creates a new
GULDHAMMERYHARVALD or raises the
%   existing singleton*. Starting from the left, property value
pairs are
%   applied to the GUI before GuldhammerHarvald_OpeningFcn gets
called. An
%   unrecognized property name or invalid value makes property
application
%   stop. All inputs are passed to GuldhammerHarvald_OpeningFcn
via varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
only one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help
GuldhammerHarvald

% Last Modified by GUIDE v2.5 14-Jan-2020 19:51:46

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',  gui_Singleton, ...
                  'gui_OpeningFcn', @GuldhammerHarvald_OpeningFcn,
                  ...
                  'gui_OutputFcn',  @GuldhammerHarvald_OutputFcn,
                  ...
                  'gui_LayoutFcn',   [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT
```

```

% --- Executes just before GuldhammerHarvald is made visible.
function GuldhammerHarvald_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)
% varargin   command line arguments to GuldhammerHarvald (see
VARARGIN)

% Choose default command line output for GuldhammerHarvald
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
global tipo_barco;
axes(handles.axes_ETSINO);
imshow(imread('descarga.jpg'))
axes(handles.axes_Buque);
switch tipo_barco
    case 'Carga general'
        imshow(imread('carga general.jpg'));
        set(handles.text_TipoBuque, 'String', 'Carga general');
    case 'Portacontenedores'
        imshow(imread('portacontenedores.jpg'));
        set(handles.text_TipoBuque, 'String', 'Portacontenedores');
    case 'Petrolero'
        imshow(imread('petrolero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Petrolero');
    case 'Costero'
        imshow(imread('costero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Costero');
    case 'Bulkcarrier'
        imshow(imread('bulkcarrier.jpg'));
        set(handles.text_TipoBuque, 'String', 'Bulkcarrier');
    case 'Ro-Ro'
        imshow(imread('ro-ro.jpg'));
        set(handles.text_TipoBuque, 'String', 'Ro-Ro');
    case 'Ferry'
        imshow(imread('ferry.jpg'));
        set(handles.text_TipoBuque, 'String', 'Ferry');
    case 'Arrastrero'
        imshow(imread('arrastrero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Arrastrero');
    case 'Remolcador'
        imshow(imread('remolcador.jpg'));
        set(handles.text_TipoBuque, 'String', 'Remolcador');
end
global calc
global cancelar
cancelar=0;
calc=0;
global comp
global metodo

```

```

global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
global Am
global At
if comp==0
Lf='';
Lpp='';
B='';
T='';
Vmin='';
Vmax='';
VolCarena ='';
t='';
XF ='';
ATB ='';
Sm ='';
AGUA ='';
Estacion='';
Ruta='';
CP='';
LCB='';
iE='';
SmArbotantes='';
SmHenchimientos='';
At='';
Am='';
else
switch metodo
case 'Holtrop y Mennen'
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_Lpp, 'String', num2str(Lpp));
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'String', num2str(T));
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_CP, 'String', num2str(CP));
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1

```

```

Densidad=1.000; %T/m3
set(handles.radiobutton_Rio, 'Value', 1);
else
Densidad=1.025; %T/m3
set(handles.radiobutton_Mar, 'Value', 1);
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_ATB, 'String', num2str(ATB));
set(handles.edit_LCB, 'String', num2str(LCB));
set(handles.edit_LCB, 'Enable', 'off');
if ATB==0
    set(handles.radiobutton_BulboNo, 'Value', 1);
else
    set(handles.radiobutton_BulboSi, 'Value', 1);
end
if Sm==0
    set(handles.radiobutton_No, 'Value', 1);
elseif Sm~=0
    set(handles.radiobutton_Si, 'Value', 1);
    set(handles.edit_Sm, 'String', num2str(Sm));
end
set(handles.popupmenu_Rutas, 'String', Ruta);
set(handles.popupmenu_Estacion, 'String', Estacion);
if SmArbotantes==0
else
    set(handles.radiobutton_Arbotantes, 'Value', 1);
    set(handles.edit_Arbotantes, 'String', num2str(SmArbotantes));
end
if SmHenchimientos==0
else
    set(handles.radiobutton_Henchimientos, 'Value', 1);

set(handles.edit_Henchimientos, 'String', num2str(SmHenchimientos));
end
case 'Amadeo García'
    set(handles.edit_Lf, 'String', num2str(Lf));
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'String', num2str(Lpp));
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'String', num2str(B));
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'String', num2str(T));
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Vmin, 'String', num2str(Vmin));
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'String', num2str(Vmax));
    set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
Densidad=1.000; %T/m3
set(handles.radiobutton_Rio, 'Value', 1);
else
Densidad=1.025; %T/m3
set(handles.radiobutton_Mar, 'Value', 1);
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_ATB, 'String', num2str(ATB));
if ATB==0
    set(handles.radiobutton_BulboNo, 'Value', 1);
else

```

```

        set(handles.radiobutton_BulboSi, 'Value', 1);
    end
    if Sm==0
        set(handles.radiobutton_No, 'Value', 1);
    else
        set(handles.radiobutton_Si, 'Value', 1);
        set(handles.edit_Sm, 'String', num2str(Sm));
    end
    set(handles.popupmenu_Rutas, 'String', Ruta);
    set(handles.popupmenu_Estacion, 'String', Estacion);
case 'Van Oortmerssen'
    set(handles.edit_Lf, 'String', num2str(Lf));
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'String', num2str(Lpp));
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'String', num2str(B));
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'String', num2str(T));
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_CP, 'String', num2str(CP));
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_Vmin, 'String', num2str(Vmin));
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'String', num2str(Vmax));
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_LCB, 'String', num2str(LCB));
    set(handles.edit_LCB, 'Enable', 'off');
    if AGUA==1
        Densidad=1.000; %T/m3
        set(handles.radiobutton_Rio, 'Value', 1);
    else
        Densidad=1.025; %T/m3
        set(handles.radiobutton_Mar, 'Value', 1);
    end
    set(handles.edit_VolCarena, 'String', num2str(VolCarena));
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_ATB, 'String', num2str(ATB));
    if ATB==0
        set(handles.radiobutton_BulboNo, 'Value', 1);
    else
        set(handles.radiobutton_BulboSi, 'Value', 0);
    end
    if Sm==0
        set(handles.radiobutton_No, 'Value', 1);
    else
        set(handles.radiobutton_Si, 'Value', 1);
        set(handles.edit_Sm, 'String', num2str(Sm));
    end
    set(handles.popupmenu_Rutas, 'String', Ruta);
    set(handles.popupmenu_Estacion, 'String', Estacion);
end
end
% UIWAIT makes GuldhammeryHarvald wait for user response (see
UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = GuldhammeryHarvald_OutputFcn(hObject, eventdata,
handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on button press in pushbutton_Calcular.
function pushbutton_Calcular_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Calcular (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global v
global v1
global v_RT
global v_EHP
global calc
global compplot
celdas=0;
servicio=0;
global tipo_barco
if strcmp(get(handles.edit_B,'String'),'') |
strcmp(get(handles.edit_B,'String'),char(zeros(1,0)))
celdas=1;
elseif strcmp(get(handles.edit_T,'String'),'') |
strcmp(get(handles.edit_T,'String'),char(zeros(1,0)))
celdas=1;
elseif get(handles.radiobutton_BulboSi,'Value')==1 &&
(strcmp(get(handles.edit_ATB,'String'),'') |
strcmp(get(handles.edit_ATB,'String'),char(zeros(1,0))))
celdas=1;
elseif get(handles.radiobutton_Si,'Value')==1
if strcmp(get(handles.edit_Sm,'String'),'') |
strcmp(get(handles.edit_Sm,'String'),char(zeros(1,0)))
celdas=1;
else
end
else
end
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
contents=cellstr(get(handles.popupmenu_Estacion,'String'));
Estacion=contents{get(handles.popupmenu_Estacion,'Value')};
if strcmp(Ruta,'--Selección--')
servicio=1;
elseif strcmp(Ruta,'Desconocida')
else
if strcmp(Estacion,'--Selección--')
servicio=1;
else
end
end
end
if celdas~=0
msgbox('Rellene todas las celdas vacias.','Error','error');
elseif servicio~=0
msgbox('Asegurese de seleccionar alguna ruta y estación de
servicio.','Error','error');
else
Lf=str2num(get(handles.edit_Lf,'String'));
Lpp=str2num(get(handles.edit_Lpp,'String'));
CP=str2num(get(handles.edit_CP,'String'));

```

```

VolCarena=str2num(get(handles.edit_VolCarena,'String'));
LCB=str2num(get(handles.edit_LCB,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
B=str2num(get(handles.edit_B,'String'));
T=str2num(get(handles.edit_T,'String'));
ATB=str2num(get(handles.edit_ATB,'String'));
CB=VolCarena/(Lf*B*T);
CM=CB/CP;
AM=CM*B*T/Lf;
SA=0;
if get(handles radiobutton_Rio,'Value')==1
    Densidad=1000; %kg/m3
    Viscdinam=1.141*10^-6; %m2/s
else
    Densidad=1025; %kg/m3
    Viscdinam=1.223*10^-6; %m2/s
end
lcb=100*LCB/Lpp;
if get(handles radiobutton_Si,'Value')==1
    Sm=str2num(get(handles.edit_Sm,'String'));
else
    switch tipo_barco
    case 'Carga general'
        Sm=1.025*Lpp*(CB*B+1.7*T);
    case 'Portacontenedores'
        Sm=0.995*(VolCarena/T+1.9*Lf*T);
    case 'Petrolero'
        Sm=1.025*Lpp*(CB*B+1.7*T);
    case 'Costero'
        Sm=1.025*Lpp*(CB*B+1.7*T);
    case 'Bulkcarrier'
        Sm=0.99*(VolCarena/T+1.9*Lf*T);
    case 'Ro-Ro'
        Sm=1.53*(VolCarena/T+0.55*Lf*T);
    case 'Ferry'
        Sm=1.11*(VolCarena/T+1.7*Lf*T);
    case 'Arrastrero'
        Sm=1.025*Lpp*(CB*B+1.7*T);
    case 'Remolcador'
        Sm=1.025*Lpp*(CB*B+1.7*T);
    end
end
if get(handles radiobutton_Henchimientos,'Value')==1
    SA=SA+str2num(get(handles.edit_Henchimientos,'String'));
else
end
if get(handles radiobutton_Arbotantes,'Value')==1
    SA=SA+str2num(get(handles.edit_Arbotantes,'String'));
else
end
SmA=Sm+SA;
v_Fn=[];
v_Rn=[];
v_EHP=[];
v_RT=[];
v_CT=[];
v_CF=[];
v_CA=[];
v_CAA=[];
v_CG=[];

```



```

v_CR=[];
x1_ent=[];
x2_ent=[];
x3_ent=[];
x4_ent=[];
y1_ent=[];
y2_ent=[];
y3_ent=[];
y4_ent=[];
CR1_salida=[];
CR2_salida=[];
CR_salida=[];
Fn_entrada=[];
for V=Vmin:0.2:Vmax
    CR=0;
    Rn=V*0.514444*Lf/Viscdinam;
    v_Rn=[v_Rn,Rn];
    CF=0.075/((log10(Rn)-2)^2);
    Fn=V*0.514444/((9.81*Lf)^(1/2));
    Fn_entrada=[Fn_entrada,Fn];
    v_Fn=[v_Fn,Fn];
    %Correccion de CR (buque estándar)
    %Aportamos los puntos de las curvas pertenecientes a las
diferentes gráficas.
    if Lpp/(VolCarena^(1/3))>=4 && Lpp/(VolCarena^(1/3))<=4.5
        %%CP=0.50

x0=[0.34761,0.34248,0.33579,0.33147,0.323985,0.313254,0.302604,0.29370
6,0.28848,0.282285,0.270717,0.256263,0.245361,0.232995,0.216036,0.1974
21,0.170934,0.15];

y0=[12,10.81,9.288,8.387,7.0891,5.431,4.2111,3.4188,3.0334,2.733,2.337
1,1.9619,1.7373,1.517,1.2966,1.1273,0.9451,0.843];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %%CP=0.55

x1=[0.385764,0.383382,0.37578,0.365301,0.356694,0.346461,0.334146,0.31
6398,0.293844,0.275085,0.260562,0.246939,0.227163,0.207615,0.188949,0.
176832,0.162348,0.15];

y1=[12,11.369,9.7172,7.9019,6.7659,5.7648,4.9112,3.9922,3.1803,2.5877,
2.1792,1.849,1.4683,1.2239,1.0678,0.9839,0.9022,0.843];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %%CP=0.60

x2=[0.398124,0.397509,0.394851,0.392076,0.387579,0.381243,0.373056,0.3
67458,0.362343,0.355242,0.347154,0.33759,0.325161,0.313536,0.306189,0.
299694,0.292326,0.280932,0.268668,0.257352,0.245943,0.236442,0.225702,
0.212643,0.195879,0.169614,0.15];

y2=[12,11.7542,10.9683,10.1466,9.1923,8.1251,7.0935,6.5598,6.2026,5.78
93,5.3993,5.0701,4.7214,4.4062,4.1918,4.0005,3.7359,3.2595,2.7409,2.32
94,1.9831,1.7483,1.5384,1.3312,1.1401,0.9524,0.843];
    [x2,ind]=sort(x2,'ascend');
    y2=y2(ind);
    %%CP=0.65

x3=[0.40794,0.40605,0.40266,0.399339,0.39594,0.39102,0.38394,0.37845,0

```

```

.37341,0.36783,0.36387,0.35808,0.35262,0.34776,0.34128,0.32898,0.32103
,0.31446,0.31077,0.30726,0.30297,0.29829,0.29379,0.28854,0.28302,0.276
93,0.2673,0.25515,0.23829,0.22164,0.2055,0.18723,0.16326,0.15,0.20253,
0.189291,0.178809,0.165486,0.15];

y3=[12,11.643,10.985,10.371,9.751,8.953,8.002,7.425,7.02,6.757,6.619,6
.511,6.473,6.474,6.525,6.667,6.718,6.712,6.688,6.619,6.486,6.195,5.743
,5.049,4.367,3.748,3.102,2.522,1.966,1.563,1.295,1.083,0.919,0.843,1.3
554,1.164,1.044,0.937,0.843];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%%CP=0.70

x4=[0.4107,0.40839,0.40515,0.40014,0.39393,0.38688,0.38244,0.3789,0.37
446,0.37017,0.36684,0.3621,0.35718,0.3501,0.34026,0.33318,0.32661,0.32
121,0.31797,0.314283,0.30951,0.30387,0.29829,0.291021,0.286188,0.28269
,0.27957,0.274902,0.27033,0.26463,0.25701,0.25065,0.244212,0.237066,0.
22791,0.21702,0.20253,0.189291,0.178809,0.165486,0.15];

y4=[11.428,11.052,10.554,9.802,9.159,8.711,8.545,8.474,8.44,8.435,8.45
6,8.534,8.671,8.947,9.308,9.482,9.569,9.5899,9.577,9.516,9.349,9.003,8
.447,7.472,6.666,6.059,5.535,4.7892,4.191,3.6152,3.1203,2.742,2.432,2.
146,1.866,1.615,1.3554,1.164,1.044,0.937,0.843];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%%CP=0.75

x5=[0.408096,0.403821,0.398991,0.394734,0.388374,0.384279,0.378804,0.3
75144,0.372723,0.365313,0.360177,0.355218,0.348555,0.343653,0.339435,0
.334005,0.329757,0.326826,0.322563,0.317976,0.313299,0.305709,0.298755
,0.29268,0.284079,0.273423,0.263364,0.254745,0.248085,0.241707,0.23286
,0.223815,0.213744,0.198825,0.179283,0.162453,0.15];

y5=[10.5651,10.068,9.6676,9.4616,9.264,9.1723,9.1231,9.125,9.1521,9.38
13,9.6746,10.146,10.7204,11.0435,11.2075,11.3645,11.4432,11.4525,11.44
12,11.3586,11.1961,10.8061,10.3055,9.7319,8.5093,6.6142,5.0452,4.0169,
3.3971,2.9384,2.4921,2.1515,1.8812,1.581,1.2828,1.0933,1];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%%CP=8

x6=[0.261207,0.257097,0.244389,0.235881,0.226011,0.218856,0.209496,0.1
99602,0.189699,0.179826,0.16545,0.15];

y6=[8.5259,7.7857,5.801,4.7758,3.8043,3.2526,2.7317,2.2928,1.9734,1.72
81,1.4523,1.2055];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos

```

```

        switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
        case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
        case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
        case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
        case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
        case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
        case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
        end

    else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
2 CP
        CP1=CPrango(index(1));
        CP2=CPrango(index(2));
        if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
            kk=CP1;
            CP1=CP2;
            CP2=kk;
        end

        switch CP1
        case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
ada);
            y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
            x1_ent=x0_interpolado;
            y1_ent=y0_interpolado;
            x2_ent=x1_interpolado;
            y2_ent=y1_interpolado;
        case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
ada);

```

```

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x1_interpolado;
    y1_ent=y1_interpolado;
    x2_ent=x2_interpolado;
    y2_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entrada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x2_interpolado;
    y1_ent=y2_interpolado;
    x2_ent=x3_interpolado;
    y2_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entrada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x3_interpolado;
    y1_ent=y3_interpolado;
    x2_ent=x4_interpolado;
    y2_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entrada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x4_interpolado;
    y1_ent=y4_interpolado;
    x2_ent=x5_interpolado;
    y2_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x5_interpolado;
    y1_ent=y5_interpolado;
    x2_ent=x6_interpolado;
    y2_ent=y6_interpolado;

```

```

    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);

    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x6_interpolado;
    y1_ent=y6_interpolado;
    x2_ent=x7_interpolado;
    y2_ent=y7_interpolado;
end
end
CR4=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.35514,0.35331,0.35091,0.34851,0.34497,0.341289,0.338127,0.331299,0.32697,0.3228,0.31818,0.31434,0.31179,0.30924,0.30597,0.30285,0.298755,0.29349,0.288102,0.28125,0.27414,0.267519,0.25821,0.24846,0.238482,0.226719,0.20838,0.19698,0.18168,0.164985,0.15];

y0=[12,11.57,10.899,9.949,8.932,8.006,7.301,6.042,5.348,4.775,4.2259,3.829,3.604,3.392,3.155,2.9592,2.7199,2.4491,2.224,1.9792,1.7769,1.6306,1.4753,1.3282,1.1881,1.0718,0.919,0.84,0.7853,0.741,0.7004];
[x0,ind]=sort(x0,'ascend');
y0=y0(ind);
%CP=0.55

x1=[0.39057,0.38679,0.378618,0.371145,0.36351,0.357216,0.35133,0.34467,0.339195,0.33249,0.324069,0.31662,0.305949,0.294135,0.28194,0.27135,0.26304,0.255501,0.24708,0.234012,0.222018,0.20829,0.1979376,0.182382,0.15];

y1=[12,11.118,9.2075,7.8497,6.7115,5.9743,5.3765,4.8044,4.3821,3.9915,3.6072,3.297,2.914,2.537,2.179,1.8957,1.6949,1.5315,1.3771,1.174,1.036,0.9198,0.8478,0.79,0.7004];
[x1,ind]=sort(x1,'ascend');
y1=y1(ind);
%CP=0.6

x2=[0.401559,0.4002456,0.397041,0.393219,0.389319,0.384291,0.3794553,0.3752166,0.370842,0.363363,0.354363,0.349251,0.342612,0.33288,0.318711,0.310122,0.302796,0.29052,0.276237,0.26559,0.25959,0.25434,0.246462,0.233793,0.223515,0.2138091,0.202371,0.190617,0.169431,0.15];

y2=[12,11.4913,10.489,9.5104,8.6812,7.8944,7.209,6.6888,6.2502,5.6632,5.1359,4.874,4.6124,4.332,3.986,3.7602,3.5099,3.045,2.462,2.0615,1.866,1.7139,1.53405,1.2994,1.1614,1.0471,0.939,0.8603,0.764,0.7004];
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.41133,0.405747,0.396888,0.3908979,0.38385,0.3773097,0.372789,0.368763,0.363786,0.3600075,0.356223,0.352296,0.348387,0.339651,0.33018,0.3232212,0.3189186,0.313983,0.308511,0.303354,0.2987775,0.293895,0.2879322,0.281319,0.275199,0.26853,0.258774,0.249129,0.238581,0.2232606,0.2072148,0.1891941,0.170304,0.15];

```

```

y3=[12,10.9308,9.2679,8.3524,7.5165,6.9321,6.6115,6.4052,6.23065,6.149
99,6.08833,6.0507,6.0375,6.0421,6.0705,6.0749,6.0379,5.9481,5.79074,5.
52369,5.11286,4.60637,3.964,3.3996,3.0039,2.6336,2.20261,1.84194,1.545
7,1.26857,1.05347,0.8772,0.77466,0.7004];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.410391,0.406209,0.401256,0.396882,0.391323,0.385743,0.3815466,0.
3766302,0.3713685,0.367497,0.361746,0.3504852,0.33987,0.3323244,0.3266
07,0.3212772,0.3156426,0.310866,0.306219,0.299616,0.291981,0.283755,0.
277968,0.2723352,0.2660301,0.25767,0.247419,0.2358492,0.2230737,0.2055
951,0.188289,0.171399,0.15];

y4=[10.9734,10.19195,9.41248,8.9359,8.5324,8.3061,8.21462,8.1687,8.161
2,8.1841,8.2595,8.45885,8.6309,8.72284,8.74318,8.70848,8.6099,8.4309,8
.08831,7.3735,6.19463,4.82312,4.0723,3.5374,3.0757,2.5942,2.1213,1.733
9,1.44643,1.154463,0.9529,0.8167,0.7004];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.391827,0.3881142,0.38337,0.378534,0.3723456,0.367686,0.361866,0.
358062,0.353043,0.347853,0.342951,0.337887,0.332556,0.327792,0.324198,
0.32004,0.3138888,0.307836,0.30084,0.2944389,0.285909,0.280146,0.27605
97,0.271407,0.264693,0.258609,0.252738,0.245379,0.239262,0.232959,0.22
6113,0.219036,0.209547,0.199188,0.1861758,0.169002,0.15];

y5=[9.31506,9.1938,9.0792,9.0353,9.0428,9.1108,9.2855,9.4852,9.83395,1
0.2247,10.52139,10.7472,10.8776,10.9086,10.881,10.7905,10.5033,10.0865
,9.43696,8.7202,7.4816,6.477,5.8104,5.1055,4.2149,3.5828,3.1267,2.6678
,2.3454,2.0776,1.8473,1.6626,1.4577,1.2788,1.0993,0.9307,0.79824];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2795259,0.27246,0.264348,0.253983,0.244815,0.23907,0.232578,0.22
4967,0.218007,0.2083251,0.1982769,0.184545,0.168393,0.15];

y6=[8.8491,7.7109,6.4749,5.10303,4.0072,3.4495,2.9487,2.49199,2.17293,
1.8535,1.60604,1.34099,1.1103,0.9014];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.223269,0.2195769,0.2134389,0.207168,0.199338,0.1896999,0.17991,0
.165954,0.15];

y7=[3.6396,3.34521,2.8895,2.5241,2.2048,1.90005,1.6451,1.364,1.09297];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

```

```

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
        case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
        case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
        case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
        case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
        case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
        case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
        case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
        end

    else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
    2 CP
        CP1=CPrango(index(1));
        CP2=CPrango(index(2));
        if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
            kk=CP1;
            CP1=CP2;
            CP2=kk;
        end

        switch CP1
            case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
ada);
            y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
            x3_ent=x0_interpolado;
            y3_ent=y0_interpolado;
            x4_ent=x1_interpolado;

```

```

        y4_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_ent
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x1_interpolado;
        y3_ent=y1_interpolado;
        x4_ent=x2_interpolado;
        y4_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_ent
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x2_interpolado;
        y3_ent=y2_interpolado;
        x4_ent=x3_interpolado;
        y4_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_ent
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x3_interpolado;
        y3_ent=y3_interpolado;
        x4_ent=x4_interpolado;
        y4_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_ent
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x4_interpolado;
        y3_ent=y4_interpolado;
        x4_ent=x5_interpolado;
        y4_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_ent
rada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_ent
rada);

```



```

        y_salida=y_salidal+((y_salida2-y_salidal)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x5_interpolado;
        y3_ent=y5_interpolado;
        x4_ent=x6_interpolado;
        y4_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salidal]=cubic_bspline(x6,y6,20,x_entr
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entr
rada);
        y_salida=y_salidal+((y_salida2-y_salidal)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x6_interpolado;
        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR45=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR4+(CR45-CR4)/(4.5-4)*(Lpp/(VolCarena^(1/3))-4);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>4.5 && Lpp/(VolCarena^(1/3))<=5
%CP=0.5

x0=[0.35514,0.35331,0.35091,0.34851,0.34497,0.341289,0.338127,0.331299
,0.32697,0.3228,0.31818,0.31434,0.31179,0.30924,0.30597,0.30285,0.2987
55,0.29349,0.288102,0.28125,0.27414,0.267519,0.25821,0.24846,0.238482,
0.226719,0.20838,0.19698,0.18168,0.164985,0.15];

y0=[12,11.57,10.899,9.949,8.932,8.006,7.301,6.042,5.348,4.775,4.2259,3
.829,3.604,3.392,3.155,2.9592,2.7199,2.4491,2.224,1.9792,1.7769,1.6306
,1.4753,1.3282,1.1881,1.0718,0.919,0.84,0.7853,0.741,0.7004];
[x0,ind]=sort(x0,'ascend');
y0=y0(ind);
%CP=0.55

x1=[0.39057,0.38679,0.378618,0.371145,0.36351,0.357216,0.35133,0.34467
,0.339195,0.33249,0.324069,0.31662,0.305949,0.294135,0.28194,0.27135,0
.26304,0.255501,0.24708,0.234012,0.222018,0.20829,0.1979376,0.182382,0
.15];

y1=[12,11.118,9.2075,7.8497,6.7115,5.9743,5.3765,4.8044,4.3821,3.9915,
3.6072,3.297,2.914,2.537,2.179,1.8957,1.6949,1.5315,1.3771,1.174,1.036
,0.9198,0.8478,0.79,0.7004];
[x1,ind]=sort(x1,'ascend');
y1=y1(ind);
%CP=0.6

x2=[0.401559,0.4002456,0.397041,0.393219,0.389319,0.384291,0.3794553,0
.3752166,0.370842,0.363363,0.354363,0.349251,0.342612,0.33288,0.318711
,0.310122,0.302796,0.29052,0.276237,0.26559,0.25959,0.25434,0.246462,0
.233793,0.223515,0.2138091,0.202371,0.190617,0.169431,0.15];

y2=[12,11.4913,10.489,9.5104,8.6812,7.8944,7.209,6.6888,6.2502,5.6632,
5.1359,4.874,4.6124,4.332,3.986,3.7602,3.5099,3.045,2.462,2.0615,1.866
,1.7139,1.53405,1.2994,1.1614,1.0471,0.939,0.8603,0.764,0.7004];
[x2,ind]=sort(x2,'ascend');

```

```

y2=y2(ind);
%CP=0.65

x3=[0.41133,0.405747,0.396888,0.3908979,0.38385,0.3773097,0.372789,0.3
68763,0.363786,0.3600075,0.356223,0.352296,0.348387,0.339651,0.33018,0
.3232212,0.3189186,0.313983,0.308511,0.303354,0.2987775,0.293895,0.287
9322,0.281319,0.275199,0.26853,0.258774,0.249129,0.238581,0.2232606,0.
2072148,0.1891941,0.170304,0.15];

y3=[12,10.9308,9.2679,8.3524,7.5165,6.9321,6.6115,6.4052,6.23065,6.149
99,6.08833,6.0507,6.0375,6.0421,6.0705,6.0749,6.0379,5.9481,5.79074,5.
52369,5.11286,4.60637,3.964,3.3996,3.0039,2.6336,2.20261,1.84194,1.545
7,1.26857,1.05347,0.8772,0.77466,0.7004];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.410391,0.406209,0.401256,0.396882,0.391323,0.385743,0.3815466,0.
3766302,0.3713685,0.367497,0.361746,0.3504852,0.33987,0.3323244,0.3266
07,0.3212772,0.3156426,0.310866,0.306219,0.299616,0.291981,0.283755,0.
277968,0.2723352,0.2660301,0.25767,0.247419,0.2358492,0.2230737,0.2055
951,0.188289,0.171399,0.15];

y4=[10.9734,10.19195,9.41248,8.9359,8.5324,8.3061,8.21462,8.1687,8.161
2,8.1841,8.2595,8.45885,8.6309,8.72284,8.74318,8.70848,8.6099,8.4309,8
.08831,7.3735,6.19463,4.82312,4.0723,3.5374,3.0757,2.5942,2.1213,1.733
9,1.44643,1.154463,0.9529,0.8167,0.7004];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.391827,0.3881142,0.38337,0.378534,0.3723456,0.367686,0.361866,0.
358062,0.353043,0.347853,0.342951,0.337887,0.332556,0.327792,0.324198,
0.32004,0.3138888,0.307836,0.30084,0.2944389,0.285909,0.280146,0.27605
97,0.271407,0.264693,0.258609,0.252738,0.245379,0.239262,0.232959,0.22
6113,0.219036,0.209547,0.199188,0.1861758,0.169002,0.15];

y5=[9.31506,9.1938,9.0792,9.0353,9.0428,9.1108,9.2855,9.4852,9.83395,1
0.2247,10.52139,10.7472,10.8776,10.9086,10.881,10.7905,10.5033,10.0865
,9.43696,8.7202,7.4816,6.477,5.8104,5.1055,4.2149,3.5828,3.1267,2.6678
,2.3454,2.0776,1.8473,1.6626,1.4577,1.2788,1.0993,0.9307,0.79824];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2795259,0.27246,0.264348,0.253983,0.244815,0.23907,0.232578,0.22
4967,0.218007,0.2083251,0.1982769,0.184545,0.168393,0.15];

y6=[8.8491,7.7109,6.4749,5.10303,4.0072,3.4495,2.9487,2.49199,2.17293,
1.8535,1.60604,1.34099,1.1103,0.9014];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.223269,0.2195769,0.2134389,0.207168,0.199338,0.1896999,0.17991,0
.165954,0.15];

y7=[3.6396,3.34521,2.8895,2.5241,2.2048,1.90005,1.6451,1.364,1.09297];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

```

```

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5

```

```

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
rada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x0_interpolado;
    y1_ent=y0_interpolado;
    x2_ent=x1_interpolado;
    y2_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x1_interpolado;
    y1_ent=y1_interpolado;
    x2_ent=x2_interpolado;
    y2_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x2_interpolado;
    y1_ent=y2_interpolado;
    x2_ent=x3_interpolado;
    y2_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x3_interpolado;
    y1_ent=y3_interpolado;
    x2_ent=x4_interpolado;
    y2_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x4_interpolado;

```

```

        y1_ent=y4_interpolado;
        x2_ent=x5_interpolado;
        y2_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x1_ent=x5_interpolado;
        y1_ent=y5_interpolado;
        x2_ent=x6_interpolado;
        y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x1_ent=x6_interpolado;
        y1_ent=y6_interpolado;
        x2_ent=x7_interpolado;
        y2_ent=y7_interpolado;
    end
end
CR45=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.36129,0.361065,0.359751,0.357309,0.354618,0.35079,0.345975,0.339105,0.332073,0.325713,0.3209115,0.315147,0.307437,0.29946,0.288897,0.280887,0.270876,0.2585424,0.2441697,0.2250603,0.1882284,0.15];

y0=[12,11.9093,11.15633,10.1695,9.1548,7.9769,6.7519,5.4484,4.4215,3.70652,3.2825,2.8842,2.4468,2.0712,1.67711,1.46673,1.27335,1.0968,0.9562,0.8311,0.7078,0.6153];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.393618,0.3877941,0.3812346,0.3756705,0.3711201,0.3651327,0.359217,0.3525618,0.3475749,0.3424902,0.335082,0.326925,0.3175062,0.306663,0.2956515,0.2856666,0.274752,0.2625951,0.2510115,0.240591,0.229002,0.2182005,0.207513,0.193653,0.171219,0.15];

y1=[12,10.6329,9.16197,8.16396,7.3261,6.3566,5.56185,4.82816,4.35929,3.9634,3.53613,3.16456,2.79624,2.44767,2.13396,1.87265,1.63112,1.3924,1.18335,1.0422,0.9248,0.8408,0.7814,0.7364,0.6713,0.6153];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

x2=[0.4053684,0.4015248,0.3967923,0.392793,0.3899016,0.3870312,0.3847815,0.380937,0.376512,0.3719133,0.363891,0.357474,0.3492402,0.345063,0.

```

```
339297,0.3309003,0.319464,0.3122109,0.30404301,0.2950812,0.2858415,0.2
785362,0.268227,0.2563485,0.2465025,0.2339715,0.2136879,0.1855815,0.15
];
```

```
y2=[12,11.0614,9.9239,8.9926,8.3679,7.89901,7.54222,6.9936,6.4507,5.95
89,5.26502,4.81316,4.39734,4.20562,4.0002,3.78001,3.56522,3.396996,3.1
4445,2.80099,2.40988,2.09963,1.7522,1.43443,1.24793,1.07718,0.8815,0.7
2808,0.6153];
```

```
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65
```

```
x3=[0.4134453,0.409935,0.404625,0.400095,0.3963411,0.391644,0.3870843,
0.381669,0.3748338,0.3683481,0.362391,0.3566244,0.3501288,0.3425289,0.
3339855,0.3257439,0.3203997,0.315144,0.310554,0.3054036,0.300315,0.295
734,0.290103,0.285984,0.281025,0.2761719,0.270255,0.262908,0.2560479,0
.2463066,0.234324,0.221667,0.2002233,0.177426,0.15];
```

```
y3=[12,11.32183,10.2512,9.4092,8.76323,8.17352,7.61683,7.01421,6.42504
,6.04536,5.79114,5.6066,5.47986,5.40781,5.3806,5.38699,5.3643,5.2804,5
.16235,4.95195,4.5945,4.1929,3.62736,3.26168,2.88775,2.59226,2.28021,1
.9629,1.72845,1.47627,1.2351,1.04718,0.84544,0.71793,0.6153];
```

```
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7
```

```
x4=[0.4189764,0.4152279,0.410517,0.40587,0.399687,0.3931899,0.3871998,
0.3823137,0.3774525,0.3711504,0.3649584,0.359481,0.3513003,0.3416439,0
.3326187,0.3273147,0.3226911,0.3183204,0.3144315,0.3100536,0.3044295,0
.2996394,0.2938554,0.289323,0.283797,0.280089,0.2750775,0.269913,0.263
1303,0.257256,0.252129,0.2453574,0.2381178,0.230532,0.222537,0.207789,
0.188868,0.16683,0.15];
```

```
y4=[12,11.3632,10.5478,9.7886,8.9943,8.4013,8.1053,7.96145,7.87791,7.8
1948,7.79856,7.805,7.85407,7.89995,7.911672,7.89476,7.83011,7.72545,7.
5686,7.2962,6.8227,6.3385,5.6006,4.9592,4.23242,3.77797,3.3249,2.91965
,2.4985,2.19879,1.9786,1.74611,1.5465,1.3788,1.2371,1.0289,0.8316,0.68
73,0.6153];
```

```
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75
```

```
x5=[0.415686,0.410445,0.404862,0.400935,0.396312,0.389367,0.382569,0.3
77034,0.370503,0.364941,0.3608325,0.3571677,0.352278,0.342408,0.335847
,0.331077,0.3258549,0.321213,0.315633,0.311061,0.3048333,0.297324,0.28
7181,0.2774394,0.268308,0.262053,0.257154,0.2483412,0.238929,0.2305959
,0.2222262,0.2109576,0.193278,0.178449,0.164088,0.15];
```

```
y5=[10.9689,10.2805,9.6619,9.3968,9.1374,8.8809,8.7227,8.6698,8.6835,8
.7584,8.8724,9.0338,9.28224,9.7282,9.9324,10.0037,10.0074,9.9686,9.821
1,9.5905,8.9931,8.0727,6.5883,5.1579,4.0199,3.3707,2.9962,2.4564,2.035
3,1.7572,1.54111,1.31299,1.04918,0.8748,0.7528,0.6689];
```

```
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8
```

```
x6=[0.289737,0.279636,0.265299,0.257049,0.25203,0.245973,0.238506,0.22
9563,0.220854,0.2120994,0.198693,0.184017,0.166359,0.15];
```

```
y6=[9.0571,7.5019,5.4157,4.3868,3.8194,3.3119,2.8063,2.3278,1.9742,1.7
156,1.4283,1.1742,0.9486,0.7982];
```

```

[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.230502,0.228792,0.224958,0.216621,0.2086812,0.1997328,0.188322,0
.177534,0.164685,0.15];

y7=[3.6122,3.4456,3.1584,2.6637,2.2891,1.9768,1.6708,1.4266,1.2001,0.9
84];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPprango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPprango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
switch CP_entrada
case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
end

else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
2 CP

```

```

CP1=CPrango(index(1));
CP2=CPrango(index(2));
if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
    kk=CP1;
    CP1=CP2;
    CP2=kk;
end

switch CP1
case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entrada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x0_interpolado;
    y3_ent=y0_interpolado;
    x4_ent=x1_interpolado;
    y4_ent=y1_interpolado;
case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entrada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x1_interpolado;
    y3_ent=y1_interpolado;
    x4_ent=x2_interpolado;
    y4_ent=y2_interpolado;
case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entrada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x2_interpolado;
    y3_ent=y2_interpolado;
    x4_ent=x3_interpolado;
    y4_ent=y3_interpolado;
case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entrada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x3_interpolado;
    y3_ent=y3_interpolado;
    x4_ent=x4_interpolado;
    y4_ent=y4_interpolado;

```



```

    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entrada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x4_interpolado;
    y3_ent=y4_interpolado;
    x4_ent=x5_interpolado;
    y4_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x5_interpolado;
    y3_ent=y5_interpolado;
    x4_ent=x6_interpolado;
    y4_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x6_interpolado;
    y3_ent=y6_interpolado;
    x4_ent=x7_interpolado;
    y4_ent=y7_interpolado;
end
end
CR5=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR45+(CR5-CR45)/(5-4.5)*(Lpp/(VolCarena^(1/3))-4.5);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>5 && Lpp/(VolCarena^(1/3))<=5.5
%CP=0.5

x0=[0.36129,0.361065,0.359751,0.357309,0.354618,0.35079,0.345975,0.339105,0.332073,0.325713,0.3209115,0.315147,0.307437,0.29946,0.288897,0.280887,0.270876,0.2585424,0.2441697,0.2250603,0.1882284,0.15];

y0=[12,11.9093,11.15633,10.1695,9.1548,7.9769,6.7519,5.4484,4.4215,3.70652,3.2825,2.8842,2.4468,2.0712,1.67711,1.46673,1.27335,1.0968,0.9562,0.8311,0.7078,0.6153];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.393618,0.3877941,0.3812346,0.3756705,0.3711201,0.3651327,0.35921

```

```
7,0.3525618,0.3475749,0.3424902,0.335082,0.326925,0.3175062,0.306663,0.2956515,0.2856666,0.274752,0.2625951,0.2510115,0.240591,0.229002,0.2182005,0.207513,0.193653,0.171219,0.15];
```

```
y1=[12,10.6329,9.16197,8.16396,7.3261,6.3566,5.56185,4.82816,4.35929,3.9634,3.53613,3.16456,2.79624,2.44767,2.13396,1.87265,1.63112,1.3924,1.18335,1.0422,0.9248,0.8408,0.7814,0.7364,0.6713,0.6153];  
[x1,ind]=sort(x1,'ascend');  
y1=y1(ind);  
%CP=0.6
```

```
x2=[0.4053684,0.4015248,0.3967923,0.392793,0.3899016,0.3870312,0.3847815,0.380937,0.376512,0.3719133,0.363891,0.357474,0.3492402,0.345063,0.339297,0.3309003,0.319464,0.3122109,0.30404301,0.2950812,0.2858415,0.2785362,0.268227,0.2563485,0.2465025,0.2339715,0.2136879,0.1855815,0.15];
```

```
y2=[12,11.0614,9.9239,8.9926,8.3679,7.89901,7.54222,6.9936,6.4507,5.9589,5.26502,4.81316,4.39734,4.20562,4.0002,3.78001,3.56522,3.396996,3.14445,2.80099,2.40988,2.09963,1.7522,1.43443,1.24793,1.07718,0.8815,0.72808,0.6153];  
[x2,ind]=sort(x2,'ascend');  
y2=y2(ind);  
%CP=0.65
```

```
x3=[0.4134453,0.409935,0.404625,0.400095,0.3963411,0.391644,0.3870843,0.381669,0.3748338,0.3683481,0.362391,0.3566244,0.3501288,0.3425289,0.3339855,0.3257439,0.3203997,0.315144,0.310554,0.3054036,0.300315,0.295734,0.290103,0.285984,0.281025,0.2761719,0.270255,0.262908,0.2560479,0.2463066,0.234324,0.221667,0.2002233,0.177426,0.15];
```

```
y3=[12,11.32183,10.2512,9.4092,8.76323,8.17352,7.61683,7.01421,6.42504,6.04536,5.79114,5.6066,5.47986,5.40781,5.3806,5.38699,5.3643,5.2804,5.16235,4.95195,4.5945,4.1929,3.62736,3.26168,2.88775,2.59226,2.28021,1.9629,1.72845,1.47627,1.2351,1.04718,0.84544,0.71793,0.6153];  
[x3,ind]=sort(x3,'ascend');  
y3=y3(ind);  
%CP=0.7
```

```
x4=[0.4189764,0.4152279,0.410517,0.40587,0.399687,0.3931899,0.3871998,0.3823137,0.3774525,0.3711504,0.3649584,0.359481,0.3513003,0.3416439,0.3326187,0.3273147,0.3226911,0.3183204,0.3144315,0.3100536,0.3044295,0.2996394,0.2938554,0.289323,0.283797,0.280089,0.2750775,0.269913,0.2631303,0.257256,0.252129,0.2453574,0.2381178,0.230532,0.222537,0.207789,0.188868,0.16683,0.15];
```

```
y4=[12,11.3632,10.5478,9.7886,8.9943,8.4013,8.1053,7.96145,7.87791,7.81948,7.79856,7.805,7.85407,7.89995,7.911672,7.89476,7.83011,7.72545,7.5686,7.2962,6.8227,6.3385,5.6006,4.9592,4.23242,3.77797,3.3249,2.91965,2.4985,2.19879,1.9786,1.74611,1.5465,1.3788,1.2371,1.0289,0.8316,0.6873,0.6153];  
[x4,ind]=sort(x4,'ascend');  
y4=y4(ind);  
%CP=0.75
```

```
x5=[0.415686,0.410445,0.404862,0.400935,0.396312,0.389367,0.382569,0.377034,0.370503,0.364941,0.3608325,0.3571677,0.352278,0.342408,0.335847,0.331077,0.3258549,0.321213,0.315633,0.311061,0.3048333,0.297324,0.287181,0.2774394,0.268308,0.262053,0.257154,0.2483412,0.238929,0.2305959,0.2222262,0.2109576,0.193278,0.178449,0.164088,0.15];
```

```

y5=[10.9689,10.2805,9.6619,9.3968,9.1374,8.8809,8.7227,8.6698,8.6835,8
.7584,8.8724,9.0338,9.28224,9.7282,9.9324,10.0037,10.0074,9.9686,9.821
1,9.5905,8.9931,8.0727,6.5883,5.1579,4.0199,3.3707,2.9962,2.4564,2.035
3,1.7572,1.54111,1.31299,1.04918,0.8748,0.7528,0.6689];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.289737,0.279636,0.265299,0.257049,0.25203,0.245973,0.238506,0.22
9563,0.220854,0.2120994,0.198693,0.184017,0.166359,0.15];

y6=[9.0571,7.5019,5.4157,4.3868,3.8194,3.3119,2.8063,2.3278,1.9742,1.7
156,1.4283,1.1742,0.9486,0.7982];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.230502,0.228792,0.224958,0.216621,0.2086812,0.1997328,0.188322,0
.177534,0.164685,0.15];

y7=[3.6122,3.4456,3.1584,2.6637,2.2891,1.9768,1.6708,1.4266,1.2001,0.9
84];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75

```

```

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
    case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
    case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
    end

    else%si el CP_entrada no coincide con uno que tenemos->interpolarm
2 CP
    CP1=CPrango(index(1));
    CP2=CPrango(index(2));
    if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
        kk=CP1;
        CP1=CP2;
        CP2=kk;
    end

    switch CP1
    case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
ada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x0_interpolado;
        y1_ent=y0_interpolado;
        x2_ent=x1_interpolado;
        y2_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
ada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
ada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x1_interpolado;
        y1_ent=y1_interpolado;
        x2_ent=x2_interpolado;
        y2_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
ada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
ada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x2_interpolado;
        y1_ent=y2_interpolado;

```

```

        x2_ent=x3_interpolado;
        y2_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_ent
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x3_interpolado;
        y1_ent=y3_interpolado;
        x2_ent=x4_interpolado;
        y2_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_ent
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x4_interpolado;
        y1_ent=y4_interpolado;
        x2_ent=x5_interpolado;
        y2_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_ent
rada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x5_interpolado;
        y1_ent=y5_interpolado;
        x2_ent=x6_interpolado;
        y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_ent
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x6_interpolado;
        y1_ent=y6_interpolado;
        x2_ent=x7_interpolado;
        y2_ent=y7_interpolado;
    end
end
CR5=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.374133,0.3727791,0.3681438,0.3633075,0.355401,0.3513189,0.347418

```

```
3,0.343182,0.3362649,0.330015,0.3236457,0.317208,0.3102597,0.302997,0.2948154,0.2851902,0.2770317,0.2661393,0.2484129,0.2352426,0.2003322,0.15];
```

```
y0=[12,11.1937,9.3176,7.7627,6.00101,5.21857,4.63045,4.0111,3.34273,2.82399,2.4077,2.0695,1.75797,1.49754,1.28153,1.09015,0.97696,0.87461,0.7525,0.6749,0.5951,0.5187];
```

```
%Vemos que los datos están desordenados: ordenamos los datos
```

```
[x0,ind]=sort(x0,'ascend');
```

```
y0=y0(ind);
```

```
%CP=0.55
```

```
x1=[0.401883,0.401358,0.397881,0.391707,0.3819483,0.3741219,0.3661656,0.3597516,0.3525279,0.3435459,0.3342129,0.3215799,0.3064023,0.289044,0.2715111,0.2546898,0.2360949,0.22422309,0.1993014,0.15];
```

```
y1=[12,11.8453,10.7716,9.1693,7.18936,5.9841,4.9864,4.31932,3.76702,3.2233,2.79842,2.31667,1.88255,1.49781,1.17404,0.9357,0.7549,0.6634,0.6031,0.51867];
```

```
[x1,ind]=sort(x1,'ascend');
```

```
y1=y1(ind);
```

```
%CP=0.6
```

```
x2=[0.416226,0.409476,0.4027911,0.397518,0.3885861,0.3817071,0.3763533,0.3701268,0.3632445,0.358581,0.353646,0.3476016,0.3429519,0.3368211,0.3280023,0.3186012,0.3089337,0.299814,0.2875461,0.2722398,0.2578887,0.2451819,0.2335092,0.2175525,0.2007015,0.176778,0.15];
```

```
y2=[12,10.4531,8.9805,8.0386,6.67552,5.85737,5.30708,4.74274,4.26512,3.9924,3.76602,3.5161,3.37685,3.2407,3.10414,2.96097,2.74536,2.4494,2.0007,1.53283,1.18886,0.97985,0.84585,0.71132,0.62716,0.57003,0.51867];
```

