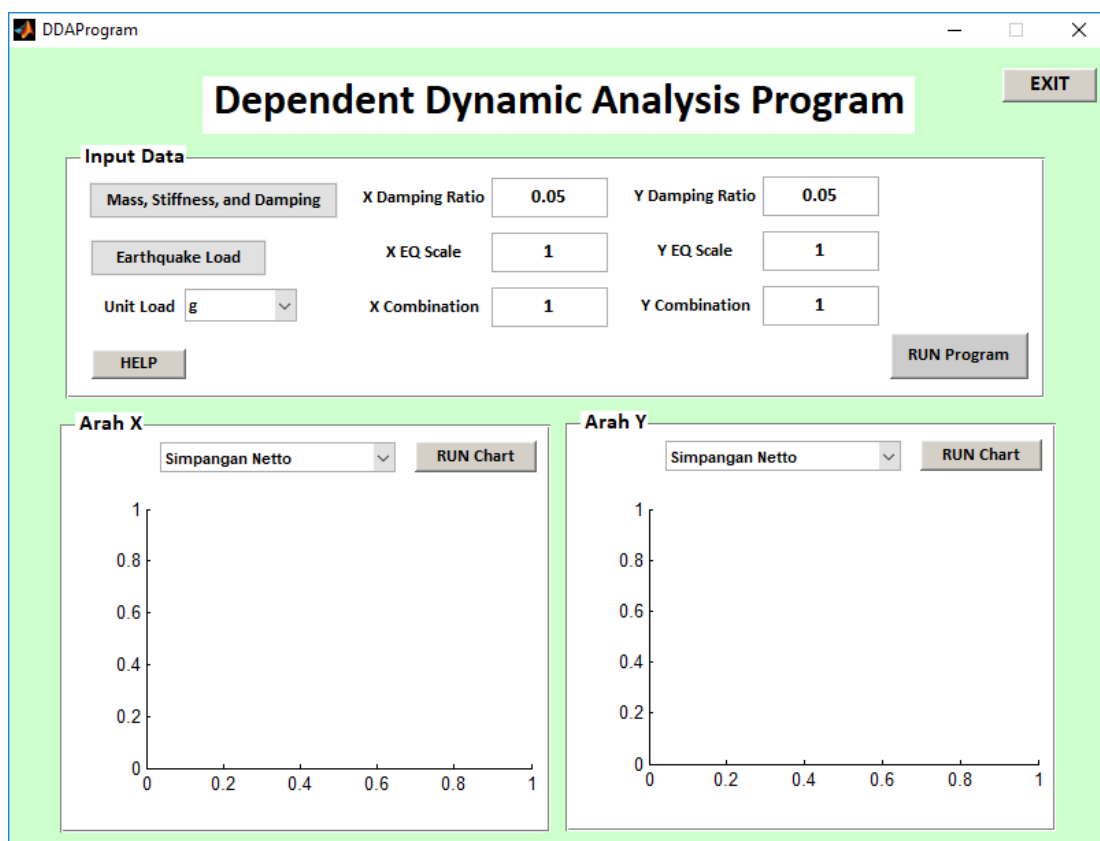


Lampiran 5 *Dependent Dynamic Analysis Program (DDAP)*

DEPENDENT DYNAMIC ANALYSIS PROGRAM (DDAP)

A. Tampilan Program

Program DDAP memiliki tampilan seperti yang ditunjukkan pada Gambar L-5.1 berikut ini.



Gambar L-5.1 Tampilan DDAP

Fungsi dari masing-masing *button* adalah:

Mass, Stiffness, and Damping = Memberikan petunjuk mengenai tata cara input massa, kekakuan, dan redaman struktur.

Earthquake Load = Memberikan petunjuk mengenai tata cara input rekaman percepatan tanah akibat gempa.

Unit Load = Satuan percepatan tanah beban gempa yang digunakan.

X Damping Ratio	= Input rasio redaman struktur tinjauan arah x.
Y Damping Ratio	= Input rasio redaman struktur tinjauan arah y.
X EQ Scale	= Input skala beban gempa tinjauan arah x.
Y EQ Scale	= Input skala beban gempa tinjauan arah y.
X Combination	= Input faktor beban gempa tinjauan arah x.
Y Combination	= Input faktor beban gempa tinjauan arah y.
HELP	= Penjelasan mengenai tata cara penggunaan program.
RUN Program	= Menjalankan analisis program.
RUN Chart	= Menampilkan grafik-grafik hasil respons struktur.

B. CODE PROGRAM

```
function varargout = DDAProgram(varargin)
% DDAPROGRAM MATLAB code for DDAProgram.fig
%   DDAPROGRAM, by itself, creates a new DDAPROGRAM or raises
the existing
%   singleton*.
%
%   H = DDAPROGRAM returns the handle to a new DDAPROGRAM or
the handle to
%   the existing singleton*.
%
%   DDAPROGRAM('CALLBACK',hObject,eventData,handles,...) calls
the local
%   function named CALLBACK in DDAPROGRAM.M with the given
input arguments.
%
%   DDAPROGRAM('Property','Value',...) creates a new DDAPROGRAM
or raises the
%   existing singleton*. Starting from the left, property
value pairs are
%   applied to the GUI before DDAProgram_OpeningFcn gets
called. An
%   unrecognized property name or invalid value makes property
application
%   stop. All inputs are passed to DDAProgram_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 DDAProgram
```

```

% Last Modified by GUIDE v2.5 16-Oct-2018 23:02:57

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                  'gui_Singleton',  gui_Singleton, ...
                  'gui_OpeningFcn', @DDAProgram_OpeningFcn, ...
                  'gui_OutputFcn',  @DDAProgram_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 DDAProgram is made visible.
function DDAProgram_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 DDAProgram (see VARARGIN)

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

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes DDAProgram wait for user response (see UIRESUME)
% uiwait(handles.figure1);

% --- Outputs from this function are returned to the command line.
function varargout = DDAProgram_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 pushbutton1.
function pushbutton1_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton1 (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of
MATLAB
% handles structure with handles and user data (see GUIDATA)
msgbox('Please Input Mass, Stifness, and Damping on Microsoft
Excel')

% --- Executes on button press in pushbutton2.
function pushbutton2_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)
msgbox('Please Input Earthquake Load on Microsoft Excel')

function edit2_Callback(hObject, eventdata, handles)
% hObject handle to edit2 (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 edit2 as text
% str2double(get(hObject,'String')) returns contents of
edit2 as a double

% --- Executes during object creation, after setting all
properties.
function edit2_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit2 (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 edit3_Callback(hObject, eventdata, handles)
% hObject handle to edit3 (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 edit3 as text
% str2double(get(hObject,'String')) returns contents of
edit3 as a double

% --- Executes during object creation, after setting all
properties.
function edit3_CreateFcn(hObject, eventdata, handles)
% hObject handle to edit3 (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 edit4_Callback(hObject, eventdata, handles)
% hObject    handle to edit4 (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 edit4 as text
%       str2double(get(hObject,'String')) returns contents of
edit4 as a double

% --- Executes during object creation, after setting all
properties.
function edit4_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit4 (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 edit5_Callback(hObject, eventdata, handles)
% hObject    handle to edit5 (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 edit5 as text
%       str2double(get(hObject,'String')) returns contents of
edit5 as a double
% --- Executes during object creation, after setting all
properties.
function edit5_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit5 (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 edit6_Callback(hObject, eventdata, handles)
% hObject    handle to edit6 (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 edit6 as text
%       str2double(get(hObject,'String')) returns contents of
edit6 as a double

% --- Executes during object creation, after setting all
properties.
function edit6_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit6 (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 edit7_Callback(hObject, eventdata, handles)
% hObject    handle to edit7 (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 edit7 as text
%       str2double(get(hObject,'String')) returns contents of
edit7 as a double

% --- Executes during object creation, after setting all
properties.
function edit7_CreateFcn(hObject, eventdata, handles)
% hObject    handle to edit7 (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 pushbutton3.
    function pushbutton3_Callback(hObject, eventdata, handles)
    % hObject    handle to pushbutton3 (see GCBO)
    % eventdata  reserved - to be defined in a future version of
    MATLAB
    % handles    structure with handles and user data (see GUIDATA)
    h=waitbar(0,'Calculation Start.....');
    n=1;
    pjg=2000;
    while n <= pjg
        n=n+1;
        waitbar(n/pjg);
    end
    close (h)

    h=waitbar(0,'Input Data.....');
    n=1;
    pjg=2500;
    while n <= pjg
        n=n+1;
        waitbar(n/pjg);
    end

    % Input Massa,Kekakuan, dan Tinggi tiap lantai bangunan beserta
    pondasi
    Massa = xlsread('Input Data.xlsx','Mass and Inersia Polar');
    KCx = xlsread('Input Data.xlsx','Stiffness and Damping X');
    KCy = xlsread('Input Data.xlsx','Stiffness and Damping Y');
    Tinggi = xlsread('Input Data.xlsx','Story Height');
    Bebangempa = xlsread('Input Data.xlsx','Earthquake Load');

    % Massa
    m0 = Massa(1);
    m1 = Massa(2);
    m2 = Massa(3);
    m3 = Massa(4);
    m4 = Massa(5);
    m5 = Massa(6);
    m6 = Massa(7);
    m7 = Massa(8);
    m8 = Massa(9);
    m9 = Massa(10);
    m10 = Massa(11);
    m11 = Massa(12);
    m12 = Massa(13);
    m13 = Massa(14);
    m14 = Massa(15);
    m15 = Massa(16);
    IG = Massa(17);

    % Kekakuan
    % Arah X

