

Apéndice B

Lista del programa del Filtro Sallen Key Pasa Bajas, Pasa
Altas y Pasa Bandas

Apéndice B

Listado de Programa: Sallen Key pasa bajas, pasa altas y pasa bandas

```
function displayskpB_OpeningFcn(hObject, eventdata, handles, varargin)
N = varargin{1}
Bn = varargin{2}
An = varargin{3}
Ws = varargin{4}
TIPO = varargin{5}

global Wc
global handles
global bandera

n = N;
if TIPO == ' '
    if bandera == 0
        set(handles.TagEditN, 'string', num2str(N))
    else
        set(handles.TagEditN, 'string', num2str(N*2))
    end
else
    set(handles.TagEditN, 'string', num2str(N))
end

global poles
global Wn
global Q
global m
global M

k = 1:n;
P = poles;

Wn = sqrt((real(P)).^2+imag(P).^2);
Q = (Wn./(2*(abs(real(P))));
Q = sort(Q, 'descend');

if TIPO == ' '
    Q(2:2:(n*2)) = [];
    Wn(2:2:(n*2)) = [];
else
    Q(2:2:(n)) = [];
    Wn(2:2:(n)) = [];
end

switch TIPO
case 'low'
    m = (1./(4*(Q.^2)));
    Q2 = num2str(Q);
    Wn2 = num2str(Wn);
    m2 = num2str(m);
```

```

        val = strcat(Wn2, ' , ', Q2, ' , ', m2);
    case 'high'
        Q2 = num2str(Q);
        Wn2 = num2str(Wn);
        val = strcat(Wn2, ' , ', Q2);
    case ' '
        Q2 = num2str(Q);
        Wn2 = num2str(Wn);
        val = strcat(Wn2, ' , ', Q2);
end

set(handles.TagListboxWn, 'string', num2str(val))
posval=get(handles.TagListboxWn, 'value');

set(handles.TagEditWn, 'string', num2str(Wn(posval, :)))
set(handles.TagEditQ, 'string', num2str(Q(posval, :)))

switch TIPO
    case 'low'
        %seleccion de m
        M = dlmread('vm.txt');
        set(handles.TagListbox, 'string', num2str(M));

        C = str2num(get(handles.TagEditC, 'String'));

        %%%%%%%%%DISEÑO 1
        n1 = ((1./(2*m(posval)*(Q(posval)).^2))-1) + ((sqrt(1-
(4*m(posval)*(Q(posval)).^2)))/(2*m(posval)*(Q(posval)).^2));
        C2 = C;
        C4 = m(posval) * C2;
        R = (1./((sqrt(m(posval)*n1))*(Wn(posval))*C));
        R1 = R;
        R3 = n1* R;

        %imprime los valores de salida
        set(handles.text50, 'string', num2str('C2 ='));
        set(handles.text4, 'string', num2str('C4 ='));
        set(handles.text33, 'string', num2str('R1 ='));
        set(handles.text6, 'string', num2str('R3 ='));
        set(handles.text5, 'string', num2str('K ='));
        set(handles.text72, 'string', num2str('Desing 1'));

        set(handles.TagEditC2, 'string', num2str(C2));
        set(handles.TagEditC4, 'string', num2str(C4));
        set(handles.TagEditR1, 'string', num2str(R1));
        set(handles.TagEditR3, 'string', num2str(R3));
        set(handles.TagEditk1, 'string', num2str(1));

        handles.C2 = C2;
        handles.C4 = C4;
        handles.R1 = R1;
        handles.R3 = R3;

        %%%%%%%%%DISEÑO 2
        C22 = C;

```

```

C42 = C;
R12 = (Q(posval)/(Wn(posval)*C));
R32 = (1/(R12*((Wn(posval))^2)*(C)^2));
%imprime los valores de salida
set(handles.text54, 'string', num2str('C2 ='));
set(handles.text52, 'string', num2str('C4 ='));
set(handles.text58, 'string', num2str('R1 ='));
set(handles.text56, 'string', num2str('R3 ='));
set(handles.text80, 'string', num2str('K ='));
set(handles.text74, 'string', num2str('Desing 2'));

set(handles.TagEditC42, 'string', num2str(C42));
set(handles.TagEditC22, 'string', num2str(C22));
set(handles.TagEditR12, 'string', num2str(R12));
set(handles.TagEditR32, 'string', num2str(R32));
set(handles.TagEditk2, 'string', num2str(2));

handles.C22 = C22;
handles.C42 = C42;
handles.R12 = R12;
handles.R32 = R32;

%%%%%%%%%%DISEÑO 3
C23 = C;
C43 = C;
Rr = 1./(C*Wn(posval));
K = 3-(1./Q(posval));
R33 = Rr;

%imprime los valores de salida
set(handles.text78, 'string', num2str('C2 ='));
set(handles.text76, 'string', num2str('C4 ='));
set(handles.text60, 'string', num2str('R1 ='));
set(handles.text82, 'string', num2str('R3 ='));
set(handles.text45, 'string', num2str('K ='));
set(handles.text73, 'string', num2str('Desing 3'));

set(handles.TagEditC43, 'string', num2str(C43));
set(handles.TagEditC23, 'string', num2str(C23));
set(handles.TagEditRr, 'string', num2str(Rr));
set(handles.TagEditR33, 'string', num2str(R33));
set(handles.TagEditK, 'string', num2str(K));

set(handles.text13, 'string', num2str('Outout Low Pass'));

handles.C23 = C23;
handles.C43 = C43;
handles.R13 = Rr;
handles.R33 = R33;
handles.K = K;

T = ['skpb.jpg'];

case 'high'
C = str2num(get(handles.TagEditC, 'String'));

