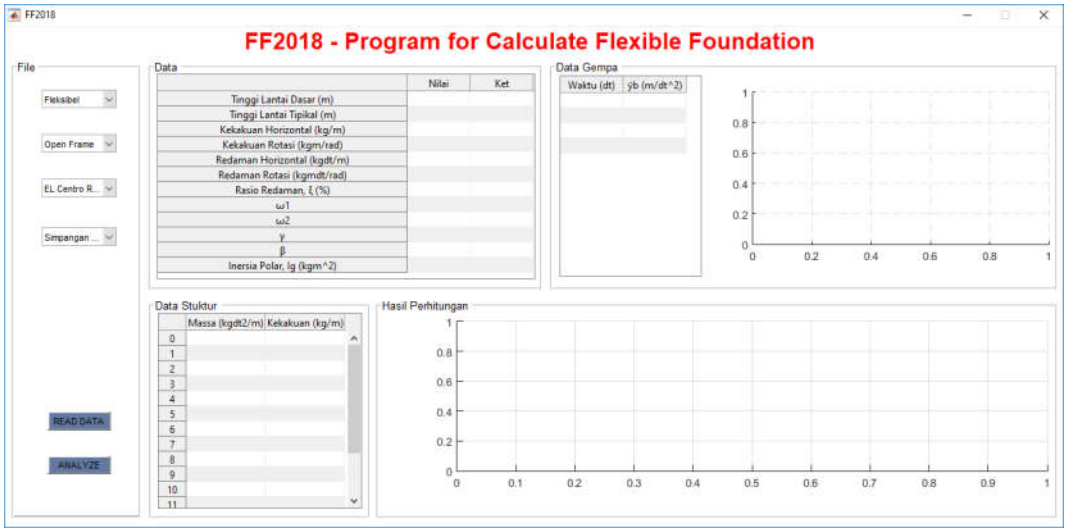
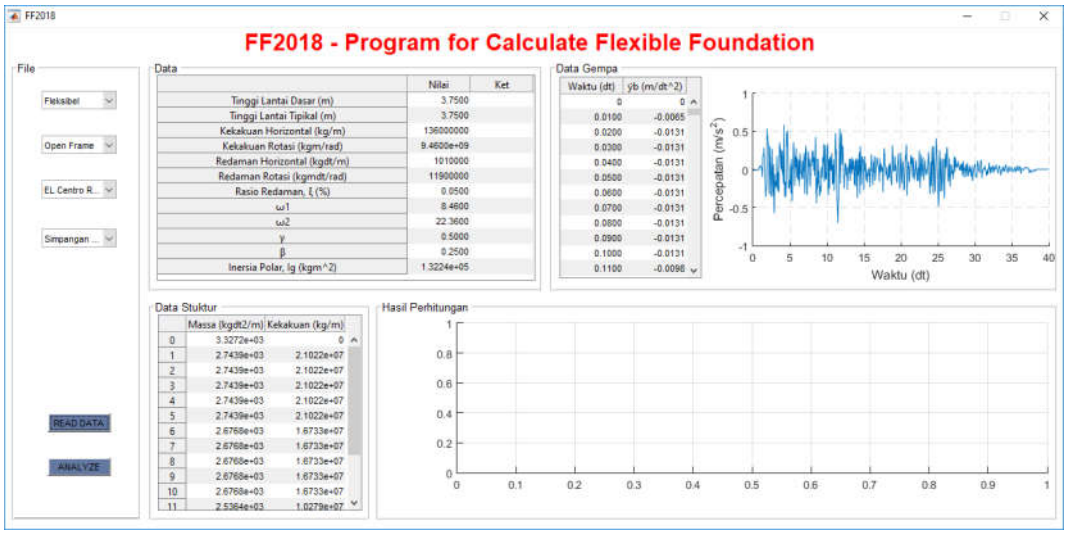
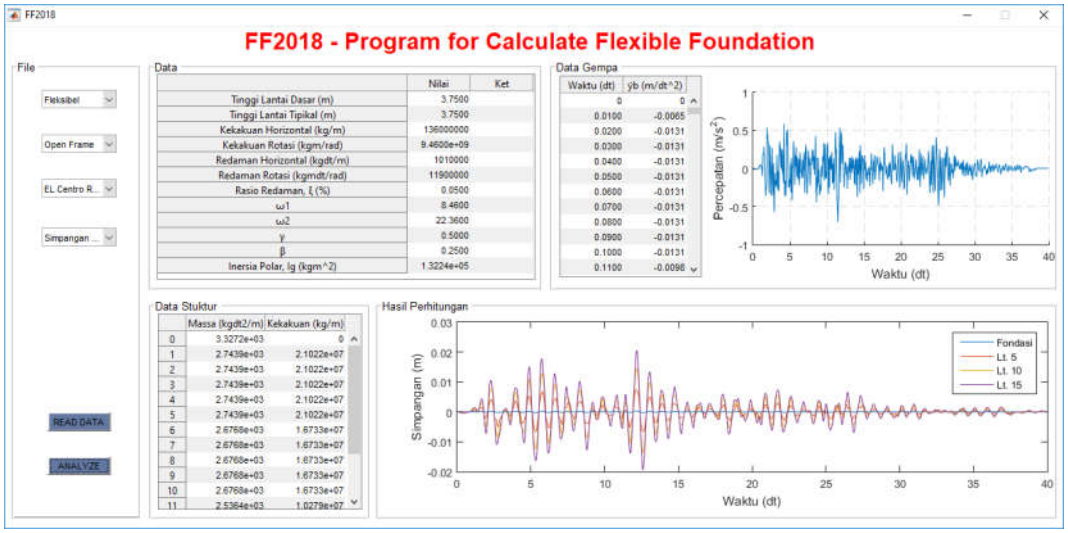
Lampiran 7 Program FF2018