```
[x2,ind]=sort(x2,'ascend');
```

```
y2=y2(ind);
```

```
%CP=0.65
```

```
x3=[0.425199,0.4233582,0.416844,0.4116741,0.4043766,0.3878289,0.3778779,0.3719958,0.3666942,0.3615321,0.3562623,0.3503328,0.342021,0.332007,0.3251172,0.31836012,0.3106836,0.3034254,0.2927061,0.2820711,0.2713662,0.262167,0.2529363,0.243702,0.2370378,0.2241819,0.2021511,0.1779087,0.15];
```

```
y3=[12,11.7222,10.6396,9.8168,8.7622,6.74897,5.83597,5.43561,5.13875,4.9247,4.775202,4.67047,4.60277,4.57121,4.52006,4.40076,4.16103,3.79099,3.03297,2.40629,1.915303,1.591899,1.32491,1.13485,1.02659,0.8823,0.70159,0.59066,0.51867];
```

```
[x3,ind]=sort(x3,'ascend');
```

```
y3=y3(ind);
```

```
%CP=0.7
```

```
x4=[0.427971,0.4276059,0.4266666,0.4252995,0.4232325,0.416889,0.408861,0.399357,0.39012,0.383478,0.3751767,0.367227,0.3604296,0.353103,0.3453174,0.3361875,0.3288633,0.3235341,0.3181716,0.3121881,0.3083703,0.3039888,0.2962278,0.2889915,0.2827533,0.2756802,0.266379,0.2582337,0.2477877,0.2374266,0.2259453,0.1954182,0.177081,0.15];
```

```
y4=[12,11.8997,11.67188,11.4602,11.14221,10.2249,9.17748,8.25424,7.643603,7.35102,7.10597,6.9646,6.88885,6.8706,6.88691,6.87879,6.8328,6.75811,6.59943,6.32077,6.06738,5.65124,4.75583,3.90988,3.29053,2.74487,2.18398,1.81816,1.49603,1.25682,1.05962,0.71221,0.61454,0.51867];
```

```
[x4,ind]=sort(x4,'ascend');
```

```
y4=y4(ind);
```

```

%CP=0.75

x5=[0.415011,0.4064499,0.3980667,0.3908502,0.3852639,0.3813906,0.37697
58,0.3730263,0.3698352,0.3659082,0.3602952,0.3506172,0.3431346,0.33532
89,0.3298836,0.3248706,0.3203001,0.3167757,0.3134364,0.3078978,0.29955
87,0.289269,0.2825829,0.2787456,0.2753793,0.2656044,0.2587113,0.252579
6,0.2441973,0.2342334,0.2241714,0.2095029,0.1938168,0.1791588,0.167690
7,0.1575501,0.15];

y5=[9.9644,9.18744,8.57599,8.22057,8.03597,7.95179,7.902603,7.89259,7.
9179,7.98116,8.11729,8.42824,8.61679,8.74039,8.784196,8.771111,8.70166
,8.60372,8.38873,7.95982,7.09225,5.792203,4.79789,4.24256,3.84663,2.96
643,2.49338,2.195745,1.86492,1.56249,1.34345,1.09766,0.90097,0.76891,0
.67391,0.60705,0.5825];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2974935,0.2936061,0.285981,0.2752527,0.2691192,0.26424,0.2564847
,0.2505081,0.2436585,0.2356914,0.2278746,0.2182152,0.206328,0.1953777,
0.1820925,0.1663983,0.15];

y6=[8.7205,8.16355,7.05854,5.46309,4.59384,4.05792,3.3819,2.94707,2.58
895,2.21703,1.914501,1.63119,1.36434,1.16656,0.97058,0.79125,0.65396];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.2392236,0.2304294,0.21772365,0.2070624,0.1966137,0.1801926,0.165
504,0.15];

y7=[3.61294,3.04004,2.37205,1.95496,1.64746,1.26948,1.01324,0.79824];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
switch CP_entrada
case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
case 0.65

```

```

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
    case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
    case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
    case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
    case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
    end

    else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
2 CP
    CP1=CPrango(index(1));
    CP2=CPrango(index(2));
    if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
        kk=CP1;
        CP1=CP2;
        CP2=kk;
    end

    switch CP1
    case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
ada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x0_interpolado;
        y3_ent=y0_interpolado;
        x4_ent=x1_interpolado;
        y4_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
ada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
ada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x1_interpolado;
        y3_ent=y1_interpolado;
        x4_ent=x2_interpolado;
        y4_ent=y2_interpolado;
    case 0.6

```



```

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x2_interpolado;
    y3_ent=y2_interpolado;
    x4_ent=x3_interpolado;
    y4_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x3_interpolado;
    y3_ent=y3_interpolado;
    x4_ent=x4_interpolado;
    y4_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x4_interpolado;
    y3_ent=y4_interpolado;
    x4_ent=x5_interpolado;
    y4_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entr
rada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x5_interpolado;
    y3_ent=y5_interpolado;
    x4_ent=x6_interpolado;
    y4_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entr
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x6_interpolado;

```

```

        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR55=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR5+(CR55-CR5)/(5.5-5)*(Lpp/(VolCarena^(1/3))-5);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>5.5 && Lpp/(VolCarena^(1/3))<=6
    %CP=0.5

x0=[0.374133,0.3727791,0.3681438,0.3633075,0.355401,0.3513189,0.347418
3,0.343182,0.3362649,0.330015,0.3236457,0.317208,0.3102597,0.302997,0.
2948154,0.2851902,0.2770317,0.2661393,0.2484129,0.2352426,0.2003322,0.
15];

y0=[12,11.1937,9.3176,7.7627,6.00101,5.21857,4.63045,4.0111,3.34273,2.
82399,2.4077,2.0695,1.75797,1.49754,1.28153,1.09015,0.97696,0.87461,0.
7525,0.6749,0.5951,0.5187];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.401883,0.401358,0.397881,0.391707,0.3819483,0.3741219,0.3661656,
0.3597516,0.3525279,0.3435459,0.3342129,0.3215799,0.3064023,0.289044,0.
2715111,0.2546898,0.2360949,0.22422309,0.1993014,0.15];

y1=[12,11.8453,10.7716,9.1693,7.18936,5.9841,4.9864,4.31932,3.76702,3.
2233,2.79842,2.31667,1.88255,1.49781,1.17404,0.9357,0.7549,0.6634,0.60
31,0.51867];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

x2=[0.416226,0.409476,0.4027911,0.397518,0.3885861,0.3817071,0.3763533
,0.3701268,0.3632445,0.358581,0.353646,0.3476016,0.3429519,0.3368211,0.
3280023,0.3186012,0.3089337,0.299814,0.2875461,0.2722398,0.2578887,0.
2451819,0.2335092,0.2175525,0.2007015,0.176778,0.15];

y2=[12,10.4531,8.9805,8.0386,6.67552,5.85737,5.30708,4.74274,4.26512,3.
9924,3.76602,3.5161,3.37685,3.2407,3.10414,2.96097,2.74536,2.4494,2.0
007,1.53283,1.18886,0.97985,0.84585,0.71132,0.62716,0.57003,0.51867];
    [x2,ind]=sort(x2,'ascend');
    y2=y2(ind);
    %CP=0.65

x3=[0.425199,0.4233582,0.416844,0.4116741,0.4043766,0.3878289,0.377877
9,0.3719958,0.3666942,0.3615321,0.3562623,0.3503328,0.342021,0.332007,
0.3251172,0.31836012,0.3106836,0.3034254,0.2927061,0.2820711,0.2713662
,0.262167,0.2529363,0.243702,0.2370378,0.2241819,0.2021511,0.1779087,0.
15];

y3=[12,11.7222,10.6396,9.8168,8.7622,6.74897,5.83597,5.43561,5.13875,4.
9247,4.775202,4.67047,4.60277,4.57121,4.52006,4.40076,4.16103,3.79099
,3.03297,2.40629,1.915303,1.591899,1.32491,1.13485,1.02659,0.8823,0.70
159,0.59066,0.51867];
    [x3,ind]=sort(x3,'ascend');
    y3=y3(ind);
    %CP=0.7

```

```

x4=[0.427971,0.4276059,0.4266666,0.4252995,0.4232325,0.416889,0.408861,
0.399357,0.39012,0.383478,0.3751767,0.367227,0.3604296,0.353103,0.3453
174,0.3361875,0.3288633,0.3235341,0.3181716,0.3121881,0.3083703,0.3039
888,0.2962278,0.2889915,0.2827533,0.2756802,0.266379,0.2582337,0.24778
77,0.2374266,0.2259453,0.1954182,0.177081,0.15];

y4=[12,11.8997,11.67188,11.4602,11.14221,10.2249,9.17748,8.25424,7.643
603,7.35102,7.10597,6.9646,6.88885,6.8706,6.88691,6.87879,6.8328,6.758
11,6.59943,6.32077,6.06738,5.65124,4.75583,3.90988,3.29053,2.74487,2.1
8398,1.81816,1.49603,1.25682,1.05962,0.71221,0.61454,0.51867];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.415011,0.4064499,0.3980667,0.3908502,0.3852639,0.3813906,0.37697
58,0.3730263,0.3698352,0.3659082,0.3602952,0.3506172,0.3431346,0.33532
89,0.3298836,0.3248706,0.3203001,0.3167757,0.3134364,0.3078978,0.29955
87,0.289269,0.2825829,0.2787456,0.2753793,0.2656044,0.2587113,0.252579
6,0.2441973,0.2342334,0.2241714,0.2095029,0.1938168,0.1791588,0.167690
7,0.1575501,0.15];

y5=[9.9644,9.18744,8.57599,8.22057,8.03597,7.95179,7.902603,7.89259,7.
9179,7.98116,8.11729,8.42824,8.61679,8.74039,8.784196,8.771111,8.70166
,8.60372,8.38873,7.95982,7.09225,5.792203,4.79789,4.24256,3.84663,2.96
643,2.49338,2.195745,1.86492,1.56249,1.34345,1.09766,0.90097,0.76891,0.
67391,0.60705,0.5825];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2974935,0.2936061,0.285981,0.2752527,0.2691192,0.26424,0.2564847
,0.2505081,0.2436585,0.2356914,0.2278746,0.2182152,0.206328,0.1953777,
0.1820925,0.1663983,0.15];

y6=[8.7205,8.16355,7.05854,5.46309,4.59384,4.05792,3.3819,2.94707,2.58
895,2.21703,1.914501,1.63119,1.36434,1.16656,0.97058,0.79125,0.65396];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.2392236,0.2304294,0.21772365,0.2070624,0.1966137,0.1801926,0.165
504,0.15];

y7=[3.61294,3.04004,2.37205,1.95496,1.64746,1.26948,1.01324,0.79824];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
switch CP_entrada

```

```

        case 0.5
[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
        case 0.55
[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
        case 0.6
[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
        case 0.65
[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
        case 0.7
[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
        case 0.75
[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
        case 0.8
[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
        case 0.85
[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
        end

    else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
2 CP
        CP1=CPrango(index(1));
        CP2=CPrango(index(2));
        if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
            kk=CP1;
            CP1=CP2;
            CP2=kk;
        end

        switch CP1
        case 0.5
[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
ada);
            y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
            x1_ent=x0_interpolado;
            y1_ent=y0_interpolado;
            x2_ent=x1_interpolado;
            y2_ent=y1_interpolado;
        case 0.55

```

```

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x1_interpolado;
    y1_ent=y1_interpolado;
    x2_ent=x2_interpolado;
    y2_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x2_interpolado;
    y1_ent=y2_interpolado;
    x2_ent=x3_interpolado;
    y2_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x3_interpolado;
    y1_ent=y3_interpolado;
    x2_ent=x4_interpolado;
    y2_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x4_interpolado;
    y1_ent=y4_interpolado;
    x2_ent=x5_interpolado;
    y2_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entr
rada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x5_interpolado;

```

```

        y1_ent=y5_interpolado;
        x2_ent=x6_interpolado;
        y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_ent
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x6_interpolado;
        y1_ent=y6_interpolado;
        x2_ent=x7_interpolado;
        y2_ent=y7_interpolado;
    end
end
CR55=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.3891147,0.3859272,0.3791058,0.3711249,0.3632157,0.355299,0.34663
62,0.3395577,0.3305355,0.322896,0.3165642,0.3058329,0.2981568,0.289978
08,0.2776365,0.26253594,0.2415003,0.2183286,0.1880079,0.15];

y0=[12,10.97828,8.88726,7.08498,5.62214,4.44574,3.4678,2.84699,2.26021
,1.85068,1.60545,1.28668,1.10704,0.970465,0.8299,0.71798,0.61504,0.536
18,0.48479,0.45895];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.416547,0.410217,0.3988782,0.38854356,0.3781497,0.3682194,0.35744
28,0.3475797,0.3383265,0.3265881,0.3079107,0.281901,0.2603841,0.242877
,0.2251752,0.2021901,0.1713822,0.15];

y1=[12,10.6861,8.47673,6.75669,5.39499,4.29652,3.39142,2.79926,2.40815
,2.05503,1.64431,1.1878,0.86562,0.68711,0.5799,0.51651,0.47798,0.45895
];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

x2=[0.427137,0.4133439,0.403317,0.3933504,0.386298,0.3782931,0.3690975
,0.3624195,0.3539667,0.3462102,0.3395874,0.3346149,0.3292503,0.3240453
,0.318666,0.309822,0.300225,0.281721,0.2656005,0.2499069,0.2360637,0.2
126241,0.177369,0.15];

y2=[12,9.2249,7.51316,6.23525,5.4257,4.67257,3.97816,3.56582,3.15313,2
.8874,2.73843,2.66021,2.61611,2.58195,2.5224,2.3681,2.11868,1.58346,1.
1919,0.8914,0.72309,0.56888,0.49333,0.45895];
    [x2,ind]=sort(x2,'ascend');
    y2=y2(ind);
    %CP=0.65

x3=[0.435024,0.429096,0.413904,0.4009959,0.3893247,0.3785907,0.370155,
0.3619572,0.355896,0.3486597,0.3390951,0.3302931,0.3235395,0.3179571,0
.31206309,0.3072471,0.3005637,0.2843112,0.2729565,0.2633664,0.2540082,
0.2389089,0.2254014,0.2096349,0.1960974,0.1786635,0.15];

```

```

y3=[12,11.0238,8.6452,7.0493,5.92229,5.10885,4.64757,4.32504,4.15498,4
.02132,3.92139,3.86816,3.82359,3.75985,3.65657,3.4973,3.15012,2.26052,
1.73274,1.39853,1.171097,0.9029,0.73569,0.62106,0.54771,0.50638,0.4589
5];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.4366329,0.430962,0.4180278,0.40479075,0.3961998,0.3888684,0.3810
345,0.3737163,0.3667788,0.3599202,0.3516717,0.3337593,0.33375918,0.318
7938,0.3118317,0.3062832,0.2969523,0.2863497,0.2777268,0.2692173,0.258
666,0.247992,0.2372214,0.2226435,0.2078682,0.1948032,0.1726995,0.15];

y4=[12,11.9484,9.37721,7.95088,7.27416,6.79302,6.42734,6.16495,5.99487
,5.90406,5.87085,5.85549,5.855495,5.68588,5.43975,5.03789,4.15281,3.21
168,2.56449,2.07786,1.65124,1.32861,1.10794,0.88635,0.71979,0.616224,0
.52181,0.45895];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.4110375,0.4073166,0.399681,0.391992,0.3846732,0.3791433,0.373727
7,0.3686427,0.3616716,0.3496353,0.3382461,0.3310776,0.3264495,0.321759
3,0.3149937,0.309081,0.3021534,0.2896017,0.2816241,0.2723853,0.264282,
0.2578443,0.2514195,0.2407587,0.2307735,0.2189127,0.2082426,0.1948032,
0.1794939,0.16366707,0.15];

y5=[8.55102,8.25389,7.73205,7.37543,7.15035,7.04676,7.00308,7.0199,7.0
9804,7.3398,7.54734,7.62803,7.6392,7.5994,7.45339,7.17203,6.55351,4.98
292,4.0372,3.16168,2.59489,2.25685,1.96804,1.62133,1.36939,1.13163,0.9
6231,0.80118,0.67071,0.565267,0.5077];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.294234,0.2868519,0.2780526,0.272505,0.2657574,0.2581926,0.249318
9,0.2376201,0.225429,0.2131581,0.1981626,0.1833126,0.1579338,0.167475]
;

y6=[7.9463,6.6935,5.29928,4.56575,3.83353,3.2312,2.71307,2.19773,1.782
23,1.4503,1.14523,0.91554,0.758262,0.5825];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85

x7=[0.2378187,0.2289768,0.2149677,0.1991769,0.1835739,0.1651533,0.15];
y7=[3.30321,2.81512,2.18207,1.655182,1.26994,0.939505,0.71633];
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

```

```

    if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
        switch CP_entrada
            case 0.5
                [x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entrada);
            case 0.55
                [x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entrada);
            case 0.6
                [x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entrada);
            case 0.65
                [x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entrada);
            case 0.7
                [x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entrada);
            case 0.75
                [x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entrada);
            case 0.8
                [x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entrada);
            case 0.85
                [x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entrada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpolarmos
            2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5
                    [x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entrada);
                    [x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entrada);
                    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
                    x3_ent=x0_interpolado;
                    y3_ent=y0_interpolado;
                    x4_ent=x1_interpolado;
                    y4_ent=y1_interpolado;

```



```

    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entrada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x1_interpolado;
    y3_ent=y1_interpolado;
    x4_ent=x2_interpolado;
    y4_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entrada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x2_interpolado;
    y3_ent=y2_interpolado;
    x4_ent=x3_interpolado;
    y4_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entrada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x3_interpolado;
    y3_ent=y3_interpolado;
    x4_ent=x4_interpolado;
    y4_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entrada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x3_ent=x4_interpolado;
    y3_ent=y4_interpolado;
    x4_ent=x5_interpolado;
    y4_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);

```

```

        x3_ent=x5_interpolado;
        y3_ent=y5_interpolado;
        x4_ent=x6_interpolado;
        y4_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_ent
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x6_interpolado;
        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR6=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR55+(CR6-CR55)/(6-5.5)*(Lpp/(VolCarena^(1/3))-5.5);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>6 && Lpp/(VolCarena^(1/3))<=6.5
%CP=0.5

x0=[0.3891147,0.3859272,0.3791058,0.3711249,0.3632157,0.355299,0.34663
62,0.3395577,0.3305355,0.322896,0.3165642,0.3058329,0.2981568,0.289978
08,0.2776365,0.26253594,0.2415003,0.2183286,0.1880079,0.15];

y0=[12,10.97828,8.88726,7.08498,5.62214,4.44574,3.4678,2.84699,2.26021
,1.85068,1.60545,1.28668,1.10704,0.970465,0.8299,0.71798,0.61504,0.536
18,0.48479,0.45895];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.416547,0.410217,0.3988782,0.38854356,0.3781497,0.3682194,0.35744
28,0.3475797,0.3383265,0.3265881,0.3079107,0.281901,0.2603841,0.242877
,0.2251752,0.2021901,0.1713822,0.15];

y1=[12,10.6861,8.47673,6.75669,5.39499,4.29652,3.39142,2.79926,2.40815
,2.05503,1.64431,1.1878,0.86562,0.68711,0.5799,0.51651,0.47798,0.45895
];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

x2=[0.427137,0.4133439,0.403317,0.3933504,0.386298,0.3782931,0.3690975
,0.3624195,0.3539667,0.3462102,0.3395874,0.3346149,0.3292503,0.3240453
,0.318666,0.309822,0.300225,0.281721,0.2656005,0.2499069,0.2360637,0.2
126241,0.177369,0.15];

y2=[12,9.2249,7.51316,6.23525,5.4257,4.67257,3.97816,3.56582,3.15313,2
.8874,2.73843,2.66021,2.61611,2.58195,2.5224,2.3681,2.11868,1.58346,1.
1919,0.8914,0.72309,0.56888,0.49333,0.45895];
    [x2,ind]=sort(x2,'ascend');
    y2=y2(ind);
    %CP=0.65

```

```
x3=[0.435024,0.429096,0.413904,0.4009959,0.3893247,0.3785907,0.370155,
0.3619572,0.355896,0.3486597,0.3390951,0.3302931,0.3235395,0.3179571,0
.31206309,0.3072471,0.3005637,0.2843112,0.2729565,0.2633664,0.2540082,
0.2389089,0.2254014,0.2096349,0.1960974,0.1786635,0.15];
```

```
y3=[12,11.0238,8.6452,7.0493,5.92229,5.10885,4.64757,4.32504,4.15498,4
.02132,3.92139,3.86816,3.82359,3.75985,3.65657,3.4973,3.15012,2.26052,
1.73274,1.39853,1.171097,0.9029,0.73569,0.62106,0.54771,0.50638,0.4589
5];
```

```
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7
```

```
x4=[0.4366329,0.430962,0.4180278,0.40479075,0.3961998,0.3888684,0.3810
345,0.3737163,0.3667788,0.3599202,0.3516717,0.3337593,0.33375918,0.318
7938,0.3118317,0.3062832,0.2969523,0.2863497,0.2777268,0.2692173,0.258
666,0.247992,0.2372214,0.2226435,0.2078682,0.1948032,0.1726995,0.15];
```

```
y4=[12,11.9484,9.37721,7.95088,7.27416,6.79302,6.42734,6.16495,5.99487
,5.90406,5.87085,5.85549,5.855495,5.68588,5.43975,5.03789,4.15281,3.21
168,2.56449,2.07786,1.65124,1.32861,1.10794,0.88635,0.71979,0.616224,0
.52181,0.45895];
```

```
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75
```

```
x5=[0.4110375,0.4073166,0.399681,0.391992,0.3846732,0.3791433,0.373727
7,0.3686427,0.3616716,0.3496353,0.3382461,0.3310776,0.3264495,0.321759
3,0.3149937,0.309081,0.3021534,0.2896017,0.2816241,0.2723853,0.264282,
0.2578443,0.2514195,0.2407587,0.2307735,0.2189127,0.2082426,0.1948032,
0.1794939,0.16366707,0.15];
```

```
y5=[8.55102,8.25389,7.73205,7.37543,7.15035,7.04676,7.00308,7.0199,7.0
9804,7.3398,7.54734,7.62803,7.6392,7.5994,7.45339,7.17203,6.55351,4.98
292,4.0372,3.16168,2.59489,2.25685,1.96804,1.62133,1.36939,1.13163,0.9
6231,0.80118,0.67071,0.565267,0.5077];
```

```
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8
```

```
x6=[0.294234,0.2868519,0.2780526,0.272505,0.2657574,0.2581926,0.249318
9,0.2376201,0.225429,0.2131581,0.1981626,0.1833126,0.1579338,0.167475]
;
```

```
y6=[7.9463,6.6935,5.29928,4.56575,3.83353,3.2312,2.71307,2.19773,1.782
23,1.4503,1.14523,0.91554,0.758262,0.5825];
```

```
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
%CP=0.85
```

```
x7=[0.2378187,0.2289768,0.2149677,0.1991769,0.1835739,0.1651533,0.15];
y7=[3.30321,2.81512,2.18207,1.655182,1.26994,0.939505,0.71633];
```

```
[x7,ind]=sort(x7,'ascend');
y7=y7(ind);
```

```
CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario
```

```

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85];%CPs de las gráficas
que tenemos

dist=abs(CPPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5
[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55
[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6
[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65
[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7
[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75
[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8
[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85
[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpolar
2 CP
            CP1=CPPrango(index(1));
            CP2=CPPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5
[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

```

```

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x0_interpolado;
        y1_ent=y0_interpolado;
        x2_ent=x1_interpolado;
        y2_ent=y1_interpolado;
        case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x1_interpolado;
        y1_ent=y1_interpolado;
        x2_ent=x2_interpolado;
        y2_ent=y2_interpolado;
        case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x2_interpolado;
        y1_ent=y2_interpolado;
        x2_ent=x3_interpolado;
        y2_ent=y3_interpolado;
        case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x3_interpolado;
        y1_ent=y3_interpolado;
        x2_ent=x4_interpolado;
        y2_ent=y4_interpolado;
        case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x4_interpolado;
        y1_ent=y4_interpolado;
        x2_ent=x5_interpolado;
        y2_ent=y5_interpolado;

```

```

    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entr
rada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x5_interpolado;
    y1_ent=y5_interpolado;
    x2_ent=x6_interpolado;
    y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entr
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x6_interpolado;
    y1_ent=y6_interpolado;
    x2_ent=x7_interpolado;
    y2_ent=y7_interpolado;
end
end
CR6=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.4262043,0.4238706,0.4198437,0.4141821,0.4008528,0.3829317,0.3744
258,0.3679557,0.36231339,0.3568161,0.35001,0.3436368,0.336897,0.328228
8,0.3191061,0.3113028,0.3019146,0.2911077,0.2783547,0.2677848,0.254424
3,0.2311923,0.2078811,0.1812273,0.15];

y0=[12,11.87233,11.44809,10.78624,8.98918,6.32542,5.16235,4.37762,3.78
648,3.28506,2.76278,2.34301,1.9686,1.61589,1.33382,1.16289,0.9965,0.84
549,0.72129,0.63912,0.56632,0.49854,0.44598,0.42426,0.41752];
[x0,ind]=sort(x0,'ascend');
y0=y0(ind);
%CP=0.55

x1=[0.4490919,0.4409769,0.4264011,0.4105443,0.40266,0.3987537,0.394718
1,0.39108,0.3877149,0.3830346,0.3749841,0.3676857,0.3594327,0.351003,0
.3425283,0.330921,0.3178464,0.299637,0.2843787,0.2706927,0.2574348,0.2
354517,0.1963026,0.15];

y1=[11.63055,10.85711,9.36229,7.59552,6.70023,6.23661,5.78809,5.3823,4
.96226,4.54915,3.8518,3.2953,2.77229,2.395,2.10537,1.80232,1.51596,1.2
1201,0.9985,0.80895,0.6663,0.54431,0.45542,0.41752];
[x1,ind]=sort(x1,'ascend');
y1=y1(ind);
%CP=0.6

x2=[0.4491744,0.4457475,0.4400739,0.4342797,0.4274778,0.4221327,0.4168
71,0.411792,0.4052223,0.4001319,0.3955173,0.3894777,0.3827697,0.373077
3,0.3643827,0.3558963,0.3468891,0.3418284,0.3372378,0.3301077,0.323895
45,0.3148053,0.3084975,0.3008664,0.2931408,0.285042,0.2767836,0.266430
9,0.2580828,0.249432,0.2418624,0.2349531,0.2225748,0.1894128,0.15];

```

```

y2=[10.57378,10.24769,9.65183,9.0094,8.24429,7.63177,7.06516,6.54861,5
.86781,5.37869,4.92637,4.39528,3.90786,3.35011,2.94834,2.64976,2.39258
,2.27707,2.202,2.11957,2.06601,1.98279,1.89532,1.75267,1.58411,1.3759,
1.18114,0.9784,0.83789,0.72706,0.62617,0.57045,0.51798,0.46015,0.41752
];
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.4492212,0.4469898,0.4386318,0.4281555,0.4208586,0.4143723,0.4053
534,0.392946,0.3841158,0.3773064,0.3697875,0.3626706,0.3548868,0.34459
05,0.3277086,0.3156219,0.308418,0.299577,0.2881677,0.2781513,0.2675535
,0.2543757,0.2415339,0.2248359,0.1927002,0.15];

y3=[9.97602,9.73748,8.75619,7.6898,6.97975,6.41882,5.7247,4.8847,4.389
53,4.0664,3.79102,3.60206,3.45521,3.31192,3.15478,3.00358,2.84121,2.51
212,1.98778,1.59448,1.25859,0.95902,0.76096,0.61012,0.48908,0.41752];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.4225698,0.408705,0.3953286,0.3861642,0.3776409,0.371556,0.364445
7,0.3576996,0.3509028,0.344424,0.3397545,0.3351783,0.3306444,0.3255528
,0.3199173,0.3146655,0.3081657,0.3029148,0.2931897,0.2853606,0.2760411
,0.2659464,0.2571879,0.2476197,0.2359374,0.2251767,0.2095707,0.1932441
,0.177813,0.160926,0.15];

y4=[7.48399,6.6235,5.85556,5.44411,5.16642,5.02846,4.89319,4.8206,4.75
869,4.7465,4.7676,4.7838,4.77799,4.73396,4.62821,4.46739,4.15889,3.759
13,3.04549,2.52619,2.01676,1.60779,1.33504,1.12218,0.9333,0.7994,0.648
04,0.5373,0.47932,0.44144,0.42557];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.4195248,0.4177227,0.4120455,0.403989,0.3970962,0.3907284,0.38527
38,0.380598,0.3742863,0.3676734,0.3576897,0.3481512,0.3389787,0.333558
6,0.3287637,0.3243387,0.3172527,0.3105144,0.3036504,0.2981448,0.289188
6,0.2815098,0.27351381,0.2642943,0.2555004,0.2462427,0.2347212,0.21967
35,0.2049807,0.1891917,0.167646,0.15];

y5=[7.34583,7.23504,6.95435,6.60464,6.36689,6.19587,6.08822,6.03199,5.
98656,5.99361,6.0557,6.17178,6.28816,6.32419,6.31417,6.26726,6.10532,5.
7997,5.32762,4.68978,3.78986,3.13713,2.60532,2.1479,1.78912,1.50225,1.
24301,0.98433,0.8054,0.65719,0.52568,0.44081];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2954052,0.2924742,0.2857428,0.2783295,0.2678415,0.2585433,0.2488
278,0.2369145,0.2222814,0.2052822,0.1880373,0.1665069,0.15];

y6=[6.08901,5.63448,4.82862,4.09883,3.30763,2.77207,2.33233,1.90349,1.
49668,1.14949,0.881414,0.63789,0.49693];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

```

```

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
        case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
        case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
        case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
        case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
        case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
        case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
        case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
        end

    else%si el CP_entrada no coincide con uno que tenemos->interpolar
2 CP
        CP1=CPPrango(index(1));
        CP2=CPPrango(index(2));
        if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
            kk=CP1;
            CP1=CP2;
            CP2=kk;
        end

        switch CP1
            case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

```



```

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x0_interpolado;
        y3_ent=y0_interpolado;
        x4_ent=x1_interpolado;
        y4_ent=y1_interpolado;
        case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x1_interpolado;
        y3_ent=y1_interpolado;
        x4_ent=x2_interpolado;
        y4_ent=y2_interpolado;
        case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x2_interpolado;
        y3_ent=y2_interpolado;
        x4_ent=x3_interpolado;
        y4_ent=y3_interpolado;
        case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x3_interpolado;
        y3_ent=y3_interpolado;
        x4_ent=x4_interpolado;
        y4_ent=y4_interpolado;
        case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x4_interpolado;
        y3_ent=y4_interpolado;
        x4_ent=x5_interpolado;
        y4_ent=y5_interpolado;

```

```

        case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x5_interpolado;
        y3_ent=y5_interpolado;
        x4_ent=x6_interpolado;
        y4_ent=y6_interpolado;
        case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x6_interpolado;
        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR65=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR6+(CR65-CR6)/(6.5-6)*(Lpp/(VolCarena^(1/3))-6);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>6.5 && Lpp/(VolCarena^(1/3))<=7
%CP=0.50 para Lpp/(VolCarena^(1/3))=6.5

x0=[0.4262043,0.4238706,0.4198437,0.4141821,0.4008528,0.3829317,0.3744258,0.3679557,0.36231339,0.3568161,0.35001,0.3436368,0.336897,0.3282288,0.3191061,0.3113028,0.3019146,0.2911077,0.2783547,0.2677848,0.2544243,0.2311923,0.2078811,0.1812273,0.15];

y0=[12,11.87233,11.44809,10.78624,8.98918,6.32542,5.16235,4.37762,3.78648,3.28506,2.76278,2.34301,1.9686,1.61589,1.33382,1.16289,0.9965,0.84549,0.72129,0.63912,0.56632,0.49854,0.44598,0.42426,0.41752];
[x0,ind]=sort(x0,'ascend');
y0=y0(ind);
%CP=0.55

x1=[0.4490919,0.4409769,0.4264011,0.4105443,0.40266,0.3987537,0.3947181,0.39108,0.3877149,0.3830346,0.3749841,0.3676857,0.3594327,0.351003,0.3425283,0.330921,0.3178464,0.299637,0.2843787,0.2706927,0.2574348,0.2354517,0.1963026,0.15];

y1=[11.63055,10.85711,9.36229,7.59552,6.70023,6.23661,5.78809,5.3823,4.96226,4.54915,3.8518,3.2953,2.77229,2.395,2.10537,1.80232,1.51596,1.21201,0.9985,0.80895,0.6663,0.54431,0.45542,0.41752];
[x1,ind]=sort(x1,'ascend');
y1=y1(ind);
%CP=0.6

x2=[0.4491744,0.4457475,0.4400739,0.4342797,0.4274778,0.4221327,0.416871,0.411792,0.4052223,0.4001319,0.3955173,0.3894777,0.3827697,0.373077

```

```
3,0.3643827,0.3558963,0.3468891,0.3418284,0.3372378,0.3301077,0.323895
45,0.3148053,0.3084975,0.3008664,0.2931408,0.285042,0.2767836,0.266430
9,0.2580828,0.249432,0.2418624,0.2349531,0.2225748,0.1894128,0.15];
```

```
y2=[10.57378,10.24769,9.65183,9.0094,8.24429,7.63177,7.06516,6.54861,5
.86781,5.37869,4.92637,4.39528,3.90786,3.35011,2.94834,2.64976,2.39258
,2.27707,2.202,2.11957,2.06601,1.98279,1.89532,1.75267,1.58411,1.3759,
1.18114,0.9784,0.83789,0.72706,0.62617,0.57045,0.51798,0.46015,0.41752
];
```

```
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65
```

```
x3=[0.4492212,0.4469898,0.4386318,0.4281555,0.4208586,0.4143723,0.4053
534,0.392946,0.3841158,0.3773064,0.3697875,0.3626706,0.3548868,0.34459
05,0.3277086,0.3156219,0.308418,0.299577,0.2881677,0.2781513,0.2675535
,0.2543757,0.2415339,0.2248359,0.1927002,0.15];
```

```
y3=[9.97602,9.73748,8.75619,7.6898,6.97975,6.41882,5.7247,4.8847,4.389
53,4.0664,3.79102,3.60206,3.45521,3.31192,3.15478,3.00358,2.84121,2.51
212,1.98778,1.59448,1.25859,0.95902,0.76096,0.61012,0.48908,0.41752];
```

```
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7
```

```
x4=[0.4225698,0.408705,0.3953286,0.3861642,0.3776409,0.371556,0.364445
7,0.3576996,0.3509028,0.344424,0.3397545,0.3351783,0.3306444,0.3255528
,0.3199173,0.3146655,0.3081657,0.3029148,0.2931897,0.2853606,0.2760411
,0.2659464,0.2571879,0.2476197,0.2359374,0.2251767,0.2095707,0.1932441
,0.177813,0.160926,0.15];
```

```
y4=[7.48399,6.6235,5.85556,5.44411,5.16642,5.02846,4.89319,4.8206,4.75
869,4.7465,4.7676,4.7838,4.77799,4.73396,4.62821,4.46739,4.15889,3.759
13,3.04549,2.52619,2.01676,1.60779,1.33504,1.12218,0.9333,0.7994,0.648
04,0.5373,0.47932,0.44144,0.42557];
```

```
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75
```

```
x5=[0.4195248,0.4177227,0.4120455,0.403989,0.3970962,0.3907284,0.38527
38,0.380598,0.3742863,0.3676734,0.3576897,0.3481512,0.3389787,0.333558
6,0.3287637,0.3243387,0.3172527,0.3105144,0.3036504,0.2981448,0.289188
6,0.2815098,0.27351381,0.2642943,0.2555004,0.2462427,0.2347212,0.21967
35,0.2049807,0.1891917,0.167646,0.15];
```

```
y5=[7.34583,7.23504,6.95435,6.60464,6.36689,6.19587,6.08822,6.03199,5.
98656,5.99361,6.0557,6.17178,6.28816,6.32419,6.31417,6.26726,6.10532,5.
7997,5.32762,4.68978,3.78986,3.13713,2.60532,2.1479,1.78912,1.50225,1.
24301,0.98433,0.8054,0.65719,0.52568,0.44081];
```

```
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8
```

```
x6=[0.2954052,0.2924742,0.2857428,0.2783295,0.2678415,0.2585433,0.2488
278,0.2369145,0.2222814,0.2052822,0.1880373,0.1665069,0.15];
```

```
y6=[6.08901,5.63448,4.82862,4.09883,3.30763,2.77207,2.33233,1.90349,1.
49668,1.14949,0.881414,0.63789,0.49693];
```

```
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);
```

```

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpol
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5

```

```

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
rada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x0_interpolado;
    y1_ent=y0_interpolado;
    x2_ent=x1_interpolado;
    y2_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x1_interpolado;
    y1_ent=y1_interpolado;
    x2_ent=x2_interpolado;
    y2_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x2_interpolado;
    y1_ent=y2_interpolado;
    x2_ent=x3_interpolado;
    y2_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x3_interpolado;
    y1_ent=y3_interpolado;
    x2_ent=x4_interpolado;
    y2_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x1_ent=x4_interpolado;

```

```

        y1_ent=y4_interpolado;
        x2_ent=x5_interpolado;
        y2_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_ent
rada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x5_interpolado;
        y1_ent=y5_interpolado;
        x2_ent=x6_interpolado;
        y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_ent
rada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_ent
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x6_interpolado;
        y1_ent=y6_interpolado;
        x2_ent=x7_interpolado;
        y2_ent=y7_interpolado;
    end
end
CR65=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.4492374,0.4379658,0.4283367,0.4189077,0.408081,0.3945447,0.37995
87,0.3714036,0.3629406,0.3563703,0.3494301,0.3410343,0.3349464,0.32592
75,0.317064,0.3069924,0.2975118,0.2867562,0.2768646,0.2616399,0.238468
2,0.2009136,0.15];

y0=[9.76779,8.99879,8.27735,7.52702,6.61109,5.41509,4.18893,3.55391,2.
94636,2.52911,2.16225,1.77927,1.54743,1.27445,1.07292,0.89189,0.7615,0
.64331,0.57061,0.49968,0.43707,0.37985,0.33333];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.4493241,0.4394583,0.4283226,0.416007,0.4021848,0.3929658,0.38614
56,0.3739167,0.3652086,0.3575646,0.3429192,0.3270495,0.3121701,0.28942
02,0.2672283,0.2478102,0.2375256,0.2226588,0.1806735,0.15];

y1=[8.65695,7.95914,7.08747,6.03486,4.89787,4.20592,3.71899,2.96985,2.
51083,2.15876,1.70588,1.36362,1.13775,0.8695,0.6453,0.4965,0.4482,0.41
523,0.36593,0.33428];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

x2=[0.449385,0.437799,0.4273623,0.4152153,0.4035021,0.395391,0.3856317
,0.3787092,0.3710205,0.3636543,0.354615,0.3459087,0.3369786,0.3240264,

```

```

0.3137481,0.3066228,0.3020832,0.2974386,0.2894619,0.2825217,0.2710038,
0.2540523,0.2460537,0.2356281,0.2217612,0.1791543,0.15];

y2=[7.89358,6.8895,6.00226,5.05263,4.20556,3.7329,3.2333,2.90902,2.610
67,2.34616,2.12552,1.95399,1.84521,1.72599,1.64109,1.57138,1.50218,1.4
2556,1.25689,1.09244,0.88912,0.64373,0.55392,0.48142,0.43225,0.36723,0
.33428];
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.4494399,0.4411674,0.4347324,0.429876,0.4191264,0.4084335,0.40109
7,0.3955971,0.3861453,0.3754431,0.368637,0.3629949,0.3568272,0.3498219
,0.340275,0.328959,0.3186375,0.3132873,0.3076797,0.3015324,0.2950671,0
.2855334,0.2757252,0.2654775,0.2583405,0.2489703,0.2364672,0.2179212,0
.1996707,0.175962,0.15];

y3=[7.17315,6.54609,6.0694,5.77258,5.15672,4.65072,4.26096,4.0034,3.62
782,3.26755,3.08501,2.95931,2.85635,2.76685,2.67179,2.59171,2.51908,2.
45671,2.34885,2.19827,1.9817,1.63504,1.31705,1.0498,0.89894,0.7609,0.6
3003,0.50735,0.4335,0.3797,0.34222];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.4494768,0.433518,0.4199532,0.4110051,0.4025796,0.3959232,0.38757
066,0.37956312,0.37253595,0.36404052,0.3550806,0.34397274,0.3335388,0.
3259698,0.32034606,0.31355271,0.3074979,0.3025731,0.29746581,0.2887464
3,0.2800089,0.2679906,0.2577828,0.2455224,0.2295231,0.2056035,0.189357
9,0.169143,0.15];

y4=[6.65625,5.98477,5.41108,5.04087,4.71636,4.4781,4.22385,4.03679,3.9
25665,3.832001,3.77553,3.74351,3.71982,3.67313,3.61465,3.515694,3.3624
5,3.15649,2.88505,2.37149,1.93491,1.49058,1.201858,0.94383,0.73849,0.5
4122,0.44092,0.38222,0.34961];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.449487,0.4430583,0.4313559,0.419703,0.4112589,0.3996339,0.389202
6,0.3788034,0.3671757,0.3496095,0.3387957,0.3313941,0.3245634,0.318569
4,0.3131502,0.30756459,0.3013443,0.2943459,0.28716936,0.278823,0.26903
16,0.2587278,0.2484642,0.23735274,0.2229681,0.2093478,0.1986234,0.1863
501,0.1679334,0.15];

y5=[6.55754,6.32108,5.89188,5.53168,5.30375,5.08592,4.96915,4.92546,4.
94636,5.06527,5.12329,5.12491,5.07375,4.96451,4.80582,4.55721,4.19424,
3.62906,3.09677,2.57556,2.09299,1.70361,1.39529,1.14149,0.90181,0.7227
4,0.61321,0.52051,0.43768,0.39687];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2977257,0.2887551,0.2786253,0.2683698,0.25815255,0.24583206,0.23
67726,0.2275398,0.2189688,0.207402,0.1945677,0.1831896,0.1650696,0.15]
;

y6=[5.11098,4.36741,3.58583,2.97818,2.501739,2.03075,1.74111,1.4913,1.
3006,1.08701,0.8883,0.7529,0.57728,0.46881];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

```

```

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpolare
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5

```



```

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
rada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x0_interpolado;
    y3_ent=y0_interpolado;
    x4_ent=x1_interpolado;
    y4_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x1_interpolado;
    y3_ent=y1_interpolado;
    x4_ent=x2_interpolado;
    y4_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x2_interpolado;
    y3_ent=y2_interpolado;
    x4_ent=x3_interpolado;
    y4_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x3_interpolado;
    y3_ent=y3_interpolado;
    x4_ent=x4_interpolado;
    y4_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x4_interpolado;

```

```

        y3_ent=y4_interpolado;
        x4_ent=x5_interpolado;
        y4_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x5_interpolado;
        y3_ent=y5_interpolado;
        x4_ent=x6_interpolado;
        y4_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x6_interpolado;
        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR7=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR65+(CR7-CR65)/(7-6.5)*(Lpp/(VolCarena^(1/3))-6.5);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>7 && Lpp/(VolCarena^(1/3))<=7.5
    %CP=0.5

x0=[0.4492374,0.4379658,0.4283367,0.4189077,0.408081,0.3945447,0.3799587,0.3714036,0.3629406,0.3563703,0.3494301,0.3410343,0.3349464,0.3259275,0.317064,0.3069924,0.2975118,0.2867562,0.2768646,0.2616399,0.2384682,0.2009136,0.15];

y0=[9.76779,8.99879,8.27735,7.52702,6.61109,5.41509,4.18893,3.55391,2.94636,2.52911,2.16225,1.77927,1.54743,1.27445,1.07292,0.89189,0.7615,0.64331,0.57061,0.49968,0.43707,0.37985,0.33333];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.4493241,0.4394583,0.4283226,0.416007,0.4021848,0.3929658,0.3861456,0.3739167,0.3652086,0.3575646,0.3429192,0.3270495,0.3121701,0.2894202,0.2672283,0.2478102,0.2375256,0.2226588,0.1806735,0.15];

y1=[8.65695,7.95914,7.08747,6.03486,4.89787,4.20592,3.71899,2.96985,2.51083,2.15876,1.70588,1.36362,1.13775,0.8695,0.6453,0.4965,0.4482,0.41523,0.36593,0.33428];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

```

```

x2=[0.449385,0.437799,0.4273623,0.4152153,0.4035021,0.395391,0.3856317
,0.3787092,0.3710205,0.3636543,0.354615,0.3459087,0.3369786,0.3240264,
0.3137481,0.3066228,0.3020832,0.2974386,0.2894619,0.2825217,0.2710038,
0.2540523,0.2460537,0.2356281,0.2217612,0.1791543,0.15];

y2=[7.89358,6.8895,6.00226,5.05263,4.20556,3.7329,3.2333,2.90902,2.610
67,2.34616,2.12552,1.95399,1.84521,1.72599,1.64109,1.57138,1.50218,1.4
2556,1.25689,1.09244,0.88912,0.64373,0.55392,0.48142,0.43225,0.36723,0
.33428];
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.4494399,0.4411674,0.4347324,0.429876,0.4191264,0.4084335,0.40109
7,0.3955971,0.3861453,0.3754431,0.368637,0.3629949,0.3568272,0.3498219
,0.340275,0.328959,0.3186375,0.3132873,0.3076797,0.3015324,0.2950671,0
.2855334,0.2757252,0.2654775,0.2583405,0.2489703,0.2364672,0.2179212,0
.1996707,0.175962,0.15];

y3=[7.17315,6.54609,6.0694,5.77258,5.15672,4.65072,4.26096,4.0034,3.62
782,3.26755,3.08501,2.95931,2.85635,2.76685,2.67179,2.59171,2.51908,2.
45671,2.34885,2.19827,1.9817,1.63504,1.31705,1.0498,0.89894,0.7609,0.6
3003,0.50735,0.4335,0.3797,0.34222];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.4494768,0.433518,0.4199532,0.4110051,0.4025796,0.3959232,0.38757
066,0.37956312,0.37253595,0.36404052,0.3550806,0.34397274,0.3335388,0.
3259698,0.32034606,0.31355271,0.3074979,0.3025731,0.29746581,0.2887464
3,0.2800089,0.2679906,0.2577828,0.2455224,0.2295231,0.2056035,0.189357
9,0.169143,0.15];

y4=[6.65625,5.98477,5.41108,5.04087,4.71636,4.4781,4.22385,4.03679,3.9
25665,3.832001,3.77553,3.74351,3.71982,3.67313,3.61465,3.515694,3.3624
5,3.15649,2.88505,2.37149,1.93491,1.49058,1.201858,0.94383,0.73849,0.5
4122,0.44092,0.38222,0.34961];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.449487,0.4430583,0.4313559,0.419703,0.4112589,0.3996339,0.389202
6,0.3788034,0.3671757,0.3496095,0.3387957,0.3313941,0.3245634,0.318569
4,0.3131502,0.30756459,0.3013443,0.2943459,0.28716936,0.278823,0.26903
16,0.2587278,0.2484642,0.23735274,0.2229681,0.2093478,0.1986234,0.1863
501,0.1679334,0.15];

y5=[6.55754,6.32108,5.89188,5.53168,5.30375,5.08592,4.96915,4.92546,4.
94636,5.06527,5.12329,5.12491,5.07375,4.96451,4.80582,4.55721,4.19424,
3.62906,3.09677,2.57556,2.09299,1.70361,1.39529,1.14149,0.90181,0.7227
4,0.61321,0.52051,0.43768,0.39687];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.2977257,0.2887551,0.2786253,0.2683698,0.25815255,0.24583206,0.23
67726,0.2275398,0.2189688,0.207402,0.1945677,0.1831896,0.1650696,0.15]
;

```