```

```

%%%%%DISEÑO 1
n1 = 4*(Q(posval)).^2;
C1 = C;
C3 = C1;
R = (1./((sqrt(n1))*(Wn(posval))*C));
R2 = R;
R4 = n1* R2;
K = 1;
%imprime los valores de salida
set(handles.text50, 'string', num2str('C1 ='));
set(handles.text4, 'string', num2str('C3 ='));
set(handles.text33, 'string', num2str('R2 ='));
set(handles.text6, 'string', num2str('R4 ='));
set(handles.text5, 'string', num2str('K ='));
set(handles.text72, 'string', num2str('Desing 1'));

set(handles.TagEditC2, 'string', num2str(C1));
set(handles.TagEditC4, 'string', num2str(C3));
set(handles.TagEditR1, 'string', num2str(R2));
set(handles.TagEditR3, 'string', num2str(R4));
set(handles.TagEditk1, 'string', num2str(K));

handles.C1 = C1;
handles.C3 = C3;
handles.R2 = R2;
handles.R4 = R4;

%%%%%DISEÑO 2
K2 = 2;
C12 = C;
C32 = C;
R22 = (1 + sqrt(1 + 8 *
Q(posval).^2))./(4*C*Wn(posval)*Q(posval));
R42 = (4*Q(posval))./(C*Wn(posval)*(1+sqrt(1+8*Q(posval).^2)));

%imprime los valores de salida
set(handles.text54, 'string', num2str('C1 ='));
set(handles.text52, 'string', num2str('C3 ='));
set(handles.text58, 'string', num2str('R2 ='));
set(handles.text56, 'string', num2str('R4 ='));
set(handles.text80, 'string', num2str('K ='));
set(handles.text74, 'string', num2str('Desing 2'));

set(handles.TagEditC22, 'string', num2str(C12));
set(handles.TagEditC42, 'string', num2str(C32));
set(handles.TagEditR12, 'string', num2str(R22));
set(handles.TagEditR32, 'string', num2str(R42));
set(handles.TagEditk2, 'string', num2str(K2));

handles.C12 = C12;
handles.C32 = C32;
handles.R22 = R22;
handles.R42 = R42;

```

```

%%%%%%%%%DISEÑO 3
C13 = C;
C33 = C;
Rr = 1/(C*(Wn(posval)));
R23 = Rr;
R43 = Rr;
K3 = 3-(1/Q(posval));

%imprime los valores de salida
set(handles.text78, 'string', num2str('C1 ='));
set(handles.text76, 'string', num2str('C3 ='));
set(handles.text60, 'string', num2str('R2 ='));
set(handles.text82, 'string', num2str('R4 ='));
set(handles.text45, 'string', num2str('K ='));
set(handles.text73, 'string', num2str('Desing 3'));

set(handles.TagEditC23, 'string', num2str(C13));
set(handles.TagEditC43, 'string', num2str(C33));
set(handles.TagEditRr, 'string', num2str(R23));
set(handles.TagEditR33, 'string', num2str(R43));
set(handles.TagEditK, 'string', num2str(K3));

set(handles.text13, 'string', num2str('Outout High Pass'));

set(handles.text47, 'enable', 'off');
set(handles.text48, 'enable', 'off');
set(handles.text84, 'enable', 'off');
set(handles.TagListbox, 'enable', 'off');

handles.C13 = C13;
handles.C33 = C33;
handles.R23 = R23;
handles.R43 = R43;
handles.K3 = K3;

T = ['skpa.jpg'];

case ' '
%%%%%%%%%DISEÑO 1 %%%%%%%%%%
C = str2num(get(handles.TagEditC, 'String'));
C3 = C;
C5 = C3;
K = 4 - (sqrt(2))./Q(posval);
Ho = K./(4 - K);
RC = (sqrt(2))./Wn(posval);
R = sqrt(2)./Wn(posval) * C;
R1 = R;
R2 = R1;
R4 = R2;

%imprime los valores de salida
set(handles.text54, 'string', num2str('C3 ='));
set(handles.text52, 'string', num2str('C5 ='));
set(handles.text58, 'string', num2str('R1 ='));
set(handles.text56, 'string', num2str('R2 ='));