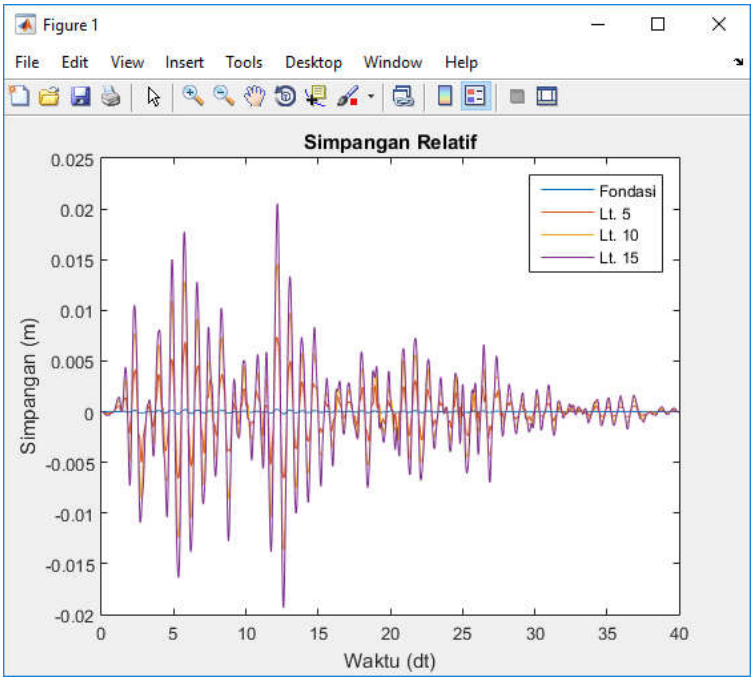
Tampilan Awal



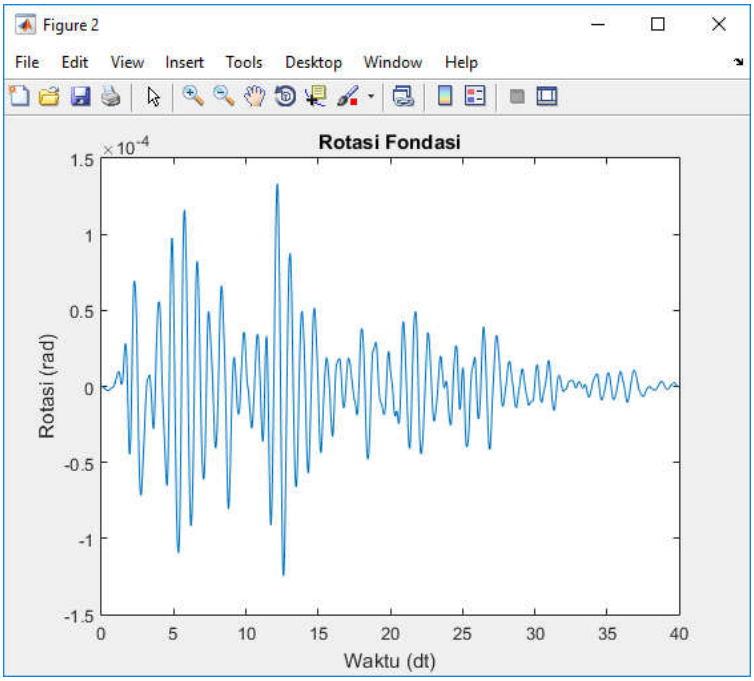
Tampilan Setelah Read Data



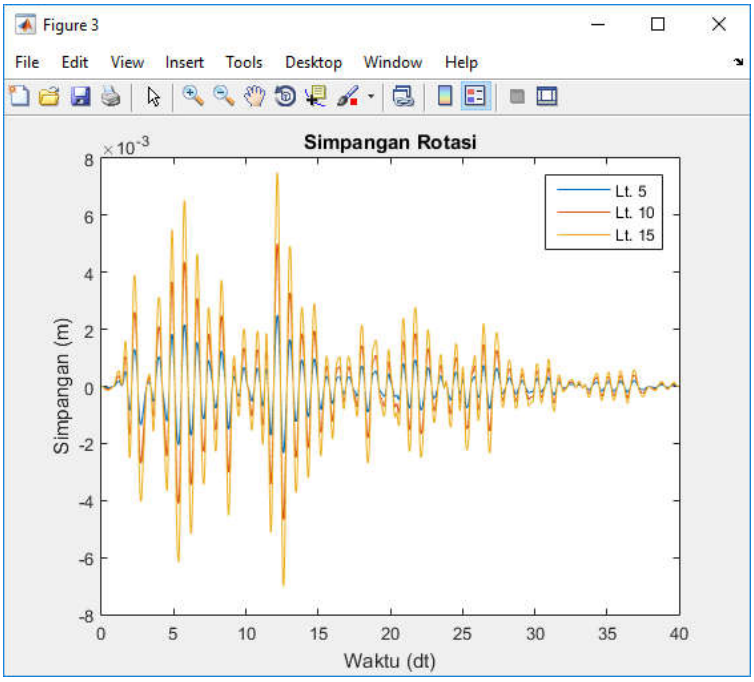
Tampilan Setelah Analyze



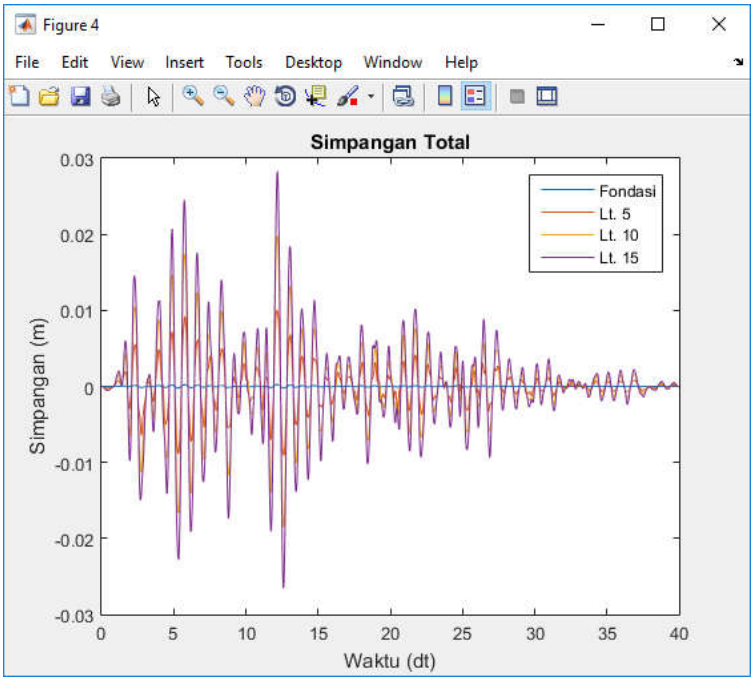
Simpangan Relatif



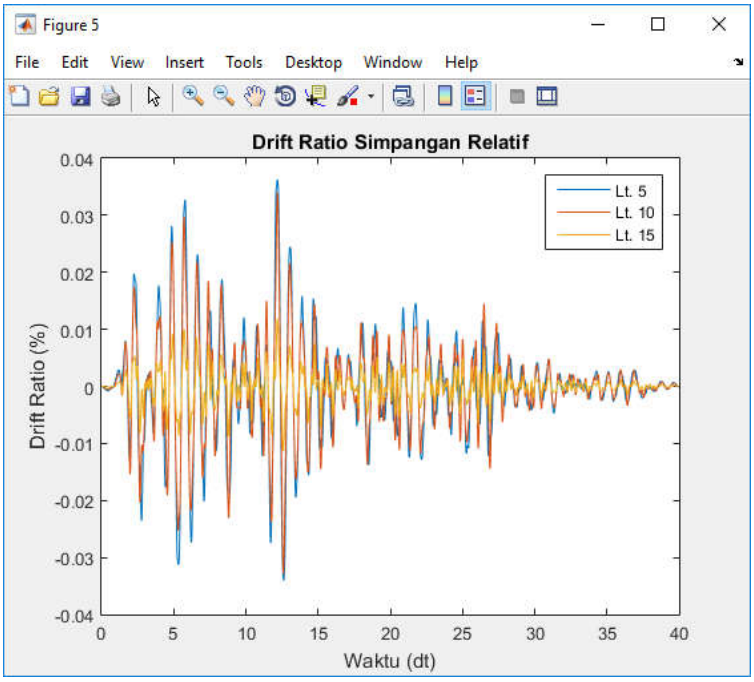
Rotasi Fondasi



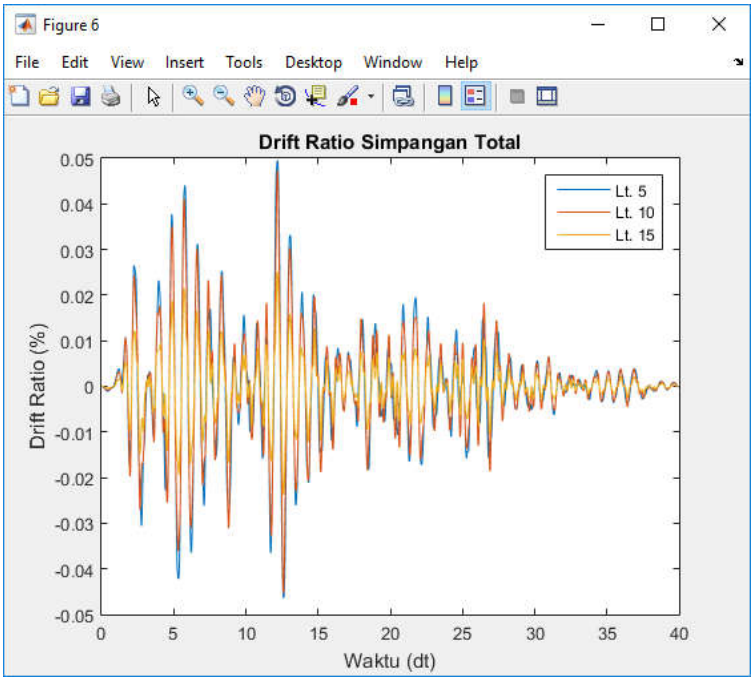
Simpangan Rotasi



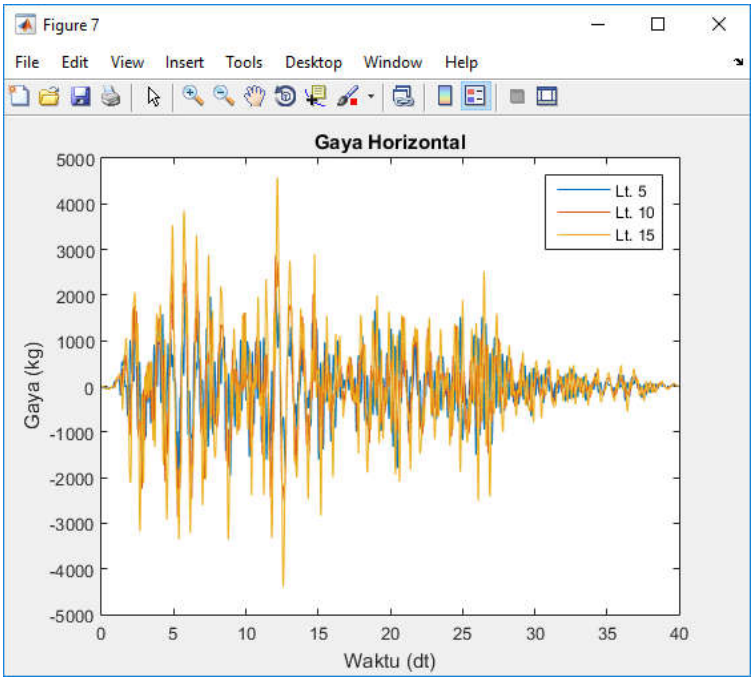
Simpangan Total



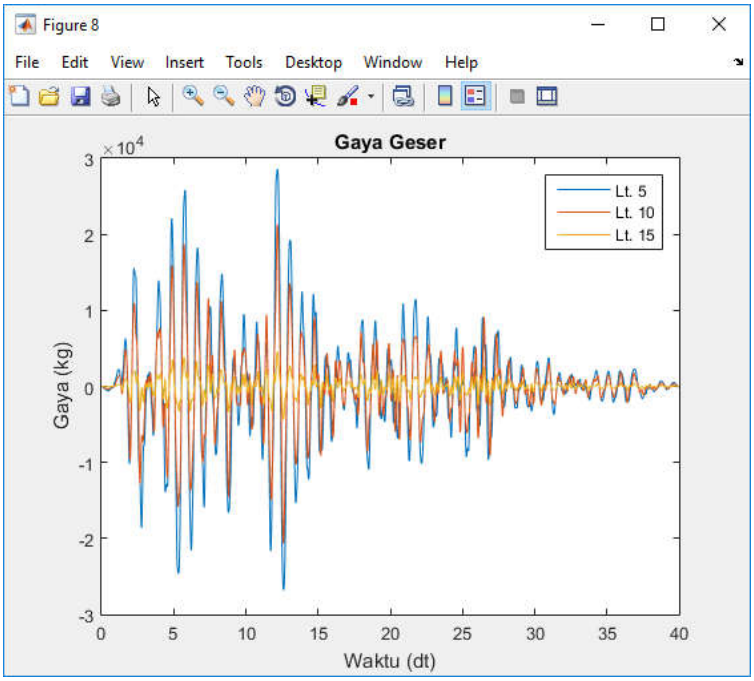
Drift Ratio Simpangan Relatif



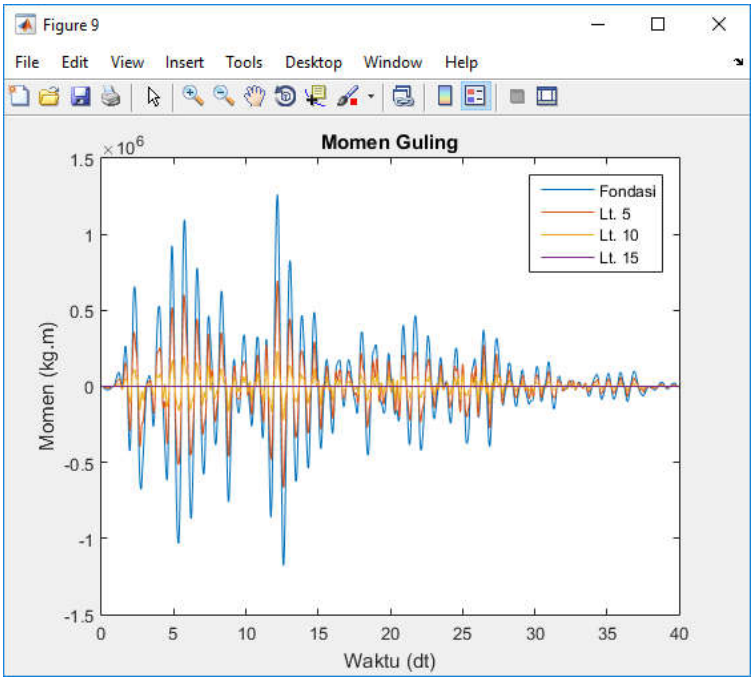
Drift Ratio Simpangan Total



Gaya Horizontal



Gaya Geser



Momen Guling

```
function varargout = FF2018(varargin)
% FF2018 MATLAB code for FF2018.fig
%      FF2018, by itself, creates a new FF2018 or raises the
existing
%      singleton*.
%
%      H = FF2018 returns the handle to a new FF2018 or the handle
to
%      the existing singleton*.
%
%      FF2018('CALLBACK',hObject,eventData,handles,...) calls the
local
%      function named CALLBACK in FF2018.M with the given input
arguments.
%
%      FF2018('Property','Value',...) creates a new FF2018 or
raises the
%      existing singleton*.  Starting from the left, property
value pairs are
%      applied to the GUI before FF2018_OpeningFcn gets called.
An
%      unrecognized property name or invalid value makes property
application
%      stop.  All inputs are passed to FF2018_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 FF2018

% Last Modified by GUIDE v2.5 24-Jul-2018 08:07:40

% Begin initialization code - DO NOT EDIT
gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn', @FF2018_OpeningFcn, ...
                   'gui_OutputFcn',  @FF2018_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 FF2018 is made visible.
function FF2018_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 FF2018 (see VARARGIN)

% Choose default command line output for FF2018
handles.output = hObject;

% Update handles structure
guidata(hObject, handles);

% UIWAIT makes FF2018 wait for user response (see UIRESUME)
% uiwait(handles.figure1);


% --- Outputs from this function are returned to the command line.
function varargout = FF2018_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 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)


% --- Executes on button press in pushbutton8.
function pushbutton8_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton8 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)