```

```
k1x = KCx(1);  
k2x = KCx(2);  
k3x = KCx(3);  
k4x = KCx(4);  
k5x = KCx(5);  
k6x = KCx(6);  
k7x = KCx(7);  
k8x = KCx(8);  
k9x = KCx(9);  
k10x = KCx(10);  
k11x = KCx(11);  
k12x = KCx(12);  
k13x = KCx(13);  
k14x = KCx(14);  
k15x = KCx(15);  
khx = KCx(16);  
krx = KCx(17);
```

```
% Arah Y
```

```
k1y = KCy(1);  
k2y = KCy(2);  
k3y = KCy(3);  
k4y = KCy(4);  
k5y = KCy(5);  
k6y = KCy(6);  
k7y = KCy(7);  
k8y = KCy(8);  
k9y = KCy(9);  
k10y = KCy(10);  
k11y = KCy(11);  
k12y = KCy(12);  
k13y = KCy(13);  
k14y = KCy(14);  
k15y = KCy(15);  
khy = KCy(16);  
kry = KCy(17);
```

```
% Tinggi tiap Lantai
```

```
h1 = Tinggi(1);  
h2 = Tinggi(2);  
h3 = Tinggi(3);  
h4 = Tinggi(4);  
h5 = Tinggi(5);  
h6 = Tinggi(6);  
h7 = Tinggi(7);  
h8 = Tinggi(8);  
h9 = Tinggi(9);  
h10 = Tinggi(10);  
h11 = Tinggi(11);  
h12 = Tinggi(12);  
h13 = Tinggi(13);  
h14 = Tinggi(14);  
h15 = Tinggi(15);
```

```
% Analisis Rotasi Fondasi Arah X  
% Menyusun Persamaan Eigen Problem
```



```

M = [m1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
      0 m2 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
      0 0 m3 0 0 0 0 0 0 0 0 0 0 0 0 0;
      0 0 0 m4 0 0 0 0 0 0 0 0 0 0 0 0;
      0 0 0 0 m5 0 0 0 0 0 0 0 0 0 0 0;
      0 0 0 0 0 m6 0 0 0 0 0 0 0 0 0 0;
      0 0 0 0 0 0 m7 0 0 0 0 0 0 0 0 0 0;
      0 0 0 0 0 0 0 m8 0 0 0 0 0 0 0 0 0;
      0 0 0 0 0 0 0 0 m9 0 0 0 0 0 0 0 0;
      0 0 0 0 0 0 0 0 0 m10 0 0 0 0 0 0;
      0 0 0 0 0 0 0 0 0 0 m11 0 0 0 0 0;
      0 0 0 0 0 0 0 0 0 0 0 m12 0 0 0 0;
      0 0 0 0 0 0 0 0 0 0 0 0 m13 0 0;
      0 0 0 0 0 0 0 0 0 0 0 0 0 m14 0;
      0 0 0 0 0 0 0 0 0 0 0 0 0 0 m15];

Kx = [k1x+k2x -k2x 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
      -k2x k2x+k3x -k3x 0 0 0 0 0 0 0 0 0 0 0 0 0;
      0 -k3x k3x+k4x -k4x 0 0 0 0 0 0 0 0 0 0 0;
      0 0 -k4x k4x+k5x -k5x 0 0 0 0 0 0 0 0 0 0;
      0 0 0 -k5x k5x+k6x -k6x 0 0 0 0 0 0 0 0 0;
      0 0 0 0 -k6x k6x+k7x -k7x 0 0 0 0 0 0 0 0;
      0 0 0 0 0 -k7x k7x+k8x -k8x 0 0 0 0 0 0 0;
      0 0 0 0 0 0 -k8x k8x+k9x -k9x 0 0 0 0 0 0;
      0 0 0 0 0 0 0 -k9x k9x+k10x -k10x 0 0 0 0 0;
      0 0 0 0 0 0 0 0 -k10x k10x+k11x -k11x 0 0 0 0;
      0 0 0 0 0 0 0 0 0 -k11x k11x+k12x -k12x 0 0 0;
      0 0 0 0 0 0 0 0 0 0 -k12x k12x+k13x -k13x 0 0;
      0 0 0 0 0 0 0 0 0 0 0 -k13x k13x+k14x -k14x 0;
      0 0 0 0 0 0 0 0 0 0 0 0 -k14x k14x+k15x -k15x;
      0 0 0 0 0 0 0 0 0 0 0 0 0 -k15x k15x];

close (h)

h=waitbar(0,'Solve Eigenproblem X Direction.....');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end

% Mencari nilai Frekuensi Sudut tiap mode
syms w

Eigenproblemx = Kx-w^2*M;
Determinanx = det(Eigenproblemx);
wx = double(sort(solve(Determinanx,w)));
w1x = wx(16);
w2x = wx(17);
w3x = wx(18);
w4x = wx(19);
w5x = wx(20);
w6x = wx(21);
w7x = wx(22);
w8x = wx(23);
w9x = wx(24);