```

```

set(handles.text80, 'string', num2str('K ='));
set(handles.text86, 'string', num2str('R4 ='));
set(handles.text88, 'string', num2str('Ho ='));
set(handles.text74, 'string', num2str('Desing 1'));

set(handles.TagEditC22, 'string', num2str(C3));
set(handles.TagEditC42, 'string', num2str(C5));
set(handles.TagEditR12, 'string', num2str(R1));
set(handles.TagEditR32, 'string', num2str(R2));
set(handles.TagEditBPR4, 'string', num2str(R4));
set(handles.TagEditk2, 'string', num2str(K));
set(handles.TagEditHo, 'string', num2str(Ho));

handles.C3 = C3;
handles.C5 = C5;
handles.R1 = R1;
handles.R2 = R2;
handles.R4 = R4;
handles.K = K;

%%%%%%%% DISEÑO 2   %%%%%%%%%
K2 = 2;
R12 = 1;
C32 = R12;
C52 = C32;
R42 = (1./(2*Wn(posval).^2))*(2-
Wn(posval)./Q(posval))+(1./(2*Wn(posval).^2))*sqrt(((2-
Wn(posval)./Q(posval)).^2)+8*Wn(posval).^2)
R22 = (1./((Wn(posval).^2)*R42-1))

%imprime los valores de salida
set(handles.text78, 'string', num2str('C3 ='));
set(handles.text76, 'string', num2str('C5 ='));
set(handles.text60, 'string', num2str('R1 ='));
set(handles.text82, 'string', num2str('R2 ='));
set(handles.text45, 'string', num2str('K ='));
set(handles.text90, 'string', num2str('R4 ='));
set(handles.text73, 'string', num2str('Desing 2'));

set(handles.TagEditC23, 'string', num2str(C52));
set(handles.TagEditC43, 'string', num2str(C32));
set(handles.TagEditRr, 'string', num2str(R12));
set(handles.TagEditR33, 'string', num2str(R22));
set(handles.TagEditBPR4b, 'string', num2str(R42));
set(handles.TagEditK, 'string', num2str(K2));

set(handles.text13, 'string', num2str('Outout Band Pass'));

set(handles.text47, 'enable', 'off');
set(handles.text48, 'enable', 'off');
set(handles.text84, 'enable', 'off');
set(handles.TagListbox, 'enable', 'off');

handles.C32 = C32;
handles.C52 = C52;

```

```

        handles.R12 = R12;
        handles.R22 = R22;
        handles.R42 = R42;
        handles.K2 = K2;

    T = ['skpBa.jpg'];
end

[X,MAP] = IMREAD(T,'jpg');
subplot(handles.axes1)
image(X)
colormap(MAP)
axis off
axis equal

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

% Update handles structure
guidata(hObject, handles);

function TagPushBack_Callback(hObject, eventdata, handles)
% hObject      handle to pushbutton2 (see GCBO)
% eventdata    reserved - to be defined in a future version of MATLAB
% handles      structure with handles and user data (see GUIDATA)
global bandera
global TIPO
TIPO
close;
if bandera == 0 %%%thomson
    activeTT(1,TIPO,3,4,5,6);
else
    active(1,2,3,4);
end
clear global handles
clc

function TagListbox_Callback(hObject, eventdata, handles)
%%para pasa bajas

global Wn
global Q
global M
global Wc
global N
global m

posval=get(handles.TagListboxWn,'value');
posm=get(handles.TagListbox,'value');
M(posm);
m(posval);

C = str2num(get(handles.TagEditC,'String'));

```



```

%%%%%%%%%%DISEÑO 1

m1 = str2num(get(handles.TagEditm1,'String'));

n1 = ((1/(2*M(posm)*(Q(posval)).^2))-1) + ((sqrt(1-
(4*M(posm)*(Q(posval)).^2)))/(2*M(posm)*(Q(posval)).^2));

C2 = C;
C4 = M(posm) * C2;
R = (1./((sqrt(M(posm)*n1))*(Wn(posval))*C));
R1 = R;
R3 = n1* R;

%imprime los valores de salida
set(handles.TagEditC2,'string',num2str(C2));
set(handles.TagEditC4,'string',num2str(C4));
%set(handles.TagEditR,'string',num2str(R));
set(handles.TagEditR1,'string',num2str(R1));
set(handles.TagEditR3,'string',num2str(R3));

if M(posm)>m(posval)
    set(handles.TagEditC2,'enable','off');
    set(handles.TagEditC4,'enable','off');
    set(handles.TagEditk1,'enable','off');
    set(handles.TagEditR1,'enable','off');
    set(handles.TagEditR3,'enable','off');
    war(1);
else
    set(handles.TagEditC2,'enable','on');
    set(handles.TagEditC4,'enable','on');
    set(handles.TagEditk1,'enable','on');
    set(handles.TagEditR1,'enable','on');
    set(handles.TagEditR3,'enable','on');
end

function TagListboxWn_Callback(hObject, eventdata, handles)

global Wn
global Q
global m
global Wc
global N
global TIPO
global handles

s=get(handles.TagListboxWn,'value');
posval=get(handles.TagListboxWn,'value');

switch TIPO
    case 'low'
        %seleccion de m
        M = dlmread('vm.txt');
        set(handles.TagListbox,'string',num2str(M));

```

```

C = str2num(get(handles.TagEditC, 'String'));

%%%%%%%%%%DISEÑO 1
n1 = ((1./(2*m(posval)*(Q(s)).^2))-1) + ((sqrt(1-
(4*m(s)*(Q(s)).^2)))/(2*m(s)*(Q(s)).^2));
C2 = C;
C4 = m(s) * C2;
R = (1./((sqrt(m(s)*n1))*(Wn(s))*C));
R1 = R;
R3 = n1* R;

%imprime los valores de salida
set(handles.text50, 'string', num2str('C2 ='));
set(handles.text4, 'string', num2str('C4 ='));
set(handles.text33, 'string', num2str('R1 ='));
set(handles.text6, 'string', num2str('R3 ='));
set(handles.text5, 'string', num2str('K ='));
set(handles.text72, 'string', num2str('Desing 1'));

set(handles.TagEditC2, 'string', num2str(C2));
set(handles.TagEditC4, 'string', num2str(C4));
set(handles.TagEditR1, 'string', num2str(R1));
set(handles.TagEditR3, 'string', num2str(R3));
set(handles.TagEditk1, 'string', num2str(1));

handles.C2(s) = C2;
handles.C4(s) = C4;
handles.R1(s) = R1;
handles.R3(s) = R3;

%%%%%%%%%%DISEÑO 2
C22 = C;
C42 = C;
R12 = (Q(s)/(Wn(s)*C));
R32 = (1/(R12*((Wn(s))^2)*(C)^2));
%imprime los valores de salida
set(handles.text54, 'string', num2str('C2 ='));
set(handles.text52, 'string', num2str('C4 ='));
set(handles.text58, 'string', num2str('R1 ='));
set(handles.text56, 'string', num2str('R3 ='));
set(handles.text80, 'string', num2str('K ='));
set(handles.text74, 'string', num2str('Desing 2'));

set(handles.TagEditC42, 'string', num2str(C42));
set(handles.TagEditC22, 'string', num2str(C22));
set(handles.TagEditR12, 'string', num2str(R12));
set(handles.TagEditR32, 'string', num2str(R32));
set(handles.TagEditk2, 'string', num2str(2));

handles.C22(s) = C22;
handles.C42(s) = C42;
handles.R12(s) = R12;
handles.R32(s) = R32;