% --- Executes on button press in pushbutton9.
function pushbutton9_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton9 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)
```

```
% --- Executes on button press in pushbutton10.
function pushbutton10_Callback(hObject, eventdata, handles)
% hObject    handle to pushbutton10 (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)


% --- Executes on selection change in popupmenu9.
function popupmenu9_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu9 (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
popupmenu9 contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
popupmenu9


% --- Executes during object creation, after setting all
properties.
function popupmenu9_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu9 (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 popupmenu10.
function popupmenu10_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu10 (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
popupmenu10 contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
popupmenu10
```

```
% --- Executes during object creation, after setting all
properties.
function popupmenu10_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu10 (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 popupmenu11.
function popupmenu11_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu11 (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
popupmenu11 contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
popupmenu11


% --- Executes during object creation, after setting all
properties.
function popupmenu11_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu11 (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 ReadData.
function ReadData_Callback(hObject, eventdata, handles)
datastruktur = load ('DataStruktur.mat')
massakekakuan = load ('MK.mat')
rekamangempa = load ('RekGem.mat')
```

```
tipefondasi = get(handles.Fondasi, 'Value');
tipestruktur = get(handles.Struktur, 'Value');
tipegempa = get(handles.Gempa, 'Value');

axes(handles.axes1);
cla;

switch tipefondasi
    case 1
        switch tipestruktur
            case 1
                set(handles.TabelData,'Data',datastruktur.FlekOF);
            case 2

set(handles.TabelData,'Data',datastruktur.FlekBrX);
        end
    case 2
        switch tipestruktur
            case 1

set(handles.TabelData,'Data',datastruktur.JepitOF);
            case 2