```

y6=[5.11098,4.36741,3.58583,2.97818,2.501739,2.03075,1.74111,1.4913,1.
3006,1.08701,0.8883,0.7529,0.57728,0.46881];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpol
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;

```

```

end

switch CP1
case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entrada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x0_interpolado;
    y1_ent=y0_interpolado;
    x2_ent=x1_interpolado;
    y2_ent=y1_interpolado;
case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entrada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x1_interpolado;
    y1_ent=y1_interpolado;
    x2_ent=x2_interpolado;
    y2_ent=y2_interpolado;
case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entrada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x2_interpolado;
    y1_ent=y2_interpolado;
    x2_ent=x3_interpolado;
    y2_ent=y3_interpolado;
case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entrada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x3_interpolado;
    y1_ent=y3_interpolado;
    x2_ent=x4_interpolado;
    y2_ent=y4_interpolado;
case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entrada);

```

```

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x1_ent=x4_interpolado;
        y1_ent=y4_interpolado;
        x2_ent=x5_interpolado;
        y2_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x1_ent=x5_interpolado;
        y1_ent=y5_interpolado;
        x2_ent=x6_interpolado;
        y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x1_ent=x6_interpolado;
        y1_ent=y6_interpolado;
        x2_ent=x7_interpolado;
        y2_ent=y7_interpolado;
    end
end
CR7=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.4494324,0.4455423,0.4372917,0.4239399,0.4124943,0.3984057,0.3853041,0.3780855,0.3708855,0.3626871,0.3508164,0.3372237,0.3273699,0.3176181,0.3080736,0.2933316,0.2762853,0.256065,0.2121099];

y0=[7.26937,7.05764,6.6021,5.85837,5.18872,4.36225,3.59812,3.19053,2.78822,2.37695,1.83447,1.33352,1.06078,0.86768,0.73445,0.57275,0.46561,0.39108,0.33783];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.4495347,0.4427577,0.4307298,0.4215465,0.4115976,0.3975156,0.3882069,0.3791493,0.3702507,0.3581061,0.3471285,0.3263817,0.2997597,0.2772717,0.2598525,0.2485017,0.2146104,0.15];

y1=[5.95923,5.63827,5.06292,4.63142,4.13143,3.45427,2.99928,2.57951,2.19874,1.81096,1.536114,1.20926,0.88407,0.64873,0.50751,0.43329,0.35657,0.30088];
    [x1,ind]=sort(x1,'ascend');

```

```

y1=y1(ind);
%CP=0.6

x2=[0.4495992,0.4355901,0.4237467,0.3981549,0.3790065,0.3617403,0.3470
085,0.3378945,0.3245268,0.310191,0.2990949,0.2886087,0.2749752,0.25887
54,0.243414,0.2122065,0.15];

y2=[5.13564,4.57228,4.05162,3.06578,2.40927,1.90875,1.66258,1.56898,1.
47991,1.38881,1.26595,1.09419,0.86045,0.62568,0.46682,0.37972,0.31178]
;
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.4496106,0.434367,0.418854,0.4058625,0.3955176,0.3817203,0.370944
,0.3604836,0.348909,0.3382512,0.326034,0.3186378,0.3117576,0.306099,0.
296751,0.285384,0.276012,0.267258,0.2571813,0.247791,0.237087,0.220256
1,0.194061,0.15];

y3=[4.9875,4.48958,3.9731,3.5174,3.1809,2.7787,2.51931,2.34463,2.22437
,2.16976,2.12441,2.07357,2.0034,1.90661,1.70732,1.40139,1.14689,0.9446
,0.7638,0.6294,0.5345,0.4362,0.3731,0.31504];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.449598,0.4401567,0.426168,0.416751,0.408456,0.402729,0.3946284,0
.383655,0.375792,0.366198,0.3513432,0.333723,0.323151,0.3156603,0.3109
77,0.3051732,0.2973591,0.2873025,0.2777973,0.269178,0.260925,0.2523297
,0.242637,0.2287743,0.2107218,0.1983216,0.177741,0.15];

y4=[5.1533,4.8316,4.3527,4.0345,3.7718,3.61612,3.4099,3.20373,3.10669,
3.05717,3.03725,3.0096,2.9528,2.87665,2.80276,2.66095,2.37239,1.94709,
1.5979,1.3224,1.11739,0.9498,0.8029,0.63967,0.49667,0.41648,0.36189,0.
32195];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.449616,0.437037,0.4249545,0.4173756,0.4083801,0.3976494,0.389667
3,0.3812613,0.3660507,0.3529266,0.3455613,0.336729,0.3308694,0.3228243
,0.3151905,0.3069207,0.298269,0.2862303,0.2758641,0.265104,0.251442,0.
2383722,0.2240865,0.2068248,0.1906206,0.179127,0.16176,0.15];

y5=[4.9045,4.5954,4.3306,4.1954,4.06825,3.98169,3.94599,3.96537,4.0046
,4.06013,4.07767,4.07399,4.05646,4.00696,3.85844,3.59816,3.1647,2.5304
8,2.07351,1.71841,1.36431,1.08919,0.8549,0.64298,0.50441,0.43062,0.361
96,0.32811];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.317775,0.314421,0.3072678,0.299781,0.2915256,0.2803605,0.2670072
,0.2533545,0.239565,0.227082,0.2158131,0.2020566,0.1827645,0.1649199,0
.15];

y6=[5.0523,4.9398,4.6212,4.21775,3.72758,3.12972,2.55334,2.07455,1.67,
1.3603,1.12729,0.90186,0.6654,0.51029,0.41394];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

```

```

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpol
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5

```



```

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
rada);

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x0_interpolado;
    y3_ent=y0_interpolado;
    x4_ent=x1_interpolado;
    y4_ent=y1_interpolado;
    case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x1_interpolado;
    y3_ent=y1_interpolado;
    x4_ent=x2_interpolado;
    y4_ent=y2_interpolado;
    case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x2_interpolado;
    y3_ent=y2_interpolado;
    x4_ent=x3_interpolado;
    y4_ent=y3_interpolado;
    case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x3_interpolado;
    y3_ent=y3_interpolado;
    x4_ent=x4_interpolado;
    y4_ent=y4_interpolado;
    case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
    x3_ent=x4_interpolado;

```

```

        y3_ent=y4_interpolado;
        x4_ent=x5_interpolado;
        y4_ent=y5_interpolado;
    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x5_interpolado;
        y3_ent=y5_interpolado;
        x4_ent=x6_interpolado;
        y4_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x6_interpolado;
        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR75=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR7+(CR75-CR7)/(7.5-7)*(Lpp/(VolCarena^(1/3))-7);
CR_salida=[CR_salida,CR];
elseif Lpp/(VolCarena^(1/3))>7.5 && Lpp/(VolCarena^(1/3))<=8
    %CP=0.5

x0=[0.4494324,0.4455423,0.4372917,0.4239399,0.4124943,0.3984057,0.3853041,0.3780855,0.3708855,0.3626871,0.3508164,0.3372237,0.3273699,0.3176181,0.3080736,0.2933316,0.2762853,0.256065,0.2121099];

y0=[7.26937,7.05764,6.6021,5.85837,5.18872,4.36225,3.59812,3.19053,2.78822,2.37695,1.83447,1.33352,1.06078,0.86768,0.73445,0.57275,0.46561,0.39108,0.33783];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.4495347,0.4427577,0.4307298,0.4215465,0.4115976,0.3975156,0.3882069,0.3791493,0.3702507,0.3581061,0.3471285,0.3263817,0.2997597,0.2772717,0.2598525,0.2485017,0.2146104,0.15];

y1=[5.95923,5.63827,5.06292,4.63142,4.13143,3.45427,2.99928,2.57951,2.19874,1.81096,1.536114,1.20926,0.88407,0.64873,0.50751,0.43329,0.35657,0.30088];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

```

```

x2=[0.4495992,0.4355901,0.4237467,0.3981549,0.3790065,0.3617403,0.3470
085,0.3378945,0.3245268,0.310191,0.2990949,0.2886087,0.2749752,0.25887
54,0.243414,0.2122065,0.15];

y2=[5.13564,4.57228,4.05162,3.06578,2.40927,1.90875,1.66258,1.56898,1.
47991,1.38881,1.26595,1.09419,0.86045,0.62568,0.46682,0.37972,0.31178]
;
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.4496106,0.434367,0.418854,0.4058625,0.3955176,0.3817203,0.370944
,0.3604836,0.348909,0.3382512,0.326034,0.3186378,0.3117576,0.306099,0.
296751,0.285384,0.276012,0.267258,0.2571813,0.247791,0.237087,0.220256
1,0.194061,0.15];

y3=[4.9875,4.48958,3.9731,3.5174,3.1809,2.7787,2.51931,2.34463,2.22437
,2.16976,2.12441,2.07357,2.0034,1.90661,1.70732,1.40139,1.14689,0.9446
,0.7638,0.6294,0.5345,0.4362,0.3731,0.31504];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.449598,0.4401567,0.426168,0.416751,0.408456,0.402729,0.3946284,0
.383655,0.375792,0.366198,0.3513432,0.333723,0.323151,0.3156603,0.3109
77,0.3051732,0.2973591,0.2873025,0.2777973,0.269178,0.260925,0.2523297
,0.242637,0.2287743,0.2107218,0.1983216,0.177741,0.15];

y4=[5.1533,4.8316,4.3527,4.0345,3.7718,3.61612,3.4099,3.20373,3.10669,
3.05717,3.03725,3.0096,2.9528,2.87665,2.80276,2.66095,2.37239,1.94709,
1.5979,1.3224,1.11739,0.9498,0.8029,0.63967,0.49667,0.41648,0.36189,0.
32195];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.449616,0.437037,0.4249545,0.4173756,0.4083801,0.3976494,0.389667
3,0.3812613,0.3660507,0.3529266,0.3455613,0.336729,0.3308694,0.3228243
,0.3151905,0.3069207,0.298269,0.2862303,0.2758641,0.265104,0.251442,0.
2383722,0.2240865,0.2068248,0.1906206,0.179127,0.16176,0.15];

y5=[4.9045,4.5954,4.3306,4.1954,4.06825,3.98169,3.94599,3.96537,4.0046
,4.06013,4.07767,4.07399,4.05646,4.00696,3.85844,3.59816,3.1647,2.5304
8,2.07351,1.71841,1.36431,1.08919,0.8549,0.64298,0.50441,0.43062,0.361
96,0.32811];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.317775,0.314421,0.3072678,0.299781,0.2915256,0.2803605,0.2670072
,0.2533545,0.239565,0.227082,0.2158131,0.2020566,0.1827645,0.1649199,0
.15];

y6=[5.0523,4.9398,4.6212,4.21775,3.72758,3.12972,2.55334,2.07455,1.67,
1.3603,1.12729,0.90186,0.6654,0.51029,0.41394];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

```

```

    CPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

    dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

    [~,index]=sort(dist,'ascend');%ordenamos las distancias

    if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
        switch CP_entrada
            case 0.5

[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
                case 0.55

[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
                case 0.6

[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
                case 0.65

[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
                case 0.7

[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
                case 0.75

[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
                case 0.8

[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
                case 0.85

[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
                end

        else%si el CP_entrada no coincide con uno que tenemos->interpolare
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5

[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

```

```

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x0_interpolado;
        y1_ent=y0_interpolado;
        x2_ent=x1_interpolado;
        y2_ent=y1_interpolado;
        case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x1_interpolado;
        y1_ent=y1_interpolado;
        x2_ent=x2_interpolado;
        y2_ent=y2_interpolado;
        case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x2_interpolado;
        y1_ent=y2_interpolado;
        x2_ent=x3_interpolado;
        y2_ent=y3_interpolado;
        case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x3_interpolado;
        y1_ent=y3_interpolado;
        x2_ent=x4_interpolado;
        y2_ent=y4_interpolado;
        case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x1_ent=x4_interpolado;
        y1_ent=y4_interpolado;
        x2_ent=x5_interpolado;
        y2_ent=y5_interpolado;

```

```

    case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x5_interpolado;
    y1_ent=y5_interpolado;
    x2_ent=x6_interpolado;
    y2_ent=y6_interpolado;
    case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
    y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
    x1_ent=x6_interpolado;
    y1_ent=y6_interpolado;
    x2_ent=x7_interpolado;
    y2_ent=y7_interpolado;
end
end
CR75=y_salida;
CR1_salida=[CR1_salida,y_salida];
%CP=0.5

x0=[0.4496109,0.4396407,0.4305846,0.4223361,0.4092369,0.3978507,0.3839283,0.3691806,0.3579579,0.3488598,0.34072509,0.3319209,0.3236154,0.31583295,0.3056856,0.2937138,0.2760396,0.2460402,0.1976793,0.15];

y0=[4.98256,4.79647,4.60687,4.39045,3.9619,3.55947,2.99009,2.35016,1.88564,1.545145,1.29558,1.06604,0.87541,0.75813,0.64144,0.5343,0.43254,0.34976,0.29754,0.2602];
    %Vemos que los datos están desordenados: ordenamos los datos
    [x0,ind]=sort(x0,'ascend');
    y0=y0(ind);
    %CP=0.55

x1=[0.4496595,0.4361022,0.4201023,0.4111611,0.3963696,0.3867441,0.3801618,0.3738789,0.3690918,0.3624195,0.3536847,0.3466077,0.3370038,0.3158439,0.2893818,0.2654418,0.2516946,0.2393388,0.2047917,0.15];

y1=[4.36029,4.06293,3.65192,3.36417,2.84816,2.4699,2.17776,1.95574,1.77152,1.59395,1.40677,1.27617,1.15465,0.94674,0.71134,0.52133,0.43559,0.3909,0.32538,0.26457];
    [x1,ind]=sort(x1,'ascend');
    y1=y1(ind);
    %CP=0.6

x2=[0.4497015,0.4470204,0.4415808,0.4357335,0.4271919,0.4138212,0.4000617,0.3901836,0.3818217,0.3744045,0.3668976,0.3553857,0.3492129,0.3367725,0.3212307,0.3139971,0.3079068,0.3030186,0.2939259,0.2764758,0.2649405,0.2518227,0.2362875,0.2021667,0.15];

y2=[3.82488,3.80954,3.73115,3.61995,3.42533,3.09745,2.68587,2.35899,2.

```

```

09723,1.89683,1.73523,1.51534,1.44784,1.35317,1.27983,1.24338,1.20648,
1.15504,1.02759,0.76953,0.61904,0.5126,0.4257,0.34566,0.27357];
[x2,ind]=sort(x2,'ascend');
y2=y2(ind);
%CP=0.65

x3=[0.4497159,0.4459227,0.4415979,0.4375221,0.4299387,0.419301,0.40130
52,0.3882498,0.3802641,0.3722724,0.3613632,0.3536757,0.3474864,0.33755
55,0.3255666,0.3165294,0.311691,0.3074991,0.3038187,0.3005802,0.293655
3,0.2862072,0.272841,0.2613993,0.2522286,0.2395275,0.2272755,0.2030301
,0.15];

y3=[3.70702,3.67758,3.63023,3.57042,3.43678,3.19719,2.7256,2.35189,2.1
5174,1.98596,1.833,1.7641,1.72751,1.71962,1.72276,1.71858,1.70511,1.67
727,1.63099,1.57493,1.42072,1.23863,0.94894,0.74169,0.62488,0.51445,0.
42953,0.36363,0.27552];
[x3,ind]=sort(x3,'ascend');
y3=y3(ind);
%CP=0.7

x4=[0.449712,0.4450119,0.4369347,0.4270452,0.4161828,0.4075344,0.39753
39,0.3911274,0.385428,0.3795576,0.3732285,0.3666267,0.3599361,0.351937
5,0.3414876,0.3325464,0.3272586,0.3187869,0.3143136,0.3097629,0.302627
7,0.2943354,0.282939,0.2720247,0.2632077,0.2554002,0.2470548,0.2353155
,0.2168049,0.1990887,0.174978,0.15];

y4=[3.70091,3.6649,3.55028,3.36229,3.11883,2.93729,2.69799,2.55722,2.4
5717,2.38619,2.33548,2.31936,2.31529,2.34469,2.39452,2.421599,2.42398,
2.40707,2.37408,2.3235,2.19589,1.97701,1.60003,1.27124,1.05408,0.9025,
0.77704,0.64389,0.49702,0.39571,0.32836,0.28374];
[x4,ind]=sort(x4,'ascend');
y4=y4(ind);
%CP=0.75

x5=[0.4164354,0.4064397,0.3921207,0.3823353,0.3738192,0.3661359,0.3605
175,0.3516021,0.3382281,0.330186,0.3242265,0.3193395,0.3131367,0.30570
72,0.2991885,0.2882988,0.2782386,0.26733585,0.2542611,0.2430639,0.2294
487,0.2180583,0.2050416,0.1882245,0.1666482,0.15];

y5=[3.42325,3.28752,3.12026,3.03366,3.00952,3.00432,3.01895,3.07113,3.
17403,3.20224,3.20198,3.17705,3.09622,2.93192,2.71882,2.30425,1.97154,
1.64424,1.3065,1.07771,0.84995,0.69553,0.5568,0.43053,0.3309,0.28824];
[x5,ind]=sort(x5,'ascend');
y5=y5(ind);
%CP=0.8

x6=[0.3780306,0.3674217,0.3522861,0.3397992,0.3322653,0.3270387,0.3211
692,0.3156858,0.3088044,0.2978469,0.2875977,0.2757552,0.2590275,0.2435
154,0.2283417,0.2165268,0.2052087,0.1958217,0.1828641,0.1681074,0.2218
89,0.15];

y6=[3.99358,4.07567,4.23188,4.3667,4.39928,4.39424,4.32922,4.21605,3.9
8111,3.51549,3.09594,2.67447,2.1479,1.71126,1.34707,1.10042,0.90494,0.
76985,0.62253,0.49598,0.4232,0.39687];
[x6,ind]=sort(x6,'ascend');
y6=y6(ind);

CP_entrada=CP;%CP que introduce el usuario
x_entrada=Fn;%coordenada x que introduce el usuario

```

```

CPPrango=[0.5 0.55 0.6 0.65 0.7 0.75 0.8];%CPs de las gráficas que
tenemos

dist=abs(CPrango-CP_entrada);%distancia entre CP y CP_entrada

[~,index]=sort(dist,'ascend');%ordenamos las distancias

if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
    switch CP_entrada
        case 0.5
[x0_interpolado,y0_interpolado,y_salida]=cubic_bspline(x0,y0,20,x_entr
ada);
            case 0.55
[x1_interpolado,y1_interpolado,y_salida]=cubic_bspline(x1,y1,20,x_entr
ada);
            case 0.6
[x2_interpolado,y2_interpolado,y_salida]=cubic_bspline(x2,y2,20,x_entr
ada);
            case 0.65
[x3_interpolado,y3_interpolado,y_salida]=cubic_bspline(x3,y3,20,x_entr
ada);
            case 0.7
[x4_interpolado,y4_interpolado,y_salida]=cubic_bspline(x4,y4,20,x_entr
ada);
            case 0.75
[x5_interpolado,y5_interpolado,y_salida]=cubic_bspline(x5,y5,20,x_entr
ada);
            case 0.8
[x6_interpolado,y6_interpolado,y_salida]=cubic_bspline(x6,y6,20,x_entr
ada);
            case 0.85
[x7_interpolado,y7_interpolado,y_salida]=cubic_bspline(x7,y7,20,x_entr
ada);
            end

        else%si el CP_entrada no coincide con uno que tenemos->interpolar
2 CP
            CP1=CPrango(index(1));
            CP2=CPrango(index(2));
            if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
                kk=CP1;
                CP1=CP2;
                CP2=kk;
            end

            switch CP1
                case 0.5
[x0_interpolado,y0_interpolado,y_salida1]=cubic_bspline(x0,y0,20,x_entr
ada);

```



```

[x1_interpolado,y1_interpolado,y_salida2]=cubic_bspline(x1,y1,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x0_interpolado;
        y3_ent=y0_interpolado;
        x4_ent=x1_interpolado;
        y4_ent=y1_interpolado;
        case 0.55

[x1_interpolado,y1_interpolado,y_salida1]=cubic_bspline(x1,y1,20,x_entr
rada);

[x2_interpolado,y2_interpolado,y_salida2]=cubic_bspline(x2,y2,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x1_interpolado;
        y3_ent=y1_interpolado;
        x4_ent=x2_interpolado;
        y4_ent=y2_interpolado;
        case 0.6

[x2_interpolado,y2_interpolado,y_salida1]=cubic_bspline(x2,y2,20,x_entr
rada);

[x3_interpolado,y3_interpolado,y_salida2]=cubic_bspline(x3,y3,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x2_interpolado;
        y3_ent=y2_interpolado;
        x4_ent=x3_interpolado;
        y4_ent=y3_interpolado;
        case 0.65

[x3_interpolado,y3_interpolado,y_salida1]=cubic_bspline(x3,y3,20,x_entr
rada);

[x4_interpolado,y4_interpolado,y_salida2]=cubic_bspline(x4,y4,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x3_interpolado;
        y3_ent=y3_interpolado;
        x4_ent=x4_interpolado;
        y4_ent=y4_interpolado;
        case 0.7

[x4_interpolado,y4_interpolado,y_salida1]=cubic_bspline(x4,y4,20,x_entr
rada);

[x5_interpolado,y5_interpolado,y_salida2]=cubic_bspline(x5,y5,20,x_entr
rada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-
CP1))*(CP_entrada-CP1);
        x3_ent=x4_interpolado;
        y3_ent=y4_interpolado;
        x4_ent=x5_interpolado;
        y4_ent=y5_interpolado;

```

```

        case 0.75

[x5_interpolado,y5_interpolado,y_salida1]=cubic_bspline(x5,y5,20,x_entrada);

[x6_interpolado,y6_interpolado,y_salida2]=cubic_bspline(x6,y6,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x5_interpolado;
        y3_ent=y5_interpolado;
        x4_ent=x6_interpolado;
        y4_ent=y6_interpolado;
        case 0.8

[x6_interpolado,y6_interpolado,y_salida1]=cubic_bspline(x6,y6,20,x_entrada);

[x7_interpolado,y7_interpolado,y_salida2]=cubic_bspline(x7,y7,20,x_entrada);
        y_salida=y_salida1+((y_salida2-y_salida1)/(CP2-CP1))*(CP_entrada-CP1);
        x3_ent=x6_interpolado;
        y3_ent=y6_interpolado;
        x4_ent=x7_interpolado;
        y4_ent=y7_interpolado;
    end
end
CR8=y_salida;
CR2_salida=[CR2_salida,y_salida];
CR=CR75+(CR8-CR75)/(8-7.5)*(Lpp/(VolCarena^(1/3))-7.5);
CR_salida=[CR_salida,CR];
else
end
%Corrección de CR por B/T
CR=CR+0.16*(B/T-2.5);
%Correccion de CR por posicion del centro de carena
lcbestandar=-43.75*Fn+9.375;
if lcb<=lcbestandar | Fn<0.15
else
    if CP>=0.5 && CP<=0.55
        y=3.793*Fn-0.8;
    elseif CP>0.55 && CP<=0.6
        y1=3.793*Fn-0.8;
        y2=3.922*Fn-0.82;
        y=y1+(y2-y1)/(0.6-0.55)*(CP-0.55);
    elseif CP>0.6 && CP<=0.65
        y1=3.922*Fn-0.82;
        y2=4*Fn-0.82;
        y=y1+(y2-y1)/(0.65-0.6)*(CP-0.6);
    elseif CP>0.65 && CP<=0.7
        y1=4*Fn-0.82;
        y2=5.625*Fn-1.1;
        y=y1+(y2-y1)/(0.7-0.65)*(CP-0.65);
    elseif CP>0.7 && CP<=0.75
        y1=5.625*Fn-1.1;
        y2=5.122*Fn-0.917;
        y=y1+(y2-y1)/(0.75-0.7)*(CP-0.7);
    elseif CP>0.75 && CP<=0.8
        y1=5.122*Fn-0.917;
        y2=6.1*Fn-0.963;

```

```

        y=y1+(y2-y1)/(0.8-0.75)*(CP-0.75);
    end
    if y<0
        y=0;
    else
    end
    Dlcb=lcb-lcbestandar;
    CR=CR+y*abs(Dlcb);
end
%Correccion de CR por formas de las secciones
if get(handles.radiobutton_ProaU,'Value')==1
    CR=CR-0.1;
else
    CR=CR+0.1;
end
if get(handles.radiobutton_PopaU,'Value')==1
    CR=CR+0.1;
else
    CR=CR-0.1;
end
%Correccion CR por bulbo de proa
if ATB/AM>=0.1 & get(handles.radiobutton_BulboSi,'Value')==1
    TABLA={'CP/Fn',0.15,0.18,0.21,0.24,0.27,0.3,0.33,0.36;
        0.5,0,0,0.2,0,-0.2,-0.4,-0.4,-0.4;
        0.6,0,0,0.2,0,-0.2,-0.3,-0.3,0;
        0.7,0,0.2,0,-0.2,-0.3,-0.3,0,0;
        0.8,0.1,0,-0.2,0,0,0,0,0};
    RESULTADOS={'CP/Fn',0.15,0.18,0.21,0.24,0.27,0.3,0.33,0.36;
        0,0,0,0,0,0,0,0,0};
    for i=2:4
        if CP==TABLA{i,1}
            for j=2:9
                RESULTADOS{2,1}=CP;
                RESULTADOS{2,j}=TABLA{i,j};
            end
        elseif CP==TABLA{5,1}
            for j=2:9
                RESULTADOS{2,1}=CP;
                RESULTADOS{2,j}=TABLA{5,j};
            end
        elseif CP>TABLA{i,1} && CP<TABLA{i+1,1}
            for j=2:9
                RESULTADOS{2,1}=CP;
                RESULTADOS{2,j}=TABLA{i,j}+(TABLA{i+1,j}-
TABLA{i,j})/(TABLA{i+1,1}-TABLA{i,1})*(CP-TABLA{i,1});
            end
        end
    end
    for i=2:8
        if Fn==RESULTADOS{1,i}
            CR=CR+RESULTADOS{2,i};
        elseif Fn==RESULTADOS{1,9}
            CR=CR+RESULTADOS{2,9};
        elseif Fn>RESULTADOS{1,i} && Fn<RESULTADOS{1,i+1}
            CR=CR+(RESULTADOS{2,i}+(RESULTADOS{2,i+1}-
RESULTADOS{2,i})/(RESULTADOS{1,i+1}-RESULTADOS{1,i})*(Fn-
RESULTADOS{1,i}));
        end
    end
end
else
end
end

```

```

%Correcciones de CR por apéndices:
if get(handles.radiobutton_Henchimientos,'Value')==1
    CR=1.05*CR;
else
end
if get(handles.radiobutton_Arbotantes,'Value')==1
    CR=1.08*CR;
else
end
CR=CR*10^(-3);
%Corrección por CA
Desp=VolCarena*Densidad/1000;
if Lpp<=100
    CA=0.4;
elseif Lpp>100 && Lpp<=150
    CA=0.4+(0.2-0.4)/(150-100)*(Lpp-100);
elseif Lpp>150 && Lpp<=200
    CA=0.2+(-0.2)/(200-150)*(Lpp-150);
elseif Lpp>200 && Lpp<=250
    CA=-0.2/(250-200)*(Lpp-200);
elseif Lpp>250 && Lpp<=300
    CA=-0.2+(-0.3+0.2)/(300-250)*(Lpp-250);
else
    CA=-0.3;
end
CA=10^-3*CA;
%Corrección por resistencia al aire y al gobierno
CAA=0.07*10^(-3);
CG=0.04*10^(-3);
%Corrección a CF por apéndices
if SA==0
else
CF=(CF+CA)*SmA/Sm;
end
CT=CF+CR+CA+CAA+CG;
RT=0.5*Densidad/9.81*SmA*(V*0.514444)^2*CT;
if strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Verano')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Pacífico') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Pacífico') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Verano')
    RT=RT*1.12;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Invierno')
    RT=RT*1.18;

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```

        elseif strcmp(Ruta,'Ruta del Este Asia') &
strcmp(Estacion,'Verano')
            RT=RT*1.15;
        elseif strcmp(Ruta,'Ruta del Este Asia') &
strcmp(Estacion,'Invierno')
            RT=RT*1.2;
        else
        end
        EHP=RT*V*0.514444/75;
        v_EHP=[v_EHP EHP];
        v_RT=[v_RT RT];
        v_CT=[v_CT CT];
        v_CF=[v_CF CF];
        v_CA=[v_CA CA];
        v_CAA=[v_CAA CAA];
        v_CG=[v_CG CG];
        v_CR=[v_CR CR];

end
v=[Vmin:0.2:Vmax];
V=[];
Fn=[];
Rn=[];
RT=[];
CT=[];
CF=[];
CA=[];
CAA=[];
CR=[];
CG=[];
EHP=[];
for i=1:((Vmin+1-Vmin)/0.2):((Vmax-Vmin)/0.2+1)
    V=[V v(i)];
    Fn=[Fn v_Fn(i)];
    Rn=[Rn v_Rn(i)];
    RT=[RT v_RT(i)];
    CT=[CT v_CT(i)];
    CF=[CF v_CF(i)];
    CR=[CR v_CR(i)];
    CA=[CA v_CA(i)];
    CAA=[CAA v_CAA(i)];
    CG=[CG v_CG(i)];
    EHP=[EHP v_EHP(i)];
end
T=table(V',Fn',Rn',CF',CR',CA',CAA',CG',CT',RT',EHP');
T.Properties.VariableNames={'V_kn','Fn','Rn','CF','CR','CA','CAA','CG',
'CT','RT_kg','EHP_CV'};
disp('-----Método de Guldhammer y
Harvald-----')
disp(' ')
disp(T)
v1=[Vmin:1:Vmax];
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b');axis tight;hold on
set(handles.plot1,'HitTest','off') ;
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,ha
ndles) )
xlabel('V(kn)')
ylabel('RT(kg)')
axes(handles.axes_EHP);

```

```

cla(handles.axes_EHP,'reset')
handles.plot2=plot(v,v_EHP,'-r');axis tight;hold on
set(handles.plot2,'HitTest','off') ;
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,
handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
calc=1;
compplot=0;
set(handles.pushbutton_Comparar,'Enable','on');
    if Lpp/(VolCarena^(1/3))>=4 & Lpp/(VolCarena^(1/3))<4.5
        a='Lpp/VolCarena^(1/3)=4';
        b='Lpp/VolCarena^(1/3)=4.5';
    elseif Lpp/(VolCarena^(1/3))>=4.5 & Lpp/(VolCarena^(1/3))<5
        a='Lpp/VolCarena^(1/3)=4.5';
        b='Lpp/VolCarena^(1/3)=5';
    elseif Lpp/(VolCarena^(1/3))>=5 & Lpp/(VolCarena^(1/3))<5.5
        a='Lpp/VolCarena^(1/3)=5';
        b='Lpp/VolCarena^(1/3)=5.5';
    elseif Lpp/(VolCarena^(1/3))>=5.5 & Lpp/(VolCarena^(1/3))<6
        a='Lpp/VolCarena^(1/3)=5.5';
        b='Lpp/VolCarena^(1/3)=6';
    elseif Lpp/(VolCarena^(1/3))>=6 & Lpp/(VolCarena^(1/3))<6.5
        a='Lpp/VolCarena^(1/3)=6';
        b='Lpp/VolCarena^(1/3)=6.5';
    elseif Lpp/(VolCarena^(1/3))>=6.5 & Lpp/(VolCarena^(1/3))<7
        a='Lpp/VolCarena^(1/3)=6.5';
        b='Lpp/VolCarena^(1/3)=7';
    elseif Lpp/(VolCarena^(1/3))>=7.5 & Lpp/(VolCarena^(1/3))<8
        a='Lpp/VolCarena^(1/3)=7.5';
        b='Lpp/VolCarena^(1/3)=8';
    end
    [~,index]=sort(dist,'ascend');%ordenamos las distancias
    if dist(index(1))==0%si el CP_entrada coincide con uno que tenemos
        c=['Lpp/VolCarena^(1/3)='
num2str(round((Lpp/VolCarena^(1/3)),4))];
        f=figure('Name',c,'NumberTitle','off');
        plot(Fn_entrada,CR_salida,'k')
        switch CP
            case 0.5
                lgd=legend('CP=0.5');
            case 0.55
                lgd=legend('CP=0.55');
            case 0.6
                lgd=legend('CP=0.6');
            case 0.65
                lgd=legend('CP=0.65');
            case 0.7
                lgd=legend('CP=0.7');
            case 0.75
                lgd=legend('CP=0.75');
            case 0.8
                lgd=legend('CP=0.8');
            case 0.85
                lgd=legend('CP=0.85');
            end
        xlabel('Fn')
        ylabel('CR*10^3')
    else%si el CP_entrada no coincide con uno que tenemos->interpolar
2 CP
        CP1=CPPrango(index(1));

```

```

CP2=CPrango(index(2));
if (CP1>CP2) %Ponemos el menor CP en CP1 y el mayor en CP2
    kk=CP1;
    CP1=CP2;
    CP2=kk;
end

ind=find(((x1_ent>=Fn_entrada(1))&(x1_ent<=Fn_entrada(end)))&((y1_ent>
=CR1_salida(1))&(y1_ent<=CR1_salida(end))));
f=figure('Name',a,'NumberTitle','off');
plot(x1_ent(ind),y1_ent(ind),'b');hold on

ind=find(((x2_ent>=Fn_entrada(1))&(x2_ent<=Fn_entrada(end)))&((y2_ent>
=CR1_salida(1))&(y2_ent<=CR1_salida(end))));
plot(x2_ent(ind),y2_ent(ind),'r');hold on
plot(Fn_entrada,CR1_salida,'k')
switch CP1
case 0.5
lgd=legend({'CP=0.5','CP=0.55','CP'});
case 0.55
lgd=legend({'CP=0.55','CP=0.6','CP'});
case 0.6
lgd=legend({'CP=0.6','CP=0.65','CP'});
case 0.65
lgd=legend({'CP=0.65','CP=0.7','CP'});
case 0.7
lgd=legend({'CP=0.7','CP=0.75','CP'});
case 0.75
lgd=legend({'CP=0.75','CP=0.8','CP'});
end
xlabel('Fn')
ylabel('CR*10^3')

ind=find(((x3_ent>=Fn_entrada(1))&(x3_ent<=Fn_entrada(end)))&((y3_ent>
=CR2_salida(1))&(y3_ent<=CR2_salida(end))));
g=figure('Name',b,'NumberTitle','off');
plot(x3_ent(ind),y3_ent(ind),'b');hold on

ind=find(((x4_ent>=Fn_entrada(1))&(x4_ent<=Fn_entrada(end)))&((y4_ent>
=CR2_salida(1))&(y4_ent<=CR2_salida(end))));
plot(x4_ent(ind),y4_ent(ind),'r');hold on
plot(Fn_entrada,CR2_salida,'k')
switch CP1
case 0.5
lgd=legend({'CP=0.5','CP=0.55','CP'});
case 0.55
lgd=legend({'CP=0.55','CP=0.6','CP'});
case 0.6
lgd=legend({'CP=0.6','CP=0.65','CP'});
case 0.65
lgd=legend({'CP=0.65','CP=0.7','CP'});
case 0.7
lgd=legend({'CP=0.7','CP=0.75','CP'});
case 0.75
lgd=legend({'CP=0.75','CP=0.8','CP'});
end
xlabel('Fn')
ylabel('CR*10^3')
movegui(f,'west')
movegui(g,'east')

end

```

end

```
% --- Executes on button press in pushbutton_Borrar.
function pushbutton_Borrar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Borrar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global calc
global comp
global metodo
global SmHenchimientos
global SmArbotantes
calc=0;
set(handles.pushbutton_Comparar,'Enable','off');
if comp==0
cla(handles.axes_Rt,'reset');
cla(handles.axes_EHP,'reset');
set(handles.edit_Lf,'String','');
set(handles.edit_Lf,'Enable','on');
set(handles.edit_Lpp,'String','');
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_B,'String','');
set(handles.edit_B,'Enable','off');
set(handles.edit_T,'String','');
set(handles.edit_T,'Enable','off');
set(handles.edit_CP,'String','');
set(handles.edit_CP,'Enable','on');
set(handles.edit_Vmin,'String','');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'String','');
set(handles.edit_Vmax,'Enable','on');
set(handles.edit_VolCarena,'String','');
set(handles.edit_VolCarena,'Enable','on');
set(handles.radiobutton_BulboSi,'Value',1);
set(handles.edit_ATB,'String','');
set(handles.edit_ATB,'Enable','off');
set(handles.edit_LCB,'String','');
set(handles.edit_LCB,'Enable','on');
set(handles.popupmenu_Rutas,'Enable','off');
set(handles.popupmenu_Rutas,'Value',1);
set(handles.popupmenu_Estacion,'Enable','off');
set(handles.popupmenu_Estacion,'Value',1);
set(handles.radiobutton_ProaU,'Enable','off');
set(handles.radiobutton_ProaU,'Value',1);
set(handles.radiobutton_ProaV,'Enable','off');
set(handles.radiobutton_ProaV,'Value',0);
set(handles.radiobutton_PopaU,'Enable','off');
set(handles.radiobutton_PopaU,'Value',1);
set(handles.radiobutton_PopaV,'Enable','off');
set(handles.radiobutton_PopaV,'Value',0);
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Rio,'Value',0);
set(handles.radiobutton_Mar,'Enable','off');
set(handles.radiobutton_Mar,'Value',1);
set(handles.radiobutton_Arbotantes,'Value',0);
set(handles.radiobutton_Arbotantes,'Enable','off');
set(handles.edit_Arbotantes,'String','');
set(handles.edit_Arbotantes,'Enable','off');
set(handles.radiobutton_Henchimientos,'Value',0);
set(handles.radiobutton_Henchimientos,'Enable','off');
set(handles.edit_Henchimientos,'String','');
```



```

set(handles.edit_Henchimientos,'Enable','off');
set(handles.radiobutton_BulboSi,'Value',1);
set(handles.radiobutton_BulboSi,'Enable','off');
set(handles.radiobutton_BulboNo,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.radiobutton_Si,'Enable','off');
set(handles.radiobutton_Si,'Value',0);
set(handles.radiobutton_No,'Enable','off');
set(handles.radiobutton_No,'Value',0);
set(handles.edit_Sm,'Enable','off');
set(handles.edit_Sm,'String','');
else
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.radiobutton_PopaU,'Value',1);
set(handles.radiobutton_ProaU,'Value',1);
set(handles.radiobutton_PopaU,'Enable','off');
set(handles.radiobutton_PopaV,'Enable','off');
set(handles.radiobutton_ProaU,'Enable','off');
set(handles.radiobutton_ProaV,'Enable','off');
axes(handles.axes_Rt);
cla;
axes(handles.axes_EHP);
cla;
switch metodo
case 'Holtrop y Mennen'
    if SmHenchimientos==0
        set(handles.edit_Henchimientos,'String','');
        set(handles.edit_Henchimientos,'Enable','off');
        set(handles.radiobutton_Henchimientos,'Value',0);
        set(handles.radiobutton_Henchimientos,'Enable','off');
    else
    end
    if SmArbotantes==0
        set(handles.edit_Arbotantes,'String','');
        set(handles.edit_Arbotantes,'Enable','off');
        set(handles.radiobutton_Arbotantes,'Value',0);
        set(handles.radiobutton_Arbotantes,'Enable','off');
    else
    end
case 'Amadeo García'
    set(handles.edit_Henchimientos,'String','');
    set(handles.edit_Arbotantes,'String','');
    set(handles.edit_Arbotantes,'Enable','off');
    set(handles.edit_Henchimientos,'Enable','off');
    set(handles.radiobutton_Arbotantes,'Value',0);
    set(handles.radiobutton_Arbotantes,'Enable','off');
    set(handles.radiobutton_Henchimientos,'Value',0);
    set(handles.radiobutton_Henchimientos,'Enable','off');
    set(handles.edit_LCB,'Enable','on');
    set(handles.edit_LCB,'String','');
    set(handles.edit_CP,'Enable','on');
    set(handles.edit_CP,'String','');
    set(handles.radiobutton_BulboSi,'Value',1);
    set(handles.edit_ATB,'String','');
    set(handles.edit_ATB,'Enable','off');
    set(handles.radiobutton_BulboSi,'Enable','off');
    set(handles.radiobutton_BulboNo,'Enable','off');

```

```

case 'Van Oortmerssen'
    set(handles.edit_Henchimientos,'String','');
    set(handles.edit_Arbotantes,'String','');
    set(handles.edit_Arbotantes,'Enable','off');
    set(handles.edit_Henchimientos,'Enable','off');
    set(handles.radiobutton_Arbotantes,'Value',0);
    set(handles.radiobutton_Arbotantes,'Enable','off');
    set(handles.radiobutton_Henchimientos,'Value',0);
    set(handles.radiobutton_Henchimientos,'Enable','off');
    set(handles.radiobutton_BulboSi,'Value',1);
    set(handles.edit_ATB,'String','');
    set(handles.edit_ATB,'Enable','off');
    set(handles.radiobutton_BulboSi,'Value',1);
    set(handles.radiobutton_BulboSi,'Enable','off');
    set(handles.radiobutton_BulboNo,'Enable','off');
end
end

% --- Executes on selection change in popupmenu_Rutas.
function popupmenu_Rutas_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Rutas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
set(handles.pushbutton_Comparar,'Enable','off');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.popupmenu_Estacion,'Value',1);
else
    set(handles.popupmenu_Estacion,'Enable','on');
    set(handles.popupmenu_Estacion,'Value',1);
end
% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Rutas contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Rutas

% --- Executes during object creation, after setting all properties.
function popupmenu_Rutas_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Rutas (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on selection change in popupmenu_Estacion.
function popupmenu_Estacion_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hints: contents = cellstr(get(hObject, 'String')) returns
popupmenu_Estacion contents as cell array
%           contents{get(hObject, 'Value')} returns selected item from
popupmenu_Estacion

% --- Executes during object creation, after setting all properties.
function popupmenu_Estacion_CreateFcn(hObject, eventdata, handles)
% hObject      handle to popupmenu_Estacion (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%           See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in radiobutton_Henchimientos.
function radiobutton_Henchimientos_Callback(hObject, eventdata,
handles)
% hObject      handle to radiobutton_Henchimientos (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hint: get(hObject, 'Value') returns toggle state of
radiobutton_Henchimientos
if get(hObject, 'Value')==1
    set(handles.edit_Henchimientos, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
else
    set(handles.edit_Henchimientos, 'Enable', 'off');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    set(handles.edit_Henchimientos, 'String', '');
end

% --- Executes on button press in radiobutton_Arbotantes.
function radiobutton_Arbotantes_Callback(hObject, eventdata, handles)
% hObject      handle to radiobutton_Arbotantes (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
if get(hObject, 'Value')==1
    set(handles.edit_Arbotantes, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
else
    set(handles.edit_Arbotantes, 'Enable', 'off');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    set(handles.edit_Arbotantes, 'String', '');
end
% Hint: get(hObject, 'Value') returns toggle state of
radiobutton_Arbotantes

```

```

function edit_Henchimientos_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Henchimientos (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Henchimientos
as text
%         str2double(get(hObject,'String')) returns contents of
edit_Henchimientos as a double
handles = guidata(hObject);
global comp
global metodo
if str2num(get(handles.edit_Henchimientos,'String'))<0
    msgbox('El valor de la superficie mojada de los henchimientos es
incorrecto.','Aviso.','error');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.radiobutton_BulboSi, 'Enable', 'off');
    set(handles.radiobutton_BulboNo, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_ProaU, 'Enable', 'off');
    set(handles.radiobutton_ProaV, 'Enable', 'off');
    set(handles.radiobutton_PopaU, 'Enable', 'off');
    set(handles.radiobutton_PopaV, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Si, 'Enable', 'off');
    set(handles.radiobutton_No, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.popupmenu_Rutas, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
else
    if comp==0
        set(handles.edit_B, 'Enable', 'on');
        if get(handles.radiobutton_BulboSi,'Value')==1
            set(handles.edit_ATB, 'Enable', 'on');
        else
        end
        set(handles.radiobutton_BulboSi, 'Enable', 'on');
        set(handles.radiobutton_BulboNo, 'Enable', 'on');
        set(handles.edit_T, 'Enable', 'on');
        set(handles.radiobutton_ProaU, 'Enable', 'on');
        set(handles.radiobutton_ProaV, 'Enable', 'on');
        set(handles.radiobutton_PopaU, 'Enable', 'on');
        set(handles.radiobutton_PopaV, 'Enable', 'on');
        set(handles.radiobutton_Si, 'Enable', 'on');
        set(handles.radiobutton_No, 'Enable', 'on');
        set(handles.radiobutton_Rio, 'Enable', 'on');
        set(handles.radiobutton_Mar, 'Enable', 'on');
        set(handles.radiobutton_Arbotantes, 'Enable', 'on');
        if get(handles.radiobutton_Arbotantes, 'Value')==1
            set(handles.edit_Arbotantes, 'Enable', 'on');
        else

```

```

        set(handles.edit_Arbotantes, 'Enable', 'off');
    end
    set(handles radiobutton_Henchimientos, 'Enable', 'on');
    if get(handles radiobutton_Si, 'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
        set(handles.edit_Sm, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas,'String'));
    Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
    if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    else
        set(handles radiobutton_ProaU, 'Enable', 'on');
        set(handles radiobutton_ProaV, 'Enable', 'on');
        set(handles radiobutton_PopaU, 'Enable', 'on');
        set(handles radiobutton_PopaV, 'Enable', 'on');
        set(handles.pushbutton_Cambiar, 'Enable', 'on');
        set(handles.pushbutton_Comparar, 'Enable', 'off');
        set(handles.pushbutton_Calcular, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        set(handles radiobutton_Arbotantes, 'Enable', 'on');
        if get(handles radiobutton_Arbotantes, 'Value')==1
            set(handles.edit_Arbotantes, 'Enable', 'on');
        else
            set(handles.edit_Arbotantes, 'Enable', 'off');
        end
    end
    set(handles radiobutton_Henchimientos, 'Enable', 'on');
    switch metodo
        case 'Holtrop y Mennen'
        case 'Amadeo García'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles radiobutton_BulboSi, 'Enable', 'on');
            set(handles radiobutton_BulboNo, 'Enable', 'on');
        case 'Van Oortmerssen'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles radiobutton_BulboSi, 'Enable', 'on');
            set(handles radiobutton_BulboNo, 'Enable', 'on');
    end
end
end
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_Henchimientos_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Henchimientos (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

end

```
function edit_Arbotantes_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Arbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Arbotantes as
text
%          str2double(get(hObject,'String')) returns contents of
edit_Arbotantes as a double
handles = guidata(hObject);
global comp
global metodo
if str2num(get(handles.edit_Arbotantes,'String'))<0
    msgbox('El valor de la superficie mojada de los arbotantes es
incorrecto.','Aviso.','error');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.radiobutton_BulboSi, 'Enable', 'off');
    set(handles.radiobutton_BulboNo, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_ProaU, 'Enable', 'off');
    set(handles.radiobutton_ProaV, 'Enable', 'off');
    set(handles.radiobutton_PopaU, 'Enable', 'off');
    set(handles.radiobutton_PopaV, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Si, 'Enable', 'off');
    set(handles.radiobutton_No, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_Henchimientos, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.popupmenu_Rutas, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
    if comp==0
        set(handles.edit_B, 'Enable', 'on');
        if get(handles.radiobutton_BulboSi,'Value')==1
            set(handles.edit_ATB, 'Enable', 'on');
        else
        end
        set(handles.radiobutton_BulboSi, 'Enable', 'on');
        set(handles.radiobutton_BulboNo, 'Enable', 'on');
        set(handles.edit_T, 'Enable', 'on');
        set(handles.radiobutton_ProaU, 'Enable', 'on');
        set(handles.radiobutton_ProaV, 'Enable', 'on');
        set(handles.radiobutton_PopaU, 'Enable', 'on');
        set(handles.radiobutton_PopaV, 'Enable', 'on');
        set(handles.radiobutton_Si, 'Enable', 'on');
        set(handles.radiobutton_No, 'Enable', 'on');
        set(handles.radiobutton_Rio, 'Enable', 'on');
        set(handles.radiobutton_Mar, 'Enable', 'on');
        set(handles.radiobutton_Arbotantes, 'Enable', 'on');
        if get(handles.radiobutton_Henchimientos, 'Value')==1
```

```

        set(handles.edit_Henchimientos, 'Enable', 'on');
    else
        set(handles.edit_Henchimientos, 'Enable', 'off');
    end
    set(handles radiobutton_Henchimientos, 'Enable', 'on');
    if get(handles radiobutton_Si, 'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
        set(handles.edit_Sm, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas,'String'));
    Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
    if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Comparar, 'Enable', 'off');
    else
        set(handles radiobutton_ProaU, 'Enable', 'on');
        set(handles radiobutton_ProaV, 'Enable', 'on');
        set(handles radiobutton_PopaU, 'Enable', 'on');
        set(handles radiobutton_PopaV, 'Enable', 'on');
        set(handles.pushbutton_Cambiar, 'Enable', 'on');
        set(handles.pushbutton_Comparar, 'Enable', 'off');
        set(handles.pushbutton_Calcular, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        set(handles radiobutton_Arbotantes, 'Enable', 'on');
        set(handles radiobutton_Henchimientos, 'Enable', 'on');
        if get(handles radiobutton_Henchimientos, 'Value')==1
            set(handles.edit_Henchimientos, 'Enable', 'on');
        else
            set(handles.edit_Henchimientos, 'Enable', 'off');
        end
    end
    switch metodo
        case 'Holtrop y Mennen'
        case 'Amadeo García'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles radiobutton_BulboSi, 'Enable', 'on');
            set(handles radiobutton_BulboNo, 'Enable', 'on');
        case 'Van Oortmerssen'
            set(handles.edit_ATB, 'Enable', 'on');
            set(handles radiobutton_BulboSi, 'Enable', 'on');
            set(handles radiobutton_BulboNo, 'Enable', 'on');
    end
end
end
end

% --- Executes during object creation, after setting all properties.
function edit_Arbotantes_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Arbotantes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.