```

```

w10x = wx(25);
w11x = wx(26);
w12x = wx(27);
w13x = wx(28);
w14x = wx(29);
w15x = wx(30);

% Menghitung Karakteristik Vibrasi (f dan T)
% Menghitung Nilai f (Frekuensi Natural)
f1x = w1x/(2*pi);
f2x = w2x/(2*pi);
f3x = w3x/(2*pi);
f4x = w4x/(2*pi);
f5x = w5x/(2*pi);
f6x = w6x/(2*pi);
f7x = w7x/(2*pi);
f8x = w8x/(2*pi);
f9x = w9x/(2*pi);
f10x = w10x/(2*pi);
f11x = w11x/(2*pi);
f12x = w12x/(2*pi);
f13x = w13x/(2*pi);
f14x = w14x/(2*pi);
f15x = w15x/(2*pi);

% Menghitung Nilai T (Periode Getar)
T1x = 1/f1x;
T2x = 1/f2x;
T3x = 1/f3x;
T4x = 1/f4x;
T5x = 1/f5x;
T6x = 1/f6x;
T7x = 1/f7x;
T8x = 1/f8x;
T9x = 1/f9x;
T10x = 1/f10x;
T11x = 1/f11x;
T12x = 1/f12x;
T13x = 1/f13x;
T14x = 1/f14x;
T15x = 1/f15x;

% Menyusun Matriks Redaman proporsional terhadap Massa dan Kekakuan
w1x = w1x;
w2x = w2x;
x1jx = str2double(get(handles.edit2,'string'));
xiix = str2double(get(handles.edit2,'string'));
Betax = 2*(x1jx*w1x - xiix*w2x)/(w1x^2 - w2x^2);
Alphax = 2*x1jx*w1x - Betax*w1x^2;

Cx = Alphax*M + Betax*Kx;
Cx(17,17) = 0;
% Menyusun persamaan Massa, Kekakuan, dan Redaman untuk perhitungan Simpangan gedung dengan rotasi pondasi
% Matriks Massa

```



```

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 chx 0;
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 crx];

Cxb = cxb1 + Cx;

% Menyusun Beban Gempa
Mb1 = [m1;
      m2;
      m3;
      m4;
      m5;
      m6;
      m7;
      m8;
      m9;
      m10;
      m11;
      m12;
      m13;
      m14;
      m15;
      m0+m1+m2+m3+m4+m5+m6+m7+m8+m9+m10+m11+m12+m13+m14+m15;

m1*h1+m2*h2+m3*h3+m4*h4+m5*h5+m6*h6+m7*h7+m8*h8+m9*h9+m10*h10+m11*
h11+m12*h12+m13*h13+m14*h14+m15*h15];
close (h)

% Iterasi Beta-Newmark Prinsip Constant Average Acceleration
gm = 0.5;
bt = 0.25;
dt = 0.01;
r = [1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1]';

h=waitbar(0, 'Iteration X Direction.....');
n=1;
pjjg=2500;
while n <= pjjg
n=n+1;
waitbar(n/pjjg);
end

% Mencari Kekakuan Efektif(ktp), a, dan b
ktpx = Kxb + (gm/(bt*dt))*Cxb + (1/(bt*dt^2))*Mb;
ax = (1/(bt*dt))*Mb + (gm/bt)*Cxb;
bx = (1/(2*bt))*Mb + dt*(gm/(2*bt)-1)*Cxb;

% Mencari delta P

```

```

satuan = get(handles.popupmenu5, 'Value');
if(satuan==1)
    satuanpakai = 981;
elseif(satuan==2)
    satuanpakai = 1;
else(satuan==3)
    satuanpakai = 9.81;
end

Skalax = str2double(get(handles.edit3, 'string'));
Kombinasix = str2double(get(handles.edit4, 'string'));
t = Bebangempa(:,1);
Px = Skalax*Kombinasix*satuanpakai*Bebangempa(:,2);

for i = 1:length(Px)
    if i==length(Px);
        break
    end
    dPx(i) = Px(i+1)-Px(i);
end

% Menghitung Simpangan setiap siklus
% Pendahuluan
n = length(Mb);
nt = length(dPx);
simpanganx = zeros(n,nt);
kecepatanx = zeros(n,nt);
percepatanx = zeros(n,nt);
gayagesertingkatx = zeros(n,nt);

simpanganx(:,1) = zeros;
kecepatanx(:,1) = zeros;
percepatanx(:,1) = zeros;
gayagesertingkatx(:,1) = zeros;

% Iterasi Setiap Siklus
for i = 1:nt

    dPx = Px(i+1)-Px(i);
    dpx = Mb1*dPx;
    dptpx = dpx + ax*kecepatanx(:,i) + bx*percepatanx(:,i);
    deltasimpanganx = ktpx\dptpx;
    deltakecepatanx = (gm/(bt*dt))*deltasimpanganx -
(gm/bt)*kecepatanx(:,i)+(dt*(1-(gm/(2*bt))))*percepatanx(:,i);
    deltapercepatanx = (1/(bt*dt^2))*deltasimpanganx -
(1/(bt*dt))*kecepatanx(:,i)-(1/(2*bt))*percepatanx(:,i);

    simpanganx(:,i+1) = simpanganx(:,i) + deltasimpanganx;
    kecepatanx(:,i+1) = kecepatanx(:,i) + deltakecepatanx;
    percepatanx(:,i+1) = percepatanx(:,i) + deltapercepatanx;
    gayagesertingkatx(:,i+1) = Kxb*simpanganx(:,i+1);

end
close (h)
% Menghitung Output Data

```

```

h=waitbar(0,'Output Data X Direction.....');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end

% Simpangan Netto
y1nx = simpanganx(1,:)';
y2nx = simpanganx(2,:)';
y3nx = simpanganx(3,:)';
y4nx = simpanganx(4,:)';
y5nx = simpanganx(5,:)';
y6nx = simpanganx(6,:)';
y7nx = simpanganx(7,:)';
y8nx = simpanganx(8,:)';
y9nx = simpanganx(9,:)';
y10nx = simpanganx(10,:)';
y11nx = simpanganx(11,:)';
y12nx = simpanganx(12,:)';
y13nx = simpanganx(13,:)';
y14nx = simpanganx(14,:)';
y15nx = simpanganx(15,:)';
y0nx = simpanganx(16,:)';

setappdata(0,'y0nxp',y0nx);
setappdata(0,'y1nxp',y1nx);
setappdata(0,'y5nxp',y5nx);
setappdata(0,'y10nxp',y10nx);
setappdata(0,'y15nxp',y15nx);

tetaradx = simpanganx(17,:)';
tetaderx = tetaradx*180/pi;

setappdata(0,'tetaradxp',tetaradx);

% Simpangan Rotasi
y1rx = tan(tetaradx)*h1;
y2rx = tan(tetaradx)*h2;
y3rx = tan(tetaradx)*h3;
y4rx = tan(tetaradx)*h4;
y5rx = tan(tetaradx)*h5;
y6rx = tan(tetaradx)*h6;
y7rx = tan(tetaradx)*h7;
y8rx = tan(tetaradx)*h8;
y9rx = tan(tetaradx)*h9;
y10rx = tan(tetaradx)*h10;
y11rx = tan(tetaradx)*h11;
y12rx = tan(tetaradx)*h12;
y13rx = tan(tetaradx)*h13;
y14rx = tan(tetaradx)*h14;
y15rx = tan(tetaradx)*h15;

setappdata(0,'y1rxp',y1rx);

```

```

setappdata(0, 'y5rxp', y5rx);
setappdata(0, 'y10rxp', y10rx);
setappdata(0, 'y15rxp', y15rx);

```

```

% Simpangan Total

```

```

y1tx = y1nx + y0nx + y1rx;
y2tx = y2nx + y0nx + y2rx;
y3tx = y3nx + y0nx + y3rx;
y4tx = y4nx + y0nx + y4rx;
y5tx = y5nx + y0nx + y5rx;
y6tx = y6nx + y0nx + y6rx;
y7tx = y7nx + y0nx + y7rx;
y8tx = y8nx + y0nx + y8rx;
y9tx = y9nx + y0nx + y9rx;
y10tx = y10nx + y0nx + y10rx;
y11tx = y11nx + y0nx + y11rx;
y12tx = y12nx + y0nx + y12rx;
y13tx = y13nx + y0nx + y13rx;
y14tx = y14nx + y0nx + y14rx;
y15tx = y15nx + y0nx + y15rx;
y0tx = y0nx;

```

```

setappdata(0, 'y0txp', y0tx);
setappdata(0, 'y1txp', y1tx);
setappdata(0, 'y5txp', y5tx);
setappdata(0, 'y10txp', y10tx);
setappdata(0, 'y15txp', y15tx);