set(handles.TabelData,'Data',datastruktur.JepitBrX);
        end
end

switch tipestruktur
    case 1
        set(handles.TabelDataStruktur,'Data',massakekakuan.MKOF);
    case 2
        set(handles.TabelDataStruktur,'Data',massakekakuan.MKBrX);
end

switch tipegempa
    case 1
        plot(rekamangempa.FR(:,1),rekamangempa.FR(:,2));
        xlabel('Waktu (dt)') % x-axis label
        ylabel('Percepatan (m/s^2)') % y-axis label
        set(handles.TabelDataGempa,'Data',rekamangempa.FR)
    case 2
        plot(rekamangempa.FM(:,1),rekamangempa.FM(:,2));
        xlabel('Waktu (dt)') % x-axis label
        ylabel('Percepatan (m/s^2)') % y-axis label
        set(handles.TabelDataGempa,'Data',rekamangempa.FM)
    case 3
        plot(rekamangempa.FT(:,1),rekamangempa.FT(:,2));
        xlabel('Waktu (dt)') % x-axis label
        ylabel('Percepatan (m/s^2)') % y-axis label
        set(handles.TabelDataGempa,'Data',rekamangempa.FT)
end
% hObject    handle to ReadData (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
```

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


% --- Executes on button press in Analyze.
function Analyze_Callback(hObject, eventdata, handles)
tabelStruktur = get(handles.TabelData, 'data');
tabelMK = get(handles.TabelDataStruktur, 'data');
tabelGempa = get(handles.TabelDataGempa, 'data');

Hdasar = tabelStruktur(1,1)
Htipikal = tabelStruktur(2,1)
KH = tabelStruktur(3,1)
KR = tabelStruktur(4,1)
CH = tabelStruktur(5,1)
CR = tabelStruktur(6,1)
RasioRedaman = tabelStruktur(7,1)
Omg1 = tabelStruktur(8,1)
Omg2 = tabelStruktur(9,1)

Beta1 = 2*(RasioRedaman*Omg1-RasioRedaman*Omg2)/(Omg1^2-Omg2^2)
Alfa = 2*RasioRedaman*Omg1-Beta1*Omg1^2

Gamma = tabelStruktur(10,1)
Beta2 = tabelStruktur(11,1)
Ig = tabelStruktur(12,1)

m0 = tabelMK(1,1)
m1 = tabelMK(2,1)
m2 = tabelMK(3,1)
m3 = tabelMK(4,1)
m4 = tabelMK(5,1)
m5 = tabelMK(6,1)
m6 = tabelMK(7,1)
m7 = tabelMK(8,1)
m8 = tabelMK(9,1)
m9 = tabelMK(10,1)
m10 = tabelMK(11,1)
m11 = tabelMK(12,1)
m12 = tabelMK(13,1)
m13 = tabelMK(14,1)
m14 = tabelMK(15,1)
m15 = tabelMK(16,1)
m16 = m0+m1+m2+m3+m4+m5+m6+m7+m8+m9+m10+m11+m12+m13+m14+m15

mh1 = m1*Hdasar
mh2 = m2*(Hdasar+Htipikal)
mh3 = m3*(Hdasar+2*Htipikal)
mh4 = m4*(Hdasar+3*Htipikal)
mh5 = m5*(Hdasar+4*Htipikal)
mh6 = m6*(Hdasar+5*Htipikal)
mh7 = m7*(Hdasar+6*Htipikal)
mh8 = m8*(Hdasar+7*Htipikal)
mh9 = m9*(Hdasar+8*Htipikal)
mh10 = m10*(Hdasar+9*Htipikal)
mh11 = m11*(Hdasar+10*Htipikal)
```