```

```

%%%%%%%%%DISEÑO 3
C23 = C;
C43 = C;
Rr = 1./(C*Wn(s));
K = 3-(1./Q(s));
R33 = Rr;

%imprime los valores de salida
set(handles.text78, 'string', num2str('C2 ='));
set(handles.text76, 'string', num2str('C4 ='));
set(handles.text60, 'string', num2str('R1 ='));
set(handles.text82, 'string', num2str('R3 ='));
set(handles.text45, 'string', num2str('K ='));
set(handles.text73, 'string', num2str('Desing 3'));

set(handles.TagEditC43, 'string', num2str(C43));
set(handles.TagEditC23, 'string', num2str(C23));
set(handles.TagEditRr, 'string', num2str(Rr));
set(handles.TagEditR33, 'string', num2str(R33));
set(handles.TagEditK, 'string', num2str(K));

set(handles.text13, 'string', num2str('Outout Low Pass'));

handles.C23(s) = C23;
handles.C43(s) = C43;
handles.R13(s) = Rr;
handles.R33(s) = R33;
handles.K(s) = K;

case 'high'
C = str2num(get(handles.TagEditC, 'String'));

%%%%%%%%%DISEÑO 1
n1 = 4*(Q(s)).^2;
C1 = C;
C3 = C1;
R = (1./((sqrt(n1))*(Wn(s))*C));
R2 = R;
R4 = n1* R2;
K = 1;

%imprime los valores de salida
set(handles.text50, 'string', num2str('C1 ='));
set(handles.text4, 'string', num2str('C3 ='));
set(handles.text33, 'string', num2str('R2 ='));
set(handles.text6, 'string', num2str('R4 ='));
set(handles.text5, 'string', num2str('K ='));
set(handles.text72, 'string', num2str('Desing 1'));

set(handles.TagEditC2, 'string', num2str(C1));
set(handles.TagEditC4, 'string', num2str(C3));
set(handles.TagEditR1, 'string', num2str(R2));
set(handles.TagEditR3, 'string', num2str(R4));
set(handles.TagEditk1, 'string', num2str(K));

handles.C1(s) = C1;

```

```

handles.C3(s) = C3;
handles.R2(s) = R2;
handles.R4(s) = R4;

%%%%%%DISEÑO 2
K2 = 2;
C12 = C;
C32 = C;
R22 = (1 + sqrt(1 + 8 * Q(s).^2))./(4*C*Wn(s)*Q(s));
R42 = (4*Q(s))./(C*Wn(s)*(1+sqrt(1+8*Q(s).^2)));

%imprime los valores de salida
set(handles.text54, 'string', num2str('C1 ='));
set(handles.text52, 'string', num2str('C3 ='));
set(handles.text58, 'string', num2str('R2 ='));
set(handles.text56, 'string', num2str('R4 ='));
set(handles.text80, 'string', num2str('K ='));
set(handles.text74, 'string', num2str('Desing 2'));

set(handles.TagEditC22, 'string', num2str(C12));
set(handles.TagEditC42, 'string', num2str(C32));
set(handles.TagEditR12, 'string', num2str(R22));
set(handles.TagEditR32, 'string', num2str(R42));
set(handles.TagEditk2, 'string', num2str(K2));

handles.C12(s) = C12;
handles.C32(s) = C32;
handles.R22(s) = R22;
handles.R42(s) = R42;

%%%%%%DISEÑO 3
C13 = C;
C33 = C;
Rr = 1/(C*(Wn(s)));
R23 = Rr;
R43 = Rr;
K3 = 3-(1/Q(s));

%imprime los valores de salida
set(handles.text78, 'string', num2str('C1 ='));
set(handles.text76, 'string', num2str('C3 ='));
set(handles.text60, 'string', num2str('R2 ='));
set(handles.text82, 'string', num2str('R4 ='));
set(handles.text45, 'string', num2str('K ='));
set(handles.text73, 'string', num2str('Desing 3'));

set(handles.TagEditC23, 'string', num2str(C13));
set(handles.TagEditC43, 'string', num2str(C33));
set(handles.TagEditRr, 'string', num2str(R23));
set(handles.TagEditR33, 'string', num2str(R43));
set(handles.TagEditK, 'string', num2str(K3));

set(handles.text13, 'string', num2str('Outout High Pass'));

set(handles.text47, 'enable', 'off');