```

```

% Interstorey Drift Ratio (%)

```

```

dr1x = (y1nx)/h1*100;
dr2x = (y2nx-y1nx)/h1*100;
dr3x = (y3nx-y2nx)/h1*100;
dr4x = (y4nx-y3nx)/h1*100;
dr5x = (y5nx-y4nx)/h1*100;
dr6x = (y6nx-y5nx)/h1*100;
dr7x = (y7nx-y6nx)/h1*100;
dr8x = (y8nx-y7nx)/h1*100;
dr9x = (y9nx-y8nx)/h1*100;
dr10x = (y10nx-y9nx)/h1*100;
dr11x = (y11nx-y10nx)/h1*100;
dr12x = (y12nx-y11nx)/h1*100;
dr13x = (y13nx-y12nx)/h1*100;
dr14x = (y14nx-y13nx)/h1*100;
dr15x = (y15nx-y14nx)/h1*100;

```

```

setappdata(0, 'dr1xp', dr1x);
setappdata(0, 'dr5xp', dr5x);
setappdata(0, 'dr10xp', dr10x);
setappdata(0, 'dr15xp', dr15x);

```

```

% Gaya Geser Tingkat

```

```

F1x = gayagesertingkatx(1, :)';
F2x = gayagesertingkatx(2, :)';
F3x = gayagesertingkatx(3, :)';
F4x = gayagesertingkatx(4, :)';

```

```

F5x = gayagesertingkatx(5,:);
F6x = gayagesertingkatx(6,:);
F7x = gayagesertingkatx(7,:);
F8x = gayagesertingkatx(8,:);
F9x = gayagesertingkatx(9,:);
F10x = gayagesertingkatx(10,:);
F11x = gayagesertingkatx(11,:);
F12x = gayagesertingkatx(12,:);
F13x = gayagesertingkatx(13,:);
F14x = gayagesertingkatx(14,:);
F15x = gayagesertingkatx(15,:);

setappdata(0, 'F1xp', F1x);
setappdata(0, 'F5xp', F5x);
setappdata(0, 'F10xp', F10x);
setappdata(0, 'F15xp', F15x);

% Gaya Geser Dasar
V1x = F1x + F2x + F3x + F4x + F5x + F6x + F7x + F8x + F9x + F10x +
F11x + F12x + F13x + F14x + F15x;
V2x = F2x + F3x + F4x + F5x + F6x + F7x + F8x + F9x + F10x + F11x
+ F12x + F13x + F14x + F15x;
V3x = F3x + F4x + F5x + F6x + F7x + F8x + F9x + F10x + F11x + F12x
+ F13x + F14x + F15x;
V4x = F4x + F5x + F6x + F7x + F8x + F9x + F10x + F11x + F12x +
F13x + F14x + F15x;
V5x = F5x + F6x + F7x + F8x + F9x + F10x + F11x + F12x + F13x +
F14x + F15x;
V6x = F6x + F7x + F8x + F9x + F10x + F11x + F12x + F13x + F14x +
F15x;
V7x = F7x + F8x + F9x + F10x + F11x + F12x + F13x + F14x + F15x;
V8x = F8x + F9x + F10x + F11x + F12x + F13x + F14x + F15x;
V9x = F9x + F10x + F11x + F12x + F13x + F14x + F15x;
V10x = F10x + F11x + F12x + F13x + F14x + F15x;
V11x = F11x + F12x + F13x + F14x + F15x;
V12x = F12x + F13x + F14x + F15x;
V13x = F13x + F14x + F15x;
V14x = F14x + F15x;
V15x = F15x;

setappdata(0, 'V1xp', V1x);
setappdata(0, 'V5xp', V5x);
setappdata(0, 'V10xp', V10x);
setappdata(0, 'V15xp', V15x);

% Momen Guling
M0x = (F1x*h1 + F2x*h2 + F3x*h3 + F4x*h4 + F5x*h5 + F6x*h6 +
F7x*h7 + F8x*h8 + F9x*h9 + F10x*h10 + F11x*h11 + F12x*h12 +
F13x*h13 + F14x*h14 + F15x*h15)/100;
M1x = (F2x*h2 + F3x*h3 + F4x*h4 + F5x*h5 + F6x*h6 + F7x*h7 +
F8x*h8 + F9x*h9 + F10x*h10 + F11x*h11 + F12x*h12 + F13x*h13 +
F14x*h14 + F15x*h15)/100;
M2x = (F3x*h3 + F4x*h4 + F5x*h5 + F6x*h6 + F7x*h7 + F8x*h8 +
F9x*h9 + F10x*h10 + F11x*h11 + F12x*h12 + F13x*h13 + F14x*h14 +
F15x*h15)/100;

```



```

M3x = (F4x*h4 + F5x*h5 + F6x*h6 + F7x*h7 + F8x*h8 + F9x*h9 +
F10x*h10 + F11x*h11 + F12x*h12 + F13x*h13 + F14x*h14 +
F15x*h15)/100;
M4x = (F5x*h5 + F6x*h6 + F7x*h7 + F8x*h8 + F9x*h9 + F10x*h10 +
F11x*h11 + F12x*h12 + F13x*h13 + F14x*h14 + F15x*h15)/100;
M5x = (F6x*h6 + F7x*h7 + F8x*h8 + F9x*h9 + F10x*h10 + F11x*h11 +
F12x*h12 + F13x*h13 + F14x*h14 + F15x*h15)/100;
M6x = (F7x*h7 + F8x*h8 + F9x*h9 + F10x*h10 + F11x*h11 + F12x*h12 +
F13x*h13 + F14x*h14 + F15x*h15)/100;
M7x = (F8x*h8 + F9x*h9 + F10x*h10 + F11x*h11 + F12x*h12 + F13x*h13
+ F14x*h14 + F15x*h15)/100;
M8x = (F9x*h9 + F10x*h10 + F11x*h11 + F12x*h12 + F13x*h13 +
F14x*h14 + F15x*h15)/100;
M9x = (F10x*h10 + F11x*h11 + F12x*h12 + F13x*h13 + F14x*h14 +
F15x*h15)/100;
M10x = (F11x*h11 + F12x*h12 + F13x*h13 + F14x*h14 + F15x*h15)/100;
M11x = (F12x*h12 + F13x*h13 + F14x*h14 + F15x*h15)/100;
M12x = (F13x*h13 + F14x*h14 + F15x*h15)/100;
M13x = (F14x*h14 + F15x*h15)/100;
M14x = (F15x*h15)/100;
M15x = zeros(length(t),1);

setappdata(0, 'M0xp', M0x);
setappdata(0, 'M1xp', M1x);
setappdata(0, 'M5xp', M5x);
setappdata(0, 'M10xp', M10x);
setappdata(0, 'M15xp', M15x);

close (h)

% Export to Excel
h=waitbar(0, 'Export to Excel X Direction.....');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end

filename = 'Output Data.xlsx';
sheetx = 'Arah X';
A1 = t;
A2 = simpanganx';
A3 =
[tetaderx, y1rx, y2rx, y3rx, y4rx, y5rx, y6rx, y7rx, y8rx, y9rx, y10rx, y11rx
, y12rx, y13rx, y14rx, y15rx];
A4 = [y1tx y2tx y3tx y4tx y5tx y6tx y7tx y8tx y9tx y10tx y11tx
y12tx y13tx y14tx y15tx y0tx];
A5 = [dr1x dr2x dr3x dr4x dr5x dr6x dr7x dr8x dr9x dr10x dr11x
dr12x dr13x dr14x dr15x];
A6 = [F1x F2x F3x F4x F5x F6x F7x F8x F9x F10x F11x F12x F13x F14x
F15x];
A7 = [V1x V2x V3x V4x V5x V6x V7x V8x V9x V10x V11x V12x V13x V14x
V15x];
A8 = [M0x M1x M2x M3x M4x M5x M6x M7x M8x M9x M10x M11x M12x M13x
M14x M15x];