```
mh12 = m12*(Hdasar+11*Htipikal)
mh13 = m13*(Hdasar+12*Htipikal)
mh14 = m14*(Hdasar+13*Htipikal)
mh15 = m15*(Hdasar+14*Htipikal)

mhtot =
mh1+mh2+mh3+mh4+mh5+mh6+mh7+mh8+mh9+mh10+mh11+mh12+mh13+mh14+mh15

mh1p2 = m1*Hdasar^2
mh2p2 = m2*(Hdasar+Htipikal)^2
mh3p2 = m3*(Hdasar+2*Htipikal)^2
mh4p2 = m4*(Hdasar+3*Htipikal)^2
mh5p2 = m5*(Hdasar+4*Htipikal)^2
mh6p2 = m6*(Hdasar+5*Htipikal)^2
mh7p2 = m7*(Hdasar+6*Htipikal)^2
mh8p2 = m8*(Hdasar+7*Htipikal)^2
mh9p2 = m9*(Hdasar+8*Htipikal)^2
mh10p2 = m10*(Hdasar+9*Htipikal)^2
mh11p2 = m11*(Hdasar+10*Htipikal)^2
mh12p2 = m12*(Hdasar+11*Htipikal)^2
mh13p2 = m13*(Hdasar+12*Htipikal)^2
mh14p2 = m14*(Hdasar+13*Htipikal)^2
mh15p2 = m15*(Hdasar+14*Htipikal)^2

m17 =
Ig+mh1p2+mh2p2+mh3p2+mh4p2+mh5p2+mh6p2+mh7p2+mh8p2+mh9p2+mh10p2+mh
11p2+mh12p2+mh13p2+mh14p2+mh15p2

k1 = tabelMK(2,2)
k2 = tabelMK(3,2)
k3 = tabelMK(4,2)
k4 = tabelMK(5,2)
k5 = tabelMK(6,2)
k6 = tabelMK(7,2)
k7 = tabelMK(8,2)
k8 = tabelMK(9,2)
k9 = tabelMK(10,2)
k10 = tabelMK(11,2)
k11 = tabelMK(12,2)
k12 = tabelMK(13,2)
k13 = tabelMK(14,2)
k14 = tabelMK(15,2)
k15 = tabelMK(16,2)

[M] = [m1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 m1 mh1
    0 m2 0 0 0 0 0 0 0 0 0 0 0 0 0 m2 mh2
    0 0 m3 0 0 0 0 0 0 0 0 0 0 0 0 m3 mh3
    0 0 0 m4 0 0 0 0 0 0 0 0 0 0 0 m4 mh4
    0 0 0 0 m5 0 0 0 0 0 0 0 0 0 0 m5 mh5
    0 0 0 0 0 m6 0 0 0 0 0 0 0 0 0 m6 mh6
    0 0 0 0 0 0 m7 0 0 0 0 0 0 0 0 m7 mh7
    0 0 0 0 0 0 0 m8 0 0 0 0 0 0 0 m8 mh8
    0 0 0 0 0 0 0 0 m9 0 0 0 0 0 0 m9 mh9
    0 0 0 0 0 0 0 0 0 m10 0 0 0 0 0 m10 mh10
    0 0 0 0 0 0 0 0 0 0 m11 0 0 0 0 m11 mh11
```

```
    0 0 0 0 0 0 0 0 0 0 m12 0 0 0 m12 mh12
    0 0 0 0 0 0 0 0 0 0 0 m13 0 0 m13 mh13
    0 0 0 0 0 0 0 0 0 0 0 0 m14 0 m14 mh14
    0 0 0 0 0 0 0 0 0 0 0 0 0 m15 m15 mh15
    m1 m2 m3 m4 m5 m6 m7 m8 m9 m10 m11 m12 m13 m14 m15 m16 mhtot
    mh1 mh2 mh3 mh4 mh5 mh6 mh7 mh8 mh9 mh10 mh11 mh12 mh13 mh14
mh15 mhtot m17]

format bank
[M]

[K] = [k1+k2 -k2 0 0 0 0 0 0 0 0 0 0 0 0 0 0
    -k2 k2+k3 -k3 0 0 0 0 0 0 0 0 0 0 0 0 0
    0 -k3 k3+k4 -k4 0 0 0 0 0 0 0 0 0 0 0 0
    0 0 -k4 k4+k5 -k5 0 0 0 0 0 0 0 0 0 0 0
    0 0 0 -k5 k5+k6 -k6 0 0 0 0 0 0 0 0 0 0
    0 0 0 0 -k6 k6+k7 -k7 0 0 0 0 0 0 0 0 0
    0 0 0 0 0 -k7 k7+k8 -k8 0 0 0 0 0 0 0 0
    0 0 0 0 0 0 -k8 k8+k9 -k9 0 0 0 0 0 0 0
    0 0 0 0 0 0 0 -k9 k9+k10 -k10 0 0 0 0 0 0
    0 0 0 0 0 0 0 0 -k10 k10+k11 -k11 0 0 0 0 0
    0 0 0 0 0 0 0 0 0 -k11 k11+k12 -k12 0 0 0 0
    0 0 0 0 0 0 0 0 0 0 -k12 k12+k13 -k13 0 0 0
    0 0 0 0 0 0 0 0 0 0 0 -k13 k13+k14 -k14 0 0
    0 0 0 0 0 0 0 0 0 0 0 0 -k14 k14+k15 -k15 0
    0 0 0 0 0 0 0 0 0 0 0 0 0 -k15 k15 0
    0 0 0 0 0 0 0 0 0 0 0 0 0 0 KH 0
    0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 KR]

format bank
[K]

[C] = Alfa*[M]+Beta1*[K]

ktp = [K]+(Gamma/(Beta2*0.01))*[C]+(1/(Beta2*0.01^2))*[M]

ktpinv = inv(ktp)

a = (1/(Beta2*0.01))*[M]+(Gamma/Beta2)*[C]

b = (1/(2*Beta2))*[M]+0.01*((Gamma/(2*Beta2))-1)*[C]

tgempa = tabelGempa(:,1)
agempa = tabelGempa(:,2)

for i = 1:length(transpose(agempa))
  if i==length(transpose(agempa));
     break
  end
  dagempa(i) = agempa(i+1)-agempa(i);
end

% Menghitung Simpangan setiap siklus
% Pendahuluan
```

```
n = length(M);
nt = length(agempa);

simpangan = zeros(n,nt);
kecepatan = zeros(n,nt);
percepatan = zeros(n,nt);
gayahorizontal = zeros(n,nt);

simpangan(:,1) = zeros;
kecepatan(:,1) = zeros;
percepatan(:,1) = zeros;
gayahorizontal(:,1) = zeros;