```

```

set(handles.text48,'enable','off');
set(handles.text84,'enable','off');
set(handles.TagListbox,'enable','off');

handles.C13(s) = C13;
handles.C33(s) = C33;
handles.R23(s) = R23;
handles.R43(s) = R43;
handles.K3(s) = K3;
case ' '
    %%%%%DISEÑO 1 %%%%%%%%%%
    C = str2num(get(handles.TagEditC,'String'));
    C3 = C;
    C5 = C3;
    K = 4 - (sqrt(2))./Q(s);
    Ho = K./(4 - K);
    RC = (sqrt(2))./Wn(s);
    R = sqrt(2)./Wn(s) * C;
    R1 = R;
    R2 = R1;
    R4 = R2;

    %imprime los valores de salida
    set(handles.text54,'string',num2str('C3 ='));
    set(handles.text52,'string',num2str('C5 ='));
    set(handles.text58,'string',num2str('R1 ='));
    set(handles.text56,'string',num2str('R2 ='));
    set(handles.text80,'string',num2str('K ='));
    set(handles.text86,'string',num2str('R4 ='));
    set(handles.text88,'string',num2str('Ho ='));
    set(handles.text74,'string',num2str('Desing 1'));

    set(handles.TagEditC22,'string',num2str(C3));
    set(handles.TagEditC42,'string',num2str(C5));
    set(handles.TagEditR12,'string',num2str(R1));
    set(handles.TagEditR32,'string',num2str(R2));
    set(handles.TagEditBPR4,'string',num2str(R4));
    set(handles.TagEditk2,'string',num2str(K));
    set(handles.TagEditHo,'string',num2str(Ho));

    handles.C3(s) = C3;
    handles.C5(s) = C5;
    handles.R1(s) = R1;
    handles.R2(s) = R2;
    handles.R4(s) = R4;
    handles.K(s) = K;

    %%%%% DISEÑO 2 %%%%%%%%%%
    K2 = 2;
    R12 = 1;
    C32 = R12;
    C52 = C32;
    R42 = (1./(2*Wn(s).^2))*(2-
Wn(s)./Q(s))+(1./(2*Wn(s).^2))*sqrt(((2-Wn(s)./Q(s)).^2)+8*Wn(s).^2)
    R22 = (1./((Wn(s).^2)*R42-1))

```

```

%imprime los valores de salida
set(handles.text78,'string',num2str('C3 ='));
set(handles.text76,'string',num2str('C5 ='));
set(handles.text60,'string',num2str('R1 ='));
set(handles.text82,'string',num2str('R2 ='));
set(handles.text45,'string',num2str('K ='));
set(handles.text90,'string',num2str('R4 ='));
set(handles.text73,'string',num2str('Desing 2'));

set(handles.TagEditC23,'string',num2str(C52));
set(handles.TagEditC43,'string',num2str(C32));
set(handles.TagEditRr,'string',num2str(R12));
set(handles.TagEditR33,'string',num2str(R22));
set(handles.TagEditBPR4b,'string',num2str(R42));
set(handles.TagEditK,'string',num2str(K2));

set(handles.text13,'string',num2str('Outout Band Pass'));

set(handles.text47,'enable','off');
set(handles.text48,'enable','off');
set(handles.text84,'enable','off');
set(handles.TagListbox,'enable','off');

handles.C32(s) = C32;
handles.C52(s) = C52;
handles.R12(s) = R12;
handles.R22(s) = R22;
handles.R42(s) = R42;
handles.K2(s) = K;

end

if mod(N,2)~=0
    if Q(s)<=.5
        set(handles.TagEditC2,'enable','off');
        set(handles.TagEditC4,'enable','off');
        set(handles.TagEditk1,'enable','off');
        set(handles.TagEditR1,'enable','off');
        set(handles.TagEditR3,'enable','off');

        set(handles.TagEditR12,'enable','off');
        set(handles.TagEditR32,'enable','off');
        set(handles.TagEditC42,'enable','off');
        set(handles.TagEditC22,'enable','off');
        set(handles.TagEditk2,'enable','off');

        set(handles.TagEditRr,'enable','off');
        set(handles.TagEditR33,'enable','off');
        set(handles.TagEditK,'enable','off');
        set(handles.TagEditC43,'enable','off');
        set(handles.TagEditC23,'enable','off');
        warningpb(Wc);
    else
        set(handles.TagEditC2,'enable','on');
    end
end