```

```

A9 =
[w1x;w2x;w3x;w4x;w5x;w6x;w7x;w8x;w9x;w10x;w11x;w12x;w13x;w14x;w15x
];
A10 =
[f1x;f2x;f3x;f4x;f5x;f6x;f7x;f8x;f9x;f10x;f11x;f12x;f13x;f14x;f15x
];
A11 =
[T1x;T2x;T3x;T4x;T5x;T6x;T7x;T8x;T9x;T10x;T11x;T12x;T13x;T14x;T15x
];
range1 = 'B4';
range2 = 'C4';
range3 = 'T4';
range4 = 'AJ4';
range5 = 'AZ4';
range6 = 'BO4';
range7 = 'CD4';
range8 = 'CS4';
range9 = 'DK4';
range10 = 'DL4';
range11 = 'DM4';
xlswrite(filename,A1,sheetx,range1)
xlswrite(filename,A2,sheetx,range2)
xlswrite(filename,A3,sheetx,range3)
xlswrite(filename,A4,sheetx,range4)
xlswrite(filename,A5,sheetx,range5)
xlswrite(filename,A6,sheetx,range6)
xlswrite(filename,A7,sheetx,range7)
xlswrite(filename,A8,sheetx,range8)
xlswrite(filename,A9,sheetx,range9)
xlswrite(filename,A10,sheetx,range10)
xlswrite(filename,A11,sheetx,range11)
close (h)

h=waitbar(0,'Calculation X Direction Finish!!!');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end
close (h)

% Analisis Rotasi Fondasi Arah Y
% Menyusun Persamaan Eigen Problem
Ky = [k1y+k2y -k2y 0 0 0 0 0 0 0 0 0 0 0 0 0;
      -k2y k2y+k3y -k3y 0 0 0 0 0 0 0 0 0 0 0 0;
      0 -k3y k3y+k4y -k4y 0 0 0 0 0 0 0 0 0 0 0;
      0 0 -k4y k4y+k5y -k5y 0 0 0 0 0 0 0 0 0 0;
      0 0 0 -k5y k5y+k6y -k6y 0 0 0 0 0 0 0 0 0;
      0 0 0 0 -k6y k6y+k7y -k7y 0 0 0 0 0 0 0 0;
      0 0 0 0 0 -k7y k7y+k8y -k8y 0 0 0 0 0 0 0;
      0 0 0 0 0 0 -k8y k8y+k9y -k9y 0 0 0 0 0 0;
      0 0 0 0 0 0 0 -k9y k9y+k10y -k10y 0 0 0 0 0;
      0 0 0 0 0 0 0 0 -k10y k10y+k11y -k11y 0 0 0 0;
      0 0 0 0 0 0 0 0 0 -k11y k11y+k12y -k12y 0 0 0;
      0 0 0 0 0 0 0 0 0 0 -k12y k12y+k13y -k13y 0 0;

```

```

0 0 0 0 0 0 0 0 0 0 0 0 -k13y k13y+k14y -k14y 0;
0 0 0 0 0 0 0 0 0 0 0 0 -k14y k14y+k15y -k15y;
0 0 0 0 0 0 0 0 0 0 0 0 -k15y k15y];

h=waitbar(0,'Solve Eigenproblem Y Direction.....');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end

% Mencari nilai Frekuensi Sudut tiap mode
syms w

Eigenproblemy = Ky-w^2*M;
Determinany = det(Eigenproblemy);
wy = double(sort(solve(Determinany,w)));
w1y = wy(16);
w2y = wy(17);
w3y = wy(18);
w4y = wy(19);
w5y = wy(20);
w6y = wy(21);
w7y = wy(22);
w8y = wy(23);
w9y = wy(24);
w10y = wy(25);
w11y = wy(26);
w12y = wy(27);
w13y = wy(28);
w14y = wy(29);
w15y = wy(30);

% Menghitung Karakteristik Vibrasi (f dan T)
% Menghitung Nilai f (Frekuensi Natural)
f1y = w1y/(2*pi);
f2y = w2y/(2*pi);
f3y = w3y/(2*pi);
f4y = w4y/(2*pi);
f5y = w5y/(2*pi);
f6y = w6y/(2*pi);
f7y = w7y/(2*pi);
f8y = w8y/(2*pi);
f9y = w9y/(2*pi);
f10y = w10y/(2*pi);
f11y = w11y/(2*pi);
f12y = w12y/(2*pi);
f13y = w13y/(2*pi);
f14y = w14y/(2*pi);
f15y = w15y/(2*pi);

% Menghitung Nilai T (Periode Getar)
T1y = 1/f1y;
T2y = 1/f2y;

```

```

T3y = 1/f3y;
T4y = 1/f4y;
T5y = 1/f5y;
T6y = 1/f6y;
T7y = 1/f7y;
T8y = 1/f8y;
T9y = 1/f9y;
T10y = 1/f10y;
T11y = 1/f11y;
T12y = 1/f12y;
T13y = 1/f13y;
T14y = 1/f14y;
T15y = 1/f15y;

% Menyusun Matriks Redaman proporsional terhadap Massa dan
Kekakuan
wjy = w1y;
wiy = w2y;
xijy = str2double(get(handles.edit5,'string'));
xiyy = str2double(get(handles.edit5,'string'));
Betay = 2*(xijy*wjy - xiyy*wiy)/(wjy^2 - wiy^2);
Alphay = 2*xijy*wjy - Betay*wjy^2;

Cy = Alphay*M + Betay*Ky;
Cy(17,17)= 0;

% Menyusun persamaan Massa, Kekakuan, dan Redaman untuk
perhitungan Simpangan gedung dengan rotasi pondasi
% Matriks Kekakuan
Kyb = [k1y+k2y -k2y 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
      -k2y k2y+k3y -k3y 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
      0 -k3y k3y+k4y -k4y 0 0 0 0 0 0 0 0 0 0 0 0;
      0 0 -k4y k4y+k5y -k5y 0 0 0 0 0 0 0 0 0 0 0;
      0 0 0 -k5y k5y+k6y -k6y 0 0 0 0 0 0 0 0 0 0;
      0 0 0 0 -k6y k6y+k7y -k7y 0 0 0 0 0 0 0 0 0;
      0 0 0 0 0 -k7y k7y+k8y -k8y 0 0 0 0 0 0 0 0;
      0 0 0 0 0 0 -k8y k8y+k9y -k9y 0 0 0 0 0 0 0;
      0 0 0 0 0 0 0 -k9y k9y+k10y -k10y 0 0 0 0 0 0;
      0 0 0 0 0 0 0 0 -k10y k10y+k11y -k11y 0 0 0 0 0;
      0 0 0 0 0 0 0 0 0 -k11y k11y+k12y -k12y 0 0 0 0;
      0 0 0 0 0 0 0 0 0 0 -k12y k12y+k13y -k13y 0 0 0;
      0 0 0 0 0 0 0 0 0 0 0 -k13y k13y+k14y -k14y 0 0;
      0 0 0 0 0 0 0 0 0 0 0 0 -k14y k14y+k15y -k15y 0;
      0 0 0 0 0 0 0 0 0 0 0 0 0 -k15y k15y 0 0;
      0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 khy 0;
      0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 kry];

% Matriks Redaman
chy = KCy(18);
cry = KCy(19);
cyb1 = [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0;
        0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0];