```

```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_B_Callback(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_B as text
%         str2double(get(hObject,'String')) returns contents of edit_B
as a double
handles = guidata(hObject);
if str2num(get(handles.edit_B,'String'))<=0
    msgbox('El valor de la eslora es incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.radiobutton_BulboSi, 'Enable', 'off');
    set(handles.radiobutton_BulboNo, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_CR, 'Enable', 'off');
    set(handles.radiobutton_ProaU, 'Enable', 'off');
    set(handles.radiobutton_ProaV, 'Enable', 'off');
    set(handles.radiobutton_PopaU, 'Enable', 'off');
    set(handles.radiobutton_PopaV, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Si, 'Enable', 'off');
    set(handles.radiobutton_No, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos, 'Enable', 'off');
    set(handles.edit_Henchimientos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.popupmenu_Rutas, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
    set(handles.edit_ATB, 'Enable', 'on');
    if get(handles.radiobutton_BulboSi,'Value')==1
        set(handles.edit_ATB, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_BulboSi, 'Enable', 'on');
    set(handles.radiobutton_BulboNo, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_Sm, 'Enable', 'on');
    set(handles.radiobutton_ProaU, 'Enable', 'on');
    set(handles.radiobutton_ProaV, 'Enable', 'on');
    set(handles.radiobutton_PopaU, 'Enable', 'on');
    set(handles.radiobutton_PopaV, 'Enable', 'on');
    set(handles.radiobutton_Si, 'Enable', 'on');
    set(handles.radiobutton_No, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_Arbotantes, 'Enable', 'on');
    end
end

```



```

else
    set(handles.edit_Arbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos, 'Value')==1
    set(handles.edit_Henchimientos, 'Enable', 'on');
else
    set(handles.edit_Henchimientos, 'Enable', 'off');
end
if get(handles.radiobutton_Si, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes during object creation, after setting all properties.
function edit_B_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_T_Callback(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_T as text
%       str2double(get(hObject, 'String')) returns contents of edit_T
as a double
handles = guihandles;
if str2num(get(handles.edit_T, 'String'))<=0
    msgbox('El valor del puntal es incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.radiobutton_BulboSi, 'Enable', 'off');
    set(handles.radiobutton_BulboNo, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.radiobutton_ProaU, 'Enable', 'off');

```

```

set(handles.radiobutton_ProaV, 'Enable', 'off');
set(handles.radiobutton_PopaU, 'Enable', 'off');
set(handles.radiobutton_PopaV, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_Si, 'Enable', 'off');
set(handles.radiobutton_No, 'Enable', 'off');
set(handles.radiobutton_Arbotantes, 'Enable', 'off');
set(handles.edit_Arbotantes, 'Enable', 'off');
set(handles.radiobutton_Henchimientos, 'Enable', 'off');
set(handles.edit_Henchimientos, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.popupmenu_Rutas, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
set(handles.edit_ATB, 'Enable', 'on');
if get(handles.radiobutton_BulboSi, 'Value')==1
    set(handles.edit_ATB, 'Enable', 'on');
else
end
set(handles.radiobutton_BulboSi, 'Enable', 'on');
set(handles.radiobutton_BulboNo, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_Sm, 'Enable', 'on');
set(handles.radiobutton_ProaU, 'Enable', 'on');
set(handles.radiobutton_ProaV, 'Enable', 'on');
set(handles.radiobutton_PopaU, 'Enable', 'on');
set(handles.radiobutton_PopaV, 'Enable', 'on');
set(handles.radiobutton_Si, 'Enable', 'on');
set(handles.radiobutton_No, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_Arbotantes, 'Enable', 'on');
else
    set(handles.edit_Arbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos, 'Value')==1
    set(handles.edit_Henchimientos, 'Enable', 'on');
else
    set(handles.edit_Henchimientos, 'Enable', 'off');
end
if get(handles.radiobutton_Si, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');

```

```

    set(handles.pushbutton_Comparar, 'Enable', 'off');
end

% --- Executes during object creation, after setting all properties.
function edit_T_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_ATB_Callback(hObject, eventdata, handles)
% hObject    handle to edit_ATB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_ATB as text
%       str2double(get(hObject, 'String')) returns contents of
edit_ATB as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_ATB, 'String')) < 0
    msgbox('El valor del área transversal del bulbo de proa es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.radiobutton_BulboSi, 'Enable', 'off');
    set(handles.radiobutton_BulboNo, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_ProaU, 'Enable', 'off');
    set(handles.radiobutton_ProaV, 'Enable', 'off');
    set(handles.radiobutton_PopaU, 'Enable', 'off');
    set(handles.radiobutton_PopaV, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Si, 'Enable', 'off');
    set(handles.radiobutton_No, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos, 'Enable', 'off');
    set(handles.edit_Henchimientos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.popupmenu_Rutas, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
    if comp == 0
        set(handles.edit_B, 'Enable', 'on');
        set(handles.radiobutton_BulboSi, 'Enable', 'on');
        set(handles.radiobutton_BulboNo, 'Enable', 'on');

```

```

set(handles.edit_T, 'Enable', 'on');
set(handles.radiobutton_ProaU, 'Enable', 'on');
set(handles.radiobutton_ProaV, 'Enable', 'on');
set(handles.radiobutton_PopaU, 'Enable', 'on');
set(handles.radiobutton_PopaV, 'Enable', 'on');
set(handles.radiobutton_Si, 'Enable', 'on');
set(handles.radiobutton_No, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_Arbotantes, 'Enable', 'on');
else
    set(handles.edit_Arbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos, 'Value')==1
    set(handles.edit_Henchimientos, 'Enable', 'on');
else
    set(handles.edit_Henchimientos, 'Enable', 'off');
end
if get(handles.radiobutton_Si, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
    set(handles.edit_Sm, 'Enable', 'off');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.popupmenu_Rutas, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Rutas,'String'));
Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
else
set(handles.radiobutton_ProaU, 'Enable', 'on');
set(handles.radiobutton_ProaV, 'Enable', 'on');
set(handles.radiobutton_PopaU, 'Enable', 'on');
set(handles.radiobutton_PopaV, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Comparar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
    set(handles.edit_Arbotantes, 'Enable', 'on');
else
    set(handles.edit_Arbotantes, 'Enable', 'off');
end
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos, 'Value')==1
    set(handles.edit_Henchimientos, 'Enable', 'on');
else
    set(handles.edit_Henchimientos, 'Enable', 'off');
end
end
end
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_ATB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_ATB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Lf_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Lf as text
% str2double(get(hObject,'String')) returns contents of edit_Lf
as a double
handles = guihandles;
if str2num(get(handles.edit_Lf,'String'))<=0
    msgbox('El valor de la eslora de flotación es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.pushbutton_Comprobar,'Enable','off');
else
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_CP, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.pushbutton_Comprobar,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lf_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_Lpp_Callback(hObject, eventdata, handles)
% hObject      handle to edit_Lpp (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Lpp as text
%         str2double(get(hObject,'String')) returns contents of
edit_Lpp as a double
handles = guidata(handles);
if str2num(get(handles.edit_Lpp,'String'))<=0
    msgbox('El valor de la eslora entre perpendiculares es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_CP, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lpp_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit_Lpp (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_CP_Callback(hObject, eventdata, handles)
% hObject      handle to edit_CP (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_CP as text
%         str2double(get(hObject,'String')) returns contents of edit_CP
as a double
handles = guidata(handles);
global comp
if str2num(get(handles.edit_CP,'String'))<=0

```

```

    msgbox('El valor del coeficiente prismático es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    if comp==0
        set(handles.edit_Lf, 'Enable', 'on');
        set(handles.edit_Lpp, 'Enable', 'on');
        set(handles.edit_VolCarena, 'Enable', 'on');
        set(handles.edit_Vmin, 'Enable', 'on');
        set(handles.edit_Vmax, 'Enable', 'on');
    else
        end
        set(handles.edit_LCB, 'Enable', 'on');
        set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_CP_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_CP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_LCB_Callback(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_LCB as text
%         str2double(get(hObject, 'String')) returns contents of
edit_LCB as a double

% --- Executes during object creation, after setting all properties.
function edit_LCB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))

```

```

        set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Comprobar.
function pushbutton_Comprobar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comprobar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
cntFn=0;
cntCP=0;
cntLpp=0;
cntLCB=0;
global tipo_barco
global comp
global metodo
global SmArbotantes
global SmHenchimientos
if strcmp(get(handles.edit_Lf,'String'),'') |
strcmp(get(handles.edit_Lf,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Lpp,'String'),'') |
strcmp(get(handles.edit_Lpp,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_CP,'String'),'') |
strcmp(get(handles.edit_CP,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_VolCarena,'String'),'') |
strcmp(get(handles.edit_VolCarena,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_LCB,'String'),'') |
strcmp(get(handles.edit_LCB,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmin,'String'),'') |
strcmp(get(handles.edit_Vmin,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmax,'String'),'') |
strcmp(get(handles.edit_Vmax,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
else
Lf=str2num(get(handles.edit_Lf,'String'));
Lpp=str2num(get(handles.edit_Lpp,'String'));
CP=str2num(get(handles.edit_CP,'String'));
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
LCB=str2num(get(handles.edit_LCB,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
for V=Vmin:1:Vmax
Fn=V*0.514444/((9.81*Lf)^(1/2));
if 0.15<=Fn & Fn<=0.45
else
    cntFn=cntFn+1;
end
end
end

```



```

if 0.5<=CP & CP<=0.8
else
    cntCP=cntCP+1;
end
if 4<=(Lpp/(VolCarena^(1/3))) & (Lpp/(VolCarena^(1/3)))<=8
else
    cntLpp=cntLpp+1;
end
if -3<=LCB & LCB<=3
else
    cntLCB=cntLCB+1;
end
if tipo_barco==0
    msgbox('Debe seleccionar el tipo de buque al que aplicar el método
de cálculo.', 'Error', 'error');
elseif cntFn~=0
    msgbox({'El valor de Fn está fuera de rango de aplicación.'
'
0.15 < Fn < 0.45
'}, 'Fuera de rango', 'error');
elseif cntCP~=0
    msgbox({'El valor de CP está fuera de rango de aplicación.'
'
0.50 < CP < 0.80
'}, 'Fuera de rango', 'error');
elseif cntLpp~=0
    msgbox({'La relación Lpp/(Vol.Carena^(1/3)) está fuera de rango
de aplicación.'
'
4 < Lpp/(Vol.Carena^(1/3)) < 8
'}, 'Fuera de rango', 'error');
elseif cntLCB~=0
    msgbox({'El valor de está fuera del rango de aplicación.'
'
-3 <LCB < 3
'}, 'Fuera de rango', 'error');
else
    msgbox('Los parámetros están dentro del rango de
aplicación.', 'Valores correctos', 'help');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'Enable', 'off');
set(handles.pushbutton_Rangos, 'Enable', 'off');
if comp==0
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.radiobutton_Si, 'Enable', 'on');
set(handles.radiobutton_No, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
if get(handles.radiobutton_Si, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on')
else
end
set(handles.radiobutton_ProaU, 'Enable', 'on');
set(handles.radiobutton_ProaV, 'Enable', 'on');
set(handles.radiobutton_PopaU, 'Enable', 'on');
set(handles.radiobutton_PopaV, 'Enable', 'on');

```

```

set(handles.radiobutton_Arbotantes, 'Enable', 'on');
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
set(handles.radiobutton_BulboSi, 'Enable', 'on');
set(handles.radiobutton_BulboNo, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
if get(handles.radiobutton_BulboSi, 'Value')==1
set(handles.edit_ATB, 'Enable', 'on');
elseif get(handles.radiobutton_BulboNo, 'Value')==1
end
set(handles.popupmenu_Rutas, 'Enable', 'on');
else
set(handles.radiobutton_ProaU, 'Enable', 'on');
set(handles.radiobutton_ProaV, 'Enable', 'on');
set(handles.radiobutton_PopaU, 'Enable', 'on');
set(handles.radiobutton_PopaV, 'Enable', 'on');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end
switch metodo
case 'Holtrop y Mennen'
if SmHenchimientos==0
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos, 'Value')==1
set(handles.edit_Henchimientos, 'Enable', 'on');
else
end
else
end
if SmArbotantes==0
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_Arbotantes, 'Enable', 'on');
else
end
else
end
case 'Amadeo García'
if get(handles.radiobutton_BulboSi, 'Value')==1
set(handles.edit_ATB, 'Enable', 'on');
elseif get(handles.radiobutton_BulboNo, 'Value')==1
end
set(handles.radiobutton_Henchimientos, 'Enable', 'on');
if get(handles.radiobutton_Henchimientos, 'Value')==1
set(handles.edit_Henchimientos, 'Enable', 'on');
else
end
set(handles.radiobutton_Arbotantes, 'Enable', 'on');
if get(handles.radiobutton_Arbotantes, 'Value')==1
set(handles.edit_Arbotantes, 'Enable', 'on');
else
end
set(handles.edit_LCB, 'Enable', 'off');
case 'Van Oortmerssen'
if get(handles.radiobutton_BulboSi, 'Value')==1
set(handles.edit_ATB, 'Enable', 'on');
elseif get(handles.radiobutton_BulboNo, 'Value')==1
end
set(handles.radiobutton_Henchimientos, 'Enable', 'on');

```

```

        if get(handles.radiobutton_Henchimientos,'Value')==1
            set(handles.edit_Henchimientos, 'Enable', 'on');
        else
            end
        set(handles.radiobutton_Arbotantes, 'Enable', 'on');
        if get(handles.radiobutton_Arbotantes,'Value')==1
            set(handles.edit_Arbotantes, 'Enable', 'on');
        else
            end
        set(handles.edit_ATB,'Enable','on');
        set(handles.radiobutton_BulboSi,'Enable','on');
        set(handles.radiobutton_BulboNo,'Enable','on');
    end
end
end

function edit_VolCarena_Callback(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_VolCarena as
text
%         str2double(get(hObject,'String')) returns contents of
edit_VolCarena as a double
handles = guihandles;
if str2num(get(handles.edit_VolCarena,'String'))<=0
    msgbox('El valor del volumen de carena es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
else
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_CP, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_VolCarena_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end
end

```

```

function edit_Vmax_Callback(hObject, eventdata, handles)
% hObject      handle to edit_Vmax (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmax as text
%         str2double(get(hObject,'String')) returns contents of
edit_Vmax as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmax,'String'))>0
    msgbox('El valor de la velocidad máxima debe ser mayor al de la
mínima.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmax,'String'))<=0
    msgbox('El valor de la velocidad máxima es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
else
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_CP, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmax_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit_Vmax (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmin_Callback(hObject, eventdata, handles)
% hObject      handle to edit_Vmin (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmin as text
% str2double(get(hObject,'String')) returns contents of
edit_Vmin as a double
handles=guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmax,'String'))>0
msgbox('El valor de la velocidad mínima debe ser menor al de la
máxima.','Aviso.','error');
set(hObject,'String','');
set(handles.edit_Lf,'Enable','off');
set(handles.edit_Lpp,'Enable','off');
set(handles.edit_CP,'Enable','off');
set(handles.edit_LCB,'Enable','off');
set(handles.edit_VolCarena,'Enable','off');
set(handles.edit_Vmax,'Enable','off');
elseif str2num(get(handles.edit_Vmin,'String'))<=0
msgbox('El valor de la velocidad mínima es
incorrecto.','Aviso.','error');
set(hObject,'String','');
set(handles.edit_Lf,'Enable','off');
set(handles.edit_Lpp,'Enable','off');
set(handles.edit_CP,'Enable','off');
set(handles.edit_LCB,'Enable','off');
set(handles.edit_VolCarena,'Enable','off');
set(handles.edit_Vmax,'Enable','off');
else
set(handles.edit_Lf,'Enable','on');
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_CP,'Enable','on');
set(handles.edit_LCB,'Enable','on');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_Vmax,'Enable','on');
end
% --- Executes during object creation, after setting all properties.
function edit_Vmin_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit_Vmin (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
set(hObject,'BackgroundColor','white');
end

function edit_Sm_Callback(hObject, eventdata, handles)
% hObject handle to edit_Sm (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Sm as text

```

```

%         str2double(get(hObject,'String')) returns contents of edit_Sm
as a double
handles = guihandles;
if str2num(get(handles.edit_Sm,'String'))<=0
    msgbox('El valor de la superficie mojada es
incorrecto.', 'Aviso.', 'error');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_ATB, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.radiobutton_ProaU, 'Enable', 'off');
    set(handles.radiobutton_ProaV, 'Enable', 'off');
    set(handles.radiobutton_PopaU, 'Enable', 'off');
    set(handles.radiobutton_PopaV, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.radiobutton_Si, 'Enable', 'off');
    set(handles.radiobutton_No, 'Enable', 'off');
    set(handles.radiobutton_Arbotantes, 'Enable', 'off');
    set(handles.edit_Arbotantes, 'Enable', 'off');
    set(handles.radiobutton_Henchimientos, 'Enable', 'off');
    set(handles.edit_Henchimientos, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.popupmenu_Rutas, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
else

    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_ATB, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.radiobutton_ProaU, 'Enable', 'on');
    set(handles.radiobutton_ProaV, 'Enable', 'on');
    set(handles.radiobutton_PopaU, 'Enable', 'on');
    set(handles.radiobutton_PopaV, 'Enable', 'on');
    set(handles.radiobutton_Si, 'Enable', 'on');
    set(handles.radiobutton_No, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    set(handles.radiobutton_Arbotantes, 'Enable', 'on');
    if get(handles.radiobutton_Arbotantes, 'Value')==1
        set(handles.edit_Arbotantes, 'Enable', 'on');
    else
        set(handles.edit_Arbotantes, 'Enable', 'off');
    end
    set(handles.radiobutton_Henchimientos, 'Enable', 'on');
    if get(handles.radiobutton_Henchimientos, 'Value')==1
        set(handles.edit_Henchimientos, 'Enable', 'on');
    else
        set(handles.edit_Henchimientos, 'Enable', 'off');
    end
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.popupmenu_Rutas, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Rutas,'String'));
    Ruta=contents{get(handles.popupmenu_Rutas,'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
end

```

```

    set(handles.pushbutton_Comparar,'Enable','off');
end

% --- Executes during object creation, after setting all properties.
function edit_Sm_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Cambiar.
function pushbutton_Cambiar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Cambiar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guihandles;
global comp
global metodo
set(handles.pushbutton_Comparar,'Enable','off');
set(handles.pushbutton_Rangos,'Enable','on');
if comp==0
set(handles.edit_Lf,'Enable','on');
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_B,'Enable','off');
set(handles.edit_T,'Enable','off');
set(handles.edit_CP,'Enable','on');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'Enable','on');
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_ATB,'Enable','off');
set(handles.edit_LCB,'Enable','on');
set(handles.popupmenu_Rutas,'Enable','off');
set(handles.popupmenu_Estacion,'Enable','off');
set(handles.radiobutton_ProaU,'Enable','off');
set(handles.radiobutton_ProaV,'Enable','off');
set(handles.radiobutton_PopaU,'Enable','off');
set(handles.radiobutton_PopaV,'Enable','off');
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Mar,'Enable','off');
set(handles.radiobutton_Arbotantes,'Enable','off');
set(handles.edit_Arbotantes,'Enable','off');
set(handles.radiobutton_Henchimientos,'Enable','off');
set(handles.edit_Henchimientos,'Enable','off');
set(handles.radiobutton_BulboSi,'Enable','off');
set(handles.radiobutton_BulboNo,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Borrar,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.radiobutton_Si,'Enable','off');
set(handles.radiobutton_No,'Enable','off');
set(handles.edit_Sm,'Enable','off');

```

```

else
switch metodo
    case 'Holtrop y Mennen'
    case 'Amadeo García'
set(handles.edit_ATB,'Enable','off');
set(handles.edit_LCB,'Enable','on');
set(handles.edit_CP,'Enable','on');
    case 'Van Oortmerssen'
set(handles.edit_ATB,'Enable','off');
end
set(handles radiobutton_ProaU,'Enable','off');
set(handles radiobutton_ProaV,'Enable','off');
set(handles radiobutton_PopaU,'Enable','off');
set(handles radiobutton_PopaV,'Enable','off');
set(handles radiobutton_Arbotantes,'Enable','off');
set(handles.edit_Arbotantes,'Enable','off');
set(handles radiobutton_Henchimientos,'Enable','off');
set(handles.edit_Henchimientos,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Borrar,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
end

% --- Executes on button press in radiobutton_Si.
function radiobutton_Si_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Si (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
if get(hObject,'Value')==1
    set(handles.edit_Sm,'Enable','on');
    set(handles radiobutton_No,'Value',0);
    set(handles.pushbutton_Comparar,'Enable','off');
else
    set(handles.edit_Sm,'Enable','off');
end
% Hint: get(hObject,'Value') returns toggle state of radiobutton_Si

% --- Executes on button press in radiobutton_No.
function radiobutton_No_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_No (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
if get(hObject,'Value')==1
    set(handles.edit_Sm,'Enable','off');
    set(handles radiobutton_Si,'Value',0);
    set(handles.edit_Sm,'String','');
    set(handles.pushbutton_Comparar,'Enable','off');
else
end
% Hint: get(hObject,'Value') returns toggle state of radiobutton_No

% --- Executes on button press in radiobutton_BulboSi.
function radiobutton_BulboSi_Callback(hObject, eventdata, handles)

```



```

% hObject    handle to radiobutton_BulboSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
if get(hObject,'Value')==1
    set(handles.edit_ATB,'Enable','on');
    set(handles.pushbutton_Comparar,'Enable','off');
else
end
% Hint: get(hObject,'Value') returns toggle state of
radiobutton_BulboSi

```

```

% --- Executes on button press in radiobutton_BulboNo.
function radiobutton_BulboNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_BulboNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
if get(hObject,'Value')==1
    set(handles.edit_ATB,'Enable','off');
    set(handles.edit_ATB,'String','');
    set(handles.pushbutton_Comparar,'Enable','off');
else
end
% Hint: get(hObject,'Value') returns toggle state of
radiobutton_BulboNo

```

```

% --- Executes on button press in pushbutton_Salir.
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Salir (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
close(gcf)
global comp
global v
global metodo
global v_EHP
global v_RT
comp=0;
switch metodo
    case 'Holtrop y Mennen'
        global vHolt
        global v_RTHolt
        global v_EHPHolt
        v=vHolt;
        v_RT=v_RTHolt;
        v_EHP=v_EHPHolt;
    case 'Amadeo Garcia'
        global vAmd
        global v_RTAMD
        global v_EHPAMD
        v=vAmd;
        v_RT=v_RTAMD;
        v_EHP=v_EHPAMD;
    case 'Van Oortmerssen'
        global vVan
        global v_RTVan
        global v_EHPVan
        v=vVan;
        v_RT=v_RTVan;
        v_EHP=v_EHPVan;

```

```

end

% --- Executes on mouse press over axes background.
function axes_Rt_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_Rt (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_RT
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_RT);
v_RT1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_RT1=[v_RT1 v_RT(j)];
        else
            end
        end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Holtrop y Mennen'
            global vHolt
            global v1Holt
            global v_RTHolt
            n=length(v1Holt);
            m=length(v_RTHolt);
            v_RT1Holt=[];
            for i=1:n
                for j=1:m
                    if v1Holt(i)==vHolt(j)
                        v_RT1Holt=[v_RT1Holt v_RTHolt(j)];
                    else
                        end
                    end
                end
            end
            end
            vcomp=vHolt;
            v1comp=v1Holt;
            v_RTcomp=v_RTHolt;
            v_RT1comp=v_RT1Holt;
            leyenda='Holtrop y Mennen';

```

```

    case 'Amadeo Garcia'
        global vAmd
        global v1Amd
        global v_RTAMD
        n=length(v1Amd);
        m=length(v_RTAMD);
        v_RT1Amd=[];
        for i=1:n
            for j=1:m
                if v1Amd(i)==vAmd(j)
                    v_RT1Amd=[v_RT1Amd v_RTAMD(j)];
                else
                    end
            end
        end
        vcomp=vAmd;
        v1comp=v1Amd;
        v_RTcomp=v_RTAMD;
        v_RT1comp=v_RT1Amd;
        leyenda='Amadeo Garcia';
    case 'Van Oortmerssen'
        global vVan
        global v1Van
        global v_RTVan
        n=length(v1Van);
        m=length(v_RTVan);
        v_RT1Van=[];
        for i=1:n
            for j=1:m
                if v1Van(i)==vVan(j)
                    v_RT1Van=[v_RT1Van v_RTVan(j)];
                else
                    end
            end
        end
        vcomp=vVan;
        v1comp=v1Van;
        v_RTcomp=v_RTVan;
        v_RT1comp=v_RT1Van;
        leyenda='Van Oortmerssen';
end

handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(vcomp,v_RTcomp,'y-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
plot(v1comp,v_RT1comp,'ro','LineWidth',2);axis tight;hold on
lgd=legend({'Guldhammer y Harvald',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
end
else
end
end

```

```

% --- Executes on mouse press over axes background.
function axes_EHP_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_EHP
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_EHP);
v_EHP1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_EHP1=[v_EHP1 v_EHP(j)];
        else
            end
        end
    end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Holtrop y Mennen'
            global vHolt
            global v1Holt
            global v_EHPHolt
            n=length(v1Holt);
            m=length(v_EHPHolt);
            v_EHP1Holt=[];
            for i=1:n
                for j=1:m
                    if v1Holt(i)==vHolt(j)
                        v_EHP1Holt=[v_EHP1Holt v_EHPHolt(j)];
                    else
                        end
                    end
                end
            end
            vcomp=vHolt;
            v1comp=v1Holt;
            v_EHPcomp=v_EHPHolt;
            v_EHP1comp=v_EHP1Holt;
            leyenda='Holtrop y Mennen';
        case 'Amadeo Garcia'
            global vAmd

```

```

        global v1Amd
        global v_EHPAmd
        n=length(v1Amd);
        m=length(v_EHPAmd);
        v_EHP1Amd=[];
        for i=1:n
            for j=1:m
                if v1Amd(i)==vAmd(j)
                    v_EHP1Amd=[v_EHP1Amd v_EHPAmd(j)];
                else
                    end
            end
        end
        vcomp=vAmd;
        v1comp=v1Amd;
        v_EHPcomp=v_EHPAmd;
        v_EHP1comp=v_EHP1Amd;
        leyenda='Amadeo Garcia';
    case 'Van Oortmerssen'
        global vVan
        global v1Van
        global v_EHPVan
        n=length(v1Van);
        m=length(v_EHPVan);
        v_EHP1Van=[];
        for i=1:n
            for j=1:m
                if v1Van(i)==vVan(j)
                    v_EHP1Van=[v_EHP1Van v_EHPVan(j)];
                else
                    end
            end
        end
        vcomp=vVan;
        v1comp=v1Van;
        v_EHPcomp=v_EHPVan;
        v_EHP1comp=v_EHP1Van;
        leyenda='Van Oortmerssen';
    end
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vcomp,v_EHPcomp,'k-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
plot(v1comp,v_EHP1comp,'bo','LineWidth',2);axis tight;hold on
lgd=legend({'Guldhammer y Harvald',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
end
else
end

% --- Executes on button press in pushbutton_Comparar.
function pushbutton_Comparar_Callback(hObject, eventdata, handles)

```

```

% hObject    handle to pushbutton_Comparar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
global tipo_barco
global metodo
global compplot
global v
global v1
global v_EHP
global v_RT
global cancelar
if comp==0 | cancelar==1
switch tipo_barco
    case 'Carga general'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Portacontenedores'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Petrolero'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Costero'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Bulkcarrier'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Ro-Ro'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Ferry'
        pop={'--Selección--','Holtrop y Mennen'};
    case 'Arrastrero'
        pop={'--Selección--','Holtrop y Mennen','Amadeo García','Van
Oortmerssen'};
    case 'Remolcador'
        pop={'--Selección--','Holtrop y Mennen','Amadeo García','Van
Oortmerssen'};
end
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global Sm
global AGUA
global Estacion
global Ruta
global LCB
global SmArbotantes
global SmHenchimientos
global vGuld
global v1Guld
global v_EHPGuld
global v_RTGuld
Lf=str2num(get(handles.edit_Lf,'String'));
Lpp=str2num(get(handles.edit_Lpp,'String'));
B=str2num(get(handles.edit_B,'String'));
T=str2num(get(handles.edit_T,'String'));
CP=str2num(get(handles.edit_CP,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));

```

```

Vmax=str2num(get(handles.edit_Vmax, 'String'));
VolCarena=str2num(get(handles.edit_VolCarena, 'String'));
LCB=str2num(get(handles.edit_LCB, 'String'));
if get(handles.radiobutton_Rio, 'Value')==1
AGUA=1;
else
AGUA=0;
end
if get(handles.radiobutton_BulboSi, 'Value')==1
ATB=str2num(get(handles.edit_ATB, 'String'));
else
ATB=0;
end
if get(handles.radiobutton_Si, 'Value')==1
Sm=str2num(get(handles.edit_Sm, 'String'));
else
Sm=0;
end
if get(handles.radiobutton_Henchimientos, 'Value')==1

SmHenchimientos=str2num(get(handles.edit_SmHenchimientos, 'String'));
else
SmHenchimientos=0;
end
if get(handles.radiobutton_Arbotantes, 'Value')==1
SmArbotantes=str2num(get(handles.edit_SmArbotantes, 'String'));
else
SmArbotantes=0;
end
contents=cellstr(get(handles.popupmenu_Rutas, 'String'));
Ruta=contents{get(handles.popupmenu_Rutas, 'Value')};
contents=cellstr(get(handles.popupmenu_Estacion, 'String'));
Estacion=contents{get(handles.popupmenu_Estacion, 'Value')};
vGuld=v;
v1Guld=v1;
v_EHPGuld=v_EHP;
v_RTGuld=v_RT;
[comp]=comparar(pop);
cancelar=1;
else
compplot=1;
switch metodo
case 'Holtrop y Mennen'
global vHolt
global v_RTHolt
global v_EHPHolt
vcomp=vHolt;
v_RTcomp=v_RTHolt;
v_EHPcomp=v_EHPHolt;
leyenda='Holtrop y Mennen';
case 'Amadeo García'
global vAmd
global v_RTAMD
global v_EHPAMD
vcomp=vAmd;
v_RTcomp=v_RTAMD;
v_EHPcomp=v_EHPAMD;
leyenda='Amadeo García';
case 'Van Oortmerssen'
global vVan
global v_RTVan

```

```

global v_EHPVan
vcomp=vVan;
v_RTcomp=v_RTVan;
v_EHPcomp=v_EHPVan;
leyenda='Van Oortmerssen';
end
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b',vcomp,v_RTcomp,'y-');axis tight;hold on
lgd=legend({'Guldhammer y Harvald',leyenda});
set(handles.plot1,'HitTest','off');
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('Rt(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r',vcomp,v_EHPcomp,'k-');axis tight;hold on
lgd=legend({'Guldhammer y Harvald',leyenda});
set(handles.plot2,'HitTest','off');
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
cancelar=0;
end

```

```

% --- Executes on button press in radiobutton_ProaU.
function radiobutton_ProaU_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_ProaU (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_ProaU
set(handles.pushbutton_Comparar,'Enable','off');

```

```

% --- Executes on button press in radiobutton_ProaV.
function radiobutton_ProaV_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_ProaV (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_ProaV
set(handles.pushbutton_Comparar,'Enable','off');

```

```

% --- Executes on button press in radiobutton_PopaU.
function radiobutton_PopaU_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_PopaU (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_PopaU
set(handles.pushbutton_Comparar,'Enable','off');

```



```

% --- Executes on button press in radiobutton_PopaV.
function radiobutton_PopaV_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_PopaV (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_PopaV
set(handles.pushbutton_Comparar,'Enable','off');

% --- Executes on button press in radiobutton_Rio.
function radiobutton_Rio_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Rio (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Rio

% --- Executes on button press in radiobutton_Mar.
function radiobutton_Mar_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Mar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Mar

% --- Executes on button press in pushbutton_Rangos.
function pushbutton_Rangos_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Rangos (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global rangometodo
rangometodo='Guldhammer y Harvald';
rangos(rangometodo);

```

Método de Amadeo García.

```
function varargout = AmadeoGarcia(varargin)
% AMADEOGARCIA MATLAB code for AmadeoGarcia.fig
%   AMADEOGARCIA, by itself, creates a new AMADEOGARCIA or raises
the existing
%   singleton*.
%
%   H = AMADEOGARCIA returns the handle to a new AMADEOGARCIA or
the handle to
%   the existing singleton*.
%
%   AMADEOGARCIA('CALLBACK',hObject,eventData,handles,...) calls
the local
%   function named CALLBACK in AMADEOGARCIA.M with the given input
arguments.
%
%   AMADEOGARCIA('Property','Value',...) creates a new AMADEOGARCIA
or raises the
%   existing singleton*. Starting from the left, property value
pairs are
%   applied to the GUI before AmadeoGarcia_OpeningFcn gets called.
An
%   unrecognized property name or invalid value makes property
application
%   stop. All inputs are passed to AmadeoGarcia_OpeningFcn via
varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
only one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help AmadeoGarcia

% Last Modified by GUIDE v2.5 14-Jan-2020 20:01:39

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @AmadeoGarcia_OpeningFcn, ...
                  'gui_OutputFcn',  @AmadeoGarcia_OutputFcn, ...
                  'gui_LayoutFcn',  [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before AmadeoGarcia is made visible.
```

```

function AmadeoGarcia_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)
% varargin   command line arguments to AmadeoGarcia (see VARARGIN)

% Choose default command line output for AmadeoGarcia
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
global tipo_barco;
axes(handles.axes_ETSIINO);
imshow(imread('descarga.jpg'))
axes(handles.axes_Buque);
switch tipo_barco
    case 'Pesquero'
        imshow(imread('pesquero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Pesquero');
    case 'Arrastrero'
        imshow(imread('arrastrero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Arrastrero');
    case 'Remolcador'
        imshow(imread('remolcador.jpg'));
        set(handles.text_TipoBuque, 'String', 'Remolcador');
end
global calc
global cancelar
cancelar=0;
calc=0;
global comp
global metodo
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
global Am
global At

```

```

if comp==0
Lf='';
Lpp='';
B='';
T='';
Vmin='';
Vmax='';
VolCarena = '';
t='';
XF = '';
ATB = '';
Sm = '';
AGUA = '';
Estacion='';
Ruta='';
CP='';
LCB='';
iE='';
SmArbotantes='';
SmHenchimientos='';
At='';
Am='';
else
switch metodo
case 'Holtrop y Mennen'
set(handles.radiobutton_LfSi, 'Value', 1);
set(handles.radiobutton_LfSi, 'Enable', 'off');
set(handles.radiobutton_LfNo, 'Enable', 'off');
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_Lpp, 'String', num2str(Lpp));
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'String', num2str(T));
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
set(handles.radiobutton_Rio, 'Value', 1);
else
set(handles.radiobutton_Mar, 'Value', 1);
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_t, 'String', num2str(t));
set(handles.edit_XF, 'String', num2str(XF));
if ATB==0
set(handles.radiobutton_Proa1, 'Value', 1);
else
set(handles.radiobutton_Proa2, 'Value', 1);
end
if Sm==0
set(handles.radiobutton_SmNo, 'Value', 1);
else
set(handles.radiobutton_SmSi, 'Value', 1);
set(handles.edit_Sm, 'String', num2str(Sm));
end
set(handles.popupmenu_Ruta, 'String', Ruta);

```

```

    set(handles.popupmenu_Estacion, 'String', Estacion);
case 'Guldhammer y Harvald'
    set(handles.radiobutton_LfSi, 'Value', 1);
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.edit_Lf, 'String', num2str(Lf));
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'String', num2str(Lpp));
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'String', num2str(B));
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'String', num2str(T));
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Vmin, 'String', num2str(Vmin));
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'String', num2str(Vmax));
    set(handles.edit_Vmax, 'Enable', 'off');
    if AGUA==1
    set(handles.radiobutton_Rio, 'Value', 1);
    else
    set(handles.radiobutton_Mar, 'Value', 1);
    end
    set(handles.edit_VolCarena, 'String', num2str(VolCarena));
    set(handles.edit_VolCarena, 'Enable', 'off');
    if ATB==0
    set(handles.radiobutton_Proa1, 'Value', 1);
    else
    set(handles.radiobutton_Proa2, 'Value', 1);
    end
    if Sm==0
    set(handles.radiobutton_SmNo, 'Value', 1);
    else
    set(handles.radiobutton_SmSi, 'Value', 1);
    set(handles.edit_Sm, 'String', num2str(Sm));
    end
    set(handles.popupmenu_Ruta, 'String', Ruta);
    set(handles.popupmenu_Estacion, 'String', Estacion);
case 'Van Oortmerssen'
    set(handles.radiobutton_LfSi, 'Value', 1);
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.edit_Lf, 'String', num2str(Lf));
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'String', num2str(Lpp));
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'String', num2str(B));
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'String', num2str(T));
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Vmin, 'String', num2str(Vmin));
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'String', num2str(Vmax));
    set(handles.edit_Vmax, 'Enable', 'off');
    if AGUA==1
    set(handles.radiobutton_Rio, 'Value', 1);
    else
    set(handles.radiobutton_Mar, 'Value', 1);
    end
    set(handles.edit_VolCarena, 'String', num2str(VolCarena));
    set(handles.edit_VolCarena, 'Enable', 'off');
    if Sm==0

```

```

        set(handles.radiobutton_SmNo, 'Value', 1);
    else
        set(handles.radiobutton_SmSi, 'Value', 1);
        set(handles.edit_Sm, 'String', num2str(Sm));
    end
    set(handles.popupmenu_Ruta, 'String', Ruta);
    set(handles.popupmenu_Estacion, 'String', Estacion);
end
end
% UIWAIT makes AmadeoGarcia wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = AmadeoGarcia_OutputFcn(hObject, eventdata,
handles)
% varargout    cell array for returning output args (see VARARGOUT);
% hObject      handle to figure
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on button press in pushbutton_Calcular.
function pushbutton_Calcular_Callback(hObject, eventdata, handles)
% hObject      handle to pushbutton_Calcular (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
global v
global v_RT
global v_EHP
global calc
global v1
global compplot
celdas=0;
seleccion=0;
conocido=0;
if get(handles.radiobutton_SmSi, 'Value')==1 &
(strcmp(get(handles.edit_Sm, 'String'), '') |
strcmp(get(handles.edit_Sm, 'String'), char(zeros(1,0))))
    celdas=1;
elseif get(handles.radiobutton_lSi, 'Value')==1 &
(strcmp(get(handles.edit_l, 'String'), '') |
strcmp(get(handles.edit_l, 'String'), char(zeros(1,0))))
    celdas=1;
elseif get(handles.radiobutton_DSi, 'Value')==1 &
(strcmp(get(handles.edit_D, 'String'), '') |
strcmp(get(handles.edit_D, 'String'), char(zeros(1,0))))
    celdas=1;
elseif get(handles.radiobutton_StccSi, 'Value')==1 &
(strcmp(get(handles.edit_Stcc, 'String'), '') |
strcmp(get(handles.edit_Stcc, 'String'), char(zeros(1,0))))
    celdas=1;
elseif strcmp(get(handles.edit_t, 'String'), '') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
    celdas=1;

```

```

elseif str2num(get(handles.edit_t, 'String'))~=0 &
(strcmp(get(handles.edit_XF, 'String'), '') |
strcmp(get(handles.edit_XF, 'String'), char(zeros(1,0))))
    celdas=1;
elseif get(handles radiobutton_Proa2, 'Value')==1 &
(strcmp(get(handles.edit_lb, 'String'), '') |
strcmp(get(handles.edit_lb, 'String'), char(zeros(1,0))))
    celdas=1;
else
end
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
contents=cellstr(get(handles.popupmenu_Estacion, 'String'));
Estacion=contents{get(handles.popupmenu_Estacion, 'Value')};
if strcmp(Ruta, '--Selección--')
    seleccion=1;
elseif strcmp(Ruta, 'Desconocida')
else
    if strcmp(Estacion, '--Selección--')
        seleccion=1;
    else
    end
end
if get(handles.radiobutton_SmSi, 'Value')==0 &
get(handles.radiobutton_SmNo, 'Value')==0
    conocido=1;
elseif get(handles.radiobutton_lSi, 'Value')==0 &
get(handles.radiobutton_lNo, 'Value')==0
    conocido=1;
elseif get(handles.radiobutton_DSi, 'Value')==0 &
get(handles.radiobutton_DNo, 'Value')==0
    conocido=1;
elseif get(handles.radiobutton_StccSi, 'Value')==0 &
get(handles.radiobutton_StccNo, 'Value')==0
    conocido=1;
else
end
if celdas~=0
msgbox('Rellene todas las celdas vacías.', 'Error', 'error');
elseif conocido~=0
msgbox('Indique si conoce o no los valores de Sm, l, D y Stcc
.', 'Error', 'error');
elseif seleccion~=0
msgbox('Asegurese de seleccionar alguna ruta y estación de
servicio.', 'Error', 'error');
else
Lpp=str2num(get(handles.edit_Lpp, 'String'));
B=str2num(get(handles.edit_B, 'String'));
T=str2num(get(handles.edit_T, 'String'));
VolCarena=str2num(get(handles.edit_VolCarena, 'String'));
Vmin=str2num(get(handles.edit_Vmin, 'String'));
Vmax=str2num(get(handles.edit_Vmax, 'String'));
t=str2num(get(handles.edit_t, 'String'));
if get(handles.radiobutton_Proa1, 'Value')==1
    if get(handles.radiobutton_LfSi, 'Value')==1
        Lf=str2num(get(handles.edit_Lf, 'String'));
    else
        Lf=1.11*VolCarena^(1/3)+0.874*Lpp-2.56;
    end
end
else
    Lf=str2num(get(handles.edit_Lf, 'String'));

```

```

        lb=str2num(get(handles.edit_lb,'String'));
    end
    if str2num(get(handles.edit_t,'String'))==0
    else
        XF=str2num(get(handles.edit_XF,'String'));
    end
    if get(handles.radiobutton_Rio,'Value')==1
    Densidad=1000; %kg/m3
    Viscdinam=1.141*10^-6; %m2/s
    else
    Densidad=1025; %kg/m3
    Viscdinam=1.223*10^-6; %m2/s
    end
    v_EHP=[];
    v_RT=[];
    v_CT=[];
    v_CF=[];
    v_CA=[];
    v_RR=[];
    v_Fn=[];
    v_Rn=[];
    for V=Vmin:0.001:Vmax
    CB=VolCarena/(Lf*B*T);
    Rn=V*0.514444*Lf/Viscdinam;
    v_Rn=[v_Rn Rn];
    Fn=V*0.514444/((9.81*Lpp)^(1/2));
    v_Fn=[v_Fn Fn];
    CF=0.075/((log10(Rn)-2)^2);
    CA=(69+200*CB*B/Lpp-0.26*Lpp+1300/Lpp-29.5*log10(Lpp)+17*B/T-
    (B/T)^(2))*10^-5;
    RR=1.24*CB*B/Lpp+0.265*Fn^2+2.151*Fn-0.298;
    if get(handles.radiobutton_DSi,'Value')==1
        D=str2num(get(handles.edit_D,'String'));
    else
        D=1+Lpp/(0.07*Lpp+20);
    end
    if get(handles.radiobutton_lSi,'Value')==1
        l=str2num(get(handles.edit_l,'String'));
    else
        l=D*0.5;
    end
    if get(handles.radiobutton_StccSi,'Value')==1
        Stcc=str2num(get(handles.edit_Stcc,'String'));
    else
        if t==0
            TM=T;
        elseif t>0
            tPR=t/Lpp*(Lpp/2-XF);
            tPP=t-tPR;
            TPR=T+tPR;
            TPP=T-tPP;
            TM=(TPR+TPP)/2;
        else
            tPR=abs(t)/Lpp*(Lpp/2-XF);
            tPP=abs(t)-tPR;
            TPR=T-tPR;
            TPP=T+tPP;
            TM=(TPR+TPP)/2;
        end
        Stcc=0.1*Lpp*TM;
    end
end

```



```

Stb=1.13*pi()*D^2*1/(0.5*D);
if get(handles.radiobutton_Proal,'Value')==1
    CT=(CF+CA)/(1-RR);
    if get(handles.radiobutton_SmSi,'Value')==1
        Sm=str2num(get(handles.edit_Sm,'String'));
    else
        Sm=3.019*VolCarena^(2/3)+0.602*Lpp*VolCarena^(1/3)-1.734;
        Sm=Sm+Stcc+Stb;
    end
else
    if get(handles.radiobutton_SmSi,'Value')==1
        Sm=str2num(get(handles.edit_Sm,'String'));
    else
        Sm=4.42*VolCarena^(2/3)+0.378*Lpp*VolCarena^(1/3)-26.5;
        Sm=Sm+Stcc+Stb;
    end
    Fnbb=V*0.514444/sqrt(9.81*lb);
    a=-47.3*Fnbb^3+292.7*Fnbb^2-579.7*Fnbb+351.7;
    b=166.82*Fnbb^3-1037.8*Fnbb^2+2062.2*Fnbb-1243.8;
    DES=a*Lpp/B+b;
    RRcb=RR/(1+(DES/100));
    CT=(CF+CA)/(1-RRcb);
end
RT=0.5*CT*Sm*Densidad/9.81*(V*0.51444)^2;
if strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Verano')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Pacífico') & strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Pacífico') & strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Verano')
    RT=RT*1.12;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Invierno')
    RT=RT*1.18;
elseif strcmp(Ruta,'Ruta del Este Asia') & strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Este Asia') & strcmp(Estacion,'Invierno')
    RT=RT*1.2;
else
end
EHP=RT*V*0.514444/75;
v_EHP=[v_EHP EHP];
v_RT=[v_RT RT];
v_CT=[v_CT CT];
v_CF=[v_CF CF];
v_CA=[v_CA CA];
v_RR=[v_RR RR];
end
v=[Vmin:0.001:Vmax];