```

```

set(handles.TagEditC4, 'enable', 'on');
set(handles.TagEditk1, 'enable', 'on');
set(handles.TagEditR1, 'enable', 'on');
set(handles.TagEditR3, 'enable', 'on');

set(handles.TagEditR12, 'enable', 'on');
set(handles.TagEditR32, 'enable', 'on');
set(handles.TagEditC42, 'enable', 'on');
set(handles.TagEditC22, 'enable', 'on');
set(handles.TagEditk2, 'enable', 'on');

set(handles.TagEditRr, 'enable', 'on');
set(handles.TagEditR33, 'enable', 'on');
set(handles.TagEditK, 'enable', 'on');
set(handles.TagEditC43, 'enable', 'on');
set(handles.TagEditC23, 'enable', 'on');

end

end
clc

function popupmenu4_Callback(hObject, eventdata, handles)
global TIPO
global N
global handles
global C
global R

s = get(handles.TagListboxWn, 'value');
desing2 = get(handles.popupmenu4, 'value');
delete respuesta.cir
diary respuesta.cir
fprintf('\n')
fprintf('.lib "nom.lib"\n')
fprintf('.AC DEC 100 .01 10\n')
fprintf('.PROBE V(*) I(*) W(*) D(*) NOISE(*)\n')
fprintf('v1 11 0 DC 0Vdc AC 1Vac \n')

switch TIPO
case 'low'
switch desing2
case 1
for j = 1:(N/2)
C2(s) = handles.C2(j);
C4(s) = handles.C4(j);
R1(s) = handles.R1(j);
R3(s) = handles.R3(j);
if j == 1
fprintf('R1%d 1%d 2%d %f\n', j, j, j, R1(s))
fprintf('R3%d 2%d 3%d %f\n', j, j, j, R3(s))
fprintf('C2%d 2%d 4%d %f\n', j, j, j, C2(s))
fprintf('C4%d 3%d 0 %f\n', j, j, C4(s))
fprintf('E1%d 4%d 0 3%d 4%d 1meg\n', j, j, j, j)
if mod(N,2)~=0
fprintf('R%d 4%d 5%d %f\n', j, j, j, R)

```

```

        fprintf('C%d 5%d 0 %f\n',j,j,C)
    end
else
    fprintf('R1%d 4%d 2%d %f\n',j,j-1,j,R1(s))
    fprintf('R3%d 2%d 3%d %f\n',j,j,j,R3(s))
    fprintf('C2%d 2%d 4%d %f\n',j,j,j,C2(s))
    fprintf('C4%d 3%d 0 %f\n',j,j,C4(s))
    fprintf('E1%d 4%d 0 3%d 4%d 1meg\n',j,j,j,j)
    if mod(N,2)~=0
        fprintf('R%d 4%d 5%d %f\n',j,j-1,j,R)
        fprintf('C%d 5%d 0 %f\n',j,j,C)
    end
end
end
case 2
for j = 1:(N/2)
    C22(s) = handles.C22(j);
    C42(s) = handles.C42(j);
    R12(s) = handles.R12(j);
    R32(s) = handles.R32(j);
    if j == 1
        fprintf('R1%d 1%d 2%d %f\n',j,j,j,R12(s))
        fprintf('R3%d 2%d 3%d %f\n',j,j,j,R32(s))
        fprintf('C2%d 2%d 4%d %f\n',j,j,j,C22(s))
        fprintf('C4%d 3%d 0 %f\n',j,j,C42(s))
        fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
        fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
        fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
        if mod(N,2)~=0
            fprintf('R%d 4%d 5%d %f\n',j,j,j,R)
            fprintf('C%d 5%d 0 %f\n',j,j,C)
        end
    end
else
    fprintf('R1%d 4%d 2%d %f\n',j,j-1,j,R12(s))
    fprintf('R3%d 2%d 3%d %f\n',j,j,j,R32(s))
    fprintf('C2%d 2%d 4%d %f\n',j,j,j,C22(s))
    fprintf('C4%d 3%d 0 %f\n',j,j,C42(s))
    fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
    fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
    fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
    if mod(N,2)~=0
        fprintf('R%d 4%d 5%d %f\n',j,j-1,j,R)
        fprintf('C%d 5%d 0 %f\n',j,j,C)
    end
end
end
case 3
for j = 1:(N/2)
    C23(s) = handles.C23(j);
    C43(s) = handles.C43(j);
    R13(s) = handles.R13(j);
    R33(s) = handles.R33(j);
    if j == 1
        fprintf('R1%d 1%d 2%d %f\n',j,j,j,R13(s))
        fprintf('R3%d 2%d 3%d %f\n',j,j,j,R33(s))
        fprintf('C2%d 2%d 4%d %f\n',j,j,j,C23(s))
        fprintf('C4%d 3%d 0 %f\n',j,j,C43(s))
    end
end

```



```

        fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
        fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
        fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
        if mod(N,2)~=0
            fprintf('R%d 4%d 5%d %f\n',j,j,j,R)
            fprintf('C%d 5%d 0 %f\n',j,j,C)
        end
    else
        fprintf('R1%d 4%d 2%d %f\n',j,j-1,j,R13(s))
        fprintf('R3%d 2%d 3%d %f\n',j,j,j,R33(s))
        fprintf('C2%d 2%d 4%d %f\n',j,j,j,C23(s))
        fprintf('C4%d 3%d 0 %f\n',j,j,C43(s))
        fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
        fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
        fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
        if mod(N,2)~=0
            fprintf('R%d 4%d 5%d %f\n',j,j-1,j,R)
            fprintf('C%d 5%d 0 %f\n',j,j,C)
        end
    end
end
    end
end
case 'high'
    switch desing2
        case 1
            for j = 1:(N/2)
                C1(s) = handles.C1(j);
                C3(s) = handles.C3(j);
                R2(s) = handles.R2(j);
                R4(s) = handles.R4(j);
                if j == 1
                    fprintf('C1%d 1%d 2%d %f\n',j,j,j,C1(s))
                    fprintf('C3%d 2%d 3%d %f\n',j,j,j,C3(s))
                    fprintf('R2%d 2%d 4%d %f\n',j,j,j,R2(s))
                    fprintf('R4%d 3%d 0 %f\n',j,j,R4(s))
                    fprintf('E1%d 4%d 0 3%d 4%d 1meg\n',j,j,j,j)
                    if mod(N,2)~=0
                        fprintf('R%d 4%d 5%d %f\n',j,j,j,R)
                        fprintf('C%d 5%d 0 %f\n',j,j,C)
                    end
                end
            else
                fprintf('C1%d 4%d 2%d %f\n',j,j-1,j,C1(s))
                fprintf('C3%d 2%d 3%d %f\n',j,j,j,C3(s))
                fprintf('R2%d 2%d 4%d %f\n',j,j,j,R2(s))
                fprintf('R4%d 3%d 0 %f\n',j,j,R4(s))
                fprintf('E1%d 4%d 0 3%d 4%d 1meg\n',j,j,j,j)
                if mod(N,2)~=0
                    fprintf('R%d 4%d 5%d %f\n',j,j-1,j,R)
                    fprintf('C%d 5%d 0 %f\n',j,j,C)
                end
            end
        end
    end
case 2
    for j = 1:(N/2)
        R22(s) = handles.R22(j);
        R42(s) = handles.R42(j);
        C12(s) = handles.C12(j);