% Iterasi Setiap Siklus
for i = 1:(length(transpose(agempa))-1)

    dagempa(i) = agempa(i+1)-agempa(i);
    dp = M(:,16)*dagempa;

    dptp(:,i) = dp(:,i) + a*kecepatan(:,i) + b*percepatan(:,i);

    deltasimpangan(:,i) = ktpinv*dptp(:,i);
    deltakecepatan(:,i) = (Gamma/(Beta2*0.01))*deltasimpangan(:,i)
- (Gamma/Beta2)*kecepatan(:,i)+(0.01*(1-
(Gamma/(2*Beta2))))*percepatan(:,i);
    deltapercepatan(:,i) = (1/(Beta2*0.01^2))*deltasimpangan(:,i)
-(1/(Beta2*0.01))*kecepatan(:,i)-(1/(2*Beta2))*percepatan(:,i);

    simpangan(:,i+1) = simpangan(:,i) + deltasimpangan(:,i);
    kecepatan(:,i+1) = kecepatan(:,i) + deltakecepatan(:,i);
    percepatan(:,i+1) = percepatan(:,i) + deltapercepatan(:,i);
    gayahorizontal(:,i+1) = [K]*simpangan(:,i+1);

end

% Simpangan Relatif
SRel0 = simpangan(16,:)';
SRel1 = simpangan(1,:)';
SRel2 = simpangan(2,:)';
SRel3 = simpangan(3,:)';
SRel4 = simpangan(4,:)';
SRel5 = simpangan(5,:)';
SRel6 = simpangan(6,:)';
SRel7 = simpangan(7,:)';
SRel8 = simpangan(8,:)';
SRel9 = simpangan(9,:)';
SRel10 = simpangan(10,:)';
SRel11 = simpangan(11,:)';
SRel12 = simpangan(12,:)';
SRel13 = simpangan(13,:)';
SRel14 = simpangan(14,:)';
SRel15 = simpangan(15,:)';

% Rotasi Fondasi
```

```
SudutRotasi = simpangan(17,:)';
RF = SudutRotasi;

% Simpangan Rotasi
SRot1 = tan(RF)*Hdasar;
SRot2 = tan(RF)*(Hdasar+Htipikal);
SRot3 = tan(RF)*(Hdasar+2*Htipikal);
SRot4 = tan(RF)*(Hdasar+3*Htipikal);
SRot5 = tan(RF)*(Hdasar+4*Htipikal);
SRot6 = tan(RF)*(Hdasar+5*Htipikal);
SRot7 = tan(RF)*(Hdasar+6*Htipikal);
SRot8 = tan(RF)*(Hdasar+7*Htipikal);
SRot9 = tan(RF)*(Hdasar+8*Htipikal);
SRot10 = tan(RF)*(Hdasar+9*Htipikal);
SRot11 = tan(RF)*(Hdasar+10*Htipikal);
SRot12 = tan(RF)*(Hdasar+11*Htipikal);
SRot13 = tan(RF)*(Hdasar+12*Htipikal);
SRot14 = tan(RF)*(Hdasar+13*Htipikal);
SRot15 = tan(RF)*(Hdasar+14*Htipikal);

% Simpangan Total
ST0 = SRel0;
ST1 = ST0 + SRel1 + SRot1;
ST2 = ST0 + SRel2 + SRot2;
ST3 = ST0 + SRel3 + SRot3;
ST4 = ST0 + SRel4 + SRot4;
ST5 = ST0 + SRel5 + SRot5;
ST6 = ST0 + SRel6 + SRot6;
ST7 = ST0 + SRel7 + SRot7;
ST8 = ST0 + SRel8 + SRot8;
ST9 = ST0 + SRel9 + SRot9;
ST10 = ST0 + SRel10 + SRot10;
ST11 = ST0 + SRel11 + SRot11;
ST12 = ST0 + SRel12 + SRot12;
ST13 = ST0 + SRel13 + SRot13;
ST14 = ST0 + SRel14 + SRot14;
ST15 = ST0 + SRel15 + SRot15;

% Drift Ratio Simpangan Relatif(%)
DRSR1 = (SRel1-0)/Hdasar*100;
DRSR2 = (SRel2-SRel1)/Htipikal*100;
DRSR3 = (SRel3-SRel2)/Htipikal*100;
DRSR4 = (SRel4-SRel3)/Htipikal*100;
DRSR5 = (SRel5-SRel4)/Htipikal*100;
DRSR6 = (SRel6-SRel5)/Htipikal*100;
DRSR7 = (SRel7-SRel6)/Htipikal*100;
DRSR8 = (SRel8-SRel7)/Htipikal*100;
DRSR9 = (SRel9-SRel8)/Htipikal*100;
DRSR10 = (SRel10-SRel9)/Htipikal*100;
DRSR11 = (SRel11-SRel10)/Htipikal*100;
DRSR12 = (SRel12-SRel11)/Htipikal*100;
DRSR13 = (SRel13-SRel12)/Htipikal*100;
DRSR14 = (SRel14-SRel13)/Htipikal*100;
DRSR15 = (SRel15-SRel14)/Htipikal*100;

% Drift Ratio Simpangan Total(%)
```

```
DRST1 = (ST1-0)/Hdasar*100;
DRST2 = (ST2-ST1)/Htipikal*100;
DRST3 = (ST3-ST2)/Htipikal*100;
DRST4 = (ST4-ST3)/Htipikal*100;
DRST5 = (ST5-ST4)/Htipikal*100;
DRST6 = (ST6-ST5)/Htipikal*100;
DRST7 = (ST7-ST6)/Htipikal*100;
DRST8 = (ST8-ST7)/Htipikal*100;
DRST9 = (ST9-ST8)/Htipikal*100;
DRST10 = (ST10-ST9)/Htipikal*100;
DRST11 = (ST11-ST10)/Htipikal*100;
DRST12 = (ST12-ST11)/Htipikal*100;
DRST13 = (ST13-ST12)/Htipikal*100;
DRST14 = (ST14-ST13)/Htipikal*100;
DRST15 = (ST15-ST14)/Htipikal*100;

% Gaya Horizontal
FH1 = gayahorizontal(1,:)';
FH2 = gayahorizontal(2,:)';
FH3 = gayahorizontal(3,:)';
FH4 = gayahorizontal(4,:)';
FH5 = gayahorizontal(5,:)';
FH6 = gayahorizontal(6,:)';
FH7 = gayahorizontal(7,:)';
FH8 = gayahorizontal(8,:)';
FH9 = gayahorizontal(9,:)';
FH10 = gayahorizontal(10,:)';
FH11 = gayahorizontal(11,:)';
FH12 = gayahorizontal(12,:)';
FH13 = gayahorizontal(13,:)';
FH14 = gayahorizontal(14,:)';
FH15 = gayahorizontal(15,:)';