```

```

V=[];
Fn=[];
Rn=[];
RT=[];
CT=[];
CF=[];
CA=[];
RR=[];
EHP=[];
for i=1:((Vmin+1-Vmin)/0.001):((Vmax-Vmin)/0.001+1)
    V=[V v(i)];
    Fn=[Fn v_Fn(i)];
    Rn=[Rn v_Rn(i)];
    RT=[RT v_RT(i)];
    CT=[CT v_CT(i)];
    CF=[CF v_CF(i)];
    CA=[CA v_CA(i)];
    RR=[RR v_RR(i)];
    EHP=[EHP v_EHP(i)];
end
T=table(V',Fn',Rn',CF',CA',RR',CT',RT',EHP');
T.Properties.VariableNames={'V_kn','Fn','Rn','CF','CA','RR_RT','CT','R
T_kg','EHP_CV'};
disp('-----Método de Amadeo
García-----')
disp(' ')
disp(T)
v1=[Vmin:1:Vmax];
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b');axis tight;hold on
set(handles.plot1,'HitTest','off') ;
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,ha
ndles) )
xlabel('V(kn)')
ylabel('RT(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset')
handles.plot2=plot(v,v_EHP,'-r');axis tight;hold on
set(handles.plot2,'HitTest','off') ;
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,
handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
calc=1;
compplot=0;
set(handles.pushbutton_Comparar,'Enable','on');
end

% --- Executes on button press in pushbutton_Borrar.
function pushbutton_Borrar_Callback(hObject,eventdata,handles)
% hObject    handle to pushbutton_Borrar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global calc
global comp
global metodo
calc=0;
set(handles.pushbutton_Comparar,'Enable','off');

```

```

set(handles.pushButton_Comprobar,'Enable','on');
set(handles.pushButton_Calcular,'Enable','off');
set(handles.pushButton_Borrar,'Enable','on');
set(handles.pushButton_Cambiar,'Enable','off');
cla(handles.axes_Rt,'reset');
cla(handles.axes_EHP,'reset');
if comp==0
set(handles.edit_Lpp,'String','');
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_B,'String','');
set(handles.edit_B,'Enable','on');
set(handles.edit_T,'String','');
set(handles.edit_T,'Enable','on');
set(handles.edit_VolCarena,'String','');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_Vmin,'String','');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'String','');
set(handles.edit_Vmax,'Enable','on');
set(handles.edit_Lf,'String','');
set(handles.edit_Lf,'Enable','off');
set(handles.radioButton_LfSi,'Enable','on');
set(handles.radioButton_LfSi,'Value',0);
set(handles.radioButton_LfNo,'Value',0);
set(handles.radioButton_LfNo,'Enable','on');
set(handles.edit_Sm,'String','');
set(handles.edit_Sm,'Enable','off');
set(handles.edit_l,'String','');
set(handles.edit_l,'Enable','off');
set(handles.edit_D,'String','');
set(handles.edit_D,'Enable','off');
set(handles.edit_Stcc,'String','');
set(handles.edit_Stcc,'Enable','off');
set(handles.edit_t,'String','');
set(handles.edit_t,'Enable','off');
set(handles.edit_lb,'String','');
set(handles.edit_lb,'Enable','off');
set(handles.edit_XF,'String','');
set(handles.edit_XF,'Enable','off');
set(handles.radioButton_SmSi,'Enable','off');
set(handles.radioButton_SmNo,'Enable','off');
set(handles.radioButton_SmSi,'Value',0);
set(handles.radioButton_SmNo,'Value',0);
set(handles.radioButton_lSi,'Enable','off');
set(handles.radioButton_lNo,'Enable','off');
set(handles.radioButton_lSi,'Value',0);
set(handles.radioButton_lNo,'Value',0);
set(handles.radioButton_DSi,'Enable','off');
set(handles.radioButton_DNo,'Enable','off');
set(handles.radioButton_DSi,'Value',0);
set(handles.radioButton_DNo,'Value',0);
set(handles.radioButton_StccSi,'Enable','off');
set(handles.radioButton_StccNo,'Enable','off');
set(handles.radioButton_StccSi,'Value',0);
set(handles.radioButton_StccNo,'Value',0);
set(handles.radioButton_Proa1,'Enable','on');
set(handles.radioButton_Proa2,'Enable','on');
set(handles.radioButton_Proa1,'Value',0);
set(handles.radioButton_Proa2,'Value',0);
set(handles.popupmenu_Ruta,'Enable','off');
set(handles.popupmenu_Ruta,'Value',1);

```

```

set(handles.popupmenu_Estacion,'Enable','off');
set(handles.popupmenu_Estacion,'Value',1);
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Rio,'Value',0);
set(handles.radiobutton_Mar,'Enable','off');
set(handles.radiobutton_Mar,'Value',1);
else
switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
set(handles.edit_t,'String','');
set(handles.edit_t,'Enable','off');
set(handles.edit_XF,'String','');
set(handles.edit_XF,'Enable','off');
    case 'Van Oortmerssen'
set(handles.radiobutton_Proal,'Enable','on');
set(handles.radiobutton_Proa2,'Enable','on');
set(handles.radiobutton_Proal,'Value',0);
set(handles.radiobutton_Proa2,'Value',0);
set(handles.edit_t,'String','');
set(handles.edit_t,'Enable','off');
set(handles.edit_XF,'String','');
set(handles.edit_XF,'Enable','off');
end
end

% --- Executes on selection change in popupmenu_Ruta.
function popupmenu_Ruta_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Ruta contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Ruta
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
set(handles.popupmenu_Estacion,'Enable','off');
set(handles.popupmenu_Estacion,'Value',1);
else
set(handles.popupmenu_Estacion,'Enable','on');
set(handles.popupmenu_Estacion,'Value',1);
end

% --- Executes during object creation, after setting all properties.
function popupmenu_Ruta_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
set(hObject,'BackgroundColor','white');
end
end

```

```

% --- Executes on selection change in popupmenu_Estacion.
function popupmenu_Estacion_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hints: contents = cellstr(get(hObject, 'String')) returns
popupmenu_Estacion contents as cell array
%         contents{get(hObject, 'Value')} returns selected item from
popupmenu_Estacion

% --- Executes during object creation, after setting all properties.
function popupmenu_Estacion_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Lpp_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lpp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: set(hObject, 'String') returns contents of edit_Lpp as text
%         str2double(set(hObject, 'String')) returns contents of
edit_Lpp as a double
handles = guihandles;
if str2num(get(handles.edit_Lpp, 'String')) <= 0
    msgbox('El valor de la eslora entre perpendiculares es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proa1, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');

```

```

    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
        set(handles.edit_Lf, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Proal, 'Value')==1
    set(handles.radiobutton_LfSi, 'Enable', 'on');
    set(handles.radiobutton_LfNo, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_Proal, 'Enable', 'on');
    set(handles.radiobutton_Proa2, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lpp_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lpp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_B_Callback(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_B as text
%         str2double(get(hObject, 'String')) returns contents of edit_B
as a double
handles = guidata(hObject);
if str2num(get(handles.edit_B, 'String'))<=0
    msgbox('El valor de la manga es incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proal, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
end

```

```

else
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
        set(handles.edit_Lf, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Proa1, 'Value')==1
    set(handles.radiobutton_LfSi, 'Enable', 'on');
    set(handles.radiobutton_LfNo, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_Proa1, 'Enable', 'on');
    set(handles.radiobutton_Proa2, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_B_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_T_Callback(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_T as text
%         str2double(get(hObject, 'String')) returns contents of edit_T
as a double
handles = guihandles;
if str2num(get(handles.edit_T, 'String'))<=0
    msgbox('El valor del calado es incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proa1, 'Enable', 'off');

```

```

set(handles radiobutton_Proa2, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
    set(handles.edit_Lf, 'Enable', 'on');
else
end
if get(handles.radiobutton_Proa1, 'Value')==1
set(handles.radiobutton_LfSi, 'Enable', 'on');
set(handles.radiobutton_LfNo, 'Enable', 'on');
else
end
set(handles.radiobutton_Proa1, 'Enable', 'on');
set(handles.radiobutton_Proa2, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_T_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in pushbutton_Comprobar.
function pushbutton_Comprobar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comprobar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guihandles;
comprobarFn=0;
global tipo_barco
global comp
global metodo
if strcmp(get(handles.edit_Lpp, 'String'), '') |
strcmp(get(handles.edit_Lpp, 'String'), char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.', 'Error', 'error');
elseif strcmp(get(handles.edit_B, 'String'), '') |
strcmp(get(handles.edit_B, 'String'), char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.', 'Error', 'error');

```



```

        set(handles.popupmenu_Estacion,'Enable','on');
    end
    set(handles.radiobutton_Rio,'Enable','on');
    set(handles.radiobutton_Mar,'Enable','on');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(handles.pushbutton_Calcular,'Enable','on');
    set(handles.pushbutton_Borrar,'Enable','on');
    set(handles.pushbutton_Cambiar,'Enable','on');
    else
        if strcmp(get(handles.edit_t,'String'),'0') |
        strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
        else
            set(handles.edit_XF,'Enable','on');
        end
        if get(handles.radiobutton_Proa2,'Value')==1
            set(handles.edit_lb,'Enable','on');
        else
            end
            set(handles.radiobutton_lSi,'Enable','on');
            set(handles.radiobutton_lNo,'Enable','on');
            if get(handles.radiobutton_lSi,'Value')==1
                set(handles.edit_l,'Enable','on');
            else
                end
                set(handles.radiobutton_DSi,'Enable','on');
                set(handles.radiobutton_DNo,'Enable','on');
                if get(handles.radiobutton_DSi,'Value')==1
                    set(handles.edit_D,'Enable','on');
                else
                    end
                    set(handles.radiobutton_StccSi,'Enable','on');
                    set(handles.radiobutton_StccNo,'Enable','on');
                    if get(handles.radiobutton_StccSi,'Value')==1
                        set(handles.edit_Stcc,'Enable','on');
                    else
                        end
                        set(handles.pushbutton_Comprobar,'Enable','off');
                        set(handles.pushbutton_Calcular,'Enable','on');
                        set(handles.pushbutton_Borrar,'Enable','on');
                        set(handles.pushbutton_Cambiar,'Enable','on');
                        switch metodo
                            case 'Holtrop y Mennen'
                            case 'Guldhammer y Harvald'
                                set(handles.edit_t,'Enable','on');
                                if strcmp(get(handles.edit_t,'String'),'0') |
                                strcmp(get(handles.edit_t,'String'),'')
                                else
                                    set(handles.edit_XF,'Enable','on');
                                end
                            case 'Van Oortmerssen'
                                set(handles.radiobutton_Proa1,'Enable','off');
                                set(handles.radiobutton_Proa2,'Enable','off');
                                set(handles.edit_t,'Enable','on');
                            end
                        end
                    end
                end
            end
        end
    end

function edit_VolCarena_Callback(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_VolCarena as
text
%           str2double(get(hObject,'String')) returns contents of
edit_VolCarena as a double
handles = guihandles;
if str2num(get(handles.edit_VolCarena,'String'))<=0
    msgbox('El valor del volumen de carena es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proa1, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
        set(handles.edit_Lf, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Proa1, 'Value')==1
        set(handles.radiobutton_LfSi, 'Enable', 'on');
        set(handles.radiobutton_LfNo, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_Proa1, 'Enable', 'on');
    set(handles.radiobutton_Proa2, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_VolCarena_CreateFcn(hObject, eventdata, handles)
% hObject      handle to edit_VolCarena (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%           See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

% --- Executes on button press in pushbutton_Cambiar.
function pushbutton_Cambiar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Cambiar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
global comp
global metodo
if comp==0
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_B,'Enable','on');
set(handles.edit_T,'Enable','on');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'Enable','on');
if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
    set(handles.edit_Lf, 'Enable', 'on');
else
end
if get(handles.radiobutton_Proa1, 'Value')==1
    set(handles.radiobutton_LfSi, 'Enable', 'on');
    set(handles.radiobutton_LfNo, 'Enable', 'on');
else
end
set(handles.radiobutton_Proa1, 'Enable', 'on');
set(handles.radiobutton_Proa2, 'Enable', 'on');
else
end
set(handles.edit_Sm,'Enable','off');
set(handles.edit_l,'Enable','off');
set(handles.edit_D,'Enable','off');
set(handles.edit_Stcc,'Enable','off');
set(handles.edit_t,'Enable','off');
set(handles.edit_XF,'Enable','off');
set(handles.edit_lb,'Enable','off');
set(handles.radiobutton_SmSi,'Enable','off');
set(handles.radiobutton_SmNo,'Enable','off');
set(handles.radiobutton_lSi,'Enable','off');
set(handles.radiobutton_lNo,'Enable','off');
set(handles.radiobutton_DSi,'Enable','off');
set(handles.radiobutton_DNo,'Enable','off');
set(handles.radiobutton_StccSi,'Enable','off');
set(handles.radiobutton_StccNo,'Enable','off');
set(handles.popupmenu_Ruta,'Enable','off');
set(handles.popupmenu_Estacion,'Enable','off');
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Mar,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Rangos,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Borrar,'Enable','on');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.pushbutton_Comparar,'Enable','off');
if strcmp(metodo,'Van Oortmerssen')
set(handles.radiobutton_Proa1, 'Enable', 'on');
set(handles.radiobutton_Proa2, 'Enable', 'on');
else
end
end

```

```

function edit_Vmax_Callback(hObject, eventdata, handles)
% hObject      handle to edit_Vmax (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmax as text
%          str2double(get(hObject,'String')) returns contents of
edit_Vmax as a double
handles = guidata(hObject);
if
str2num(get(handles.edit_Vmax,'String'))<str2num(get(handles.edit_Vmin
,'String')) & str2num(get(handles.edit_Vmax,'String'))>0
    msgbox('El valor de la velocidad máxima debe ser mayor al de la
mínima.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proa1, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmax,'String'))<=0
    msgbox('El valor de la velocidad máxima es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proa1, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
        set(handles.edit_Lf, 'Enable', 'on');
    else
    end
    if get(handles.radiobutton_Proa1, 'Value')==1
    set(handles.radiobutton_LfSi, 'Enable', 'on');
    set(handles.radiobutton_LfNo, 'Enable', 'on');
    else
    end
end

```

```

    set(handles.radiobutton_Proa1, 'Enable', 'on');
    set(handles.radiobutton_Proa2, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmax_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmax (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Vmin_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Vmin as text
% str2double(get(hObject, 'String')) returns contents of
edit_Vmin as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax, 'String')) < str2num(get(handles.edit_Vmin
, 'String')) & str2num(get(handles.edit_Vmin, 'String')) > 0
    msgbox('El valor de la velocidad mínima debe ser mayor al de la
máxima.', 'Aviso.', 'error');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proa1, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmin, 'String')) < 0
    msgbox('El valor de la velocidad mínima es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');

```

```

set(handles.radiobutton_LfNo, 'Enable', 'off');
set(handles.radiobutton_Proa1, 'Enable', 'off');
set(handles.radiobutton_Proa2, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
if get(handles.radiobutton_LfSi, 'Value')==1 |
get(handles.radiobutton_Proa2, 'Value')==1
set(handles.edit_Lf, 'Enable', 'on');
else
end
if get(handles.radiobutton_Proa1, 'Value')==1
set(handles.radiobutton_LfSi, 'Enable', 'on');
set(handles.radiobutton_LfNo, 'Enable', 'on');
else
end
set(handles.radiobutton_Proa1, 'Enable', 'on');
set(handles.radiobutton_Proa2, 'Enable', 'on');
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmin_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
set(hObject,'BackgroundColor','white');
end

function edit_Sm_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Sm as text
%         str2double(get(hObject,'String')) returns contents of edit_Sm
as a double
handles = guihandles;
global comp
global metodo
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_Sm, 'String')) <= 0
msgbox('El valor de la superficie mojada sin apéndices es
incorrecto.', 'Aviso.', 'error');
set(handles.popupmenu_Ruta, 'Enable', 'off');

```



```

set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.edit_XF, 'Enable', 'off');
set(handles.edit_t, 'Enable', 'off');
set(handles.edit_lb, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_lSi, 'Enable', 'off');
set(handles.radiobutton_lNo, 'Enable', 'off');
set(handles.edit_l, 'Enable', 'off');
set(handles.radiobutton_DSi, 'Enable', 'off');
set(handles.radiobutton_DNo, 'Enable', 'off');
set(handles.edit_D, 'Enable', 'off');
set(handles.radiobutton_StccSi, 'Enable', 'off');
set(handles.radiobutton_StccNo, 'Enable', 'off');
set(handles.edit_Stcc, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
    if comp==0
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
        Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
        if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
            else
                set(handles.popupmenu_Estacion, 'Enable', 'on');
            end
            if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
                else
                    set(handles.edit_XF, 'Enable', 'on');
                end
                if get(handles.radiobutton_Proa2, 'Value')==1
                    set(handles.edit_lb, 'Enable', 'on');
                else
                    end
                    set(handles.edit_t, 'Enable', 'on');
                    set(handles.radiobutton_SmSi, 'Enable', 'on');
                    set(handles.radiobutton_SmNo, 'Enable', 'on');
                    set(handles.radiobutton_lSi, 'Enable', 'on');
                    set(handles.radiobutton_lNo, 'Enable', 'on');
                    if get(handles.radiobutton_lSi, 'Value')==1
                        set(handles.edit_l, 'Enable', 'on');
                    else
                        end
                        set(handles.radiobutton_DSi, 'Enable', 'on');
                        set(handles.radiobutton_DNo, 'Enable', 'on');
                        if get(handles.radiobutton_DSi, 'Value')==1
                            set(handles.edit_D, 'Enable', 'on');
                        else
                            end
                            set(handles.radiobutton_StccSi, 'Enable', 'on');
                            set(handles.radiobutton_StccNo, 'Enable', 'on');
                            if get(handles.radiobutton_StccSi, 'Value')==1
                                set(handles.edit_Stcc, 'Enable', 'on');
                            else
                                end
                                set(handles.radiobutton_Rio, 'Enable', 'on');
                                set(handles.radiobutton_Mar, 'Enable', 'on');

```

```

set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
else
if get(handles.radiobutton_Proa2, 'Value')==1
    set(handles.edit_lb, 'Enable', 'on');
else
end
set(handles.radiobutton_lSi, 'Enable', 'on');
set(handles.radiobutton_lNo, 'Enable', 'on');
if get(handles.radiobutton_lSi, 'Value')==1
set(handles.edit_l, 'Enable', 'on');
else
end
set(handles.radiobutton_DSi, 'Enable', 'on');
set(handles.radiobutton_DNo, 'Enable', 'on');
if get(handles.radiobutton_DSi, 'Value')==1
set(handles.edit_D, 'Enable', 'on');
else
end
set(handles.radiobutton_StccSi, 'Enable', 'on');
set(handles.radiobutton_StccNo, 'Enable', 'on');
if get(handles.radiobutton_StccSi, 'Value')==1
set(handles.edit_Stcc, 'Enable', 'on');
else
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
        set(handles.edit_t, 'Enable', 'on');
        if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
        else
            set(handles.edit_XF, 'Enable', 'on');
        end
    case 'Van Oortmerssen'
        set(handles.edit_t, 'Enable', 'on');
        if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
        else
            set(handles.edit_XF, 'Enable', 'on');
        end
    end
end
end
end

% --- Executes during object creation, after setting all properties.
function edit_Sm_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

```

end

```
function edit_Stcc_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Stcc (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Stcc as text
%        str2double(get(hObject,'String')) returns contents of
edit_Stcc as a double
handles = guidata(hObject);
global comp
global metodo
if str2num(get(handles.edit_Stcc,'String'))<=0
    msgbox('El valor de la superficie del timón y del codaste cerrado
es incorrecto.', 'Aviso.', 'error');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.edit_XF, 'Enable', 'off');
    set(handles.edit_t, 'Enable', 'off');
    set(handles.edit_lb, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_lSi, 'Enable', 'off');
    set(handles.radiobutton_lNo, 'Enable', 'off');
    set(handles.edit_l, 'Enable', 'off');
    set(handles.radiobutton_DSi, 'Enable', 'off');
    set(handles.radiobutton_DNo, 'Enable', 'off');
    set(handles.edit_D, 'Enable', 'off');
    set(handles.radiobutton_StccSi, 'Enable', 'off');
    set(handles.radiobutton_StccNo, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
    if comp==0
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta,'String'));
        Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
        if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
        else
            set(handles.popupmenu_Estacion, 'Enable', 'on');
        end
        if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
        else
            set(handles.edit_XF, 'Enable', 'on');
        end
        if get(handles.radiobutton_Proa2,'Value')==1
            set(handles.edit_lb, 'Enable', 'on');
        else
        end
        set(handles.edit_t, 'Enable', 'on');
        set(handles.radiobutton_SmSi, 'Enable', 'on');
        set(handles.radiobutton_SmNo, 'Enable', 'on');
        if get(handles.radiobutton_SmSi, 'Value')==1
```

```

set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles radiobutton_lSi, 'Enable', 'on');
set(handles radiobutton_lNo, 'Enable', 'on');
if get(handles radiobutton_lSi, 'Value')==1
set(handles.edit_l, 'Enable', 'on');
else
end
set(handles radiobutton_DSi, 'Enable', 'on');
set(handles radiobutton_DNo, 'Enable', 'on');
if get(handles radiobutton_DSi, 'Value')==1
set(handles.edit_D, 'Enable', 'on');
else
end
set(handles radiobutton_StccSi, 'Enable', 'on');
set(handles radiobutton_StccNo, 'Enable', 'on');
set(handles radiobutton_Rio, 'Enable', 'on');
set(handles radiobutton_Mar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
else
if get(handles radiobutton_Proa2, 'Value')==1
set(handles.edit_lb, 'Enable', 'on');
else
end
set(handles radiobutton_lSi, 'Enable', 'on');
set(handles radiobutton_lNo, 'Enable', 'on');
if get(handles radiobutton_lSi, 'Value')==1
set(handles.edit_l, 'Enable', 'on');
else
end
set(handles radiobutton_DSi, 'Enable', 'on');
set(handles radiobutton_DNo, 'Enable', 'on');
if get(handles radiobutton_DSi, 'Value')==1
set(handles.edit_D, 'Enable', 'on');
else
end
set(handles radiobutton_StccSi, 'Enable', 'on');
set(handles radiobutton_StccNo, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
switch metodo
case 'Holtrop y Mennen'
case 'Guldhammer y Harvald'
set(handles.edit_t, 'Enable', 'on');
if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
else
set(handles.edit_XF, 'Enable', 'on');
end
case 'Van Oortmerssen'
set(handles.edit_t, 'Enable', 'on');
if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
else
set(handles.edit_XF, 'Enable', 'on');
end
end
end

```

```

end
end

% --- Executes during object creation, after setting all properties.
function edit_Stcc_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Stcc (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_D_Callback(hObject, eventdata, handles)
% hObject    handle to edit_D (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_D as text
% str2double(get(hObject,'String')) returns contents of edit_D
as a double
handles = guihandles;
global comp
global metodo
set(handles.pushbutton_Comparar,'Enable','on');
if str2num(get(handles.edit_D,'String'))<=0
    msgbox('El valor del diámetro del propulsor es
incorrecto.','Aviso.','error');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.edit_XF,'Enable','off');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_lb,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.radiobutton_lSi,'Enable','off');
    set(handles.radiobutton_lNo,'Enable','off');
    set(handles.edit_l,'Enable','off');
    set(handles.radiobutton_DSi,'Enable','off');
    set(handles.radiobutton_DNo,'Enable','off');
    set(handles.radiobutton_StccSi,'Enable','off');
    set(handles.radiobutton_StccNo,'Enable','off');
    set(handles.edit_Stcc,'Enable','off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
else
    if comp==0
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta,'String'));
        Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
    end
end

```

```

if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
else
set(handles.edit_XF, 'Enable', 'on');
end
if get(handles.radiobutton_Proa2, 'Value')==1
    set(handles.edit_lb, 'Enable', 'on');
else
end
set(handles.edit_t, 'Enable', 'on');
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.radiobutton_lSi, 'Enable', 'on');
set(handles.radiobutton_lNo, 'Enable', 'on');
if get(handles.radiobutton_lSi, 'Value')==1
set(handles.edit_l, 'Enable', 'on');
else
end
set(handles.radiobutton_DSi, 'Enable', 'on');
set(handles.radiobutton_DNo, 'Enable', 'on');
set(handles.radiobutton_StccSi, 'Enable', 'on');
set(handles.radiobutton_StccNo, 'Enable', 'on');
if get(handles.radiobutton_StccSi, 'Value')==1
set(handles.edit_Stcc, 'Enable', 'on');
else
end
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
else
if get(handles.radiobutton_Proa2, 'Value')==1
    set(handles.edit_lb, 'Enable', 'on');
else
end
set(handles.radiobutton_lSi, 'Enable', 'on');
set(handles.radiobutton_lNo, 'Enable', 'on');
if get(handles.radiobutton_lSi, 'Value')==1
set(handles.edit_l, 'Enable', 'on');
else
end
set(handles.radiobutton_DSi, 'Enable', 'on');
set(handles.radiobutton_DNo, 'Enable', 'on');
set(handles.radiobutton_StccSi, 'Enable', 'on');
set(handles.radiobutton_StccNo, 'Enable', 'on');
if get(handles.radiobutton_StccSi, 'Value')==1
set(handles.edit_Stcc, 'Enable', 'on');
else
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');

```

```

switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
        set(handles.edit_t,'Enable','on');
        if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
        else
            set(handles.edit_XF,'Enable','on');
            end
            case 'Van Oortmerssen'
                set(handles.edit_t,'Enable','on');
                if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
                else
                    set(handles.edit_XF,'Enable','on');
                    end
            end
        end
    end
end

% --- Executes during object creation, after setting all properties.
function edit_D_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_D (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_l_Callback(hObject, eventdata, handles)
% hObject    handle to edit_l (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_l as text
%         str2double(get(hObject,'String')) returns contents of edit_l
as a double
handles = guihandles;
global comp
global metodo
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_l,'String'))<=0
    msgbox('El valor de la longitud de la tobera es
incorrecto.','Aviso.','error');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.edit_XF,'Enable','off');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_lb,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.radiobutton_lSi,'Enable','off');

```

```

set(handles radiobutton_lNo, 'Enable', 'off');
set(handles radiobutton_DSi, 'Enable', 'off');
set(handles radiobutton_DNo, 'Enable', 'off');
set(handles edit_D, 'Enable', 'off');
set(handles radiobutton_StccSi, 'Enable', 'off');
set(handles radiobutton_StccNo, 'Enable', 'off');
set(handles edit_Stcc, 'Enable', 'off');
set(handles radiobutton_Rio, 'Enable', 'off');
set(handles radiobutton_Mar, 'Enable', 'off');
set(handles pushbutton_Calcular, 'Enable', 'off');
set(handles pushbutton_Borrar, 'Enable', 'off');
set(handles pushbutton_Cambiar, 'Enable', 'off');
else
    if comp==0
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
        Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
        if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
            else
                set(handles.popupmenu_Estacion, 'Enable', 'on');
            end
        if strcmp(get(handles.edit_t, 'String'), '0') |
        strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
            else
                set(handles.edit_XF, 'Enable', 'on');
            end
        if get(handles.radiobutton_Proa2, 'Value')==1
            set(handles.edit_lb, 'Enable', 'on');
        else
            end
        set(handles.edit_t, 'Enable', 'on');
        set(handles.radiobutton_SmSi, 'Enable', 'on');
        set(handles.radiobutton_SmNo, 'Enable', 'on');
        if get(handles.radiobutton_SmSi, 'Value')==1
            set(handles.edit_Sm, 'Enable', 'on');
        else
            end
        set(handles.radiobutton_lSi, 'Enable', 'on');
        set(handles.radiobutton_lNo, 'Enable', 'on');
        set(handles.radiobutton_DSi, 'Enable', 'on');
        set(handles.radiobutton_DNo, 'Enable', 'on');
        if get(handles.radiobutton_DSi, 'Value')==1
            set(handles.edit_D, 'Enable', 'on');
        else
            end
        set(handles.radiobutton_StccSi, 'Enable', 'on');
        set(handles.radiobutton_StccNo, 'Enable', 'on');
        if get(handles.radiobutton_StccSi, 'Value')==1
            set(handles.edit_Stcc, 'Enable', 'on');
        else
            end
        set(handles.radiobutton_Rio, 'Enable', 'on');
        set(handles.radiobutton_Mar, 'Enable', 'on');
        set(handles.pushbutton_Calcular, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        set(handles.pushbutton_Cambiar, 'Enable', 'on');
        else
            if get(handles.radiobutton_Proa2, 'Value')==1
                set(handles.edit_lb, 'Enable', 'on');
            else
                end
        end
    end

```



```

set(handles.radiobutton_lSi, 'Enable', 'on');
set(handles.radiobutton_lNo, 'Enable', 'on');
set(handles.radiobutton_DSi, 'Enable', 'on');
set(handles.radiobutton_DNo, 'Enable', 'on');
if get(handles.radiobutton_DSi, 'Value')==1
set(handles.edit_D, 'Enable', 'on');
else
end
set(handles.radiobutton_StccSi, 'Enable', 'on');
set(handles.radiobutton_StccNo, 'Enable', 'on');
if get(handles.radiobutton_StccSi, 'Value')==1
set(handles.edit_Stcc, 'Enable', 'on');
else
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
set(handles.edit_t, 'Enable', 'on');
if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
else
set(handles.edit_XF, 'Enable', 'on');
end
    case 'Van Oortmerssen'
set(handles.edit_t, 'Enable', 'on');
if strcmp(get(handles.edit_t, 'String'), '0') |
strcmp(get(handles.edit_t, 'String'), char(zeros(1,0)))
else
set(handles.edit_XF, 'Enable', 'on');
end
end
end
end
end

% --- Executes during object creation, after setting all properties.
function edit_1_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_1 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in radiobutton_SmSi.
function radiobutton_SmSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject, 'Value') returns toggle state of radiobutton_SmSi
handles = guidata(hObject);

```

```

set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.radiobutton_SmNo,'Value',0);
    set(handles.edit_Sm,'Enable','on');
else
end

% --- Executes on button press in radiobutton_SmNo.
function radiobutton_SmNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_SmNo
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.radiobutton_SmSi,'Value',0);
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_Sm,'String','');
else
end

% --- Executes on button press in radiobutton_lSi.
function radiobutton_lSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_lSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_lSi
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.radiobutton_lNo,'Value',0);
    set(handles.edit_l,'Enable','on');
else
end

% --- Executes on button press in radiobutton_lNo.
function radiobutton_lNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_lNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_lNo
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.radiobutton_lSi,'Value',0);
    set(handles.edit_l,'Enable','off');
    set(handles.edit_l,'String','');
else
end

% --- Executes on button press in radiobutton_DSi.

```

```

function radiobutton_DSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_DSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_DSi
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject, 'Value')==1
    set(handles.radiobutton_DNo, 'Value', 0);
    set(handles.edit_D, 'Enable', 'on');
else
end

% --- Executes on button press in radiobutton_DNo.
function radiobutton_DNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_DNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_DNo
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject, 'Value')==1
    set(handles.radiobutton_DSi, 'Value', 0);
    set(handles.edit_D, 'Enable', 'off');
    set(handles.edit_D, 'String', '');
else
end

% --- Executes on button press in radiobutton_StccSi.
function radiobutton_StccSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_StccSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_StccSi
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject, 'Value')==1
    set(handles.radiobutton_StccNo, 'Value', 0);
    set(handles.edit_Stcc, 'Enable', 'on');
else
end

% --- Executes on button press in radiobutton_StccNo.
function radiobutton_StccNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_StccNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_StccNo
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');

```

```

if get(hObject,'Value')==1
    set(handles.radiobutton_StccSi,'Value',0);
    set(handles.edit_Stcc,'Enable','off');
    set(handles.edit_Stcc,'String','');
else
end

% --- Executes on button press in radiobutton_Mar.
function radiobutton_Mar_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Mar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Mar

function edit_t_Callback(hObject, eventdata, handles)
% hObject    handle to edit_t (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_t as text
%        str2double(get(hObject,'String')) returns contents of edit_t
as a double
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
    set(handles.edit_XF,'Enable','off');
    set(handles.edit_XF,'String','');
else
    set(handles.edit_XF,'Enable','on');
end

% --- Executes during object creation, after setting all properties.
function edit_t_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_t (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%        See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_XF_Callback(hObject, eventdata, handles)
% hObject    handle to edit_XF (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

```

```

set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hints: get(hObject, 'String') returns contents of edit_XF as text
%         str2double(get(hObject, 'String')) returns contents of edit_XF
as a double

% --- Executes during object creation, after setting all properties.
function edit_XF_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_XF (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Lf_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Lf as text
%         str2double(get(hObject, 'String')) returns contents of edit_Lf
as a double
handles = guihandles;
if str2num(get(handles.edit_Lf, 'String'))<=0
    msgbox('El valor de la eslora de flotación es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_Proal, 'Enable', 'off');
    set(handles.radiobutton_Proa2, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    if get(handles.radiobutton_Proal, 'Value')==1
        set(handles.radiobutton_LfSi, 'Enable', 'on');
        set(handles.radiobutton_LfNo, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_Proal, 'Enable', 'on');

```

```

set(handles.radiobutton_Proa2, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lf_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_LfSi.
function radiobutton_LfSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_LfSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_LfSi
handles = guidata(hObject);
if get(hObject,'Value')==1
    set(handles.radiobutton_LfNo,'Value',0);
    set(handles.edit_Lf,'Enable','on');
else
end

% --- Executes on button press in radiobutton_LfNo.
function radiobutton_LfNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_LfNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_LfNo
handles = guidata(hObject);
if get(hObject,'Value')==1
    set(handles.radiobutton_LfSi,'Value',0);
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_Lf,'String','');
end

function edit_lb_Callback(hObject, eventdata, handles)
% hObject    handle to edit_lb (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_lb as text
%       str2double(get(hObject,'String')) returns contents of edit_lb
as a double
handles = guidata(hObject);

```

```

global comp
global metodo
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_lb,'String'))<=0
    msgbox('El valor de la protuberancia del bulbo es
incorrecto.','Aviso.','error');
    set(handles.popupmenu_Ruta,'Enable','off');
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.edit_t,'Enable','off');
    set(handles.edit_XF,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.radiobutton_lSi,'Enable','off');
    set(handles.radiobutton_lNo,'Enable','off');
    set(handles.edit_l,'Enable','off');
    set(handles.radiobutton_DSi,'Enable','off');
    set(handles.radiobutton_DNo,'Enable','off');
    set(handles.edit_D,'Enable','off');
    set(handles.radiobutton_StccSi,'Enable','off');
    set(handles.radiobutton_StccNo,'Enable','off');
    set(handles.edit_Stcc,'Enable','off');
    set(handles.radiobutton_Rio,'Enable','off');
    set(handles.radiobutton_Mar,'Enable','off');
    set(handles.pushbutton_Calcular,'Enable','off');
    set(handles.pushbutton_Borrar,'Enable','off');
    set(handles.pushbutton_Cambiar,'Enable','off');
else
    if comp==0
        set(handles.popupmenu_Ruta,'Enable','on');
        contents=cellstr(get(handles.popupmenu_Ruta,'String'));
        Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
        if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
        else
            set(handles.popupmenu_Estacion,'Enable','on');
        end
        if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
        else
            set(handles.edit_XF,'Enable','on');
        end
        set(handles.edit_t,'Enable','on');
        set(handles.radiobutton_SmSi,'Enable','on');
        set(handles.radiobutton_SmNo,'Enable','on');
        if get(handles.radiobutton_SmSi,'Value')==1
            set(handles.edit_Sm,'Enable','on');
        else
        end
        set(handles.radiobutton_lSi,'Enable','on');
        set(handles.radiobutton_lNo,'Enable','on');
        if get(handles.radiobutton_lSi,'Value')==1
            set(handles.edit_l,'Enable','on');
        else
        end
        set(handles.radiobutton_DSi,'Enable','on');
        set(handles.radiobutton_DNo,'Enable','on');
        if get(handles.radiobutton_DSi,'Value')==1
            set(handles.edit_D,'Enable','on');
        else
        end
        set(handles.radiobutton_StccSi,'Enable','on');

```

```

set(handles.radiobutton_StccNo,'Enable','on');
if get(handles.radiobutton_StccSi,'Value')==1
set(handles.edit_Stcc,'Enable','on');
else
end
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
else
set(handles.radiobutton_lSi,'Enable','on');
set(handles.radiobutton_lNo,'Enable','on');
if get(handles.radiobutton_lSi,'Value')==1
set(handles.edit_l,'Enable','on');
else
end
set(handles.radiobutton_DSi,'Enable','on');
set(handles.radiobutton_DNo,'Enable','on');
if get(handles.radiobutton_DSi,'Value')==1
set(handles.edit_D,'Enable','on');
else
end
set(handles.radiobutton_StccSi,'Enable','on');
set(handles.radiobutton_StccNo,'Enable','on');
if get(handles.radiobutton_StccSi,'Value')==1
set(handles.edit_Stcc,'Enable','on');
else
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
set(handles.edit_t,'Enable','on');
if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
else
set(handles.edit_XF,'Enable','on');
end
    case 'Van Oortmerssen'
set(handles.edit_t,'Enable','on');
if strcmp(get(handles.edit_t,'String'),'0') |
strcmp(get(handles.edit_t,'String'),char(zeros(1,0)))
else
set(handles.edit_XF,'Enable','on');
end
end
end
end

% --- Executes during object creation, after setting all properties.
function edit_lb_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_lb (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.

```



```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_Proal.
function radiobutton_Proal_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Proal (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
global comp
if comp==0
if get(handles.radiobutton_Proal,'Value')==1
    set(handles.radiobutton_LfSi, 'Enable', 'on');
    set(handles.radiobutton_LfNo, 'Enable', 'on');
    set(handles.edit_lb, 'String', '');
    set(handles.edit_Lf, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
else
end
else
    set(handles.edit_lb, 'String', '');
end
% Hint: get(hObject,'Value') returns toggle state of radiobutton_Proal

% --- Executes on button press in radiobutton_Proa2.
function radiobutton_Proa2_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Proa2 (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
global comp
if comp==0
if get(handles.radiobutton_Proa2,'Value')==1
    set(handles.radiobutton_LfSi, 'Enable', 'off');
    set(handles.radiobutton_LfNo, 'Enable', 'off');
    set(handles.radiobutton_LfSi, 'Value', 0);
    set(handles.radiobutton_LfNo, 'Value', 0);
    set(handles.edit_Lf, 'Enable', 'on');
else
end
else
end
% Hint: get(hObject,'Value') returns toggle state of radiobutton_Proa2

% --- Executes on button press in pushbutton_Salir.
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Salir (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
close(gcf)
global comp
global metodo
global v
global v_EHP
global v_RT

```

```

comp=0;
switch metodo
    case 'Holtrop y Mennen'
        global vHolt
        global v_RTHolt
        global v_EHPHolt
        v=vHolt;
        v_RT=v_RTHolt;
        v_EHP=v_EHPHolt;
    case 'Guldhammer y Harvald'
        global vGuld
        global v_RTGuld
        global v_EHPGuld
        v=vGuld;
        v_RT=v_RTGuld;
        v_EHP=v_EHPGuld;
    case 'Van Oortmerssen'
        global vVan
        global v_RTVan
        global v_EHPVan
        v=vVan;
        v_RT=v_RTVan;
        v_EHP=v_EHPVan;
end

% --- Executes on mouse press over axes background.
function axes_Rt_ButtonDownFcn(hObject, eventdata, handles)
% hObject      handle to axes_Rt (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
global v
global v_RT
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_RT);
v_RT1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_RT1=[v_RT1 v_RT(j)];
        else
            end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')

```

```

xlabel('V(kn)')
ylabel('RT(kg)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Holtrop y Mennen'
            global vHolt
            global v1Holt
            global v_RTHolt
            n=length(v1Holt);
            m=length(v_RTHolt);
            v_RT1Holt=[];
            for i=1:n
                for j=1:m
                    if v1Holt(i)==vHolt(j)
                        v_RT1Holt=[v_RT1Holt v_RTHolt(j)];
                    else
                        end
                end
            end
            vcomp=vHolt;
            v1comp=v1Holt;
            v_RTcomp=v_RTHolt;
            v_RT1comp=v_RT1Holt;
            leyenda='Holtrop y Mennen';
        case 'Guldhammer y Harvald'
            global vGuld
            global v1Guld
            global v_RTGuld
            n=length(v1Guld);
            m=length(v_RTGuld);
            v_RT1Guld=[];
            for i=1:n
                for j=1:m
                    if v1Guld(i)==vGuld(j)
                        v_RT1Guld=[v_RT1Guld v_RTGuld(j)];
                    else
                        end
                end
            end
            vcomp=vGuld;
            v1comp=v1Guld;
            v_RTcomp=v_RTGuld;
            v_RT1comp=v_RT1Guld;
            leyenda='Guldhammer y Harvald';
        case 'Van Oortmerssen'
            global vVan
            global v1Van
            global v_RTVan
            n=length(v1Van);
            m=length(v_RTVan);
            v_RT1Van=[];
            for i=1:n
                for j=1:m
                    if v1Van(i)==vVan(j)
                        v_RT1Van=[v_RT1Van v_RTVan(j)];
                    else
                        end
                end
            end
            vcomp=vVan;
            v1comp=v1Van;

```

```

        v_RTcomp=v_RTVan;
        v_RTlcomp=v_RTlVan;
        leyenda='Van Oortmerssen';
    end
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(vcomp,v_RTcomp,'y-','LineWidth',2);axis tight;hold on
plot(vl,v_RTl,'ro','LineWidth',2);axis tight;hold on
plot(vlcomp,v_RTlcomp,'ro','LineWidth',2);axis tight;hold on
lgd=legend({'Amadeo Garcia',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
end
else
end

% --- Executes on mouse press over axes background.
function axes_EHP_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_EHP
global vl
global calc
global comp
global metodo
global compplot
if calc==1
n=length(vl);
m=length(v_EHP);
v_EHP1=[];
for i=1:n
    for j=1:m
        if vl(i)==v(j)
            v_EHP1=[v_EHP1 v_EHP(j)];
        else
        end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vl,v_EHP1,'bo','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')

```

```

elseif comp==1 & compplot==1
    switch metodo
        case 'Holtrop y Mennen'
            global vHolt
            global v1Holt
            global v_EHPHolt
            n=length(v1Holt);
            m=length(v_EHPHolt);
            v_EHP1Holt=[];
            for i=1:n
                for j=1:m
                    if v1Holt(i)==vHolt(j)
                        v_EHP1Holt=[v_EHP1Holt v_EHPHolt(j)];
                    else
                        end
                end
            end
            vcomp=vHolt;
            v1comp=v1Holt;
            v_EHPcomp=v_EHPHolt;
            v_EHP1comp=v_EHP1Holt;
            leyenda='Holtrop y Mennen';
        case 'Guldhammer y Harvald'
            global vGuld
            global v1Guld
            global v_EHPGuld
            n=length(v1Guld);
            m=length(v_EHPGuld);
            v_EHP1Guld=[];
            for i=1:n
                for j=1:m
                    if v1Guld(i)==vGuld(j)
                        v_EHP1Guld=[v_EHP1Guld v_EHPGuld(j)];
                    else
                        end
                end
            end
            vcomp=vGuld;
            v1comp=v1Guld;
            v_EHPcomp=v_EHPGuld;
            v_EHP1comp=v_EHP1Guld;
            leyenda='Guldhammer y Harvald';
        case 'Van Oortmerssen'
            global vVan
            global v1Van
            global v_EHPVan
            n=length(v1Van);
            m=length(v_EHPVan);
            v_EHP1Van=[];
            for i=1:n
                for j=1:m
                    if v1Van(i)==vVan(j)
                        v_EHP1Van=[v_EHP1Van v_RTVan(j)];
                    else
                        end
                end
            end
            vcomp=vVan;
            v1comp=v1Van;
            v_EHPcomp=v_EHPVan;
            v_EHP1comp=v_EHP1Van;
    end
end

```

```

        leyenda='Van Oortmerssen';
    end
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vcomp,v_EHPcomp,'k-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
plot(v1comp,v_EHP1comp,'bo','LineWidth',2);axis tight;hold on
lgd=legend({'Amadeo Garcia',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
end
else
end

% --- Executes on button press in pushbutton_Comparar.
function pushbutton_Comparar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comparar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
global tipo_barco
global metodo
global compplot
global v
global v1
global v_EHP
global v_RT
global cancelar
if comp==0 | cancelar==1
switch tipo_barco
    case 'Arrastrero'
        pop={'--Selección--','Holtrop y Mennen','Guldhammer y
Harvald','Van Oortmerssen'};
    case 'Remolcador'
        pop={'--Selección--','Holtrop y Mennen','Guldhammer y
Harvald','Van Oortmerssen'};
    case 'Pesquero'
        pop={'--Selección--','Van Oortmerssen'};
end
global Lf
global Lpp
global B
global T
global Vmin
global Vmax
global VolCarena
global t
global XF
global ATB
global Sm
global AGUA
global Estacion
global Ruta

```

```

global vAmd
global v1Amd
global v_EHPAmd
global v_RTamd
Lpp=str2num(get(handles.edit_Lpp,'String'));
B=str2num(get(handles.edit_B,'String'));
T=str2num(get(handles.edit_T,'String'));
t=str2num(get(handles.edit_t,'String'));
if t==0
XF=0;
else
XF=str2num(get(handles.edit_XF,'String'));
end
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
if get(handles.radiobutton_LfSi,'Value')==1;
Lf=str2num(get(handles.edit_Lf,'String'));
else
Lf=1.11*VolCarena^(1/3)+0.874*Lpp-2.56;
end
if get(handles.radiobutton_Rio,'Value')==1
AGUA=1;
else
AGUA=0;
end
if get(handles.radiobutton_SmSi,'Value')==1
Sm=str2num(get(handles.edit_Sm,'String'));
else
Sm=0;
end
if get(handles.radiobutton_Proal,'Value')==1
ATB=0;
else
ATB='';
end
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
contents=cellstr(get(handles.popupmenu_Estacion,'String'));
Estacion=contents{get(handles.popupmenu_Estacion,'Value')};
vAmd=v;
v1Amd=v1;
v_EHPAmd=v_EHP;
v_RTamd=v_RT;
[comp]=comparar(pop);
cancelar=1;
else
compplot=1;
switch metodo
case 'Holtrop y Mennen'
global vHolt
global v_RTHolt
global v_EHPHolt
vcomp=vHolt;
v_RTcomp=v_RTHolt;
v_EHPcomp=v_EHPHolt;
leyenda='Holtrop y Mennen';
case 'Guldhammer y Harvald'
global vGuld
global v_RTGuld
global v_EHPGuld