```



```

    if i==length(Py);
        break
    end
    dPy(i) = Py(i+1)-Py(i);
end

% Menghitung Simpangan setiap siklus
% Pendahuluan
n = length(Mb);
nt = length(dPy);
simpangany = zeros(n,nt);
kecepatany = zeros(n,nt);
percepatany = zeros(n,nt);
gayagesertingkaty = zeros(n,nt);

simpangany(:,1) = zeros;
kecepatany(:,1) = zeros;
percepatany(:,1) = zeros;
gayagesertingkaty(:,1) = zeros;

% Iterasi Setiap Siklus
for i = 1:nt

    dPy = Py(i+1)-Py(i);
    dpy = Mb1*dPy;
    dptpy = dpy + ay*kecepatany(:,i) + by*percepatany(:,i);
    deltasimpangany = ktpy\dptpy;
    deltakecepatany = (gm/(bt*dt))*deltasimpangany -
(gm/bt)*kecepatany(:,i)+(dt*(1-(gm/(2*bt))))*percepatany(:,i);
    deltapercepatany = (1/(bt*dt^2))*deltasimpangany -
(1/(bt*dt))*kecepatany(:,i)-(1/(2*bt))*percepatany(:,i);

    simpangany(:,i+1) = simpangany(:,i) + deltasimpangany;
    kecepatany(:,i+1) = kecepatany(:,i) + deltakecepatany;
    percepatany(:,i+1) = percepatany(:,i) + deltapercepatany;
    gayagesertingkaty(:,i+1) = Kyb*simpangany(:,i+1);

end
close (h)

% Menghitung Output Data
h=waitbar(0,'Output Data Y Direction.....');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end

% Simpangan Netto
y1ny = simpangany(1,:);
y2ny = simpangany(2,:);
y3ny = simpangany(3,:);
y4ny = simpangany(4,:);
y5ny = simpangany(5,:);

```

```

y6ny = simpangany(6,:)';
y7ny = simpangany(7,:)';
y8ny = simpangany(8,:)';
y9ny = simpangany(9,:)';
y10ny = simpangany(10,:)';
y11ny = simpangany(11,:)';
y12ny = simpangany(12,:)';
y13ny = simpangany(13,:)';
y14ny = simpangany(14,:)';
y15ny = simpangany(15,:)';
y0ny = simpangany(16,:)';

setappdata(0, 'y0nyp', y0ny);
setappdata(0, 'y1nyp', y1ny);
setappdata(0, 'y5nyp', y5ny);
setappdata(0, 'y10nyp', y10ny);
setappdata(0, 'y15nyp', y15ny);

tetarady = simpangany(17,:)';
tetadery = tetarady*180/pi;

setappdata(0, 'tetaradyp', tetarady);

% Simpangan Rotasi
y1ry = tan(tetarady)*h1;
y2ry = tan(tetarady)*h2;
y3ry = tan(tetarady)*h3;
y4ry = tan(tetarady)*h4;
y5ry = tan(tetarady)*h5;
y6ry = tan(tetarady)*h6;
y7ry = tan(tetarady)*h7;
y8ry = tan(tetarady)*h8;
y9ry = tan(tetarady)*h9;
y10ry = tan(tetarady)*h10;
y11ry = tan(tetarady)*h11;
y12ry = tan(tetarady)*h12;
y13ry = tan(tetarady)*h13;
y14ry = tan(tetarady)*h14;
y15ry = tan(tetarady)*h15;

setappdata(0, 'y1ryp', y1ry);
setappdata(0, 'y5ryp', y5ry);
setappdata(0, 'y10ryp', y10ry);
setappdata(0, 'y15ryp', y15ry);

% Simpangan Total
y1ty = y1ny + y0ny + y1ry;
y2ty = y2ny + y0ny + y2ry;
y3ty = y3ny + y0ny + y3ry;
y4ty = y4ny + y0ny + y4ry;
y5ty = y5ny + y0ny + y5ry;
y6ty = y6ny + y0ny + y6ry;
y7ty = y7ny + y0ny + y7ry;
y8ty = y8ny + y0ny + y8ry;
y9ty = y9ny + y0ny + y9ry;

```

```

y10ty = y10ny + y0ny + y10ry;
y11ty = y11ny + y0ny + y11ry;
y12ty = y12ny + y0ny + y12ry;
y13ty = y13ny + y0ny + y13ry;
y14ty = y14ny + y0ny + y14ry;
y15ty = y15ny + y0ny + y15ry;
y0ty = y0ny;

setappdata(0, 'y0typ', y0ty);
setappdata(0, 'y1typ', y1ty);
setappdata(0, 'y5typ', y5ty);
setappdata(0, 'y10typ', y10ty);
setappdata(0, 'y15typ', y15ty);

% Interstorey Drift Ratio (%)
dr1y = (y1ny)/h1*100;
dr2y = (y2ny-y1ny)/h1*100;
dr3y = (y3ny-y2ny)/h1*100;
dr4y = (y4ny-y3ny)/h1*100;
dr5y = (y5ny-y4ny)/h1*100;
dr6y = (y6ny-y5ny)/h1*100;
dr7y = (y7ny-y6ny)/h1*100;
dr8y = (y8ny-y7ny)/h1*100;
dr9y = (y9ny-y8ny)/h1*100;
dr10y = (y10ny-y9ny)/h1*100;
dr11y = (y11ny-y10ny)/h1*100;
dr12y = (y12ny-y11ny)/h1*100;
dr13y = (y13ny-y12ny)/h1*100;
dr14y = (y14ny-y13ny)/h1*100;
dr15y = (y15ny-y14ny)/h1*100;

setappdata(0, 'dr1yp', dr1y);
setappdata(0, 'dr5yp', dr5y);
setappdata(0, 'dr10yp', dr10y);
setappdata(0, 'dr15yp', dr15y);

% Gaya Geser Tingkat
F1y = gayagesertingkaty(1, :)';
F2y = gayagesertingkaty(2, :)';
F3y = gayagesertingkaty(3, :)';
F4y = gayagesertingkaty(4, :)';
F5y = gayagesertingkaty(5, :)';
F6y = gayagesertingkaty(6, :)';
F7y = gayagesertingkaty(7, :)';
F8y = gayagesertingkaty(8, :)';
F9y = gayagesertingkaty(9, :)';
F10y = gayagesertingkaty(10, :)';
F11y = gayagesertingkaty(11, :)';
F12y = gayagesertingkaty(12, :)';
F13y = gayagesertingkaty(13, :)';
F14y = gayagesertingkaty(14, :)';
F15y = gayagesertingkaty(15, :)';

setappdata(0, 'F1yp', F1y);
setappdata(0, 'F5yp', F5y);