```

```

C32(s) = handles.C32(j);
if j == 1
    fprintf('C1%d 1%d 2%d %f\n',j,j,j,C12(s))
    fprintf('C3%d 2%d 3%d %f\n',j,j,j,C32(s))
    fprintf('R2%d 2%d 4%d %f\n',j,j,j,R22(s))
    fprintf('R4%d 3%d 0 %f\n',j,j,R42(s))
    fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
    fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
    fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
    if mod(N,2)~=0
        fprintf('R%d 4%d 5%d %f\n',j,j,j,R)
        fprintf('C%d 5%d 0 %f\n',j,j,C)
    end
else
    fprintf('C1%d 4%d 2%d %f\n',j,j-1,j,C12(s))
    fprintf('C3%d 2%d 3%d %f\n',j,j,j,C32(s))
    fprintf('R2%d 2%d 4%d %f\n',j,j,j,R22(s))
    fprintf('R4%d 3%d 0 %f\n',j,j,R42(s))
    fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
    fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
    fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
    if mod(N,2)~=0
        fprintf('R%d 4%d 5%d %f\n',j,j-1,j,R)
        fprintf('C%d 5%d 0 %f\n',j,j,C)
    end
end
end
case 3
for j = 1:(N/2)
    R23(s) = handles.R23(j);
    R43(s) = handles.R43(j);
    C13(s) = handles.C13(j);
    C33(s) = handles.C33(j);
    if j == 1
        fprintf('C1%d 1%d 2%d %f\n',j,j,j,C13(s))
        fprintf('C3%d 2%d 3%d %f\n',j,j,j,C33(s))
        fprintf('R2%d 2%d 4%d %f\n',j,j,j,R23(s))
        fprintf('R4%d 3%d 0 %f\n',j,j,R43(s))
        fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
        fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
        fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
        if mod(N,2)~=0
            fprintf('R%d 4%d 5%d %f\n',j,j,j,R)
            fprintf('C%d 5%d 0 %f\n',j,j,C)
        end
    end
else
    fprintf('C1%d 4%d 2%d %f\n',j,j-1,j,C13(s))
    fprintf('C3%d 2%d 3%d %f\n',j,j,j,C33(s))
    fprintf('R2%d 2%d 4%d %f\n',j,j,j,R23(s))
    fprintf('R4%d 3%d 0 %f\n',j,j,R43(s))
    fprintf('E1%d 4%d 0 5%d 3%d 1meg\n',j,j,j,j)
    fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
    fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
    if mod(N,2)~=0
        fprintf('R%d 4%d 5%d %f\n',j,j-1,j,R)
        fprintf('C%d 5%d 0 %f\n',j,j,C)
    end
end
end

```

```

end
end
end
case ' '
switch desing2
case 1
for j = 1:N
R1(s) = handles.R1(j);
R2(s) = handles.R2(j);
R4(s) = handles.R4(j);
C3(s) = handles.C3(j);
C5(s) = handles.C5(j);
if j == 1
fprintf('R1%d 1%d 2%d %f\n',j,j,j,R1(s))
fprintf('C3%d 2%d 3%d %f\n',j,j,j,C3(s))
fprintf('C5%d 2%d 0 %f\n',j,j,C5(s))
fprintf('R4%d 3%d 0 %f\n',j,j,R4(s))
fprintf('R2%d 2%d 4%d %f\n',j,j,j,R2(s))
fprintf('E1%d 4%d 0 3%d 5%d 1meg\n',j,j,j,j)
fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
else
fprintf('R1%d 1%d 2%d %f\n',j,j-1,j,R1(s))
fprintf('C3%d 2%d 3%d %f\n',j,j,j,C3(s))
fprintf('C5%d 2%d 0 %f\n',j,j,C5(s))
fprintf('R4%d 3%d 0 %f\n',j,j,R4(s))
fprintf('R2%d 2%d 4%d %f\n',j,j,j,R2(s))
fprintf('E1%d 4%d 0 3%d 5%d 1meg\n',j,j,j,j)
fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
end
end
case 2
for j = 1:N
R12(s) = handles.R12(j);
R22(s) = handles.R22(j);
R42(s) = handles.R42(j);
C32(s) = handles.C32(j);
C52(s) = handles.C52(j);
if j == 1
fprintf('R1%d 1%d 2%d %f\n',j,j,j,R12(s))
fprintf('C3%d 2%d 3%d %f\n',j,j,j,C32(s))
fprintf('C5%d 2%d 0 %f\n',j,j,C52(s))
fprintf('R4%d 3%d 0 %f\n',j,j,R42(s))
fprintf('R2%d 2%d 4%d %f\n',j,j,j,R22(s))
fprintf('E1%d 4%d 0 3%d 5%d 1meg\n',j,j,j,j)
fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
else
fprintf('R1%d 1%d 2%d %f\n',j,j-1,j,R12(s))
fprintf('C3%d 2%d 3%d %f\n',j,j,j,C32(s))
fprintf('C5%d 2%d 0 %f\n',j,j,C52(s))
fprintf('R4%d 3%d 0 %f\n',j,j,R42(s))
fprintf('R2%d 2%d 4%d %f\n',j,j,j,R22(s))
fprintf('E1%d 4%d 0 3%d 5%d 1meg\n',j,j,j,j)
fprintf('Ra%d 4%d 5%d %f\n',j,j,j,1000)
fprintf('Rb%d 5%d 0 %f\n',j,j,1000)
end
end
end
end
end