```

```

vcomp=vGuld;
v_RTcomp=v_RTGuld;
v_EHPcomp=v_EHPGuld;
leyenda='Guldhammer y Harvald';
case 'Van Oortmerssen'
global vVan
global v_RTVan
global v_EHPVan
vcomp=vVan;
v_RTcomp=v_RTVan;
v_EHPcomp=v_EHPVan;
leyenda='Van Oortmerssen';
end
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b',vcomp,v_RTcomp,'y-');axis tight;hold on
lgd=legend({'Amadeo Garcia',leyenda});
set(handles.plot1,'HitTest','off');
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('Rt(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r',vcomp,v_EHPcomp,'k-');axis tight;hold on
lgd=legend({'Amadeo Garcia',leyenda});
set(handles.plot2,'HitTest','off');
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
cancelar=0;
end

% --- Executes on button press in radiobutton_Rio.
function radiobutton_Rio_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Rio (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Rio

% --- Executes on button press in pushbutton_Rangos.
function pushbutton_Rangos_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Rangos (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global rangometodo
rangometodo='Amadeo García';
rangos(rangometodo);

```


Método de Van Oortmerssen.

```
function varargout = VanOortmerssen(varargin)
% VANOORTMERSSEN MATLAB code for VanOortmerssen.fig
%     VANOORTMERSSEN, by itself, creates a new VANOORTMERSSEN or
raises the existing
%     singleton*.
%
%     H = VANOORTMERSSEN returns the handle to a new VANOORTMERSSEN
or the handle to
%     the existing singleton*.
%
%     VANOORTMERSSEN('CALLBACK',hObject,eventData,handles,...) calls
the local
%     function named CALLBACK in VANOORTMERSSEN.M with the given
input arguments.
%
%     VANOORTMERSSEN('Property','Value',...) creates a new
VANOORTMERSSEN or raises the
%     existing singleton*. Starting from the left, property value
pairs are
%     applied to the GUI before VanOortmerssen_OpeningFcn gets
called. An
%     unrecognized property name or invalid value makes property
application
%     stop. All inputs are passed to VanOortmerssen_OpeningFcn via
varargin.
%
%     *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
only one
%     instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help VanOortmerssen

% Last Modified by GUIDE v2.5 14-Jan-2020 23:02:14

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @VanOortmerssen_OpeningFcn, ...
                  'gui_OutputFcn',  @VanOortmerssen_OutputFcn, ...
                  'gui_LayoutFcn',  [], ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before VanOortmerssen is made visible.
```

```

function VanOortmerssen_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to VanOortmerssen (see VARARGIN)

% Choose default command line output for VanOortmerssen
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
global tipo_barco;
axes(handles.axes_ETSIÑO);
imshow(imread('descarga.jpg'))
axes(handles.axes_Buque);
switch tipo_barco
    case 'Pesquero'
        imshow(imread('pesquero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Pesquero');
    case 'Arrastrero'
        imshow(imread('arrastrero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Arrastrero');
    case 'Remolcador'
        imshow(imread('remolcador.jpg'));
        set(handles.text_TipoBuque, 'String', 'Remolcador');
end
global calc
global cancelar
cancelar=0;
calc=0;
global comp
global metodo
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
global Am
global At

```

```

if comp==0
Lf='';
Lpp='';
B='';
T='';
Vmin='';
Vmax='';
VolCarena = '';
t='';
XF = '';
ATB = '';
Sm = '';
AGUA = '';
Estacion='';
Ruta='';
CP='';
LCB='';
iE='';
SmArbotantes='';
SmHenchimientos='';
At='';
Am='';
else
switch metodo
case 'Holtrop y Mennen'
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_Lpp, 'String', num2str(Lpp));
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'String', num2str(T));
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_CP, 'String', num2str(CP));
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
Densidad=1.000; %T/m3
set(handles radiobutton_Rio, 'Value', 1);
set(handles radiobutton_Rio, 'Enable', 'off');
set(handles radiobutton_Mar, 'Enable', 'off');
else
Densidad=1.025; %T/m3
set(handles radiobutton_Mar, 'Value', 1);
set(handles radiobutton_Rio, 'Enable', 'off');
set(handles radiobutton_Mar, 'Enable', 'off');
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_LCB, 'String', num2str(LCB));
set(handles.edit_LCB, 'Enable', 'off');
set(handles radiobutton_SmSi, 'Enable', 'off');
set(handles radiobutton_SmNo, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
if Sm==0
set(handles radiobutton_SmNo, 'Value', 1);
elseif Sm~=0
set(handles radiobutton_SmSi, 'Value', 1);

```

```

        set(handles.edit_Sm, 'String', num2str(Sm));
    end
    set(handles.popupmenu_Ruta, 'String', Ruta);
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'String', Estacion);
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    if iE==0
        set(handles.radiobutton_iENo, 'Value', 1);
    else
        set(handles.radiobutton_iESi, 'Value', 1);
        set(handles.edit_iE, 'String', num2str(iE));
    end
case 'Amadeo García'
    set(handles.edit_Lf, 'String', num2str(Lf));
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'String', num2str(Lpp));
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'String', num2str(B));
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'String', num2str(T));
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_Vmin, 'String', num2str(Vmin));
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'String', num2str(Vmax));
    set(handles.edit_Vmax, 'Enable', 'off');
    if AGUA==1
        Densidad=1.000; %T/m3
        set(handles.radiobutton_Rio, 'Value', 1);
        set(handles.radiobutton_Rio, 'Enable', 'off');
        set(handles.radiobutton_Mar, 'Enable', 'off');
    else
        Densidad=1.025; %T/m3
        set(handles.radiobutton_Mar, 'Value', 1);
        set(handles.radiobutton_Rio, 'Enable', 'off');
        set(handles.radiobutton_Mar, 'Enable', 'off');
    end
    set(handles.edit_VolCarena, 'String', num2str(VolCarena));
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    if Sm==0
        set(handles.radiobutton_SmNo, 'Value', 1);
    elseif Sm~=0
        set(handles.radiobutton_SmSi, 'Value', 1);
        set(handles.edit_Sm, 'String', num2str(Sm));
    end
    set(handles.popupmenu_Ruta, 'String', Ruta);
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'String', Estacion);
    set(handles.popupmenu_Estacion, 'Enable', 'off');
case 'Guldhammer y Harvald'
    set(handles.edit_Lf, 'String', num2str(Lf));
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Lpp, 'String', num2str(Lpp));
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'String', num2str(B));
    set(handles.edit_B, 'Enable', 'off');

```

```

set(handles.edit_T, 'String', num2str(T));
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_CP, 'String', num2str(CP));
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
Densidad=1.000; %T/m3
set(handles radiobutton_Rio, 'Value', 1);
set(handles radiobutton_Rio, 'Enable', 'off');
set(handles radiobutton_Mar, 'Enable', 'off');
else
Densidad=1.025; %T/m3
set(handles radiobutton_Mar, 'Value', 1);
set(handles radiobutton_Rio, 'Enable', 'off');
set(handles radiobutton_Mar, 'Enable', 'off');
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_LCB, 'String', num2str(LCB));
set(handles.edit_LCB, 'Enable', 'off');
set(handles radiobutton_SmSi, 'Enable', 'off');
set(handles radiobutton_SmNo, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
if Sm==0
    set(handles radiobutton_SmNo, 'Value', 1);
elseif Sm~=0
    set(handles radiobutton_SmSi, 'Value', 1);
    set(handles.edit_Sm, 'String', num2str(Sm));
end
set(handles.popupmenu_Ruta, 'String', Ruta);
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'String', Estacion);
set(handles.popupmenu_Estacion, 'Enable', 'off');
end
end
% UIWAIT makes VanOortmerssen wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = VanOortmerssen_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on button press in pushbutton_Calcular.
function pushbutton_Calcular_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Calcular (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global v
global v1
global v_RT
global v_EHP

```

```

global calc
global compplot
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
contents=cellstr(get(handles.popupmenu_Estacion,'String'));
Estacion=contents{get(handles.popupmenu_Estacion,'Value')};
if get(handles.radiobutton_SmSi,'Value')==0 &
get(handles.radiobutton_SmNo,'Value')==0
    msgbox('Debe indicar si se conoce o no el valor de
Sm.','Error','error');
elseif strcmp(Ruta,'--Selección--')
    msgbox('Debe seleccionar una ruta de servicio del
barco.','Error','error');
elseif strcmp(Estacion,'--Selección--') &&
not(strcmp(Ruta,'Desconocida'))
    msgbox('Debe seleccionar una ruta de servicio del
barco.','Error','error');
else
Lpp=str2num(get(handles.edit_Lpp,'String'));
Lf=str2num(get(handles.edit_Lf,'String'));
B=str2num(get(handles.edit_B,'String'));
T=str2num(get(handles.edit_T,'String'));
LCB=str2num(get(handles.edit_LCB,'String'));
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
CP=str2num(get(handles.edit_CP,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
if get(handles.radiobutton_Rio,'Value')==1
Densidad=1000; %kg/m3
Viscdinam=1.141*10^-6; %m2/s
else
Densidad=1025; %kg/m3
Viscdinam=1.223*10^-6; %m2/s
end
Ld=(Lf+Lpp)/2;
CB=VolCarena/(Ld*B*T);
CM=CB/CP;
lcb=100*LCB/Ld;
Desp=VolCarena*Densidad;%kg
if get(handles.radiobutton_SmSi,'Value')==1
Sm=str2num(get(handles.edit_Sm,'String'));
else
Sm=3.223*VolCarena^(2/3)+0.5402*Lf*VolCarena^(1/3);
end
CA=0;
if get(handles.radiobutton_Rugosidad,'Value')==1
    CA=CA+0.35*10^-3;
else
end
if get(handles.radiobutton_Gobierno,'Value')==1
    CA=CA+0.04*10^-3;
else
end
if get(handles.radiobutton_QuillasBalance,'Value')==1
    CA=CA+0.04*10^-3;
else
end
if get(handles.radiobutton_Aire,'Value')==1
    CA=CA+0.08*10^-3;
else
end

```

```

v_EHP=[];
v_RT=[];
v_RF=[];
v_RA=[];
v_RR=[];
v_C1=[];
v_C2=[];
v_C3=[];
v_C4=[];
v_Fn=[];
v_Rn=[];
for V=Vmin:0.001:Vmax
    RA=0.5*Densidad/9.81*Sm*(V*0.514444)^2*CA;
    Rn=V*0.514444*Ld/Viscdinam;
    v_Rn=[v_Rn Rn];
    Fn=V*0.514444/((9.81*Ld)^(1/2));
    v_Fn=[v_Fn Fn];
    CF=0.075/((log10(Rn)-2)^2);
    RF=0.5*Densidad/9.81*Sm*(V*0.514444)^2*CF;
    if get(handles.radiobutton_iESi,'Value')==1
        iE=str2num(get(handles.edit_iE,'String'));
    else
        Lr=Ld*(1-CP+(0.06*CP*lcb)/(4*CP-1));
        iE=1+89*exp(-(Lf/B)^0.80856*(1-CF)^0.30484*(1-CP-
0.0225*LCB)^0.6367*(Lr/B)^0.34574*(100*VolCarena/Lf^3)^0.16302);
        end
        Cw1=iE*Ld/B;
        C1=(79.32134-0.09287*lcb-0.00209*lcb^2-
246.45596*CP+187.13664*CP^2-1.42983*Ld/B+0.11898*(Ld/B)^2+0.15727*Cw1-
0.00064*Cw1^2-2.52862*B/T+0.50619*(B/T)^2+1.62851*CM)*10^-3;
        C2=(6714.88397+19.830*lcb+2.66997*lcb^2-
19662.024*CP+14099.904*CP^2+137.33613*Ld/B-13.36938*(Ld/B)^2-
4.49852*Cw1+0.021*Cw1^2+216.44923*B/T-35.07602*(B/T)^2-
128.72535*CM)*10^-3;
        C3=(-908.44371+2.52704*lcb-0.35794*lcb^2+755.1866*CP-
48.93952*CP^2+9.86873*Ld/B-0.77652*(Ld/B)^2+3.7902*Cw1-0.01879*Cw1^2-
9.24399*B/T+1.28571*(B/T)^2+250.6491*CM)*10^-3;
        C4=(3012.14549+2.71437*lcb+0.25521*lcb^2-
9198.8084*CP+6886.60416*CP^2-159.92694*Ld/B+16.23621*(Ld/B)^2-
0.82014*Cw1+0.00225*Cw1^2+236.3797*B/T-
44.1782*(B/T)^2+207.2558*CM)*10^-3;
        v_C1=[v_C1 C1];
        v_C2=[v_C2 C2];
        v_C3=[v_C3 C3];
        v_C4=[v_C4 C4];
        m=0.14347*CP^(-2.1976);
        RR=(C1*exp(-m/(9*Fn^2))+C2*exp(-m/(Fn^2))+C3*exp(-
m/(Fn^2))*sin(1/(Fn^2))+C4*exp(-m/(Fn^2))*cos(1/(Fn^2)))*Desp;
        RT=RF+RA+RR;
        if strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Verano')
            RT=RT*1.15;
        elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Invierno')
            RT=RT*1.2;
        elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Verano')
            RT=RT*1.2;
        elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Invierno')
            RT=RT*1.3;

```

```

        elseif strcmp(Ruta, 'Ruta del Pacífico') &
strcmp(Estacion, 'Verano')
            RT=RT*1.15;
        elseif strcmp(Ruta, 'Ruta del Pacífico') &
strcmp(Estacion, 'Invierno')
            RT=RT*1.3;
        elseif strcmp(Ruta, 'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion, 'Verano')
            RT=RT*1.12;
        elseif strcmp(Ruta, 'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion, 'Invierno')
            RT=RT*1.18;
        elseif strcmp(Ruta, 'Ruta del Este Asia') &
strcmp(Estacion, 'Verano')
            RT=RT*1.15;
        elseif strcmp(Ruta, 'Ruta del Este Asia') &
strcmp(Estacion, 'Invierno')
            RT=RT*1.2;
        else
            end
            EHP=RT*v*0.514444/75;
            v_EHP=[v_EHP EHP];
            v_RT=[v_RT RT];
            v_RF=[v_RF RF];
            v_RA=[v_RA RA];
            v_RR=[v_RR RR];
end
v=[Vmin:0.001:Vmax];
V=[];
Fn=[];
Rn=[];
RT=[];
RF=[];
RA=[];
C1=[];
C2=[];
C3=[];
C4=[];
RR=[];
EHP=[];
for i=1:((Vmin+1-Vmin)/0.001):((Vmax-Vmin)/0.001+1)
    V=[V v(i)];
    Fn=[Fn v_Fn(i)];
    Rn=[Rn v_Rn(i)];
    RT=[RT v_RT(i)];
    RF=[RF v_RF(i)];
    RA=[RA v_RA(i)];
    C1=[C1 v_C1(i)];
    C2=[C2 v_C2(i)];
    C3=[C3 v_C3(i)];
    C4=[C4 v_C4(i)];
    RR=[RR v_RR(i)];
    EHP=[EHP v_EHP(i)];
end
T=table(V',Fn',Rn',RF',RA',C1',C2',C3',C4',RR',RT',EHP');
T.Properties.VariableNames={'V_kn','Fn','Rn','RF_kg','RA_kg','C1','C2',
'C3','C4','RR_kg','RT_kg','EHP_CV'};
disp('-----Método de Van
Oortmerssen-----')
disp(' ')
disp(T)

```



```

v1=[Vmin:1:Vmax];
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b');axis tight;hold on
set(handles.plot1,'HitTest','off');
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('RT(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset')
handles.plot2=plot(v,v_EHP,'-r');axis tight;hold on
set(handles.plot2,'HitTest','off');
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
calc=1;
compplot=0;
set(handles.pushbutton_Comparar,'Enable','on');
end

```

```

% --- Executes on button press in pushbutton_Borrar.
function pushbutton_Borrar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Borrar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global calc
global comp
global metodo
set(handles.pushbutton_Comparar,'Enable','off');
calc=0;
cla(handles.axes_Rt,'reset');
cla(handles.axes_EHP,'reset');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.pushbutton_Borrar,'Enable','on');
set(handles.radiobutton_Rugosidad,'Value', 0);
set(handles.radiobutton_Gobierno,'Value', 0);
set(handles.radiobutton_QuillasBalance,'Value', 0);
set(handles.radiobutton_Aire,'Value', 0);
if comp==0
set(handles.edit_Lpp,'String','');
set(handles.edit_Lpp,'Enable','on');
set(handles.edit_Lf,'String','');
set(handles.edit_Lf,'Enable','on');
set(handles.edit_B,'String','');
set(handles.edit_B,'Enable','on');
set(handles.edit_T,'String','');
set(handles.edit_T,'Enable','on');
set(handles.edit_VolCarena,'String','');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_Vmin,'String','');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'String','');
set(handles.edit_Vmax,'Enable','on');
set(handles.edit_Sm,'String','');
set(handles.edit_Sm,'Enable','off');
set(handles.radiobutton_SmSi,'Value',0);
set(handles.radiobutton_SmNo,'Value',0);

```

```

set(handles.radiobutton_Rio, 'Value', 0);
set(handles.radiobutton_Mar, 'Value', 1);
set(handles.popupmenu_Ruta, 'Value', 1);
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Value', 1);
set(handles.edit_LCB, 'String', '');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_CP, 'String', '');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_iE, 'String', '');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Value', 0);
set(handles.radiobutton_iENo, 'Value', 0);
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
else
switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
        set(handles.edit_iE, 'String', '');
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        set(handles.radiobutton_iESi, 'Value', 0);
        set(handles.radiobutton_iENo, 'Value', 0);
    case 'Amadeo García'
        set(handles.edit_LCB, 'String', '');
        set(handles.edit_LCB, 'Enable', 'on');
        set(handles.edit_CP, 'String', '');
        set(handles.edit_CP, 'Enable', 'on');
        set(handles.edit_iE, 'String', '');
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        set(handles.radiobutton_iESi, 'Value', 0);
        set(handles.radiobutton_iENo, 'Value', 0);
end
end

```

```

function edit_CP_Callback(hObject, eventdata, handles)
% hObject    handle to edit_CP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_CP as text
%        str2double(get(hObject, 'String')) returns contents of edit_CP
as a double
handles = guidata(hObject);
global comp
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_CP, 'String')) <= 0
    msgbox('El valor del coeficiente prismático es incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');

```

```

set(handles.edit_Vmax, 'Enable', 'off');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
    if comp==0
        set(handles.radiobutton_Rugosidad, 'Enable', 'on');
        set(handles.radiobutton_Gobierno, 'Enable', 'on');
        set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
        set(handles.radiobutton_Aire, 'Enable', 'on');
        set(handles.edit_Lf, 'Enable', 'on');
        set(handles.edit_LCB, 'Enable', 'on');
        set(handles.edit_B, 'Enable', 'on');
        set(handles.edit_T, 'Enable', 'on');
        set(handles.edit_VolCarena, 'Enable', 'on');
        set(handles.edit_Lpp, 'Enable', 'on');
        set(handles.edit_Vmin, 'Enable', 'on');
        set(handles.edit_Vmax, 'Enable', 'on');
        set(handles.radiobutton_Rio, 'Enable', 'on');
        set(handles.radiobutton_Mar, 'Enable', 'on');
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        if get(handles.radiobutton_iESi, 'Value')==1
            set(handles.edit_iE, 'Enable', 'on');
        else
        end
        set(handles.radiobutton_SmSi, 'Enable', 'on');
        set(handles.radiobutton_SmNo, 'Enable', 'on');
        if get(handles.radiobutton_SmSi, 'Value')==1
            set(handles.edit_Sm, 'Enable', 'on');
        else
        end
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
        Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
        if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
        else
            set(handles.popupmenu_Estacion, 'Enable', 'on');
        end
        set(handles.pushbutton_Comprobar, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        else
        set(handles.pushbutton_Comprobar, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        set(handles.edit_LCB, 'Enable', 'on');
    end
end

```

```

set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
end
end

% --- Executes during object creation, after setting all properties.
function edit_CP_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_CP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Lf_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Lf as text
%         str2double(get(hObject, 'String')) returns contents of edit_Lf
as a double
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_Lf, 'String'))<=0
    msgbox('El valor de la eslora de la flotación es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');

```

```

set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lf_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

```

```

function edit_VolCarena_Callback(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_VolCarena as
text
%          str2double(get(hObject,'String')) returns contents of
edit_VolCarena as a double
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_VolCarena,'String'))<=0
    msgbox('El valor del volumen de carena es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.radiobutton_Rugosidad, 'Enable', 'off');
    set(handles.radiobutton_Gobierno, 'Enable', 'off');
    set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
    set(handles.radiobutton_Aire, 'Enable', 'off');
else
    set(handles.radiobutton_Rugosidad, 'Enable', 'on');
    set(handles.radiobutton_Gobierno, 'Enable', 'on');
    set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
    set(handles.radiobutton_Aire, 'Enable', 'on');
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
    set(handles.edit_Lpp, 'Enable', 'on');
    set(handles.edit_CP, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    if get(handles.radiobutton_iESi,'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
    else

```

```

end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_VolCarena_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

```

```

function edit_T_Callback(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_T as text
%       str2double(get(hObject, 'String')) returns contents of edit_T
as a double
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_T, 'String'))<=0
    msgbox('El valor del calado es incorrecto.', 'Aviso.', 'error');
set(hObject, 'String', '');
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'Enable', 'off');
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');

```

```

set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_T_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))

```



```

        set(hObject,'BackgroundColor','white');
end

function edit_B_Callback(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_B as text
%        str2double(get(hObject,'String')) returns contents of edit_B
as a double
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_B,'String'))<=0
    msgbox('El valor de la manga es incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_Lpp,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_VolCarena,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.popupmenu_Ruta,'Enable','off');
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.radiobutton_Rio,'Enable','off');
    set(handles.radiobutton_Mar,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(handles.pushbutton_Calcular,'Enable','off');
    set(handles.pushbutton_Borrar,'Enable','off');
    set(handles.radiobutton_Rugosidad,'Enable','off');
    set(handles.radiobutton_Gobierno,'Enable','off');
    set(handles.radiobutton_QuillasBalance,'Enable','off');
    set(handles.radiobutton_Aire,'Enable','off');
else
    set(handles.radiobutton_Rugosidad,'Enable','on');
    set(handles.radiobutton_Gobierno,'Enable','on');
    set(handles.radiobutton_QuillasBalance,'Enable','on');
    set(handles.radiobutton_Aire,'Enable','on');
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_LCB,'Enable','on');
    set(handles.edit_Lpp,'Enable','on');
    set(handles.edit_T,'Enable','on');
    set(handles.edit_VolCarena,'Enable','on');
    set(handles.edit_CP,'Enable','on');
    set(handles.edit_Vmin,'Enable','on');
    set(handles.edit_Vmax,'Enable','on');
    set(handles.radiobutton_Rio,'Enable','on');
    set(handles.radiobutton_Mar,'Enable','on');
    set(handles.radiobutton_iESi,'Enable','on');
    set(handles.radiobutton_iENo,'Enable','on');
    if get(handles.radiobutton_iESi,'Value')==1

```

```

        set(handles.edit_iE, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.popupmenu_Ruta, 'Enable', 'on');
    contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
    Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_B_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Lpp_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lpp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Lpp as text
%         str2double(get(hObject, 'String')) returns contents of
edit_Lpp as a double
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_Lpp, 'String'))<=0
    msgbox('El valor de la eslora entre perpendiculares es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');

```

```

set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lpp_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lpp (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%     See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Comprobar.
function pushbutton_Comprobar_Callback(hObject, eventdata, handles)
% hObject     handle to pushbutton_Comprobar (see GCBO)
% eventdata   reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)
handles = guidata(handles);
comprobariE=0;
comprobarFn=0;
comprobarVLF=0;
global tipo_barco
if strcmp(get(handles.edit_Lpp,'String'),'') |
strcmp(get(handles.edit_Lpp,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Lf,'String'),'') |
strcmp(get(handles.edit_Lf,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_B,'String'),'') |
strcmp(get(handles.edit_B,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_T,'String'),'') |
strcmp(get(handles.edit_T,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_VolCarena,'String'),'') |
strcmp(get(handles.edit_VolCarena,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmin,'String'),'') |
strcmp(get(handles.edit_Vmin,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmax,'String'),'') |
strcmp(get(handles.edit_Vmax,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_LCB,'String'),'') |
strcmp(get(handles.edit_LCB,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_CP,'String'),'') |
strcmp(get(handles.edit_CP,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif get(handles.radiobutton_iESi,'Value')==1 &
(strcmp(get(handles.edit_iE,'String'),' ') |
strcmp(get(handles.edit_iE,'String'),char(zeros(1,0))))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');

```

```

elseif get(handles.radiobutton_SmSi, 'Value')==1 &
(strcmp(get(handles.edit_Sm, 'String'), ' ') |
strcmp(get(handles.edit_Sm, 'String'), char(zeros(1,0))))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.', 'Error', 'error');
elseif get(handles.radiobutton_iESi, 'Value')==0 &
get(handles.radiobutton_iENo, 'Value')==0
    msgbox('Debe indicar si se conoce o no el valor de
iE.', 'Error', 'error');
else
Lpp=str2num(get(handles.edit_Lpp, 'String'));
Lf=str2num(get(handles.edit_Lf, 'String'));
B=str2num(get(handles.edit_B, 'String'));
T=str2num(get(handles.edit_T, 'String'));
LCB=str2num(get(handles.edit_LCB, 'String'));
VolCarena=str2num(get(handles.edit_VolCarena, 'String'));
CP=str2num(get(handles.edit_CP, 'String'));
Vmin=str2num(get(handles.edit_Vmin, 'String'));
Vmax=str2num(get(handles.edit_Vmax, 'String'));
Ld=(Lf+Lpp)/2;
lcb=100*LCB/Ld;
CB=VolCarena/(Ld*B*T);
CM=CB/CP;
if get(handles.radiobutton_Rio, 'Value')==1
Densidad=1000; %kg/m3
Viscdinam=1.141*10^-6; %m2/s
else
Densidad=1025; %kg/m3
Viscdinam=1.223*10^-6; %m2/s
end
for V=Vmin:(Vmax-Vmin):Vmax
    Rn=V*Ld/Viscdinam;
    Fn=V*0.514444/((9.81*Ld)^(1/2));
    CF=0.075/((log10(Rn)-2)^2);
    if get(handles.radiobutton_iESi, 'Value')==1
        iE=str2num(get(handles.edit_iE, 'String'));
    else
        Lr=Lf*(1-CP+(0.06*CP*lcb)/(4*CP-1));
        iE=1+89*exp(-(Lf/B)^0.80856*(1-CF)^0.30484*(1-CP-
0.0225*lcb)^0.6367*(Lr/B)^0.34574*(100*VolCarena/Lf^3)^0.16302);
    end
    if 10>iE | iE>46
        comprobariE=1;
    elseif 0>Fn | Fn>0.5
        comprobarFn=1;
    elseif 0>V*0.514444/((Lf)^(1/2)) | V*0.514444/((Lf)^(1/2))>1.79
        comprobarVLF=1;
    else
        end
end
if tipo_barco==0
    msgbox('Debe seleccionar el tipo de buque al que aplicar el método
de cálculo.', 'Error', 'error');
elseif 8>Lf | Lf>80
    msgbox({'El valor de la eslora de flotación está fuera de rango de
aplicación.'
        ,
        '8 < Lf < 80
'}, 'Fuera de rango', 'error');
elseif 5>VolCarena | VolCarena>3000
    msgbox({'El valor del volumen de carena está fuera del rango de
aplicación.'

```



```

    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.edit_CP,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
end
end

% --- Executes on selection change in popupmenu_Ruta.
function popupmenu_Ruta_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Ruta contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Ruta
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.popupmenu_Estacion,'Value',1);
else
    set(handles.popupmenu_Estacion,'Enable','on');
    set(handles.popupmenu_Estacion,'Value',1);
end

% --- Executes during object creation, after setting all properties.
function popupmenu_Ruta_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on selection change in popupmenu_Estacion.
function popupmenu_Estacion_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Estacion contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Estacion

```

```

% --- Executes during object creation, after setting all properties.
function popupmenu_Estacion_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmax_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Vmax (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmax as text
% str2double(get(hObject,'String')) returns contents of
edit_Vmax as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<str2num(get(handles.edit_Vmin
,'String')) & str2num(get(handles.edit_Vmax,'String'))>0
    msgbox('El valor de la velocidad máxima debe ser mayor al de la
mínima.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.radiobutton_Rugosidad, 'Enable', 'off');
    set(handles.radiobutton_Gobierno, 'Enable', 'off');
    set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
    set(handles.radiobutton_Aire, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmax,'String'))<=0
    msgbox('El valor de la velocidad máxima es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');

```



```

set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');

```

```

end

% --- Executes during object creation, after setting all properties.
function edit_Vmax_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmax (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmin_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmin as text
%         str2double(get(hObject,'String')) returns contents of
edit_Vmin as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<str2num(get(handles.edit_Vmin
,'String')) & str2num(get(handles.edit_Vmin,'String'))>0
    msgbox('El valor de la velocidad mínima debe ser mayor al de la
máxima.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.radiobutton_Rugosidad, 'Enable', 'off');
    set(handles.radiobutton_Gobierno, 'Enable', 'off');
    set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
    set(handles.radiobutton_Aire, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmin,'String'))<0

```

```

msgbox('El valor de la velocidad mínima es
incorrecto.', 'Aviso.', 'error');
set(hObject, 'String', '');
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_Lpp, 'Enable', 'off');
set(handles.edit_Vmax, 'Enable', 'off');
set(handles.edit_CP, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');

```

```

end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmin_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_iE_Callback(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_iE as text
%         str2double(get(hObject,'String')) returns contents of edit_iE
as a double
handles = guihandles;
global comp
global metodo
if str2num(get(handles.edit_iE,'String'))<=0
    msgbox('El valor del semiángulo de la flotación es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_CP, 'Enable', 'off');
    set(handles.edit_Lpp, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
    set(handles.radiobutton_Rugosidad, 'Enable', 'off');
    set(handles.radiobutton_Gobierno, 'Enable', 'off');
    set(handles.radiobutton_QuillasBalance, 'Enable', 'off');

```

```

    set(handles.radiobutton_Aire, 'Enable', 'off');
else
    if comp==0
        set(handles.radiobutton_Rugosidad, 'Enable', 'on');
        set(handles.radiobutton_Gobierno, 'Enable', 'on');
        set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
        set(handles.radiobutton_Aire, 'Enable', 'on');
        set(handles.edit_Lf, 'Enable', 'on');
        set(handles.edit_B, 'Enable', 'on');
        set(handles.edit_T, 'Enable', 'on');
        set(handles.edit_LCB, 'Enable', 'on');
        set(handles.edit_VolCarena, 'Enable', 'on');
        set(handles.edit_CP, 'Enable', 'on');
        set(handles.edit_Vmin, 'Enable', 'on');
        set(handles.edit_Vmax, 'Enable', 'on');
        set(handles.radiobutton_Rio, 'Enable', 'on');
        set(handles.radiobutton_Mar, 'Enable', 'on');
        set(handles.radiobutton_iESi, 'Enable', 'on');
        set(handles.radiobutton_iENo, 'Enable', 'on');
        set(handles.edit_Lpp, 'Enable', 'on');
        set(handles.radiobutton_SmSi, 'Enable', 'on');
        set(handles.radiobutton_SmNo, 'Enable', 'on');
        if get(handles.radiobutton_SmSi, 'Value')==1
            set(handles.edit_Sm, 'Enable', 'on');
        else
        end
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
        Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
        if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
        else
            set(handles.popupmenu_Estacion, 'Enable', 'on');
        end
        set(handles.pushbutton_Comprobar, 'Enable', 'on');
        set(handles.pushbutton_Borrar, 'Enable', 'on');
        else
            set(handles.radiobutton_iESi, 'Enable', 'on');
            set(handles.radiobutton_iENo, 'Enable', 'on');
            set(handles.radiobutton_Rugosidad, 'Enable', 'on');
            set(handles.radiobutton_Gobierno, 'Enable', 'on');
            set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
            set(handles.radiobutton_Aire, 'Enable', 'on');
            set(handles.pushbutton_Comprobar, 'Enable', 'on');
            set(handles.pushbutton_Borrar, 'Enable', 'on');
        switch metodo
        case 'Holtrop y Mennen'
        case 'Guldhammer y Harvald'
            set(handles.edit_LCB, 'Enable', 'on');
        case 'Amadeo García'
            set(handles.edit_LCB, 'Enable', 'on');
            set(handles.edit_CP, 'Enable', 'on');
        end
        end
end

% --- Executes during object creation, after setting all properties.
function edit_iE_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%     See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_iENo.
function radiobutton_iENo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_iENo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iENo
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject,'Value')==1
    set(handles.radiobutton_iESi,'Value',0);
    set(handles.edit_iE,'Enable','off');
    set(handles.edit_iE,'String','');
else
end

% --- Executes on button press in radiobutton_iESi.
function radiobutton_iESi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_iESi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iESi
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject,'Value')==1
    set(handles.radiobutton_iENo,'Value',0);
    set(handles.edit_iE,'Enable','on');
else
end

function edit_Sm_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Sm as text
%     str2double(get(hObject,'String')) returns contents of edit_Sm
%     as a double
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_Sm,'String'))<=0
    msgbox('El valor de la superficie mojada es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');

```

```

set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
set(handles.radiobutton_Rugosidad, 'Enable', 'off');
set(handles.radiobutton_Gobierno, 'Enable', 'off');
set(handles.radiobutton_QuillasBalance, 'Enable', 'off');
set(handles.radiobutton_Aire, 'Enable', 'off');
else
set(handles.radiobutton_Rugosidad, 'Enable', 'on');
set(handles.radiobutton_Gobierno, 'Enable', 'on');
set(handles.radiobutton_QuillasBalance, 'Enable', 'on');
set(handles.radiobutton_Aire, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Borrar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Sm_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in radiobutton_SmNo.
function radiobutton_SmNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject, 'Value') returns toggle state of radiobutton_SmNo
handles = guihandles;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject, 'Value')==1
    set(handles.radiobutton_SmSi, 'Value', 0);
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.edit_Sm, 'String', '');
else
end
end

```

```

% --- Executes on button press in radiobutton_SmSi.
function radiobutton_SmSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_SmSi
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if get(hObject,'Value')==1
    set(handles.radiobutton_SmNo, 'Value', 0);
    set(handles.edit_Sm, 'Enable', 'on');
else
end

```

```

function edit_LCB_Callback(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_LCB as text
%        str2double(get(hObject,'String')) returns contents of
edit_LCB as a double

```

```

% --- Executes during object creation, after setting all properties.
function edit_LCB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

% --- Executes on button press in radiobutton_Rugosidad.
function radiobutton_Rugosidad_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Rugosidad (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Rugosidad

```

```

% --- Executes on button press in radiobutton_Gobierno.
function radiobutton_Gobierno_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Gobierno (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

```



```

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_Gobierno

% --- Executes on button press in radiobutton_QuillasBalance.
function radiobutton_QuillasBalance_Callback(hObject, eventdata,
handles)
% hObject    handle to radiobutton_QuillasBalance (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hint: get(hObject,'Value') returns toggle state of
radiobutton_QuillasBalance

% --- Executes on button press in radiobutton_Aire.
function radiobutton_Aire_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Aire (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Aire

% --- Executes on button press in pushbutton_Cambiar.
function pushbutton_Cambiar_Callback(~, eventdata, handles)
% hObject    handle to pushbutton_Cambiar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guihandles;
global comp
global metodo
set(handles.pushbutton_Comparar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Rangos, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
if comp==0
set(handles.edit_Lpp, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.edit_CP, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
else
switch metodo
    case 'Holtrop y Mennen'
    case 'Guldhammer y Harvald'
        set(handles.radiobutton_iESi, 'Enable', 'on');

```

```

        set(handles.radiobutton_iENo,'Enable','on');
        if get(handles.radiobutton_iESi,'Value')==1
            set(handles.edit_iE,'Enable','on');
        else
            end
        case 'Amadeo García'
            set(handles.edit_CP,'Enable','on');
            set(handles.edit_LCB,'Enable','on');
            set(handles.radiobutton_iESi,'Enable','on');
            set(handles.radiobutton_iENo,'Enable','on');
            if get(handles.radiobutton_iESi,'Value')==1
                set(handles.edit_iE,'Enable','on');
            else
                end
    end
end
end

% --- Executes on button press in pushbutton_Salir.
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Salir (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
close(gcf)
global comp
global metodo
global v
global v_EHP
global v_RT
comp=0;
switch metodo
    case 'Holtrop y Mennen'
        global vHolt
        global v_RTHolt
        global v_EHPHolt
        v=vHolt;
        v_RT=v_RTHolt;
        v_EHP=v_EHPHolt;
    case 'Guldhammer y Harvald'
        global vGuld
        global v_RTGuld
        global v_EHPGuld
        v=vGuld;
        v_RT=v_RTGuld;
        v_EHP=v_EHPGuld;
    case 'Amadeo García'
        global vAmd
        global v_RTAMD
        global v_EHPAMD
        v=vAmd;
        v_RT=v_RTAMD;
        v_EHP=v_EHPAMD;
end

% --- Executes on mouse press over axes background.
function axes_Rt_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_Rt (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v

```

```

global v_RT
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_RT);
v_RT1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_RT1=[v_RT1 v_RT(j)];
        else
            end
        end
    end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Guldhammer y Harvald'
            global vGuld
            global v1Guld
            global v_RTGuld
            n=length(v1Guld);
            m=length(v_RTGuld);
            v_RT1Guld=[];
            for i=1:n
                for j=1:m
                    if v1Guld(i)==vGuld(j)
                        v_RT1Guld=[v_RT1Guld v_RTGuld(j)];
                    else
                        end
                    end
                end
            end
            vcomp=vGuld;
            v1comp=v1Guld;
            v_RTcomp=v_RTGuld;
            v_RT1comp=v_RT1Guld;
            leyenda='Guldhammer y Harvald';
        case 'Amadeo Garcia'
            global vAmd
            global v1Amd
            global v_RTAMD
            n=length(v1Amd);
            m=length(v_RTAMD);
            v_RT1Amd=[];
            for i=1:n

```

```

        for j=1:m
            if v1Amd(i)==vAmd(j)
                v_RT1Amd=[v_RT1Amd v_RTAMD(j)];
            else
                end
            end
        end
        vcomp=vAmd;
        v1comp=v1Amd;
        v_RTcomp=v_RTAMD;
        v_RT1comp=v_RT1Amd;
        leyenda='Amadeo García';
    case 'Holtrop y Mennen'
        global vHolt
        global v1Holt
        global v_RTHolt
        n=length(v1Holt);
        m=length(v_RTHolt);
        v_RT1Holt=[];
        for i=1:n
            for j=1:m
                if v1Holt(i)==vHolt(j)
                    v_RT1Holt=[v_RT1Holt v_RTHolt(j)];
                else
                    end
            end
        end
        vcomp=vHolt;
        v1comp=v1Holt;
        v_RTcomp=v_RTHolt;
        v_RT1comp=v_RT1Holt;
        leyenda='Holtrop y Mennen';
    end
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off') ;
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(vcomp,v_RTcomp,'y-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
plot(v1comp,v_RT1comp,'ro','LineWidth',2);axis tight;hold on
lgd=legend({'Van Oortmerssen',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
end
else
end

% --- Executes on mouse press over axes background.
function axes_EHP_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_EHP
global v1
global calc

```

```

global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_EHP);
v_EHP1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_EHP1=[v_EHP1 v_EHP(j)];
        else
            end
        end
    end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Guldhammer y Harvald'
            global vGuld
            global v1Guld
            global v_EHPGuld
            n=length(v1Guld);
            m=length(v_EHPGuld);
            v_EHP1Guld=[];
            for i=1:n
                for j=1:m
                    if v1Guld(i)==vGuld(j)
                        v_EHP1Guld=[v_EHP1Guld v_EHPGuld(j)];
                    else
                        end
                    end
                end
            end
            vcomp=vGuld;
            v1comp=v1Guld;
            v_EHPcomp=v_EHPGuld;
            v_EHP1comp=v_EHP1Guld;
            leyenda='Guldhammer y Harvald';
        case 'Amadeo Garcia'
            global vAmd
            global v1Amd
            global v_EHPAmd
            n=length(v1Amd);
            m=length(v_EHPAmd);
            v_EHP1Amd=[];
            for i=1:n
                for j=1:m
                    if v1Amd(i)==vAmd(j)
                        v_EHP1Amd=[v_EHP1Amd v_EHPAmd(j)];
                    end
                end
            end
        end
    end
end

```

```

        else
        end
    end
    end
    vcomp=vAmd;
    vlcomp=vlAmd;
    v_EHPcomp=v_EHPAmd;
    v_EHP1comp=v_EHP1Amd;
    leyenda='Amadeo Garcia';
case 'Holtrop y Mennen'
    global vHolt
    global vlHolt
    global v_RTHolt
    n=length(vlHolt);
    m=length(v_RTHolt);
    v_RT1Holt=[];
    for i=1:n
        for j=1:m
            if vlHolt(i)==vHolt(j)
                v_RT1Holt=[v_RT1Holt v_RTHolt(j)];
            else
            end
        end
    end
    vcomp=vHolt;
    vlcomp=vlHolt;
    v_RTcomp=v_RTHolt;
    v_RT1comp=v_RT1Holt;
    leyenda='Holtrop y Mennen';
end
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vcomp,v_EHPcomp,'k-','LineWidth',2);axis tight;hold on
plot(vl,v_EHP1,'bo','LineWidth',2);axis tight;hold on
plot(vlcomp,v_EHP1comp,'bo','LineWidth',2);axis tight;hold on
lgd=legend({'Van Oortmerssen',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
end
else
end

% --- Executes on button press in pushbutton_Comparar.
function pushbutton_Comparar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comparar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
global tipo_barco
global metodo
global v
global vl
global v_EHP

```

```

global v_RT
global vVan
global v1Van
global v_EHPVan
global v_RTVan
global compplot
global cancelar
if comp==0 | cancelar==1
switch tipo_barco
    case 'Arrastrero'
        pop={'--Selección--', 'Holtrop y Mennen', 'Guldhammer y
Harvald', 'Amadeo García', };
    case 'Remolcador'
        pop={'--Selección--', 'Holtrop y Mennen', 'Guldhammer y
Harvald', 'Amadeo García', };
    case 'Pesquero'
        pop={'--Selección--', 'Amadeo García', };
end
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global LCB
global iE
global Sm
global AGUA
global Estacion
global Ruta
Lf=str2num(get(handles.edit_Lf, 'String'));
Lpp=str2num(get(handles.edit_Lpp, 'String'));
B=str2num(get(handles.edit_B, 'String'));
T=str2num(get(handles.edit_T, 'String'));
CP=str2num(get(handles.edit_CP, 'String'));
Vmin=str2num(get(handles.edit_Vmin, 'String'));
Vmax=str2num(get(handles.edit_Vmax, 'String'));
VolCarena=str2num(get(handles.edit_VolCarena, 'String'));
if get(handles.radiobutton_Rio, 'Value')==1
Densidad=1.000; %Tm3
AGUA=1;
else
Densidad=1.025; %T/m3
AGUA=0;
end
LCB=str2num(get(handles.edit_LCB, 'String'));
if get(handles.radiobutton_SmSi, 'Value')==1
    Sm=str2num(get(handles.edit_Sm, 'String'));
else
    Sm=0;
end
if get(handles.radiobutton_iESi, 'Value')==1
    iE=str2num(get(handles.edit_iE, 'String'));
else
    iE=0;
end
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
contents=cellstr(get(handles.popupmenu_Estacion, 'String'));

```

```

Estacion=contents(get(handles.popupmenu_Estacion, 'Value'));
vVan=v;
v1Van=v1;
v_EHPVan=v_EHP;
v_RTVan=v_RT;
[comp]=comparar(pop);
cancelar=1;
else
compplot=1;
switch metodo
    case 'Guldhammer y Harvald'
        global vGuld
        global v_RTGuld
        global v_EHPGuld
        vcomp=vGuld;
        v_RTcomp=v_RTGuld;
        v_EHPcomp=v_EHPGuld;
        leyenda='Guldhammer y Harvald';
    case 'Amadeo Garcia'
        global vAmd
        global v_RTAMD
        global v_EHPAMD
        vcomp=vAmd;
        v_RTcomp=v_RTAMD;
        v_EHPcomp=v_EHPAMD;
        leyenda='Amadeo Garcia';
    case 'Holtrop y Mennen'
        global vHolt
        global v_RTHolt
        global v_EHPHolt
        vcomp=vHolt;
        v_RTcomp=v_RTHolt;
        v_EHPcomp=v_EHPHolt;
        leyenda='Holtrop y Mennen';
end
axes(handles.axes_Rt);
cla(handles.axes_Rt, 'reset');
handles.plot1=plot(v,v_RT, '-b', vcomp, v_RTcomp, 'y-'); axis tight; hold on
lgd=legend({'Van Oortmerssen', leyenda});
set(handles.plot1, 'HitTest', 'off') ;
set(handles.axes_Rt, 'ButtonDownFcn', @(s,e) axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('Rt(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP, 'reset');
handles.plot2=plot(v,v_EHP, '-r', vcomp, v_EHPcomp, 'k-'); axis tight; hold on
lgd=legend({'Van Oortmerssen', leyenda});
set(handles.plot2, 'HitTest', 'off') ;
set(handles.axes_EHP, 'ButtonDownFcn', @(s,e) axes_EHP_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
cancelar=0;
end

% --- Executes on button press in radiobutton_Rio.
function radiobutton_Rio_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_Rio (see GCBO)

```



```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');
% Hint: get(hObject,'Value') returns toggle state of radiobutton_Rio

% --- Executes on button press in radiobutton_Mar.
function radiobutton_Mar_Callback(hObject, eventdata, handles)
% hObject handle to radiobutton_Mar (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hint: get(hObject,'Value') returns toggle state of radiobutton_Mar

% --- Executes on button press in pushbutton_Rangos.
function pushbutton_Rangos_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Rangos (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global rangometodo
rangometodo='Van Oortmerssen';
rangos(rangometodo);

```

Método de Mercier-Savitsky.

```
function varargout = MercierSavitsky(varargin)
% MERCIERSAVITSKY MATLAB code for MercierSavitsky.fig
%   MERCIERSAVITSKY, by itself, creates a new MERCIERSAVITSKY or
%   raises the existing
%   singleton*.
%
%   H = MERCIERSAVITSKY returns the handle to a new MERCIERSAVITSKY
%   or the handle to
%   the existing singleton*.
%
%   MERCIERSAVITSKY('CALLBACK',hObject,eventData,handles,...) calls
%   the local
%   function named CALLBACK in MERCIERSAVITSKY.M with the given
%   input arguments.
%
%   MERCIERSAVITSKY('Property','Value',...) creates a new
%   MERCIERSAVITSKY or raises the
%   existing singleton*. Starting from the left, property value
%   pairs are
%   applied to the GUI before MercierSavitsky_OpeningFcn gets
%   called. An
%   unrecognized property name or invalid value makes property
%   application
%   stop. All inputs are passed to MercierSavitsky_OpeningFcn via
%   varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
%   only one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help MercierSavitsky

% Last Modified by GUIDE v2.5 14-Jan-2020 23:29:39

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @MercierSavitsky_OpeningFcn, ...
                  'gui_OutputFcn',  @MercierSavitsky_OutputFcn, ...
                  'gui_LayoutFcn',   [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before MercierSavitsky is made visible.
```

```

function MercierSavitsky_OpeningFcn(hObject, eventdata, handles,
varargin)
% This function has no output args, see OutputFcn.
% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to MercierSavitsky (see VARARGIN)

% Choose default command line output for MercierSavitsky
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
global tipo_barco;
axes(handles.axes_ETSIÑO);
imshow(imread('descarga.jpg'))
axes(handles.axes_Buque);
switch tipo_barco
    case 'Buque rápido'
        imshow(imread('buque rapido.jpg'));
        set(handles.text_TipoBuque, 'String', 'Buque rápido');
    case 'Patrullero'
        imshow(imread('patrullero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Patrullero');
    case 'Militar'
        imshow(imread('militar.jpg'));
        set(handles.text_TipoBuque, 'String', 'Militar');
end
global calc
global cancelar
cancelar=0;
calc=0;
global comp
global metodo
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
global Am
global At