```



```

setappdata(0, 'F10yp', F10y);
setappdata(0, 'F15yp', F15y);

% Gaya Geser Dasar
V1y = F1y + F2y + F3y + F4y + F5y + F6y + F7y + F8y + F9y + F10y +
F11y + F12y + F13y + F14y + F15y;
V2y = F2y + F3y + F4y + F5y + F6y + F7y + F8y + F9y + F10y + F11y
+ F12y + F13y + F14y + F15y;
V3y = F3y + F4y + F5y + F6y + F7y + F8y + F9y + F10y + F11y + F12y
+ F13y + F14y + F15y;
V4y = F4y + F5y + F6y + F7y + F8y + F9y + F10y + F11y + F12y +
F13y + F14y + F15y;
V5y = F5y + F6y + F7y + F8y + F9y + F10y + F11y + F12y + F13y +
F14y + F15y;
V6y = F6y + F7y + F8y + F9y + F10y + F11y + F12y + F13y + F14y +
F15y;
V7y = F7y + F8y + F9y + F10y + F11y + F12y + F13y + F14y + F15y;
V8y = F8y + F9y + F10y + F11y + F12y + F13y + F14y + F15y;
V9y = F9y + F10y + F11y + F12y + F13y + F14y + F15y;
V10y = F10y + F11y + F12y + F13y + F14y + F15y;
V11y = F11y + F12y + F13y + F14y + F15y;
V12y = F12y + F13y + F14y + F15y;
V13y = F13y + F14y + F15y;
V14y = F14y + F15y;
V15y = F15y;

setappdata(0, 'V1yp', V1y);
setappdata(0, 'V5yp', V5y);
setappdata(0, 'V10yp', V10y);
setappdata(0, 'V15yp', V15y);

% Momen Guling
M0y = (F1y*h1 + F2y*h2 + F3y*h3 + F4y*h4 + F5y*h5 + F6y*h6 +
F7y*h7 + F8y*h8 + F9y*h9 + F10y*h10 + F11y*h11 + F12y*h12 +
F13y*h13 + F14y*h14 + F15y*h15)/100;
M1y = (F2y*h2 + F3y*h3 + F4y*h4 + F5y*h5 + F6y*h6 + F7y*h7 +
F8y*h8 + F9y*h9 + F10y*h10 + F11y*h11 + F12y*h12 + F13y*h13 +
F14y*h14 + F15y*h15)/100;
M2y = (F3y*h3 + F4y*h4 + F5y*h5 + F6y*h6 + F7y*h7 + F8y*h8 +
F9y*h9 + F10y*h10 + F11y*h11 + F12y*h12 + F13y*h13 + F14y*h14 +
F15y*h15)/100;
M3y = (F4y*h4 + F5y*h5 + F6y*h6 + F7y*h7 + F8y*h8 + F9y*h9 +
F10y*h10 + F11y*h11 + F12y*h12 + F13y*h13 + F14y*h14 +
F15y*h15)/100;
M4y = (F5y*h5 + F6y*h6 + F7y*h7 + F8y*h8 + F9y*h9 + F10y*h10 +
F11y*h11 + F12y*h12 + F13y*h13 + F14y*h14 + F15y*h15)/100;
M5y = (F6y*h6 + F7y*h7 + F8y*h8 + F9y*h9 + F10y*h10 + F11y*h11 +
F12y*h12 + F13y*h13 + F14y*h14 + F15y*h15)/100;
M6y = (F7y*h7 + F8y*h8 + F9y*h9 + F10y*h10 + F11y*h11 + F12y*h12 +
F13y*h13 + F14y*h14 + F15y*h15)/100;
M7y = (F8y*h8 + F9y*h9 + F10y*h10 + F11y*h11 + F12y*h12 + F13y*h13
+ F14y*h14 + F15y*h15)/100;
M8y = (F9y*h9 + F10y*h10 + F11y*h11 + F12y*h12 + F13y*h13 +
F14y*h14 + F15y*h15)/100;
M9y = (F10y*h10 + F11y*h11 + F12y*h12 + F13y*h13 + F14y*h14 +
F15y*h15)/100;

```

```

M10y = (F11y*h11 + F12y*h12 + F13y*h13 + F14y*h14 + F15y*h15)/100;
M11y = (F12y*h12 + F13y*h13 + F14y*h14 + F15y*h15)/100;
M12y = (F13y*h13 + F14y*h14 + F15y*h15)/100;
M13y = (F14y*h14 + F15y*h15)/100;
M14y = (F15y*h15)/100;
M15y = zeros(length(t),1);

setappdata(0, 'M0yp', M0y);
setappdata(0, 'M1yp', M1y);
setappdata(0, 'M5yp', M5y);
setappdata(0, 'M10yp', M10y);
setappdata(0, 'M15yp', M15y);

close (h)

% Export to Excel
h=waitbar(0, 'Export to Excel Y Direction.....');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end
sheety = 'Arah Y';
B1 = t;
B2 = simpangany';
B3 =
[tetadery, y1ry, y2ry, y3ry, y4ry, y5ry, y6ry, y7ry, y8ry, y9ry, y10ry, y11ry
, y12ry, y13ry, y14ry, y15ry];
B4 = [y1ty y2ty y3ty y4ty y5ty y6ty y7ty y8ty y9ty y10ty y11ty
y12ty y13ty y14ty y15ty y0ty];
B5 = [dr1y dr2y dr3y dr4y dr5y dr6y dr7y dr8y dr9y dr10y dr11y
dr12y dr13y dr14y dr15y];
B6 = [F1y F2y F3y F4y F5y F6y F7y F8y F9y F10y F11y F12y F13y F14y
F15y];
B7 = [V1y V2y V3y V4y V5y V6y V7y V8y V9y V10y V11y V12y V13y V14y
V15y];
B8 = [M0y M1y M2y M3y M4y M5y M6y M7y M8y M9y M10y M11y M12y M13y
M14y M15y];
B9 =
[w1y;w2y;w3y;w4y;w5y;w6y;w7y;w8y;w9y;w10y;w11y;w12y;w13y;w14y;w15y
];
B10 =
[f1y;f2y;f3y;f4y;f5y;f6y;f7y;f8y;f9y;f10y;f11y;f12y;f13y;f14y;f15y
];
B11 =
[T1y;T2y;T3y;T4y;T5y;T6y;T7y;T8y;T9y;T10y;T11y;T12y;T13y;T14y;T15y
];
xlswrite(filename,B1,sheety,range1)
xlswrite(filename,B2,sheety,range2)
xlswrite(filename,B3,sheety,range3)
xlswrite(filename,B4,sheety,range4)
xlswrite(filename,B5,sheety,range5)
xlswrite(filename,B6,sheety,range6)
xlswrite(filename,B7,sheety,range7)
xlswrite(filename,B8,sheety,range8)

```

```

xlswrite(filename,B9,sheety,range9)
xlswrite(filename,B10,sheety,range10)
xlswrite(filename,B11,sheety,range11)
close (h)

h=waitbar(0,'Calculation Y Direction Finish!!!');
n=1;
pjpg=2500;
while n <= pjpg
n=n+1;
waitbar(n/pjpg);
end
close (h)
msgbox('Calculation Finish!!! The Results are in the Output
Data.xlsx and then you can klik RUN chart');

% --- Executes on button press in pushbutton4.
function pushbutton4_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton4 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
msgbox('Input data on Microsoft Excel and TextBox and then press
RUN Program to do the analysis and then press RUN Chart to see the
charts')

% --- Executes on selection change in popupmenu3.
function popupmenu3_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu3 (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
popupmenu3 contents as cell array
%          contents{get(hObject,'Value')} returns selected item from
popupmenu3

% --- Executes during object creation, after setting all
properties.
function popupmenu3_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu3 (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 pushbutton6.
function pushbutton6_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton6 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)

% Plot Grafik
Bebangempa = xlsread('Input Data.xlsx','Earthquake Load');
t = Bebangempa(:,1);

y0ny = getappdata(0, 'y0nyp');
y1ny = getappdata(0, 'y1nyp');
y5ny = getappdata(0, 'y5nyp');
y10ny = getappdata(0, 'y10nyp');
y15ny = getappdata(0, 'y15nyp');
tetarady = getappdata(0, 'tetaradyp');
y1ry = getappdata(0, 'y1ryp');
y5ry = getappdata(0, 'y5ryp');
y10ry = getappdata(0, 'y10ryp');
y15ry = getappdata(0, 'y15ryp');
y0ty = getappdata(0, 'y0typ');
y1ty = getappdata(0, 'y1typ');
y5ty = getappdata(0, 'y5typ');
y10ty = getappdata(0, 'y10typ');
y15ty = getappdata(0, 'y15typ');
dr1y = getappdata(0, 'dr1yp');
dr5y = getappdata(0, 'dr5yp');
dr10y = getappdata(0, 'dr10yp');
dr15y = getappdata(0, 'dr15yp');
F1y = getappdata(0, 'F1yp');
F5y = getappdata(0, 'F5yp');
F10y = getappdata(0, 'F10yp');
F15y = getappdata(0, 'F15yp');
V1y = getappdata(0, 'V1yp');
V5y = getappdata(0, 'V5yp');
V10y = getappdata(0, 'V10yp');
V15y = getappdata(0, 'V15yp');
M0y = getappdata(0, 'M0yp');
M1y = getappdata(0, 'M1yp');
M5y = getappdata(0, 'M5yp');
M10y = getappdata(0, 'M10yp');
M15y = getappdata(0, 'M15yp');

plotdatay = get(handles.popupmenu3, 'Value');

% Simpangan Netto
grid on
if(plotdatay==1)
plot(t, y0ny, t, y1ny, t, y5ny, t, y10ny, t, y15ny);
hold on;
plot(t, 0, 'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Simpangan Netto (cm)')
legend('Fondasi', 'Lt 1', 'Lt 5', 'Lt 10', 'Lt 15')