% Gaya Geser
GG1 = FH1 + FH2 + FH3 + FH4 + FH5 + FH6 + FH7 + FH8 + FH9 + FH10 +
FH11 + FH12 + FH13 + FH14 + FH15;
GG2 = FH2 + FH3 + FH4 + FH5 + FH6 + FH7 + FH8 + FH9 + FH10 + FH11
+ FH12 + FH13 + FH14 + FH15;
GG3 = FH3 + FH4 + FH5 + FH6 + FH7 + FH8 + FH9 + FH10 + FH11 + FH12
+ FH13 + FH14 + FH15;
GG4 = FH4 + FH5 + FH6 + FH7 + FH8 + FH9 + FH10 + FH11 + FH12 +
FH13 + FH14 + FH15;
GG5 = FH5 + FH6 + FH7 + FH8 + FH9 + FH10 + FH11 + FH12 + FH13 +
FH14 + FH15;
GG6 = FH6 + FH7 + FH8 + FH9 + FH10 + FH11 + FH12 + FH13 + FH14 +
FH15;
GG7 = FH7 + FH8 + FH9 + FH10 + FH11 + FH12 + FH13 + FH14 + FH15;
GG8 = FH8 + FH9 + FH10 + FH11 + FH12 + FH13 + FH14 + FH15;
GG9 = FH9 + FH10 + FH11 + FH12 + FH13 + FH14 + FH15;
GG10 = FH10 + FH11 + FH12 + FH13 + FH14 + FH15;
GG11 = FH11 + FH12 + FH13 + FH14 + FH15;
GG12 = FH12 + FH13 + FH14 + FH15;
GG13 = FH13 + FH14 + FH15;
GG14 = FH14 + FH15;
GG15 = FH15;
```

```
% Momen Guling
MG0 = FH1*Hdasar + FH2*(Hdasar+Htipikal) + FH3*(Hdasar+2*Htipikal)
+ FH4*(Hdasar+3*Htipikal) + FH5*(Hdasar+4*Htipikal) +
FH6*(Hdasar+5*Htipikal) + FH7*(Hdasar+6*Htipikal) +
FH8*(Hdasar+7*Htipikal) + FH9*(Hdasar+8*Htipikal) +
FH10*(Hdasar+9*Htipikal) + FH11*(Hdasar+10*Htipikal) +
FH12*(Hdasar+11*Htipikal)+ FH13*(Hdasar+12*Htipikal) +
FH14*(Hdasar+13*Htipikal) +FH15*(Hdasar+14*Htipikal);
MG1 = FH2*Htipikal + FH3*2*Htipikal + FH4*3*Htipikal +
FH5*4*Htipikal + FH6*5*Htipikal + FH7*6*Htipikal + FH8*7*Htipikal
+ FH9*8*Htipikal + FH10*9*Htipikal + FH11*10*Htipikal +
FH12*11*Htipikal + FH13*12*Htipikal + FH14*13*Htipikal +
FH15*14*Htipikal;
MG2 = FH3*Htipikal + FH4*2*Htipikal + FH5*3*Htipikal +
FH6*4*Htipikal + FH7*5*Htipikal + FH8*6*Htipikal + FH9*7*Htipikal
+ FH10*8*Htipikal + FH11*9*Htipikal + FH12*10*Htipikal +
FH13*11*Htipikal + FH14*12*Htipikal + FH15*13*Htipikal;
MG3 = FH4*Htipikal + FH5*2*Htipikal + FH6*3*Htipikal +
FH7*4*Htipikal + FH8*5*Htipikal + FH9*6*Htipikal + FH10*7*Htipikal
+ FH11*8*Htipikal + FH12*9*Htipikal + FH13*10*Htipikal +
FH14*11*Htipikal + FH15*12*Htipikal;
MG4 = FH5*Htipikal + FH6*2*Htipikal + FH7*3*Htipikal +
FH8*4*Htipikal + FH9*5*Htipikal + FH10*6*Htipikal +
FH11*7*Htipikal + FH12*8*Htipikal + FH13*9*Htipikal +
FH14*10*Htipikal + FH15*11*Htipikal;
MG5 = FH6*Htipikal + FH7*2*Htipikal + FH8*3*Htipikal +
FH9*4*Htipikal + FH10*5*Htipikal + FH11*6*Htipikal +
FH12*7*Htipikal + FH13*8*Htipikal + FH14*9*Htipikal +
FH15*10*Htipikal;
MG6 = FH7*Htipikal + FH8*2*Htipikal + FH9*3*Htipikal +
FH10*4*Htipikal + FH11*5*Htipikal + FH12*6*Htipikal +
FH13*7*Htipikal + FH14*8*Htipikal + FH15*9*Htipikal;
MG7 = FH8*Htipikal + FH9*2*Htipikal + FH10*3*Htipikal +
FH11*4*Htipikal + FH12*5*Htipikal + FH13*6*Htipikal +
FH14*7*Htipikal + FH15*8*Htipikal;
MG8 = FH9*Htipikal + FH10*2*Htipikal + FH11*3*Htipikal +
FH12*4*Htipikal + FH13*5*Htipikal + FH14*6*Htipikal +
FH15*7*Htipikal;
MG9 = FH10*Htipikal + FH11*2*Htipikal + FH12*3*Htipikal +
FH13*4*Htipikal + FH14*5*Htipikal + FH15*6*Htipikal;
MG10 = FH11*Htipikal + FH12*2*Htipikal + FH13*3*Htipikal +
FH14*4*Htipikal + FH15*5*Htipikal;
MG11 = FH12*Htipikal + FH13*2*Htipikal + FH14*3*Htipikal +
FH15*4*Htipikal;
MG12 = FH13*Htipikal + FH14*2*Htipikal + FH15*3*Htipikal;
MG13 = FH14*Htipikal + FH15*2*Htipikal;
MG14 = FH15*Htipikal;
MG15 = zeros(length(agempa),1);

Hasil = get(handles.HasilPerhitungan, 'Value');

axes(handles.axes2);
cla;

switch Hasil
    case 1
```

```
plot(tgempa,SRel0,tgempa,SRel5,tgempa,SRel10,tgempa,SRel15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Simpangan (m)')
        legend('Fondasi','Lt. 5','Lt. 10','Lt. 15')
    case 2
        plot(tgempa,RF);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Rotasi (rad)')
    case 3
        plot(tgempa,SRot5,tgempa,SRot10,tgempa,SRot15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Simpangan (m)')
        legend('Lt. 5','Lt. 10','Lt. 15')
    case 4
        plot(tgempa,ST0,tgempa,ST5,tgempa,ST10,tgempa,ST15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Simpangan (m)')
        legend('Fondasi','Lt. 5','Lt. 10','Lt. 15')
    case 5
        plot(tgempa,DRSR5,tgempa,DRSR10,tgempa,DRSR15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Drift Ratio (%)')
        legend('Lt. 5','Lt. 10','Lt. 15')
    case 6
        plot(tgempa,DRST5,tgempa,DRST10,tgempa,DRST15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Drift Ratio (%)')
        legend('Lt. 5','Lt. 10','Lt. 15')
    case 7
        plot(tgempa,FH5,tgempa,FH10,tgempa,FH15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Gaya (kg)')
        legend('Lt. 5','Lt. 10','Lt. 15')
    case 8
```

```
        plot(tgempa,GG5,tgempa,GG10,tgempa,GG15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Gaya (kg)')
        legend('Lt. 5','Lt. 10','Lt. 15')
    case 9
        plot(tgempa,MG0,tgempa,MG5,tgempa,MG10,tgempa,MG15);
        hold on;
        plot(tgempa,0,'k');
        hold off;
        xlabel('Waktu (dt)')
        ylabel('Momen (kg.m)')
        legend('Fondasi','Lt. 5','Lt. 10','Lt. 15')
end