```

```

if comp==0
Lf='';
Lpp='';
B='';
T='';
Vmin='';
Vmax='';
VolCarena ='';
t='';
XF ='';
ATB ='';
Sm ='';
AGUA ='';
Estacion='';
Ruta='';
CP='';
LCB='';
iE='';
SmArbotantes='';
SmHenchimientos='';
At='';
Am='';
else
switch metodo
case 'Ping-Zhong'
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_Am, 'String', num2str(Am));
set(handles.edit_At, 'String', num2str(At));
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
Densidad=1.000; %T/m3
set(handles.radiobutton_Rio, 'Value', 1);
else
Densidad=1.025; %T/m3
set(handles.radiobutton_Mar, 'Value', 1);
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_LCB, 'String', num2str(LCB));
if Sm==0
set(handles.radiobutton_SmNo, 'Value', 1);
elseif Sm~=0
set(handles.radiobutton_SmSi, 'Value', 1);
set(handles.edit_Sm, 'String', num2str(Sm));
end
set(handles.popupmenu_Ruta, 'String', Ruta);
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'String', Estacion);
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
if iE==0
set(handles.radiobutton_iENo, 'Value', 1);
else
set(handles.radiobutton_iESi, 'Value', 1);
set(handles.edit_iE, 'String', num2str(iE));

```

```

        end
    end
end

% UIWAIT makes MercierSavitsky wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = MercierSavitsky_OutputFcn(hObject, eventdata,
handles)
% varargout    cell array for returning output args (see VARARGOUT);
% hObject      handle to figure
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on button press in pushbutton_Calcular.
function pushbutton_Calcular_Callback(hObject, eventdata, handles)
% hObject      handle to pushbutton_Calcular (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
global v
global v1
global calc
global v_EHP
global v_RT
global compplot
celdas=0;
seleccion=0;
conocido=0;
if get(handles.radiobutton_SmSi, 'Value')==1
    if strcmp(get(handles.edit_Sm, 'String'), '') |
strcmp(get(handles.edit_Sm, 'String'), char(zeros(1,0)))
        celdas=1;
    else
    end
elseif get(handles.radiobutton_SmNo, 'Value')==1
    if strcmp(get(handles.edit_T, 'String'), '') |
strcmp(get(handles.edit_T, 'String'), char(zeros(1,0)))
        celdas=1;
    else
    end
elseif get(handles.radiobutton_iESi, 'Value')==1
    if strcmp(get(handles.edit_iE, 'String'), '') |
strcmp(get(handles.edit_iE, 'String'), char(zeros(1,0)))
        celdas=1;
    else
    end
elseif get(handles.radiobutton_iENo, 'Value')==1
    if strcmp(get(handles.edit_LCB, 'String'), '') |
strcmp(get(handles.edit_LCB, 'String'), char(zeros(1,0)))
        celdas=1;
    elseif strcmp(get(handles.edit_T, 'String'), '') |
strcmp(get(handles.edit_T, 'String'), char(zeros(1,0)))
        celdas=1;
    else

```

```

    end
elseif strcmp(get(handles.edit_Lf,'String'),'') |
strcmp(get(handles.edit_Lf,'String'),char(zeros(1,0)))
    celdas=1;
elseif strcmp(get(handles.edit_B,'String'),'') |
strcmp(get(handles.edit_B,'String'),char(zeros(1,0)))
    celdas=1;
elseif strcmp(get(handles.edit_At,'String'),'') |
strcmp(get(handles.edit_At,'String'),char(zeros(1,0)))
    celdas=1;
elseif strcmp(get(handles.edit_Am,'String'),'') |
strcmp(get(handles.edit_Am,'String'),char(zeros(1,0)))
    celdas=1;
else
end
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
contents=cellstr(get(handles.popupmenu_Estacion,'String'));
Estacion=contents{get(handles.popupmenu_Estacion,'Value')};
if strcmp(Ruta,'--Selección--')
    seleccion=1;
elseif strcmp(Ruta,'Desconocida')
else
    if strcmp(Estacion,'--Selección--')
        seleccion=1;
    else
    end
end
if get(handles.radiobutton_SmSi,'Value')==0 &
get(handles.radiobutton_SmNo,'Value')==0
    conocido=1;
elseif get(handles.radiobutton_iESi,'Value')==0 &
get(handles.radiobutton_iENo,'Value')==0
    conocido=1;
else
end
if celdas~=0
msgbox('Rellene todas las celdas vacías.','Error','error');
elseif conocido~=0
msgbox('Indique si conoce o no los valores de Sm y
iE.','Error','error');
elseif seleccion~=0
msgbox('Asegurese de seleccionar alguna ruta y estación de
servicio.','Error','error');
else
Lf=str2num(get(handles.edit_Lf,'String'));
B=str2num(get(handles.edit_B,'String'));
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
At=str2num(get(handles.edit_At,'String'));
Am=str2num(get(handles.edit_Am,'String'));
CA=0;
if get(handles.radiobutton_Rio,'Value')==1
Densidad=1000; %kg/m3
Viscdinam=1.141*10^-6; %m2/s
else
Densidad=1025; %kg/m3
Viscdinam=1.223*10^-6; %m2/s
end
if get(handles.radiobutton_SmNo,'Value')==1

```

```

T=str2num(get(handles.edit_T, 'String'));

Sm=VolCarena^(2/3)*2.262*sqrt(Lf/(VolCarena^(1/3)))*(1+0.046*B/T+0.002
87*(B/T)^2);
else
    Sm=str2num(get(handles.edit_Sm, 'String'));
end
Desp2=45360;
VolCarena2=Desp2/1025;
v_EHP=[];
v_RT=[];
v_CT=[];
v_CF=[];
v_CA=[];
v_Fnv=[];
v_Rn=[];
for V=Vmin:0.001:Vmax
Fnv=V*0.514444/sqrt(9.81*VolCarena^(1/3));
v_Fnv=[v_Fnv Fnv];
Rn=Fnv*Lf/(VolCarena^(1/3))*sqrt(9.81*VolCarena2)/Viscdinam;
v_Rn=[v_Rn Rn];
CF=0.075/((log10(Rn)-2)^2);
CF2=newton(Rn);
if get(handles radiobutton_iENo, 'Value')==1
    T=str2num(get(handles.edit_T, 'String'));
    LCB=str2num(get(handles.edit_LCB, 'String'));
    lcb=100*LCB/Lf;
    CB=VolCarena/(Lf*B*T);
    CM=Am/(B*T);
    CP=CB/CM;
    Lr=Lf*(1-CP+(0.06*CP*lcb)/(4*CP-1));
    iE=1+89*exp(-(Lf/B)^0.80856*(1-CF)^0.30484*(1-CP-
0.0225*lcb)^0.6367*(Lr/B)^0.34574*(100*VolCarena/Lf^3)^0.16302);
else
    iE=str2num(get(handles.edit_iE, 'String'));
end
Desp=VolCarena*Densidad;
TABLA={'Fnv',1,1.1,1.2,1.3,1.4,1.5,1.6,1.7,1.8,1.9,2;

'A1',0.06473,0.10776,0.09483,0.03475,0.03013,0.03163,0.03194,0.04343,0
.05036,0.05612,0.05967;
'A2',-0.48680,-0.88787,-0.63720,0,0,0,0,0,0,0,0;
'A4',-0.01030,-0.01634,-0.01540,-0.00978,-0.00664,0,0,0,0,0,0;
'A5',-0.06490,-0.13444,-0.13580,-0.05097,-0.05540,-0.10543,-
0.08599,-0.13289,-0.15597,-0.18661,-0.19758;
'A6',0,0,-0.16046,-0.21880,-0.19359,-0.20540,-0.19442,-
0.18062,-0.17813,-0.18288,-0.20152;

'A7',0.10628,0.18186,0.16803,0.10434,0.09612,0.06007,0.06191,0.05487,0
.05099,0.04744,0.04645;

'A8',0.97310,1.83080,1.55972,0.43510,0.51820,0.58230,0.52049,0.78195,0
.92859,1.18569,1.30026;
'A9',-0.00272,-0.00389,-0.00309,-0.00198,-0.00215,-0.00372,-
0.00360,-0.00332,-0.00308,-0.00244,-0.00212;

'A10',0.01089,0.01467,0.03481,0.04113,0.03901,0.04794,0.04436,0.04187,
0.04111,0.04124,0.04343;

'A15',0,0,0,0,0,0.08317,0.07366,0.12147,0.14928,0.18090,0.19769;

```

```

        'A18',-1.40962,-2.46696,-2.15556,-0.92663,-0.95276,-0.70895,-
0.72057,-0.95929,-1.12178,-1.38644,-1.55127;

'A19',0.29136,0.47305,1.02992,1.06392,0.97757,1.19737,1.18119,1.01562,
0.93144,0.78414,0.78282;
'A24',0.02971,0.05877,0.05198,0.02209,0.02413,0,0,0,0,0,0;
'A27',-0.00150,-0.00356,-0.00303,-0.00105,-
0.00140,0,0,0,0,0,0);
X=VolCarena^(1/3)/Lf;
Z=VolCarena/(B^3);
U=sqrt(2*iE);
W=At/Am;
for j=2:12
    if TABLA{1,j}==Fnv

RT2=TABLA{2,j}+TABLA{3,j}*X+TABLA{4,j}*U+TABLA{5,j}*W+TABLA{6,j}*X*Z+T
ABLA{7,j}*X*U+TABLA{8,j}*X*W+TABLA{9,j}*Z*U+TABLA{10,j}*Z*W+TABLA{11,j
}*W^2+TABLA{12,j}*X*W^2+TABLA{13,j}*Z*X^2+TABLA{14,j}*U*W^2+TABLA{15,j
}*W*U^2;
    elseif TABLA{1,j}<Fnv & TABLA{1,j+1}>Fnv
        INTERPOLACION={'Fnv',Fnv;
            'A1',0;
            'A2',0;
            'A4',0;
            'A5',0;
            'A6',0;
            'A7',0;
            'A8',0;
            'A9',0;
            'A10',0;
            'A15',0;
            'A18',0;
            'A19',0;
            'A24',0;
            'A27',0};
        for m=2:15
            INTERPOLACION{m,2}=TABLA{m,j}+(TABLA{m,j+1}-
TABLA{m,j})/(TABLA{1,j+1}-TABLA{1,j})*(Fnv-TABLA{1,j});
        end

RT2=INTERPOLACION{2,2}+INTERPOLACION{3,2}*X+INTERPOLACION{4,2}*U+INTER
POLACION{5,2}*W+INTERPOLACION{6,2}*X*Z+INTERPOLACION{7,2}*X*U+INTERPOL
ACION{8,2}*X*W+INTERPOLACION{9,2}*Z*U+INTERPOLACION{10,2}*Z*W+INTERPOL
ACION{11,2}*W^2+INTERPOLACION{12,2}*X*W^2+INTERPOLACION{13,2}*Z*X^2+IN
TERPOLACION{14,2}*U*W^2+INTERPOLACION{15,2}*W*U^2;
        else
            end

end
if Desp==Desp2
    RT=RT2*Desp;
else
    RT=Desp*(RT2+((CF+CA-CF2)*Sm*Fnv^2)/(2*VolCarena^(2/3)));
    CT=RT/(0.5*Densidad/9.81*Sm*(V*0.514444)^2);
end
if strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.2;

```



```

elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Verano')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Pacífico') & strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Pacífico') & strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Verano')
    RT=RT*1.12;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Invierno')
    RT=RT*1.18;
elseif strcmp(Ruta,'Ruta del Este Asia') & strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Este Asia') & strcmp(Estacion,'Invierno')
    RT=RT*1.2;
else
end
EHP=RT*V*0.514444/75;
v_EHP=[v_EHP EHP];
v_RT=[v_RT RT];
v_CT=[v_CT CT];
v_CF=[v_CF CF];
v_CA=[v_CA CA];
end
v=[Vmin:0.001:Vmax];
V=[];
Fn=[];
Rn=[];
RT=[];
CT=[];
CF=[];
CA=[];
EHP=[];
for i=1:((Vmin+1-Vmin)/0.001):((Vmax-Vmin)/0.001+1)
    V=[V v(i)];
    Fn=[Fn v_Fnv(i)];
    Rn=[Rn v_Rn(i)];
    RT=[RT v_RT(i)];
    CT=[CT v_CT(i)];
    CF=[CF v_CF(i)];
    CA=[CA v_CA(i)];
    EHP=[EHP v_EHP(i)];
end
T=table(V,'Fn','Rn','CF','CA','CT','RT','EHP');
T.Properties.VariableNames={'V_kn','Fn','Rn','CF','CA','CT','RT_kg','E
HP_CV'};
disp('-----Método de Mercier-Savitsky-
-----')
disp(' ')
disp(T)
v1=[Vmin:1:Vmax];
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b');axis tight;hold on
set(handles.plot1,'HitTest','off');

```

```

set(handles.axes_Rt, 'ButtonDownFcn', @(s,e) axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('RT(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP, 'reset')
handles.plot2=plot(v,v_EHP, '-r');axis tight;hold on
set(handles.plot2, 'HitTest', 'off') ;
set(handles.axes_EHP, 'ButtonDownFcn', @(s,e) axes_EHP_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
calc=1;
set(handles.pushbutton_Comparar, 'Enable', 'on');
complot=0;
end

```

```

% --- Executes on button press in pushbutton_Borrar.
function pushbutton_Borrar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Borrar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global calc
calc=0;
global comp
set(handles.pushbutton_Comparar, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
cla(handles.axes_Rt, 'reset');
cla(handles.axes_EHP, 'reset');
if comp==0
set(handles.edit_Lf, 'String', '');
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_B, 'String', '');
set(handles.edit_At, 'Enable', 'off');
set(handles.edit_At, 'String', '');
set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_Am, 'String', '');
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_T, 'String', '');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_LCB, 'String', '');
set(handles.edit_VolCarena, 'String', '');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_Vmin, 'String', '');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'String', '');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.edit_iE, 'String', '');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'String', '');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.edit_Sm, 'String', '');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Value', 0);
set(handles.radiobutton_SmNo, 'Value', 0);
set(handles.radiobutton_SmSi, 'Enable', 'off');

```

```

set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Value', 0);
set(handles.radiobutton_iENo, 'Value', 0);
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Value', 1);
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Value', 1);
set(handles.radiobutton_Rio, 'Value', 0);
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Value', 1);
set(handles.radiobutton_Mar, 'Enable', 'off');
else
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_T, 'String', '');
end

function edit_VolCarena_Callback(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_VolCarena as
text
%          str2double(get(hObject, 'String')) returns contents of
edit_VolCarena as a double
handles = guihandles;
if str2num(get(handles.edit_VolCarena, 'String')) <= 0
    msgbox('El valor del volumen de carena es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_VolCarena_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Lf_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Lf as text
%         str2double(get(hObject,'String')) returns contents of edit_Lf
as a double
handles = guidata;
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_Lf, 'String')) <= 0
    msgbox('El valor de la eslora de la flotación es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
else
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_At, 'Enable', 'on');
    set(handles.edit_Am, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    if get(handles.radiobutton_iENo, 'Value') == 1
        set(handles.edit_LCB, 'Enable', 'on');
        set(handles.edit_T, 'Enable', 'on');
    elseif get(handles.radiobutton_iESi, 'Value') == 1
        set(handles.edit_iE, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmNo, 'Value') == 1
        set(handles.edit_T, 'Enable', 'on');
    elseif get(handles.radiobutton_SmSi, 'Value') == 1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.popupmenu_Ruta, 'Enable', 'on');
    contents = cellstr(get(handles.popupmenu_Ruta, 'String'));
    Ruta = contents{get(handles.popupmenu_Ruta, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Calcular, 'Enable', 'on');
end
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_Lf_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Comprobar.
function pushbutton_Comprobar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comprobar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guihandles;
global tipo_barco;
global comp
set(handles.pushbutton_Comparar,'Enable','off');
if strcmp(get(handles.edit_VolCarena,'String'),'') |
strcmp(get(handles.edit_VolCarena,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmin,'String'),'') |
strcmp(get(handles.edit_Vmin,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmax,'String'),'') |
strcmp(get(handles.edit_Vmax,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
else
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
comprobarFnv=0;
for V=Vmin:(Vmax-Vmin):Vmax
    Fnv=V*0.514444/sqrt(9.81*VolCarena^(1/3));
    if 1>Fnv | Fnv>2
        comprobarFnv=1;
    else
        end
end
if tipo_barco==0
    msgbox('Debe seleccionar un tipo de barco.','Error','error');
elseif comprobarFnv==1
    msgbox({'El valor de Fnv está fuera de su rango de aplicación.'
'                               Fnv=V/sqrt(g·Vol.Carena^(1/3))
'                               1< Fnv <2
'},'Fuera de rango','error')
else
    msgbox('Los parámetros están dentro del rango de
aplicación.','Valores correctos','help');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(handles.pushbutton_Calcular,'Enable','on');

```

```

set(handles.pushbutton_Cambiar,'Enable','on');
if comp==0
set(handles.edit_VolCarena,'Enable','off');
set(handles.edit_Vmin,'Enable','off');
set(handles.edit_Vmax,'Enable','off');
set(handles.edit_Lf,'Enable','on');
set(handles.edit_B,'Enable','on');
set(handles.edit_At,'Enable','on');
set(handles.edit_Am,'Enable','on');
set(handles.radiobutton_Rio,'Enable','on');
set(handles.radiobutton_Mar,'Enable','on');
set(handles.radiobutton_iESi,'Enable','on');
set(handles.radiobutton_iENo,'Enable','on');
if get(handles.radiobutton_iENo,'Value')==1
set(handles.edit_LCB,'Enable','on');
set(handles.edit_T,'Enable','on');
elseif get(handles.radiobutton_iESi,'Value')==1
set(handles.edit_iE,'Enable','on');
else
end
set(handles.radiobutton_SmSi,'Enable','on');
set(handles.radiobutton_SmNo,'Enable','on');
if get(handles.radiobutton_SmNo,'Value')==1
set(handles.edit_T,'Enable','on');
elseif get(handles.radiobutton_SmSi,'Value')==1
set(handles.edit_Sm,'Enable','on');
else
end
set(handles.popupmenu_Ruta,'Enable','on');
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
if strcmp(Ruta,'--Selección--') | strcmp(Ruta,'Desconocida')
else
set(handles.popupmenu_Estacion,'Enable','on');
end
else
if get(handles.radiobutton_SmNo,'Value')==1
set(handles.edit_T,'Enable','on');
else
end
end
end
end

function edit_At_Callback(hObject, eventdata, handles)
% hObject handle to edit_At (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_At as text
% str2double(get(hObject,'String')) returns contents of edit_At
as a double
handles = guidata(hObject);
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_At,'String'))<=0
msgbox('El valor del área del espejo es
incorrecto.','Aviso.','error');
set(hObject,'String','');
set(handles.edit_Lf,'Enable','off');
set(handles.edit_B,'Enable','off');
set(handles.edit_T,'Enable','off');

```

```

set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
else
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iENo, 'Value')==1
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
elseif get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmNo, 'Value')==1
set(handles.edit_T, 'Enable', 'on');
elseif get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Calcular, 'Enable', 'on');
set(handles.pushbutton_Cambiar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_At_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_At (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
set(hObject, 'BackgroundColor', 'white');
end

```

```

function edit_Am_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Am (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Am as text
%        str2double(get(hObject,'String')) returns contents of edit_Am
as a double
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_Am,'String'))<=0
    msgbox('El valor del área de la sección maestra es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_At,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.edit_Sm,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.popupmenu_Ruta,'Enable','off');
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.radiobutton_Rio,'Enable','off');
    set(handles.radiobutton_Mar,'Enable','off');
    set(handles.pushbutton_Cambiar,'Enable','off');
    set(handles.pushbutton_Calcular,'Enable','off');
else
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_At,'Enable','on');
    set(handles.radiobutton_Rio,'Enable','on');
    set(handles.radiobutton_Mar,'Enable','on');
    set(handles.radiobutton_iESi,'Enable','on');
    set(handles.radiobutton_iENo,'Enable','on');
    if get(handles.radiobutton_iENo,'Value')==1
        set(handles.edit_LCB,'Enable','on');
        set(handles.edit_T,'Enable','on');
    elseif get(handles.radiobutton_iESi,'Value')==1
        set(handles.edit_iE,'Enable','on');
    else
    end
    set(handles.radiobutton_SmSi,'Enable','on');
    set(handles.radiobutton_SmNo,'Enable','on');
    if get(handles.radiobutton_SmNo,'Value')==1
        set(handles.edit_T,'Enable','on');
    elseif get(handles.radiobutton_SmSi,'Value')==1
        set(handles.edit_Sm,'Enable','on');
    else
    end
    set(handles.popupmenu_Ruta,'Enable','on');
    contents=cellstr(get(handles.popupmenu_Ruta,'String'));
    Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
    if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')

```



```

else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Am_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Am (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on selection change in popupmenu_Ruta.
function popupmenu_Ruta_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Ruta contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Ruta
handles = guihandles;
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
set(handles.pushbutton_Comparar,'Enable','off');
if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.popupmenu_Estacion,'Value',1);
else
    set(handles.popupmenu_Estacion,'Enable','on');
    set(handles.popupmenu_Estacion,'Value',1);
end

% --- Executes during object creation, after setting all properties.
function popupmenu_Ruta_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on selection change in popupmenu_Estacion.

```

```

function popupmenu_Estacion_Callback(hObject, eventdata, handles)
% hObject      handle to popupmenu_Estacion (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hints: contents = cellstr(get(hObject, 'String')) returns
popupmenu_Estacion contents as cell array
%           contents{get(hObject, 'Value')} returns selected item from
popupmenu_Estacion

% --- Executes during object creation, after setting all properties.
function popupmenu_Estacion_CreateFcn(hObject, eventdata, handles)
% hObject      handle to popupmenu_Estacion (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Vmax_Callback(hObject, eventdata, handles)
% hObject      handle to edit_Vmax (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Vmax as text
%       str2double(get(hObject, 'String')) returns contents of
edit_Vmax as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax, 'String')) <= str2num(get(handles.edit_Vmi
n, 'String')) & str2num(get(handles.edit_Vmax, 'String')) > 0
    msgbox('El valor de la velocidad mínima debe ser mayor al de la
máxima.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmax, 'String')) < 0
    msgbox('El valor de la velocidad máxima es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.

```

```

function edit_Vmax_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmax (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmin_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmin as text
%       str2double(get(hObject,'String')) returns contents of
edit_Vmin as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmin,'String'))>0
    msgbox('El valor de la velocidad minima debe ser mayor al de la
mxima.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmin,'String'))<0
    msgbox('El valor de la velocidad minima es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
else
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmin_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%       See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_Sm_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Sm as text
%        str2double(get(hObject,'String')) returns contents of edit_Sm
as a double
handles = guidata(hObject);
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_Sm,'String'))<=0
    msgbox('El valor de la superficie mojada es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.edit_At,'Enable','off');
    set(handles.edit_Am,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.popupmenu_Ruta,'Enable','off');
    set(handles.popupmenu_Estacion,'Enable','off');
    set(handles.radiobutton_Rio,'Enable','off');
    set(handles.radiobutton_Mar,'Enable','off');
    set(handles.pushbutton_Cambiar,'Enable','off');
    set(handles.pushbutton_Calcular,'Enable','off');
else
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_At,'Enable','on');
    set(handles.edit_Am,'Enable','on');
    set(handles.radiobutton_Rio,'Enable','on');
    set(handles.radiobutton_Mar,'Enable','on');
    set(handles.radiobutton_iESi,'Enable','on');
    set(handles.radiobutton_iENo,'Enable','on');
    if get(handles.radiobutton_iENo,'Value')==1
        set(handles.edit_LCB,'Enable','on');
        set(handles.edit_T,'Enable','on');
    elseif get(handles.radiobutton_iESi,'Value')==1
        set(handles.edit_iE,'Enable','on');
    else
    end
    set(handles.radiobutton_SmSi,'Enable','on');
    set(handles.radiobutton_SmNo,'Enable','on');
    set(handles.popupmenu_Ruta,'Enable','on');
    contents=cellstr(get(handles.popupmenu_Ruta,'String'));
    Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
    if strcmp(Ruta,'--Selección--') || strcmp(Ruta,'Desconocida')
    else
        set(handles.popupmenu_Estacion,'Enable','on');
    end
    set(handles.pushbutton_Cambiar,'Enable','on');
    set(handles.pushbutton_Calcular,'Enable','on');
end
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_Sm_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_SmNo.
function radiobutton_SmNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmNo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_SmNo
handles = guidata(hObject);
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    msgbox('Para estimar el valor de Sm, es necesario conocer el valor
de T.','Aviso.','help');
    set(handles.edit_T,'Enable','on');
    set(handles.radiobutton_SmSi,'Value',0);
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_Sm,'String','');
else
end

% --- Executes on button press in radiobutton_SmSi.
function radiobutton_SmSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_SmSi
handles = guidata(hObject);
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.edit_T,'String','');
    set(handles.edit_T,'Enable','off');
    set(handles.radiobutton_SmNo,'Value',0);
    set(handles.edit_Sm,'Enable','on');
else
end

function edit_iE_Callback(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_iE as text

```

```

%         str2double(get(hObject,'String')) returns contents of edit_iE
as a double
handles = guidata(handles);
set(handles.pushbutton_Comparar, 'Enable', 'off');
if str2num(get(handles.edit_iE, 'String')) <= 0
    msgbox('El valor del semiángulo de la flotación es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_T, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.radiobutton_Rio, 'Enable', 'off');
    set(handles.radiobutton_Mar, 'Enable', 'off');
    set(handles.pushbutton_Cambiar, 'Enable', 'off');
    set(handles.pushbutton_Calcular, 'Enable', 'off');
else
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_At, 'Enable', 'on');
    set(handles.edit_Am, 'Enable', 'on');
    set(handles.radiobutton_Rio, 'Enable', 'on');
    set(handles.radiobutton_Mar, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmNo, 'Value') == 1
        set(handles.edit_T, 'Enable', 'on');
    elseif get(handles.radiobutton_SmSi, 'Value') == 1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.popupmenu_Ruta, 'Enable', 'on');
    contents = cellstr(get(handles.popupmenu_Ruta, 'String'));
    Ruta = contents{get(handles.popupmenu_Ruta, 'Value')};
    if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    else
        set(handles.popupmenu_Estacion, 'Enable', 'on');
    end
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Calcular, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_iE_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.

```

```

% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_iENo.
function radiobutton_iENo_Callback(hObject, eventdata, handles)
% hObject handle to radiobutton_iENo (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iENo
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    msgbox('Para estimar el valor de iE, es necesario conocer los
valores de LCB y T.','Aviso.','help');
    set(handles.edit_LCB,'Enable','on');
    set(handles.edit_T,'Enable','on');
    set(handles.radiobutton_iESi,'Value',0);
    set(handles.edit_iE,'Enable','off');
    set(handles.edit_iE,'String','');
else
end

% --- Executes on button press in radiobutton_iESi.
function radiobutton_iESi_Callback(hObject, eventdata, handles)
% hObject handle to radiobutton_iESi (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if get(hObject,'Value')==1
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_T,'Enable','off');
    set(handles.edit_LCB,'String','');
    set(handles.edit_T,'String','');
    set(handles.radiobutton_iENo,'Value',0);
    set(handles.edit_iE,'Enable','on');
else
end
% Hint: get(hObject,'Value') returns toggle state of radiobutton_iESi

function edit_B_Callback(hObject, eventdata, handles)
% hObject handle to edit_B (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_B as text
% str2double(get(hObject,'String')) returns contents of edit_B
as a double
handles = guihandles;
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_B,'String'))<=0
    msgbox('El valor de la manga es incorrecto.','Aviso.','error');
    set(hObject,'String','');

```

```

set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_At, 'Enable', 'off');
set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
else
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_At, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iENo, 'Value')==1
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_T, 'Enable', 'on');
elseif get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmNo, 'Value')==1
    set(handles.edit_T, 'Enable', 'on');
elseif get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
end
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_B_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.

```



```

if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_LCB_Callback(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar,'Enable','off');

% Hints: get(hObject,'String') returns contents of edit_LCB as text
%        str2double(get(hObject,'String')) returns contents of
edit_LCB as a double

```

```

% --- Executes during object creation, after setting all properties.
function edit_LCB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%        See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_T_Callback(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_T as text
%        str2double(get(hObject,'String')) returns contents of edit_T
as a double
handles = guihandles;
global comp
set(handles.pushbutton_Comparar,'Enable','off');
if str2num(get(handles.edit_T,'String'))<=0
    msgbox('El valor del calado es incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.popupmenu_Ruta, 'Enable', 'off');

```

```

set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
set(handles.pushbutton_Calcular, 'Enable', 'off');
else
set(handles.pushbutton_Cambiar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'on');
if comp==0
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_At, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.radiobutton_Rio, 'Enable', 'on');
set(handles.radiobutton_Mar, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iENo, 'Value')==1
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_T, 'Enable', 'on');
elseif get(handles.radiobutton_iESi, 'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmNo, 'Value')==1
set(handles.edit_T, 'Enable', 'on');
elseif get(handles.radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.popupmenu_Ruta, 'Enable', 'on');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
else
set(handles.popupmenu_Estacion, 'Enable', 'on');
end
else
end
end
end

% --- Executes during object creation, after setting all properties.
function edit_T_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_T (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in pushbutton_Cambiar.

```

```

function pushbutton_Cambiar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Cambiar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
global comp
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Calcular, 'Enable', 'off');
set(handles.pushbutton_Cambiar, 'Enable', 'off');
if comp==0
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_At, 'Enable', 'off');
set(handles.edit_Am, 'Enable', 'off');
set(handles.radiobutton_Rio, 'Enable', 'off');
set(handles.radiobutton_Mar, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENO, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.edit_T, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'Enable', 'off');
else
end

```

```

% --- Executes on button press in pushbutton_Salir.
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Salir (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
close(gcf)
global comp
global metodo
global v
global v_EHP
global v_RT
comp=0;
switch metodo
case 'Ping-Zhong'
    global vPing
    global v_RTping
    global v_EHPPing
    v=vPing;
    v_RT=v_RTping;
    v_EHP=v_EHPPing;
end

```

```

% --- Executes on mouse press over axes background.
function axes_Rt_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_Rt (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      structure with handles and user data (see GUIDATA)
global v
global v_RT
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_RT);
v_RT1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_RT1=[v_RT1 v_RT(j)];
        else
            end
        end
    end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off');
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Ping-Zhong'
            global vPing
            global v1Ping
            global v_RT1Ping
            n=length(v1Ping);
            m=length(v_RT1Ping);
            v_RT1Ping=[];
            for i=1:n
                for j=1:m
                    if v1Ping(i)==vPing(j)
                        v_RT1Ping=[v_RT1Ping v_RT1Ping(j)];
                    else
                        end
                    end
                end
            end
            vcomp=vPing;
            v1comp=v1Ping;
            v_RTcomp=v_RT1Ping;
            v_RT1comp=v_RT1Ping;
            leyenda='Ping-Zhong';
        end
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off');
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(vcomp,v_RTcomp,'y-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
plot(v1comp,v_RT1comp,'ro','LineWidth',2);axis tight;hold on

```

```

lgd=legend({'Mercier-Savitsky',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
end
else
end

% --- Executes on mouse press over axes background.
function axes_EHP_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_EHP
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_EHP);
v_EHP1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_EHP1=[v_EHP1 v_EHP(j)];
        else
        end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Ping-Zhong'
            global vPing
            global v1Ping
            global v_EHPPing
            n=length(v1Ping);
            m=length(v_EHPPing);
            v_EHP1Ping=[];

```

```

        for i=1:n
            for j=1:m
                if v1Ping(i)==vPing(j)
                    v_EHP1Ping=[v_EHP1Ping v_EHPPing(j)];
                else
                    end
            end
        end
        vcomp=vPing;
        vlcomp=v1Ping;
        v_EHPcomp=v_EHPPing;
        v_EHP1comp=v_EHP1Ping;
        leyenda='Ping-Zhong';
    end
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vcomp,v_EHPcomp,'k-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
plot(vlcomp,v_EHP1comp,'bo','LineWidth',2);axis tight;hold on
lgd=legend({'Mercier-Savitsky',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
end
else
end

% --- Executes on button press in pushbutton_Comparar.
function pushbutton_Comparar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comparar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
global tipo_barco
global metodo
global v
global v1
global v_EHP
global v_RT
global vMer
global v1Mer
global v_EHPMer
global v_RTMer
global compplot
global cancelar
if comp==0 | cancelar==1
switch tipo_barco
    case 'Buque rápido'
        pop={'--Selección--','Ping-Zhong'};
    case 'Patrullero'
        pop={'--Selección--','Ping-Zhong'};
    case 'Militar'
        pop={'--Selección--','Ping-Zhong'};
end
global Lf

```

```

global B
global Vmin
global Vmax
global VolCarena
global LCB
global iE
global Sm
global At
global Am
global AGUA
global Estacion
global Ruta
Lf=str2num(get(handles.edit_Lf, 'String'));
B=str2num(get(handles.edit_B, 'String'));
At=str2num(get(handles.edit_At, 'String'));
Am=str2num(get(handles.edit_Am, 'String'));
Vmin=str2num(get(handles.edit_Vmin, 'String'));
Vmax=str2num(get(handles.edit_Vmax, 'String'));
VolCarena=str2num(get(handles.edit_VolCarena, 'String'));
if get(handles radiobutton_Rio, 'Value')==1
Densidad=1.000; %Tm3
AGUA=1;
else
Densidad=1.025; %T/m3
AGUA=0;
end
LCB=str2num(get(handles.edit_LCB, 'String'));
if get(handles radiobutton_SmSi, 'Value')==1
Sm=str2num(get(handles.edit_Sm, 'String'));
else
Sm=0;
end
if get(handles radiobutton_iESi, 'Value')==1
iE=str2num(get(handles.edit_iE, 'String'));
else
iE=0;
end
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
contents=cellstr(get(handles.popupmenu_Estacion, 'String'));
Estacion=contents{get(handles.popupmenu_Estacion, 'Value')};
vMer=v;
v1Mer=v1;
v_EHPMer=v_EHP;
v_RTMer=v_RT;
[comp]=comparar(pop);
cancelar=1;
else
compplot=1;
switch metodo
case 'Ping-Zhong'
global vPing
global v_RTPing
global v_EHPPing
vcomp=vPing;
v_RTcomp=v_RTPing;
v_EHPcomp=v_EHPPing;
leyenda='Ping-Zhong';
end
axes(handles.axes_Rt);
cla(handles.axes_Rt, 'reset');

```

```

handles.plot1=plot(v,v_RT,'-b',vcomp,v_RTcomp,'y-');axis tight;hold on
lgd=legend({'Mercier-Savitsky',leyenda});
set(handles.plot1,'HitTest','off') ;
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('Rt(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r',vcomp,v_EHPcomp,'k-');axis tight;hold on
lgd=legend({'Mercier-Savitsky',leyenda});
set(handles.plot2,'HitTest','off') ;
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')
cancelar=0;
end

```


Método de Ping-Zhong.

```
function varargout = PingZhong(varargin)
% PINGZHONG MATLAB code for PingZhong.fig
%   PINGZHONG, by itself, creates a new PINGZHONG or raises the
existing
%   singleton*.
%
%   H = PINGZHONG returns the handle to a new PINGZHONG or the
handle to
%   the existing singleton*.
%
%   PINGZHONG('CALLBACK',hObject,eventData,handles,...) calls the
local
%   function named CALLBACK in PINGZHONG.M with the given input
arguments.
%
%   PINGZHONG('Property','Value',...) creates a new PINGZHONG or
raises the
%   existing singleton*. Starting from the left, property value
pairs are
%   applied to the GUI before PingZhong_OpeningFcn gets called. An
%   unrecognized property name or invalid value makes property
application
%   stop. All inputs are passed to PingZhong_OpeningFcn via
varargin.
%
%   *See GUI Options on GUIDE's Tools menu. Choose "GUI allows
only one
%   instance to run (singleton)".
%
% See also: GUIDE, GUIDATA, GUIHANDLES

% Edit the above text to modify the response to help PingZhong

% Last Modified by GUIDE v2.5 14-Jan-2020 23:39:05

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',   gui_Singleton, ...
                  'gui_OpeningFcn', @PingZhong_OpeningFcn, ...
                  'gui_OutputFcn',  @PingZhong_OutputFcn, ...
                  'gui_LayoutFcn',   [] , ...
                  'gui_Callback',    []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
% End initialization code - DO NOT EDIT

% --- Executes just before PingZhong is made visible.
function PingZhong_OpeningFcn(hObject, eventdata, handles, varargin)
% This function has no output args, see OutputFcn.
```

```

% hObject    handle to figure
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% varargin   command line arguments to PingZhong (see VARARGIN)

% Choose default command line output for PingZhong
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);
set(handles.output, 'Units', 'pixels');
screenSize=get(0, 'ScreenSize');
position=get(handles.output, 'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.output, 'Position', position);
global tipo_barco;
axes(handles.axes_ETSINO);
imshow(imread('descarga.jpg'))
axes(handles.axes_Buque);
switch tipo_barco
    case 'Buque rápido'
        imshow(imread('buque rapido.jpg'));
        set(handles.text_TipoBuque, 'String', 'Buque rápido');
    case 'Patrullero'
        imshow(imread('patrullero.jpg'));
        set(handles.text_TipoBuque, 'String', 'Patrullero');
    case 'Militar'
        imshow(imread('militar.jpg'));
        set(handles.text_TipoBuque, 'String', 'Militar');
end
global calc
global cancelar
cancelar=0;
calc=0;
global comp
global metodo
global Lf
global Lpp
global B
global T
global CP
global Vmin
global Vmax
global VolCarena
global ATB
global XF
global LCB
global t
global iE
global Sm
global AGUA
global Estacion
global Ruta
global SmArbotantes
global SmHenchimientos
global Am
global At
if comp==0
Lf='';
Lpp='';

```

```

B='';
T='';
Vmin='';
Vmax='';
VolCarena = '';
t='';
XF = '';
ATB = '';
Sm = '';
AGUA = '';
Estacion='';
Ruta='';
CP='';
LCB='';
iE='';
SmArbotantes='';
SmHenchimientos='';
At='';
Am='';
else
switch metodo
case 'Mercier-Savitsky'
set(handles.edit_Lf, 'String', num2str(Lf));
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'String', num2str(B));
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_Am, 'String', num2str(Am));
set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_At, 'String', num2str(At));
set(handles.edit_At, 'Enable', 'off');
set(handles.edit_Vmin, 'String', num2str(Vmin));
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'String', num2str(Vmax));
set(handles.edit_Vmax, 'Enable', 'off');
if AGUA==1
Densidad=1.000; %T/m3
set(handles.radiobutton_Rio, 'Value', 1);
else
Densidad=1.025; %T/m3
set(handles.radiobutton_Mar, 'Value', 1);
end
set(handles.edit_VolCarena, 'String', num2str(VolCarena));
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_LCB, 'String', num2str(LCB));
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
if Sm==0
set(handles.radiobutton_SmNo, 'Value', 1);
elseif Sm~=0
set(handles.radiobutton_SmSi, 'Value', 1);
set(handles.edit_Sm, 'String', num2str(Sm));
end
set(handles.popupmenu_Ruta, 'String', Ruta);
set(handles.popupmenu_Ruta, 'Enable', 'off');
set(handles.popupmenu_Estacion, 'String', Estacion);
set(handles.popupmenu_Estacion, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');

```

```

set(handles.radiobutton_iESi,'Enable','off');
set(handles.radiobutton_iENo,'Enable','off');
if iE==0
    set(handles.radiobutton_iENo,'Value',1);
else
    set(handles.radiobutton_iESi,'Value',1);
    set(handles.edit_iE,'String',num2str(iE));
end
end
end
% UIWAIT makes PingZhong wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = PingZhong_OutputFcn(hObject, eventdata, handles)
% varargout cell array for returning output args (see VARARGOUT);
% hObject handle to figure
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Get default command line output from handles structure
varargout{1} = handles.output;

% --- Executes on button press in pushbutton_Calcular.
function pushbutton_Calcular_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Calcular (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
global v_EHP
global v_RT
global v
global v1
global calc
global compplot
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
contents=cellstr(get(handles.popupmenu_Estacion,'String'));
Estacion=contents{get(handles.popupmenu_Estacion,'Value')};
if strcmp(Ruta,'--Selección--')
    msgbox('Debe seleccionar una ruta de servicio del
barco.','Error','error');
elseif strcmp(Estacion,'--Selección--') &&
not(strcmp(Ruta,'Desconocida'))
    msgbox('Debe seleccionar una ruta de servicio del
barco.','Error','error');
else
Lf=str2num(get(handles.edit_Lf,'String'));
B=str2num(get(handles.edit_B,'String'));
Am=str2num(get(handles.edit_Am,'String'));
At=str2num(get(handles.edit_At,'String'));
LCB=str2num(get(handles.edit_LCB,'String'));
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
CV=1000*VolCarena/(Lf^3);
CP=VolCarena/(Am*Lf);
Ft=At/Am;
F=100*LCB/Lf;

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```

CA=0.4*10^-3;
lcb=100*LCB/Lf;
if get(handles.radiobutton_Rio, 'Value')==1
Densidad=1000; %kg/m3
Viscdinam=1.141*10^-6; %m2/s
else
Densidad=1025; %kg/m3
Viscdinam=1.223*10^-6; %m2/s
end
Desp=VolCarena*Densidad;%kg
if get(handles.radiobutton_SmSi, 'Value')==1
Sm=str2num(get(handles.edit_Sm, 'String'));
else
Sm=3.223*VolCarena^(2/3)+0.5402*Lf*VolCarena^(1/3);
end
v_EHP=[];
v_RT=[];
v_CT=[];
v_CF=[];
v_CR=[];
v_CA=[];
v_Fn=[];
v_Rn=[];
for V=Vmin:0.01:Vmax
Rn=V*0.514444*Lf/Viscdinam;
v_Rn=[v_Rn Rn];
Fn=V*0.514444/((9.81*Lf)^(1/2));
v_Fn=[v_Fn Fn];
CF=0.075/((log10(Rn)-2)^2);
if get(handles.radiobutton_iESi, 'Value')==1
iE=str2num(get(handles.edit_iE, 'String'));
else
Lr=Lf*(1-CP+(0.06*CP*lcb)/(4*CP-1));
iE=1+89*exp(-(Lf/B)^0.80856*(1-CF)^0.30484*(1-CP-
0.0225*lcb)^0.6367*(Lr/B)^0.34574*(100*VolCarena/Lf^3)^0.16302);
end
TABLAX={'i', 'Xi';
0,1;
1,CV^0.25;
2,CV^0.5;
3,CV^0.75;
4,CV;
5,CV^2;
6,CV^2.25;
7,CV^3;
8,CV^4;
9,CV^4.5;
10,CV^5;
11,Ft^2;
12,Ft^3;
13,CP;
14,F;
15,F^3;
16,iE^0.5;
17,iE;
18,F*CV^0.5;
19,CV*F;
20,CV*F^2;
21,CV*F^3;
22,CV*F^5;
23,CV*F^6;

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```

24,CP*CV^0.5;
25,CV*CP^0.5;
26,CV*CP;
27,CV*CP^2;
28,CV^(2)*CP^2;
29,CV*iE^0.5;
30,CV^(0.5)*iE;
31,CV*iE;
32,CV*iE^1.5;
33,CV*iE^3;
34,CV*iE^4;
35,CV*iE^5;
36,CV*iE^0.5;
37,CV*Ft^0.5;
38,CV*Ft;
39,CV*Ft^2;
40,CV*Ft^4.5;
41,CV*Ft^5;
42,Ft*F;
43,Ft*F^3;
44,Ft*CP^2;
45,Ft*CP^3;
46,Ft/CP;
47,Ft*iE;
48,Ft*iE^1.5;
49,Ft*CV^3;
50,CV*Ft*F;
51,F*CP*Ft;
52,F^2*CP^2*Ft^2;
53,CV*Ft*F*CP};
TABLAB={ 'B/Fn',0.4,0.45,0.5,0.55,0.6,0.7,0.8,0.9,1;
'B0',0.42805,-11.52091,14.52452,-0.1736828,2.78574,-
0.35459,-6.71762,-1.994458,1.20146;
'B1',0,12.05635,0,0,0,0,0,0,0;
'B2',0,0,-15.14608,0,0,0,0,0,0;
'B3',0,0,0,0,-8.29346,0,0,0,0;
'B4',0,0,0,0,0,0,-0.751494,0,0;
'B5',0,0,0,0,0,-0.177265,0,0,-1.080677;
'B6',0,0,0,0,-0.031805,0,0,0,0;
'B7',-0.0113839,0,0,0,0,0,-0.0009476,-0.0009158,0.193216;
'B8',0,0,-0.0002901,0,0,0,0,0,0;
'B9',0.0001653,0,0,0,0,0,0,0,0;
'B10',0,0,0,0,0,0,0,0,-0.0011667;
'B11',0,0,0,19.48025,0,11.02738,0,0,0;
'B12',0,0,17.454218,0,0,0,7.226846,0,-15.69293;
'B13',0,0,-21.87962,0,0,0,0,5.053618,-17.853539;
'B14',0,0,0,0,0,0,0,0,-0.0893517;
'B15',0,0,0,-0.0032666,0,0,0.0079214,0,0;
'B16',0,0,0,0,0,0,4.8320759,0,1.6347212;
'B17',0,0,0,0,0,0,-0.809705,0,0;
'B18',0,0,0.1199874,0,0,0,0,0,0;
'B19',0,0,0,0.190309,0.23562,0.185261,0.0446722,0,0;
'B20',0,0,0.0340045,0,-0.032878,0,0,0.0105693,0;
'B21',0.0022619,0,-0.005236,0,0,0,-0.0020337,-0.0018758,0;
'B22',0,0.362547*10^-3,0,0,0,0,0,0,0;
'B23',-0.11915*10^-4,-0.58925*10^-4,0,0,0,0,0,0,0;
'B24',0,0,23.81034,0,0,0,0,0,12.22024;
'B25',0,0,0,0,9.7215,0,0,0,0;
'B26',0,0,0,0,0,2.813155,2.8205227,1.3038071,0;
'B27',2.76043,0.95357,0,4.2690504,0,0,0,0,0;
'B28',0,0,0,0,0,0.283344,0,0,0;

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'B29',0,0,0.5344617,0.1262725,0,0,0,0,0;
'B30',0,0,0,0,0,0,0,0,-0.0837985;
'B31',0.0286367,0,0,0,0,0,0.0208361,0,0;
'B32',0,0,0,0,-0.0028312,0,0,0,0;
'B33',0,0.581294*10^-4,0,0,0,0,0,0;
'B34',-0.3881*10^-6,0,0,0,0,0,0,0;
'B35',0,-0.594*10^-7,0,0,0.79*10^-8,0,0,0;
'B36',0,0,0,0,0,0.0060398,0,0;
'B37',-0.6157,-0.25582,0,0,-0.71001,0,0,0;
'B38',0,0,0,0,-2.27459,0,0,0;
'B39',1.63655,0,0,2.468475,0,2.366091,0,0;
'B40',0,0,0,0,38.129,0,0,0;
'B41',-3.28294,0,0,0,-40.043,0,0,0;
'B42',0,0,0,0,0,0,-0.969916,0,0;
'B43',0,0,-0.0172769,0,0,0,0,0;
'B44',0,0,0,-13.891417,0,0,0,0;
'B45',0,0,0,0,0,0,0,14.15138;
'B46',0,0,0,0,0,0,-1.0089253,-2.0058359,0;
'B47',0,0,0,-0.451056,0,-0.325001,0,0;
'B48',0,0,-0.1614093,0,0,0,0,0;
'B49',0,0,0,0,0,0,0.0027594,0;
'B50',0,0,0,-0.610085,0,0,0,0;
'B51',0,0,0,0,0,-2.25472,0,0;
'B52',0,0,0,0,0,0.568792,0,0;
'B53',0,0,0,0,0,-0.8565412,0,0};

CR=0;
for j=2:10
    if TABLAB{1,j}==Fn
        for i=2:55
            CR=CR+TABLAB{i,j}*TABLAX{i,2};
        end
    elseif TABLAB{1,j}<Fn & TABLAB{1,j+1}>Fn
        INTERPOLACION={'Fn',Fn;
            'B0',0;
            'B1',0;
            'B2',0;
            'B3',0;
            'B4',0;
            'B5',0;
            'B6',0;
            'B7',0;
            'B8',0;
            'B9',0;
            'B10',0;
            'B11',0;
            'B12',0;
            'B13',0;
            'B14',0;
            'B15',0;
            'B16',0;
            'B17',0;
            'B18',0;
            'B19',0;
            'B20',0;
            'B21',0;
            'B22',0;
            'B23',0;
            'B24',0;
            'B25',0;
            'B26',0;
            'B27',0;

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```

        'B28',0;
        'B29',0;
        'B30',0;
        'B31',0;
        'B32',0;
        'B33',0;
        'B34',0;
        'B35',0;
        'B36',0;
        'B37',0;
        'B38',0;
        'B39',0;
        'B40',0;
        'B41',0;
        'B42',0;
        'B43',0;
        'B44',0;
        'B45',0;
        'B46',0;
        'B47',0;
        'B48',0;
        'B49',0;
        'B50',0;
        'B51',0;
        'B52',0;
        'B53',0};
    for m=2:55
        INTERPOLACION{m,2}=TABLAB{m,j}+(TABLAB{m,j+1}-
TABLAB{m,j})/(TABLAB{1,j+1}-TABLAB{1,j})*(Fn-TABLAB{1,j});
        CR=CR+INTERPOLACION{m,2}*TABLAX{m,2};
    end
end
end
CR=CR*10^-3;
CT=CF+CR+CA;
RT=0.5*Densidad/9.81*Sm*(V*0.514444)^2*CT;
if strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Este)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Verano')
    RT=RT*1.2;
elseif strcmp(Ruta,'Ruta del Atlántico Norte (hacia Oeste)') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Pacífico') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Pacífico') &
strcmp(Estacion,'Invierno')
    RT=RT*1.3;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Verano')
    RT=RT*1.12;
elseif strcmp(Ruta,'Ruta del Atlántico Sur y Australia') &
strcmp(Estacion,'Invierno')
    RT=RT*1.18;
end
end
end

```



```

elseif strcmp(Ruta,'Ruta del Este Asia') &
strcmp(Estacion,'Verano')
    RT=RT*1.15;
elseif strcmp(Ruta,'Ruta del Este Asia') &
strcmp(Estacion,'Invierno')
    RT=RT*1.2;
else
end
EHP=V*0.514444*RT/75;
v_EHP=[v_EHP EHP];
v_RT=[v_RT RT];
v_CT=[v_CT CT];
v_CF=[v_CF CF];
v_CR=[v_CR CR];
v_CA=[v_CA CA];
end
v=[Vmin:0.01:Vmax];
V=[];
Fn=[];
Rn=[];
RT=[];
CT=[];
CF=[];
CR=[];
CA=[];
EHP=[];
for i=1:(Vmin+1-Vmin)/0.01:(Vmax-Vmin)/0.01+1)
    V=[V v(i)];
    Fn=[Fn v_Fn(i)];
    Rn=[Rn v_Rn(i)];
    RT=[RT v_RT(i)];
    CT=[CT v_CT(i)];
    CF=[CF v_CF(i)];
    CR=[CR v_CR(i)];
    CA=[CA v_CA(i)];
    EHP=[EHP v_EHP(i)];
end
T=table(V',Fn',Rn',CF',CA',CR',CT',RT',EHP');
T.Properties.VariableNames={'V_kn','Fn','Rn','CF','CA','CR','CT','RT_k
g','EHP_CV'};
disp('-----Método de Ping-Zhong-----')
disp(' ')
disp(T)
v1=[Vmin:1:Vmax];
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b');axis tight;hold on
set(handles.plot1,'HitTest','off');
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,ha
ndles) )
xlabel('V(kn)')
ylabel('RT(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r');axis tight;hold on
set(handles.plot2,'HitTest','off');
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,
handles) )
xlabel('V(kn)')
ylabel('EHP(C.V.)')