```

```

    % Sudut Rotasi
    grid on
    elseif(plotdatay==2)
    plot(t,tetarady);
    hold on;
    plot(t,0,'k');
    hold off;
    xlabel('Waktu (dt)')
    ylabel('Rotasi (rad)')

    % Simpangan Rotasi
    grid on
    elseif(plotdatay==3)
    plot(t,y1ry,t,y5ry,t,y10ry,t,y15ry);
    hold on;
    plot(t,0,'k');
    hold off;
    xlabel('Waktu (dt)')
    ylabel('Simpangan Rotasi (cm)')
    legend('Lt 1','Lt 5','Lt 10','Lt 15')

    % Simpangan Total
    grid on
    elseif(plotdatay==4)
    plot(t,y0ty,t,y1ty,t,y5ty,t,y10ty,t,y15ty);
    hold on;
    plot(t,0,'k');
    hold off;
    xlabel('Waktu (dt)')
    ylabel('Simpangan Total (cm)')
    legend('Fondasi','Lt 1','Lt 5','Lt 10','Lt 15')

    % Interstorey Drift Ratio
    grid on
    elseif(plotdatay==5)
    plot(t,dr1y,t,dr5y,t,dr10y,t,dr15y);
    hold on;
    plot(t,0,'k');
    hold off;
    xlabel('Waktu (dt)')
    ylabel('Interstorey Drift (%)')
    legend('Lt 1','Lt 5','Lt 10','Lt 15')

    % Gaya Geser Tingkat
    grid on
    elseif(plotdatay==6)
    plot(t,F1y,t,F5y,t,F10y,t,F15y);
    hold on;
    plot(t,0,'k');
    hold off;
    xlabel('Waktu (dt)')
    ylabel('Gaya Geser Tingkat (kg)')
    legend('Lt 1','Lt 5','Lt 10','Lt 15')

    % Gaya Geser Dasar

```

```

grid on
elseif(plotdatay==7)
plot(t,V1y,t,V5y,t,V10y,t,V15y);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Gaya Geser Dasar (kg)')
legend('Lt 1','Lt 5','Lt 10','Lt 15')

% Momen Guling
grid on
else(plotdatay==8)
plot(t,M0y,t,M1y,t,M5y,t,M10y,t,M15y);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Momen Guling (kg.m)')
legend('Lt Dasar','Lt 1','Lt 5','Lt 10','Lt 15')
grid on
end

% --- Executes on selection change in popupmenu2.
function popupmenu2_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu2 (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
popupmenu2 contents as cell array
%         contents{get(hObject,'Value')} returns selected item from
popupmenu2

% --- Executes during object creation, after setting all
properties.
function popupmenu2_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu2 (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 pushbutton5.
function pushbutton5_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton5 (see GCBO)

```

```

% eventdata reserved - to be defined in a future version of
MATLAB
% handles structure with handles and user data (see GUIDATA)
Bebangempa = xlsread('Input Data.xlsx','Earthquake Load');
t = Bebangempa(:,1);

y0nx = getappdata(0,'y0nxp');
y1nx = getappdata(0,'y1nxp');
y5nx = getappdata(0,'y5nxp');
y10nx = getappdata(0,'y10nxp');
y15nx = getappdata(0,'y15nxp');
tetaradx = getappdata(0,'tetaradxp');
y1rx = getappdata(0,'y1rxp');
y5rx = getappdata(0,'y5rxp');
y10rx = getappdata(0,'y10rxp');
y15rx = getappdata(0,'y15rxp');
y0tx = getappdata(0,'y0txp');
y1tx = getappdata(0,'y1txp');
y5tx = getappdata(0,'y5txp');
y10tx = getappdata(0,'y10txp');
y15tx = getappdata(0,'y15txp');
dr1x = getappdata(0,'dr1xp');
dr5x = getappdata(0,'dr5xp');
dr10x = getappdata(0,'dr10xp');
dr15x = getappdata(0,'dr15xp');
F1x = getappdata(0,'F1xp');
F5x = getappdata(0,'F5xp');
F10x = getappdata(0,'F10xp');
F15x = getappdata(0,'F15xp');
V1x = getappdata(0,'V1xp');
V5x = getappdata(0,'V5xp');
V10x = getappdata(0,'V10xp');
V15x = getappdata(0,'V15xp');
M0x = getappdata(0,'M0xp');
M1x = getappdata(0,'M1xp');
M5x = getappdata(0,'M5xp');
M10x = getappdata(0,'M10xp');
M15x = getappdata(0,'M15xp');

plotdatax = get(handles.popupmenu2,'Value');

% Simpangan Netto
grid on
if(plotdatax==1)
plot(t,y0nx,t,y1nx,t,y5nx,t,y10nx,t,y15nx);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Simpangan Netto (cm)')
legend('Fondasi','Lt 1','Lt 5','Lt 10','Lt 15')

% Sudut Rotasi
grid on
elseif(plotdatax==2)
plot(t,tetaradx);

```

```

hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Rotasi (rad)')

% Simpangan Rotasi
grid on
elseif(plotdatax==3)
plot(t,y1rx,t,y5rx,t,y10rx,t,y15rx);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Simpangan Rotasi (cm)')
legend('Lt 1','Lt 5','Lt 10','Lt 15')

% Simpangan Total
grid on
elseif(plotdatax==4)
plot(t,y0tx,t,y1tx,t,y5tx,t,y10tx,t,y15tx);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Simpangan Total (cm)')
legend('Fondasi','Lt 1','Lt 5','Lt 10','Lt 15')

% Interstorey Drift Ratio
grid on
elseif(plotdatax==5)
plot(t,dr1x,t,dr5x,t,dr10x,t,dr15x);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Interstorey Drift (%)')
legend('Lt 1','Lt 5','Lt 10','Lt 15')

% Gaya Geser Tingkat
grid on
elseif(plotdatax==6)
plot(t,F1x,t,F5x,t,F10x,t,F15x);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Gaya Geser Tingkat (kg)')
legend('Lt 1','Lt 5','Lt 10','Lt 15')

% Gaya Geser Dasar
grid on
elseif(plotdatax==7)
plot(t,V1x,t,V5x,t,V10x,t,V15x);
hold on;

```



```

plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Gaya Geser Dasar (kg)')
legend('Lt 1','Lt 5','Lt 10','Lt 15')

% Momen Guling
grid on
else(plotdatax==8)
plot(t,M0x,t,M1x,t,M5x,t,M10x,t,M15x);
hold on;
plot(t,0,'k');
hold off;
xlabel('Waktu (dt)')
ylabel('Momen Guling (kg.m)')
legend('Lt Dasar','Lt 1','Lt 5','Lt 10','Lt 15')
grid on
end

% --- Executes on selection change in popupmenu5.
function popupmenu5_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu5 (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
popupmenu5 contents as cell array
%          contents{get(hObject,'Value')} returns selected item from
popupmenu5

% --- Executes during object creation, after setting all
properties.
function popupmenu5_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu5 (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 pushbutton7.
function pushbutton7_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton7 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
exit;

```