% Export to Excel
filename = 'Results Fleksibilitas Fondasi.xlsx';
sheet = 'FF2018';
A1 = tgempa;
A2 = [SRel0 SRel1 SRel2 SRel3 SRel4 SRel5 SRel6 SRel7 SRel8 SRel9
SRel10 SRel11 SRel12 SRel13 SRel14 SRel15];
A3 =
[RF,SRot1,SRot2,SRot3,SRot4,SRot5,SRot6,SRot7,SRot8,SRot9,SRot10,S
Rot11,SRot12,SRot13,SRot14,SRot15];
A4 = [ST0 ST1 ST2 ST3 ST4 ST5 ST6 ST7 ST8 ST9 ST10 ST11 ST12 ST13
ST14 ST15];
A5 = [DRSR1 DRSR2 DRSR3 DRSR4 DRSR5 DRSR6 DRSR7 DRSR8 DRSR9 DRSR10
DRSR11 DRSR12 DRSR13 DRSR14 DRSR15];
A6 = [DRST1 DRST2 DRST3 DRST4 DRST5 DRST6 DRST7 DRST8 DRST9 DRST10
DRST11 DRST12 DRST13 DRST14 DRST15];
A7 = [FH1 FH2 FH3 FH4 FH5 FH6 FH7 FH8 FH9 FH10 FH11 FH12 FH13 FH14
FH15];
A8 = [GG1 GG2 GG3 GG4 GG5 GG6 GG7 GG8 GG9 GG10 GG11 GG12 GG13 GG14
GG15];
A9 = [MG0 MG1 MG2 MG3 MG4 MG5 MG6 MG7 MG8 MG9 MG10 MG11 MG12 MG13
MG14 MG15];
range1 = 'A2';
range2 = 'B2';
range3 = 'R2';
range4 = 'AH2';
range5 = 'AX2';
range6 = 'BM2';
range7 = 'CB2';
range8 = 'CQ2';
range9 = 'DF2';
xlswrite(filename,A1,sheet,range1)
xlswrite(filename,A2,sheet,range2)
xlswrite(filename,A3,sheet,range3)
xlswrite(filename,A4,sheet,range4)
xlswrite(filename,A5,sheet,range5)
xlswrite(filename,A6,sheet,range6)
xlswrite(filename,A7,sheet,range7)
xlswrite(filename,A8,sheet,range8)
xlswrite(filename,A9,sheet,range9)
```

```
% Simpangan Relatif
figure(1)
plot(tgempa,SRel0,tgempa,SRel5,tgempa,SRel10,tgempa,SRel15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Simpangan Relatif');
xlabel('Waktu (dt)')
ylabel('Simpangan (m)')
legend('Fondasi','Lt. 5','Lt. 10','Lt. 15')

% Rotasi Fondasi
figure(2)
plot(tgempa,RF);
hold on;
plot(tgempa,0,'k');
hold off;
title('Rotasi Fondasi');
xlabel('Waktu (dt)')
ylabel('Rotasi (rad)')

% Simpangan Rotasi
figure(3)
plot(tgempa,SRot5,tgempa,SRot10,tgempa,SRot15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Simpangan Rotasi');
xlabel('Waktu (dt)')
ylabel('Simpangan (m)')
legend('Lt. 5','Lt. 10','Lt. 15')

% Simpangan Total
figure(4)
plot(tgempa,ST0,tgempa,ST5,tgempa,ST10,tgempa,ST15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Simpangan Total');
xlabel('Waktu (dt)')
ylabel('Simpangan (m)')
legend('Fondasi','Lt. 5','Lt. 10','Lt. 15')

% Drift Ratio Simpangan Relatif
figure(5)
plot(tgempa,DRSR5,tgempa,DRSR10,tgempa,DRSR15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Drift Ratio Simpangan Relatif');
xlabel('Waktu (dt)')
ylabel('Drift Ratio (%)')
legend('Lt. 5','Lt. 10','Lt. 15')
```

```
% Drift Ratio Simpangan Total
figure(6)
plot(tgempa,DRST5,tgempa,DRST10,tgempa,DRST15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Drift Ratio Simpangan Total');
xlabel('Waktu (dt)')
ylabel('Drift Ratio (%)')
legend('Lt. 5','Lt. 10','Lt. 15')

% Gaya Horizontal
figure(7)
plot(tgempa,FH5,tgempa,FH10,tgempa,FH15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Gaya Horizontal');
xlabel('Waktu (dt)')
ylabel('Gaya (kg)')
legend('Lt. 5','Lt. 10','Lt. 15')

% Gaya Geser Dasar
figure(8)
plot(tgempa,GG5,tgempa,GG10,tgempa,GG15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Gaya Geser');
xlabel('Waktu (dt)')
ylabel('Gaya (kg)')
legend('Lt. 5','Lt. 10','Lt. 15')

% Momen Guling
figure(9)
plot(tgempa,MG0,tgempa,MG5,tgempa,MG10,tgempa,MG15);
hold on;
plot(tgempa,0,'k');
hold off;
title('Momen Guling');
xlabel('Waktu (dt)')
ylabel('Momen (kg.m)')
legend('Fondasi','Lt. 5','Lt. 10','Lt. 15')
% hObject    handle to Analyze (see GCBO)
% eventdata  reserved - to be defined in a future version of
MATLAB
% handles    structure with handles and user data (see GUIDATA)


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


% --- Executes during object creation, after setting all
properties.
function Fondasi_CreateFcn(hObject, eventdata, handles)
% hObject    handle to Fondasi (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 Struktur.
function Struktur_Callback(hObject, eventdata, handles)
% hObject    handle to Struktur (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
Struktur contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
Struktur


% --- Executes during object creation, after setting all
properties.
function Struktur_CreateFcn(hObject, eventdata, handles)
% hObject    handle to Struktur (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 Gempa.
function Gempa_Callback(hObject, eventdata, handles)
% hObject    handle to Gempa (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 Gempa
contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
Gempa


% --- Executes during object creation, after setting all
properties.
function Gempa_CreateFcn(hObject, eventdata, handles)
% hObject    handle to Gempa (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 HasilPerhitungan.
function HasilPerhitungan_Callback(hObject, eventdata, handles)
% hObject    handle to HasilPerhitungan (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
HasilPerhitungan contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
HasilPerhitungan


% --- Executes during object creation, after setting all
properties.
function HasilPerhitungan_CreateFcn(hObject, eventdata, handles)
% hObject    handle to HasilPerhitungan (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 popupmenu16.
function popupmenu16_Callback(hObject, eventdata, handles)
% hObject    handle to popupmenu16 (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
popupmenu16 contents as cell array
%        contents{get(hObject,'Value')} returns selected item from
popupmenu16


% --- Executes during object creation, after setting all
properties.
function popupmenu16_CreateFcn(hObject, eventdata, handles)
% hObject    handle to popupmenu16 (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
```