```

```

calc=1;
compplot=0;
set(handles.pushbutton_Comparar,'Enable','on');
end

% --- Executes on button press in pushbutton_Borrar.
function pushbutton_Borrar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Borrar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global calc
calc=0;
global comp
set(handles.pushbutton_Comparar,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.pushbutton_Calcular,'Enable','off');
cla(handles.axes_Rt,'reset');
cla(handles.axes_EHP,'reset');
if comp==0
set(handles.edit_Lf,'String','');
set(handles.edit_Lf,'Enable','on');
set(handles.edit_B,'String','');
set(handles.edit_B,'Enable','on');
set(handles.edit_At,'Enable','on');
set(handles.edit_At,'String','');
set(handles.edit_Am,'Enable','on');
set(handles.edit_Am,'String','');
set(handles.edit_LCB,'Enable','on');
set(handles.edit_LCB,'String','');
set(handles.edit_VolCarena,'String','');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_Vmin,'String','');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'String','');
set(handles.edit_Vmax,'Enable','on');
set(handles.edit_iE,'String','');
set(handles.edit_iE,'Enable','off');
set(handles.edit_Sm,'String','');
set(handles.edit_Sm,'Enable','off');
set(handles.edit_Sm,'String','');
set(handles.edit_Sm,'Enable','off');
set(handles.radiobutton_SmSi,'Value',0);
set(handles.radiobutton_SmNo,'Value',0);
set(handles.radiobutton_SmSi,'Enable','on');
set(handles.radiobutton_SmNo,'Enable','on');
set(handles.radiobutton_iESi,'Value',0);
set(handles.radiobutton_iENo,'Value',0);
set(handles.radiobutton_iESi,'Enable','on');
set(handles.radiobutton_iENo,'Enable','on');
set(handles.popupmenu_Ruta,'Enable','off');
set(handles.popupmenu_Ruta,'Value',1);
set(handles.popupmenu_Estacion,'Enable','off');
set(handles.popupmenu_Estacion,'Value',1);
set(handles.radiobutton_Rio,'Value',0);
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Mar,'Value',1);
set(handles.radiobutton_Mar,'Enable','off');
else
end

```

```

% --- Executes on selection change in popupmenu_Ruta.
function popupmenu_Ruta_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Ruta contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Ruta
handles = guidata(hObject);
set(handles.pushbutton_Comparar, 'Enable', 'off');
contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
if strcmp(Ruta, '--Selección--') || strcmp(Ruta, 'Desconocida')
    set(handles.popupmenu_Estacion, 'Enable', 'off');
    set(handles.popupmenu_Estacion, 'Value', 1);
else
    set(handles.popupmenu_Estacion, 'Enable', 'on');
    set(handles.popupmenu_Estacion, 'Value', 1);
end

% --- Executes during object creation, after setting all properties.
function popupmenu_Ruta_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Ruta (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on selection change in popupmenu_Estacion.
function popupmenu_Estacion_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
set(handles.pushbutton_Comparar, 'Enable', 'off');

% Hints: contents = cellstr(get(hObject,'String')) returns
popupmenu_Estacion contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu_Estacion

% --- Executes during object creation, after setting all properties.
function popupmenu_Estacion_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu_Estacion (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: popupmenu controls usually have a white background on Windows.

```

```

% See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Cambiar.
function pushbutton_Cambiar_Callback(hObject, eventdata, handles)
% hObject handle to pushbutton_Cambiar (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)
handles = guidata(handles);
set(handles.pushbutton_Comparar,'Enable','off');
global comp
set(handles.pushbutton_Calcular,'Enable','off');
set(handles.pushbutton_Cambiar,'Enable','off');
set(handles.pushbutton_Comprobar,'Enable','on');
set(handles.pushbutton_Rangos,'Enable','on');
if comp==0
set(handles.edit_Lf,'Enable','on');
set(handles.edit_B,'Enable','on');
set(handles.edit_VolCarena,'Enable','on');
set(handles.edit_At,'Enable','on');
set(handles.edit_Am,'Enable','on');
set(handles.edit_LCB,'Enable','on');
set(handles.edit_Vmin,'Enable','on');
set(handles.edit_Vmax,'Enable','on');
set(handles.radiobutton_iESi,'Enable','on');
set(handles.radiobutton_iENo,'Enable','on');
set(handles.radiobutton_SmSi,'Enable','on');
set(handles.radiobutton_SmNo,'Enable','on');
if get(handles.radiobutton_iESi,'Value')==1
    set(handles.edit_iE,'Enable','on');
else
end
if get(handles.radiobutton_SmSi,'Value')==1
    set(handles.edit_Sm,'Enable','on');
else
end
set(handles.radiobutton_Rio,'Enable','off');
set(handles.radiobutton_Mar,'Enable','off');
set(handles.popupmenu_Ruta,'Enable','off');
set(handles.popupmenu_Estacion,'Enable','off');
else
end

function edit_Lf_Callback(hObject, eventdata, handles)
% hObject handle to edit_Lf (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Lf as text
% str2double(get(hObject,'String')) returns contents of edit_Lf
as a double
handles = guidata(handles);
if str2num(get(handles.edit_Lf,'String'))<=0
    msgbox('El valor de la eslora de la flotación es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_B,'Enable','off');

```

```

set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_Vmin, 'Enable', 'off');
set(handles.edit_Vmax, 'Enable', 'off');
set(handles.edit_At, 'Enable', 'off');
set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
else
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_At, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Lf_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Lf (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
% See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_Am_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Am (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_Am as text

```

```

%         str2double(get(hObject,'String')) returns contents of edit_Am
as a double
handles = guihandles;
if str2num(get(handles.edit_Am,'String'))<=0
    msgbox('El valor del área de la maestra es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
else
    set(handles.edit_B,'Enable','on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_At, 'Enable', 'on');
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    if get(handles.radiobutton_iESi,'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmSi,'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Am_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Am (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

function edit_At_Callback(hObject, eventdata, handles)
% hObject    handle to edit_At (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_At as text
%        str2double(get(hObject,'String')) returns contents of edit_At
as a double
handles = guidata(hObject);
if str2num(get(handles.edit_At,'String'))<=0
    msgbox('El valor del área del espejo de popa es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
else
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_VolCarena, 'Enable', 'on');
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_Am, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    if get(handles.radiobutton_iESi, 'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_At_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_At (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB

```

```

% handles      empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%      See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in pushbutton_Comprobar.
function pushbutton_Comprobar_Callback(hObject, eventdata, handles)
% hObject      handle to pushbutton_Comprobar (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
handles = guihandles;
comprobariE=0;
comprobarFn=0;
global comp
global tipo_barco
if strcmp(get(handles.edit_Lf,'String'),'') |
strcmp(get(handles.edit_Lf,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_B,'String'),'') |
strcmp(get(handles.edit_B,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_At,'String'),'') |
strcmp(get(handles.edit_At,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Am,'String'),'') |
strcmp(get(handles.edit_Am,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_LCB,'String'),'') |
strcmp(get(handles.edit_LCB,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_VolCarena,'String'),'') |
strcmp(get(handles.edit_VolCarena,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmin,'String'),'') |
strcmp(get(handles.edit_Vmin,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif strcmp(get(handles.edit_Vmax,'String'),'') |
strcmp(get(handles.edit_Vmax,'String'),char(zeros(1,0)))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif get(handles.radiobutton_iESi,'Value')==1 &
(strcmp(get(handles.edit_iE,'String'),' ') |
strcmp(get(handles.edit_iE,'String'),char(zeros(1,0))))
    msgbox('Debe darle valor a todos los parámetros a
comprobar.','Error','error');
elseif get(handles.radiobutton_SmSi,'Value')==1 &
(strcmp(get(handles.edit_Sm,'String'),' ') |
strcmp(get(handles.edit_Sm,'String'),char(zeros(1,0))))

```



```

        CP=Vol.Carena/(Am·Lf)
    }, 'Fuera de rango', 'error');
elseif 0>Ft | Ft>0.74
    msgbox({'El valor de Ft está fuera de rango de aplicación.'
        Ft=At/Am
    }, 'Fuera de rango', 'error');
elseif 0>F | F>6.4
    msgbox({'El valor de F está fuera de rango de aplicación.'
        F=100·lcb/Lf
    }, 'Fuera de rango', 'error');
elseif comprobariE==1
    msgbox({'El valor del semiáng. de la flotación está fuera del rango
de aplicación.'
        7.6° < iE <
26.6°
    }, 'Fuera de rango', 'error');
elseif comprobarFn==1
    msgbox({'El valor del número de Froude (Fn) está fuera del rango de
aplicación.'
        Fn=V/sqrt(g·Lf)
    }, 'Fuera de rango', 'error');
else
    msgbox('Los parámetros están dentro del rango de
aplicación.', 'Valores correctos', 'help');
    set(handles.pushbutton_Calcular, 'Enable', 'on');
    set(handles.pushbutton_Cambiar, 'Enable', 'on');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Rangos, 'Enable', 'off');
    if comp==0
        set(handles.edit_Lf, 'Enable', 'off');
        set(handles.edit_B, 'Enable', 'off');
        set(handles.edit_VolCarena, 'Enable', 'off');
        set(handles.edit_At, 'Enable', 'off');
        set(handles.edit_Am, 'Enable', 'off');
        set(handles.edit_LCB, 'Enable', 'off');
        set(handles.edit_Vmin, 'Enable', 'off');
        set(handles.edit_Vmax, 'Enable', 'off');
        set(handles.radiobutton_iESi, 'Enable', 'off');
        set(handles.radiobutton_iENo, 'Enable', 'off');
        set(handles.radiobutton_SmSi, 'Enable', 'off');
        set(handles.radiobutton_SmNo, 'Enable', 'off');
        set(handles.edit_iE, 'Enable', 'off');
        set(handles.edit_Sm, 'Enable', 'off');
        set(handles.radiobutton_Rio, 'Enable', 'on');
        set(handles.radiobutton_Mar, 'Enable', 'on');
        set(handles.popupmenu_Ruta, 'Enable', 'on');
        contents=cellstr(get(handles.popupmenu_Ruta, 'String'));
        Ruta=contents{get(handles.popupmenu_Ruta, 'Value')};
        if strcmp(Ruta, '--Selección--') | strcmp(Ruta, 'Desconocida')
        else
            set(handles.popupmenu_Estacion, 'Enable', 'on');
        end
    else
    end
end

```

```
end
end
```

```
function edit_VolCarena_Callback(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_VolCarena as
text
%         str2double(get(hObject,'String')) returns contents of
edit_VolCarena as a double
handles = guihandles;
if str2num(get(handles.edit_VolCarena,'String'))<=0
    msgbox('El valor del volumen de carena es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
else
    set(handles.edit_B, 'Enable', 'on');
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_At, 'Enable', 'on');
    set(handles.edit_Am, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    if get(handles.radiobutton_iESi, 'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmSi, 'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
```

```

function edit_VolCarena_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_VolCarena (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_LCB_Callback(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
% Hints: get(hObject,'String') returns contents of edit_LCB as text
%         str2double(get(hObject,'String')) returns contents of
edit_LCB as a double

% --- Executes during object creation, after setting all properties.
function edit_LCB_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_LCB (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmin_Callback(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmin as text
%         str2double(get(hObject,'String')) returns contents of
edit_Vmin as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmin,'String'))>0
    msgbox('El valor de la velocidad mínima debe ser mayor al de la
máxima.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_VolCarena,'Enable','off');
    set(handles.edit_At,'Enable','off');

```

```

set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Vmax, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmin,'String'))<0
msgbox('El valor de la velocidad mínima es
incorrecto.', 'Aviso.', 'error');
set(hObject, 'String', '');
set(handles.edit_Lf, 'Enable', 'off');
set(handles.edit_B, 'Enable', 'off');
set(handles.edit_VolCarena, 'Enable', 'off');
set(handles.edit_At, 'Enable', 'off');
set(handles.edit_Am, 'Enable', 'off');
set(handles.edit_LCB, 'Enable', 'off');
set(handles.edit_Vmax, 'Enable', 'off');
set(handles.edit_iE, 'Enable', 'off');
set(handles.edit_Sm, 'Enable', 'off');
set(handles.radiobutton_iESi, 'Enable', 'off');
set(handles.radiobutton_iENo, 'Enable', 'off');
set(handles.radiobutton_SmSi, 'Enable', 'off');
set(handles.radiobutton_SmNo, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
else
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_At, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi,'Value')==1
set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi,'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_Vmin_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmin (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

```

```

% Hint: edit controls usually have a white background on Windows.
%     See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUiControlBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

function edit_Vmax_Callback(hObject, eventdata, handles)
% hObject     handle to edit_Vmax (see GCBO)
% eventdata   reserved - to be defined in a future version of MATLAB
% handles     structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Vmax as text
%     str2double(get(hObject,'String')) returns contents of
edit_Vmax as a double
handles = guihandles;
if
str2num(get(handles.edit_Vmax,'String'))<=str2num(get(handles.edit_Vmi
n,'String')) & str2num(get(handles.edit_Vmax,'String'))>0
    msgbox('El valor de la velocidad máxima debe ser mayor al de la
máxima.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
elseif str2num(get(handles.edit_Vmin,'String'))<=0
    msgbox('El valor de la velocidad máxima es
incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
else

```

```

set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_At, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.radiobutton_iESi, 'Enable', 'on');
set(handles.radiobutton_iENo, 'Enable', 'on');
if get(handles.radiobutton_iESi, 'Value')==1
    set(handles.edit_iE, 'Enable', 'on');
else
end
set(handles.radiobutton_SmSi, 'Enable', 'on');
set(handles.radiobutton_SmNo, 'Enable', 'on');
if get(handles.radiobutton_SmSi, 'Value')==1
    set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_Vmax_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Vmax (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUiControlBackgroundColor'))
    set(hObject, 'BackgroundColor', 'white');
end

function edit_iE_Callback(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject, 'String') returns contents of edit_iE as text
%         str2double(get(hObject, 'String')) returns contents of edit_iE
as a double
handles = guihandles;
if str2num(get(handles.edit_iE, 'String'))<=0
    msgbox('El valor del semiángulo de la flotación es
incorrecto.', 'Aviso.', 'error');
    set(hObject, 'String', '');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_B, 'Enable', 'off');
    set(handles.edit_VolCarena, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');

```

```

set(handles.edit_Sm, 'Enable', 'off');
set(handles radiobutton_iESi, 'Enable', 'off');
set(handles radiobutton_iENo, 'Enable', 'off');
set(handles radiobutton_SmSi, 'Enable', 'off');
set(handles radiobutton_SmNo, 'Enable', 'off');
set(handles.pushbutton_Comprobar, 'Enable', 'off');
set(handles.pushbutton_Borrar, 'Enable', 'off');
else
set(handles.edit_B, 'Enable', 'on');
set(handles.edit_LCB, 'Enable', 'on');
set(handles.edit_VolCarena, 'Enable', 'on');
set(handles.edit_At, 'Enable', 'on');
set(handles.edit_Am, 'Enable', 'on');
set(handles.edit_Lf, 'Enable', 'on');
set(handles.edit_Vmin, 'Enable', 'on');
set(handles.edit_Vmax, 'Enable', 'on');
set(handles radiobutton_iESi, 'Enable', 'on');
set(handles radiobutton_iENo, 'Enable', 'on');
set(handles radiobutton_SmSi, 'Enable', 'on');
set(handles radiobutton_SmNo, 'Enable', 'on');
if get(handles radiobutton_SmSi, 'Value')==1
set(handles.edit_Sm, 'Enable', 'on');
else
end
set(handles.pushbutton_Comprobar, 'Enable', 'on');
set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_iE_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_iE (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject, 'BackgroundColor'),
get(0, 'defaultUicontrolBackgroundColor'))
set(hObject, 'BackgroundColor', 'white');
end

% --- Executes on button press in radiobutton_SmSi.
function radiobutton_SmSi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmSi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject, 'Value') returns toggle state of radiobutton_SmSi
handles = guihandles;
if get(hObject, 'Value')==1
set(handles radiobutton_SmNo, 'Value', 0);
set(handles.edit_Sm, 'Enable', 'on');
else
end

% --- Executes on button press in radiobutton_SmNo.
function radiobutton_SmNo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_SmNo (see GCBO)

```



```

% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_SmNo
if get(handles.radiobutton_SmNo,'Value')==1
    set(handles.radiobutton_SmSi,'Value',0);
    set(handles.edit_Sm,'Enable','off');
    set(handles.edit_Sm,'String','');
else
end

function edit_Sm_Callback(hObject, eventdata, handles)
% hObject handle to edit_Sm (see GCBO)
% eventdata reserved - to be defined in a future version of MATLAB
% handles structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_Sm as text
% str2double(get(hObject,'String')) returns contents of edit_Sm
as a double
handles = guihandles;
if str2num(get(handles.edit_Sm,'String'))<=0
    msgbox('El valor de la superficie mojada es
incorrecto.','Aviso.','error');
    set(hObject,'String','');
    set(handles.edit_B,'Enable','off');
    set(handles.edit_Lf,'Enable','off');
    set(handles.edit_VolCarena,'Enable','off');
    set(handles.edit_At,'Enable','off');
    set(handles.edit_Am,'Enable','off');
    set(handles.edit_LCB,'Enable','off');
    set(handles.edit_Vmin,'Enable','off');
    set(handles.edit_Vmax,'Enable','off');
    set(handles.edit_iE,'Enable','off');
    set(handles.radiobutton_iESi,'Enable','off');
    set(handles.radiobutton_iENo,'Enable','off');
    set(handles.radiobutton_SmSi,'Enable','off');
    set(handles.radiobutton_SmNo,'Enable','off');
    set(handles.pushbutton_Comprobar,'Enable','off');
    set(handles.pushbutton_Borrar,'Enable','off');
else
    set(handles.edit_LCB,'Enable','on');
    set(handles.edit_B,'Enable','on');
    set(handles.edit_VolCarena,'Enable','on');
    set(handles.edit_At,'Enable','on');
    set(handles.edit_Am,'Enable','on');
    set(handles.edit_Lf,'Enable','on');
    set(handles.edit_Vmin,'Enable','on');
    set(handles.edit_Vmax,'Enable','on');
    set(handles.radiobutton_iESi,'Enable','on');
    set(handles.radiobutton_iENo,'Enable','on');
    set(handles.radiobutton_SmSi,'Enable','on');
    set(handles.radiobutton_SmNo,'Enable','on');
    if get(handles.radiobutton_iESi,'Value')==1
        set(handles.edit_iE,'Enable','on');
    else
    end
    set(handles.pushbutton_Comprobar,'Enable','on');
    set(handles.pushbutton_Borrar,'Enable','on');
end
end

```

```

% --- Executes during object creation, after setting all properties.
function edit_Sm_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_Sm (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

% --- Executes on button press in radiobutton_iENo.
function radiobutton_iENo_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_iENo (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iENo
if get(hObject,'Value')==1
    if (strcmp(get(handles.edit_Vmin,'String'),'') |
strcmp(get(handles.edit_Vmin,'String'),char(zeros(1,0)))) |
(strcmp(get(handles.edit_Vmax,'String'),'') |
strcmp(get(handles.edit_Vmax,'String'),char(zeros(1,0))))
        msgbox('Para estimar el valor de iE, es necesario conocer los
valores del rango de velocidades.','Aviso.','help');
        set(handles.radiobutton_iESi,'Value',0);
        set(handles.radiobutton_iENo,'Value',0);
        set(handles.edit_iE,'Enable','off');
        set(handles.edit_iE,'String','');
    else
        set(handles.radiobutton_iESi,'Value',0);
        set(handles.edit_iE,'Enable','off');
        set(handles.edit_iE,'String','');
    end
end

% --- Executes on button press in radiobutton_iESi.
function radiobutton_iESi_Callback(hObject, eventdata, handles)
% hObject    handle to radiobutton_iESi (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hint: get(hObject,'Value') returns toggle state of radiobutton_iESi
handles = guihandles;
if get(hObject,'Value')==1
    set(handles.radiobutton_iENo,'Value',0);
    set(handles.edit_iE,'Enable','on');
else
end

function edit_B_Callback(hObject, eventdata, handles)

```

```

% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Hints: get(hObject,'String') returns contents of edit_B as text
%         str2double(get(hObject,'String')) returns contents of edit_B
as a double
handles = guidata(handles);
if str2num(get(handles.edit_B,'String'))<=0
    msgbox('El valor de la manga es incorrecto.','Aviso.','error');
    set(hObject, 'String', '');
    set(handles.edit_LCB, 'Enable', 'off');
    set(handles.edit_Lf, 'Enable', 'off');
    set(handles.edit_Vmin, 'Enable', 'off');
    set(handles.edit_Vmax, 'Enable', 'off');
    set(handles.edit_At, 'Enable', 'off');
    set(handles.edit_Am, 'Enable', 'off');
    set(handles.edit_iE, 'Enable', 'off');
    set(handles.edit_Sm, 'Enable', 'off');
    set(handles.radiobutton_iESi, 'Enable', 'off');
    set(handles.radiobutton_iENo, 'Enable', 'off');
    set(handles.radiobutton_SmSi, 'Enable', 'off');
    set(handles.radiobutton_SmNo, 'Enable', 'off');
    set(handles.pushbutton_Comprobar, 'Enable', 'off');
    set(handles.pushbutton_Borrar, 'Enable', 'off');
else
    set(handles.edit_LCB, 'Enable', 'on');
    set(handles.edit_Lf, 'Enable', 'on');
    set(handles.edit_At, 'Enable', 'on');
    set(handles.edit_Am, 'Enable', 'on');
    set(handles.edit_Vmin, 'Enable', 'on');
    set(handles.edit_Vmax, 'Enable', 'on');
    set(handles.radiobutton_iESi, 'Enable', 'on');
    set(handles.radiobutton_iENo, 'Enable', 'on');
    if get(handles.radiobutton_iESi,'Value')==1
        set(handles.edit_iE, 'Enable', 'on');
    else
    end
    set(handles.radiobutton_SmSi, 'Enable', 'on');
    set(handles.radiobutton_SmNo, 'Enable', 'on');
    if get(handles.radiobutton_SmSi,'Value')==1
        set(handles.edit_Sm, 'Enable', 'on');
    else
    end
    set(handles.pushbutton_Comprobar, 'Enable', 'on');
    set(handles.pushbutton_Borrar, 'Enable', 'on');
end

% --- Executes during object creation, after setting all properties.
function edit_B_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit_B (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: edit controls usually have a white background on Windows.
%         See ISPC and COMPUTER.
if ispc && isequal(get(hObject,'BackgroundColor'),
get(0,'defaultUicontrolBackgroundColor'))
    set(hObject,'BackgroundColor','white');
end

```

```

% --- Executes on button press in pushbutton_Salir.
function pushbutton_Salir_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Salir (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
close(gcf)
global comp
global metodo
global v
global v_EHP
global v_RT
comp=0;
switch metodo
    case 'Mercier-Savitsky'
        global vMer
        global v_RTMer
        global v_EHPMer
        v=vMer;
        v_RT=v_RTMer;
        v_EHP=v_EHPMer;
end

% --- Executes on mouse press over axes background.
function axes_Rt_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_Rt (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_RT
global v1
global calc
global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_RT);
v_RT1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_RT1=[v_RT1 v_RT(j)];
        else
            end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off');
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')

```

```

elseif comp==1 & compplot==1
    switch metodo
        case 'Mercier-Savitsky'
            global vMer
            global v1Mer
            global v_RTMer
            n=length(v1Mer);
            m=length(v_RTMer);
            v_RT1Mer=[];
            for i=1:n
                for j=1:m
                    if v1Mer(i)==vMer(j)
                        v_RT1Mer=[v_RT1Mer v_RTMer(j)];
                    else
                        end
                end
            end
            vcomp=vMer;
            v1comp=v1Mer;
            v_RTcomp=v_RTMer;
            v_RT1comp=v_RT1Mer;
            leyenda='Mercier-Savitsky';
        end
handles.newfig=figure('Name','Curva RT-V','NumberTitle','off');
plot(v,v_RT,'b-','LineWidth',2);axis tight;hold on
plot(vcomp,v_RTcomp,'y-','LineWidth',2);axis tight;hold on
plot(v1,v_RT1,'ro','LineWidth',2);axis tight;hold on
plot(v1comp,v_RT1comp,'ro','LineWidth',2);axis tight;hold on
lgd=legend({'Ping-Zhong',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('RT(kg)')
end
else
end

% --- Executes during object creation, after setting all properties.
function axes_Rt_CreateFcn(hObject, eventdata, handles)
% hObject    handle to axes_Rt (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    empty - handles not created until after all CreateFcns
called

% Hint: place code in OpeningFcn to populate axes_Rt

% --- Executes on mouse press over axes background.
function axes_EHP_ButtonDownFcn(hObject, eventdata, handles)
% hObject    handle to axes_EHP (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global v
global v_EHP
global v1
global calc

```

```

global comp
global metodo
global compplot
if calc==1
n=length(v1);
m=length(v_EHP);
v_EHP1=[];
for i=1:n
    for j=1:m
        if v1(i)==v(j)
            v_EHP1=[v_EHP1 v_EHP(j)];
        else
            end
    end
end
end
if comp==0 | compplot==0
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;
position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
elseif comp==1 & compplot==1
    switch metodo
        case 'Mercier-Savitsky'
            global vMer
            global v1Mer
            global v_EHPMer
            n=length(v1Mer);
            m=length(v_EHPMer);
            v_EHP1Mer=[];
            for i=1:n
                for j=1:m
                    if v1Mer(i)==vMer(j)
                        v_EHP1Mer=[v_EHP1Mer v_EHPMer(j)];
                    else
                        end
                end
            end
            end
            vcomp=vMer;
            v1comp=v1Mer;
            v_EHPcomp=v_EHPMer;
            v_EHP1comp=v_EHP1Mer;
            leyenda='Mercier-Savitsky';
        end
handles.newfig=figure('Name','Curva EHP-V','NumberTitle','off');
plot(v,v_EHP,'r-','LineWidth',2);axis tight;hold on
plot(vcomp,v_EHPcomp,'k-','LineWidth',2);axis tight;hold on
plot(v1,v_EHP1,'bo','LineWidth',2);axis tight;hold on
plot(v1comp,v_EHP1comp,'bo','LineWidth',2);axis tight;hold on
lgd=legend({'Ping-Zhong',leyenda});
set(handles.newfig,'Units','pixels');
screenSize=get(0,'ScreenSize');
position=get(handles.output,'Position');
position(1)=(screenSize(3)-position(3))/2;

```

```

position(2)=(screenSize(4)-position(4))/2;
set(handles.newfig,'Position',position);
movegui(handles.newfig,'center')
xlabel('V(kn)')
ylabel('EHP(C.V.)')
end
else
end

% --- Executes on button press in pushbutton_Comparar.
function pushbutton_Comparar_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton_Comparar (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global comp
global tipo_barco
global metodo
global v
global v1
global v_EHP
global v_RT
global vPing
global v1Ping
global v_EHPPing
global v_RTPing
global compplot
global cancelar
if comp==0 | cancelar==1
switch tipo_barco
    case 'Buque rápido'
        pop={'--Selección--','Mercier-Savitsky'};
    case 'Patrullero'
        pop={'--Selección--','Mercier-Savitsky'};
    case 'Militar'
        pop={'--Selección--','Mercier-Savitsky'};
end
global Lf
global B
global Vmin
global Vmax
global VolCarena
global LCB
global iE
global Sm
global At
global Am
global AGUA
global Estacion
global Ruta
Lf=str2num(get(handles.edit_Lf,'String'));
B=str2num(get(handles.edit_B,'String'));
At=str2num(get(handles.edit_At,'String'));
Am=str2num(get(handles.edit_Am,'String'));
Vmin=str2num(get(handles.edit_Vmin,'String'));
Vmax=str2num(get(handles.edit_Vmax,'String'));
VolCarena=str2num(get(handles.edit_VolCarena,'String'));
if get(handles.radiobutton_Rio,'Value')==1
Densidad=1.000; %Tm3
AGUA=1;
else

```

```

Densidad=1.025; %T/m3
AGUA=0;
end
LCB=str2num(get(handles.edit_LCB,'String'));
if get(handles.radiobutton_SmSi,'Value')==1
    Sm=str2num(get(handles.edit_Sm,'String'));
else
    Sm=0;
end
if get(handles.radiobutton_iESi,'Value')==1
    iE=str2num(get(handles.edit_iE,'String'));
else
    iE=0;
end
contents=cellstr(get(handles.popupmenu_Ruta,'String'));
Ruta=contents{get(handles.popupmenu_Ruta,'Value')};
contents=cellstr(get(handles.popupmenu_Estacion,'String'));
Estacion=contents{get(handles.popupmenu_Estacion,'Value')};
vPing=v;
v1Ping=v1;
v_EHPPing=v_EHP;
v_RTPing=v_RT;
[comp]=comparar(pop);
cancelar=1;
else
    compplot=1;
switch metodo
    case 'Mercier-Savitsky'
        global vMer
        global v_RTMer
        global v_EHPMer
        vcomp=vMer;
        v_RTcomp=v_RTMer;
        v_EHPcomp=v_EHPMer;
        leyenda='Mercier-Savitsky';
end
axes(handles.axes_Rt);
cla(handles.axes_Rt,'reset');
handles.plot1=plot(v,v_RT,'-b',vcomp,v_RTcomp,'y-');axis tight;hold on
lgd=legend({'Ping-Zhong',leyenda});
set(handles.plot1,'HitTest','off');
set(handles.axes_Rt,'ButtonDownFcn',@(s,e)axes_Rt_ButtonDownFcn(s,e,handles))
xlabel('V(kn)')
ylabel('Rt(kg)')
axes(handles.axes_EHP);
cla(handles.axes_EHP,'reset');
handles.plot2=plot(v,v_EHP,'-r',vcomp,v_EHPcomp,'k-');axis tight;hold on
lgd=legend({'Ping-Zhong',leyenda});
set(handles.plot2,'HitTest','off');
set(handles.axes_EHP,'ButtonDownFcn',@(s,e)axes_EHP_ButtonDownFcn(s,e,handles))
xlabel('V(kn)')
ylabel('EHP(C.V.)')
cancelar=0;
end

% --- Executes on button press in pushbutton_Rangos.
function pushbutton_Rangos_Callback(hObject, eventdata, handles)

```



```
% hObject    handle to pushbutton_Rangos (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
global rangometodo
rangometodo='Ping-Zhong';
rangos(rangometodo);
```

Comparación entre métodos.

```
function [comp] = comparar (pop)
comp =1;
d = dialog('Position',[480 300 400 150], 'Name', 'Comparación de
métodos:');

txt = uicontrol('Parent',d,...
    'Style','text',...
    'FontSize',12,...
    'Position',[-140 -48 500 150],...
    'String','Escoja un método:');

btn = uicontrol('Parent',d,...
    'FontSize',12,...
    'Position',[210 25 80 30],...
    'String','Cancelar',...
    'Callback',@btn_callback);
btn = uicontrol('Parent',d,...
    'Tag','handles.btn',...
    'FontSize',12,...
    'Position',[120 25 80 30],...
    'String','Aceptar',...
    'Enable','off',...
    'Callback',@btn1_callback);
popup = uicontrol('Parent',d,...
    'Style','popup',...
    'FontSize',12,...
    'Position',[180 80 200 25],...
    'String',pop,...
    'Callback',@popup_callback);

function popup_callback(popup,event)
idx = popup.Value;
popup_items = popup.String;
% This code uses dot notation to get properties.
% Dot notation runs in R2014b and later.
% For R2014a and earlier:
% idx = get(popup,'Value');
% popup_items = get(popup,'String');
comp = char(popup_items(idx,:));
if strcmp(comp,'--Selección--')
    set(btn,'Enable','off');
else
    set(btn,'Enable','on');
end
end
function btn_callback(popup,event)
close(gcf);
end
function btn1_callback(popup,event)
switch comp
case 'Guldhammer y Harvald'
    close (gcf);
    GuldhammerHarvald
case 'Amadeo García'
    close (gcf);
    AmadeoGarcia
case 'Van Oortmerssen'
    close (gcf);
```

```
VanOortmerssen
case 'Holtrop y Mennen'
close (gcf);
HoltropyMennen2
case 'Mercier-Savitsky'
close (gcf);
MercierSavitsky
case 'Ping-Zhong'
close (gcf);
PingZhong
end
end
end
```

Rangos de aplicación.

```
function rangos(rangometodo)
switch rangometodo
case 'Holtrop y Mennen'
    d = dialog('Position',[400 350 550 180],'Name','Rangos de
valores:');

    txt = uicontrol('Parent',d,...
        'Style','text',...
        'Position',[10 10 500 150],...
        'String',{'
                Tipo buque
Fnmáx  CPmin  CPmáx  L/Bmin  L/Bmáx  B/Tmin  B/Tmáx'
'
0.3      0.56      0.75      5.3      8      2.4      4
'
                Portacontenedores
0.45     0.55     0.67     6      9.5     3      4
'
                Petroleros,bulkcarriers
0.24     0.73     0.85     5.1     7.1     2.4     3.2
'
                Arrastreros,costeros,remolcadores 0.38
0.55     0.65     3.9     6.3     2.1     3
'
                Ro-Ro y ferries
0.35     0.55     0.67     5.3     8      3.2     4
'
});

    btn = uicontrol('Parent',d,...
        'Position',[230 25 80 30],...
        'String','Cerrar',...
        'Callback','delete(gcf)');
case 'Guldhammer y Harvald'
d = dialog('Position',[600 350 300 150],'Name','Rangos de valores:');

    txt = uicontrol('Parent',d,...
        'FontSize',9,...
        'Style','text',...
        'Position',[-100 10 500 120],...
        'String',{'0.15<Fn<0.45'
'0.50<CP<0.80'
'4.0<Lpp/Vol.Carena^(1/3)<8.0'
'-3.0<LCB<3.0'});

    btn = uicontrol('Parent',d,...
        'FontSize',9,...
        'Position',[110 25 80 30],...
        'String','Cerrar',...
        'Callback','delete(gcf)');
case 'Amadeo García'
    d = dialog('Position',[650 350 230 150],'Name','Rangos:');

    txt = uicontrol('Parent',d,...
        'FontSize',10,...
        'Style','text',...
        'Position',[-130 10 500 120],...
        'String',{'25<Lpp<60'
'0.25<Fn<0.40'
'0.095<CB·B/Lpp<0.165'});

    btn = uicontrol('Parent',d,...
```

```

        'FontSize',10,...
        'Position',[80 25 80 30],...
        'String','Cerrar',...
        'Callback','delete(gcf)');
case 'Van Oortmerssen'
d = dialog('Position',[650 280 230 250],'Name','Rangos:');

txt = uicontrol('Parent',d,...
    'FontSize',10,...
    'Style','text',...
    'Position',[-130 50 500 180],...
    'String',{'8<Lf<80'
        '5<Vol.Carena<3000'
        '3<Lf/B<6.2'
        '1.9<B/T<4'
        '0.5<CP<0.725'
        '0.73<CM<0.97'
        '-8%Ld<lcb<8%Ld'
        '10°<iE<46°'
        '0<V/sqrt(Lf)<1.79'
        '0<Fn<0.5'});

btn = uicontrol('Parent',d,...
    'FontSize',10,...
    'Position',[80 25 80 30],...
    'String','Cerrar',...
    'Callback','delete(gcf)');
case 'Ping-Zhong'
d = dialog('Position',[650 280 230 200],'Name','Rangos:');

txt = uicontrol('Parent',d,...
    'FontSize',10,...
    'Style','text',...
    'Position',[-130 50 500 130],...
    'String',{'1.55<CV<11.0'
        '0.573<CP<0.764'
        '0<FT<0.74'
        '0<F<6.4'
        '7.6<iE<26.6'});

btn = uicontrol('Parent',d,...
    'FontSize',10,...
    'Position',[80 40 80 30],...
    'String','Cerrar',...
    'Callback','delete(gcf)');
end
end

```

Método de Newton Raphson.

```
function Cf=newton(Rn)
%Método de Newton para la ecuacion:
%0.0586*(log10(Rn*x))^( -2)-x=0

% datos iniciales
x0 = 0.001;

% número máximo de iteraciones
itermax = 20;

% Epsilon inicializado a un valor alto
eps = 1e-15;

% Un vector para aproximar el histórico de aproximaciones
xvals = x0;

% Número de iteraciones realizadas
itercount = 0;

% Eje x
x = linspace(0, 10, 100);

e=exp(1);
% bucle principal

%Rn=252.5108e+006;%164.6810e+006;

while (abs((0.0586*(log10(Rn*x0))^( -2)-x0))>eps) &&
(itercount<=itermax)
    % x1 = nuevo valor de la aproximacion a la raiz
    % x0 = valor actual de la aproximacion a la raiz

    x1=x0-(0.0586*(log10(Rn*x0))^( -2)-x0)/(-0.1172e0 / log(Rn * x0) ^
3 * log(0.10e2) ^ 2 / x0 - 0.1e1);

    % Añadimos el resultado al histórico
    xvals = [xvals; x1];
    %actualizamos el valor del dato inicial
    x0 = x1;
    %aumentamos en 1 el registro del número de iteraciones
    itercount = itercount+1;
end
Cf=x0;

% Mostramos los resultados
% verbose=0;%si queremos sacar por pantalla información sobre el
resultado poner a 1
% if(verbose==1)
%     disp(['La aproximación final de la raíz mediante el método de
newton es: ' num2str(xvals(end))])
%     disp(['Las aproximaciones sucesivas de la raíz son: '])
%     format long
```

```
% xvals
% format short
% x0=xvals(end);
% disp(['El valor de la función en la raíz aproximada es: '
num2str(0.0586*(log10(Rn*x0))^(-2)-x0)])
% disp(['El número de iteraciones realizadas es: '
num2str(itercount)])
% end
```

B-Splines Cúbicos.

```
function [ux,vy,y0]=cubic_bspline(x,y,m,x0)
%Programa para interpolar curvas velocidad-resistencia
%entradas:
%x son los nodos en el eje x
%y son los nodos en el eje y
%m es el número de nodos intermedios que deseamos interpolar
%x0 es un dato concreto para el que queremos obtener un y0
%salidas:
%ux eje x interpolado
%uy eje y interpolado
%[x,ind]=sort(x);
%y=y(ind);

ux=[];
vy=[];
xp=x;
yp=y;
%Necesitamos un punto mas al principio y al final de los
datos:reflejamos
x_ext1=x(1)+(x(1)-(x(2:5)));
x_ext1=x_ext1(end:-1:1);
x_ext2=x(end)+(x(end)-(x(end-4:end-1)));
x_ext2=x_ext2(end:-1:1);

y=[extrapolacion(x(1:4),y(1:4),x_ext1) y extrapolacion(x(end-
3:end),y(end-3:end),x_ext2)];
x=[x_ext1 x x_ext2];
n=length(x);

for i=3:n-1
    %eje x equiespaciado
    u=linspace(0,1,m);
    v=linspace(0,1,m);
    %bases de polinomios
    bx0=(1/6)*u.^3;
    bx1=(1/6)*(1+3*u+3*u.^2-3*u.^3);
    bx2=(1/6)*(4-6*u.^2+3*u.^3);
    bx3=(1/6)*(1-3*u+3*u.^2-u.^3);
    by0=(1/6)*v.^3;
    by1=(1/6)*(1+3*v+3*v.^2-3*v.^3);
    by2=(1/6)*(4-6*v.^2+3*v.^3);
    by3=(1/6)*(1-3*v+3*v.^2-v.^3);
    %interpolamos coordenadas x e y
    interpx=(x(i-2)*bx0+x(i-1)*bx1+x(i)*bx2+x(i+1)*bx3);
    interpy=(y(i-2)*by0+y(i-1)*by1+y(i)*by2+y(i+1)*by3);
    %guardamos resultados
    ux=[ux interpx];
    vy=[vy interpy];
end
[~,index]=sort(ux,'ascend');
ux=ux(index);
vy=vy(index);

%Calculamos la coordenada y0 para la coordenada x0 de entrada
dist=abs(ux-x0);
[~,index]=sort(dist);
datol=ux(index(1));
if datol>x0
```



```

    if ux(index(1))==ux(1)
        datosx=[ux(index(1)) ux(index(1))];
        datosy=[vy(index(1)) vy(index(1))];
    else
        datosx=[ux(index(1)-1) ux(index(1))];
        datosy=[vy(index(1)-1) vy(index(1))];
    end
    if datosx(1)==datosx(2)
        y0=datosy(1);
    else
        y0=datosy(1)+(datosy(2)-datosy(1))/(datosx(2)-datosx(1))*(x0-
datosx(1));
    end
elseif dato1<x0
    if ux(index(1))==ux(end)
        datosx=[ux(index(1)) ux(index(1))];
        datosy=[vy(index(1)) vy(index(1))];
    else
        datosx=[ux(index(1)) ux(index(1)+1)];
        datosy=[vy(index(1)) vy(index(1)+1)];
    end
    if datosx(1)==datosx(2)
        y0=datosy(1);
    else
        y0=datosy(1)+(datosy(2)-datosy(1))/(datosx(2)-datosx(1))*(x0-
datosx(1));
    end
else
    indice=find(x==x0);
    y0=y(indice);
end

%figure;plot(xp,yp,'o');hold on;plot(ux,vy,'-')

```

Extrapolación.

```
function y_ext=extrapolacion(x,y,x_ext)

x0=x(1);
x1=x(2);
x2=x(3);
x3=x(4);
y0=y(1);
y1=y(2);
y2=y(3);
y3=y(4);

a=y0;
b=(y0 - y1)/(x0 - x1);
c=-(x0*y1 - x1*y0 - x0*y2 + x2*y0 + x1*y2 - x2*y1)/((x0 - x1)*(x0 -
x2)*(x1 - x2));
d=-(x0*x1^2*y2 - x0*x2^2*y1 + x1*x2^2*y0 - x0^2*x1*y2 + x0^2*x2*y1 -
x1^2*x2*y0 - x0*x1^2*y3 + x0*x3^2*y1 - x1*x3^2*y0 + x0^2*x1*y3 -
x0^2*x3*y1 + x1^2*x3*y0 + x0*x2^2*y3 - x0*x3^2*y2 + x2*x3^2*y0 -
x0^2*x2*y3 + x0^2*x3*y2 - x2^2*x3*y0 - x1*x2^2*y3 + x1*x3^2*y2 -
x2*x3^2*y1 + x1^2*x2*y3 - x1^2*x3*y2 + x2^2*x3*y1)/((x0 - x1)*(x0 -
x2)*(x0 - x3)*(x1 - x2)*(x1 - x3)*(x2 - x3));

y_ext=a+b*(x_ext-x0) + c*(x_ext-x0).*(x_ext-x1) + d*(x_ext-
x0).*(x_ext-x1).*(x_ext-x2);
```