```

```

                end
            end
        end
    end
end
if TIPO == ' '
    if desing2 == 3
        unable;
    else
        j=N;
        fprintf('.print AC V(4%d)\n',j)
        fprintf('.end')
        diary off
        !C:/Orcad/PSpice/pspice.exe run C:/elip3/respuesta.cir
    end
else
    if mod(N,2)~=0
        j = int8((N/2)-1);
        fprintf('.print AC V(5%d)\n',j)
    else
        j = N/2;
        fprintf('.print AC V(4%d)\n',j)
    end
    fprintf('.end')
    diary off
    !C:/Orcad/PSpice/pspice.exe run C:/elip3/respuesta.cir
end

clc

function popupmenu5_Callback(hObject, eventdata, handles)
global Ws
global TIPO
global handles
global Wc
global N
global Q
global bandera

if bandera == 0 %%thomson
    Ws = Wc;
end

v = get(handles.TagListboxWn, 'value');
desing = get(handles.popupmenu5, 'value');

switch TIPO
    case 'low'
        switch desing
            case 1
                C2 = handles.C2(v);
                C4 = handles.C4(v);
                R1 = handles.R1(v);
                R3 = handles.R3(v);
                K = 1;
            case 2
                C2 = handles.C22(v);

```

```

        C4 = handles.C42(v);
        R1 = handles.R12(v);
        R3 = handles.R32(v);
        K = 2;
    case 3
        C2 = handles.C23(v);
        C4 = handles.C43(v);
        R1 = handles.R13(v);
        R3 = handles.R33(v);
        K = handles.K(v);
    end
    z = K/(R1*R3*C2*C4);
    p1 = ((1/(R3*C4)))+(1/(R1*C2))+(1/(R3*C2))-(K/(R3*C4));
    p = 1/(R1*R3*C2*C4);

    num = [0 z];
    den = [1 p1 p];
    if mod (N,2)~=0
        if Q(v)<=.5
            global C
            C;
            R = 1/(Wc*C);
            p1 = R;
            p = 1;
            num = [0 1];
            den = [p1 p];
        end
    end
    case 'high'
        switch desing
            case 1
                C1 = handles.C1(v);
                C3 = handles.C3(v);
                R2 = handles.R2(v);
                R4 = handles.R4(v);
                K = 1;
            case 2
                C1 = handles.C12(v);
                C3 = handles.C32(v);
                R2 = handles.R22(v);
                R4 = handles.R42(v);
                K = 2;
            case 3
                C1 = handles.C13(v);
                C3 = handles.C33(v);
                R2 = handles.R23(v);
                R4 = handles.R43(v);
                K = handles.K3(v);
        end
        z = K;
        p1 = ((1/(R2*C1)))+(1/(R4*C3))+(1/(R4*C1))-(K/(R2*C1));
        p = 1/(R2*R4*C1*C3);

        num = [z 0 0];
        den = [1 p1 p];
        if mod (N,2)~=0
            if Q(v)<=.5

```

```

        global C
        C;
        R = 1/(Wc*C);
        p1 = R;
        p = 1;

        num = [1 0];
        den = [p1 p];
    end
end
case ' '
    switch desing
        case 1
            C3 = handles.C3(v);
            C5 = handles.C5(v);
            R1 = handles.R1(v);
            R2 = handles.R2(v);
            R4 = handles.R4(v);
            K = handles.K(v);
            z = K/(R1*C5);
            p1 = ((1/(R1*C5)))+(1/(R2*C5))+(1/(R4*C5))+(1/(R4*C3))-
(K/(R2*C5));
            p = (1/(R4*C3*C5))*((1/R1)+(1/R2));

            num = [z 0];
            den = [1 p1 p];
        case 2
            C3 = handles.C32(v);
            C5 = handles.C52(v);
            R1 = handles.R12(v);
            R2 = handles.R22(v);
            R4 = handles.R42(v);
            K = handles.K2(v);
            z = K/(R1*C5);
            p1 = ((1/(R1*C5)))+(1/(R2*C5))+(1/(R4*C5))+(1/(R4*C3))-
(K/(R2*C5));
            p = (1/(R4*C3*C5))*((1/R1)+(1/R2));

            num = [z 0];
            den = [1 p1 p];
        end
    end
end
if TIPO == ' '
    if desing == 3
        unable;
    else
        transfer(num,den,Ws, TIPO,v,Q,N);
    end
else
    transfer(num,den,Ws, TIPO,v,Q,N);
end
end

```