BAB VI
Kesimpulan dan Saran

6.1. Kesimpulan

Berdasarkan hasil analisis penggunaan program optimasi pondasi telapak gabungan dengan menggunakan algoritma genetik dapat di ambil kesimpulan, yaitu:

1. Perencanaan pondasi dengan optimasi mendapatkan harga yang lebih murah dibanding perencanaan tanpa optimasi, untuk kasus yang sebelah kiri dibatasi oleh garis batas tanah dan yang menggunakan 3 pias dapat dihemat biaya sebesar 2,3987 %, sedangkan yang menggunakan 4 pias dapat dihemat biaya sebesar 12,5364 % dan yang menggunakan 5 pias dapat dihemat sebesar 10,7070 %. Untuk kasus yang sebelah kiri dan kanan dibatasi oleh garis batas tanah dan yang menggunakan 4 pias dapat dihemat biaya sebesar 31,5277 % sedangkan yang menggunakan 5 pias dapat dihemat biaya sebesar 34,4882 %.
2. Jumlah individu maksimum menggunakan Delphi 6.0 adalah 2500.
3. Penggunaan parameter pinalti yang sangat kecil mempunyai kemungkinan yang besar untuk mendapat hasil yang melanggar kendala yang ada, sedangkan menggunakan parameter pinalti yang terlalu besar akan menghasilkan optimasi menuju titik optimum lokal.
4. Memperbanyak jumlah individu dalam populasi akan menambah kemampuan Algoritma genetik untuk mencapai titik optimum yang sebenarnya. Apabila jumlah individu sedikit maka hasil operasinya sering memberikan hasil yang berlainan karena masih prematur konvergensinya.
5. Semakin banyak variabel desain, semakin lama waktu eksekusi yang dibutuhkan, hal ini disebabkan jumlah string individu yang diperlukan makin banyak. Untuk kasus yang sebelah kiri dibatasi oleh garis batas tanah dan yang menggunakan 3 pias dibutuhkan waktu 0,2392 jam, sedangkan yang menggunakan 4 pias dibutuhkan waktu 7,2481 jam dan yang menggunakan 5 pias dibutuhkan waktu 17,5172 jam. Untuk kasus yang sebelah kiri dan kanan dibatasi oleh garis batas tanah dan yang menggunakan 4 pias dibutuhkan

waktu 5,2783 jam sedangkan yang menggunakan 5 pias dibutuhkan waktu 20,0294 jam.

6. Semakin banyak jumlah individu, semakin lama waktu eksekusi yang dibutuhkan.

6.2. Saran

1. Pada penyusunan dan penulisan program optimasi pondasi telapak gabungan ini, hanya menggunakan sebuah joint tambahan dimasing-masing pias, dan dapat dikembangkan mengunakan beberapa joint agar analisis yang diperoleh dapat lebih baik.
2. Tidak tertutup kemungkinan penggunaan metode optimasi dan metode analisis yang lain untuk memperoleh hasil yang lebih baik, misalnya metode optimasi *fleksibel polyhedron, metode analisis ketenyi, metode analisis finite element* dan lain-lain.

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```
unit UInput1;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, StdCtrls, Grids, Buttons;

type
  TFInput1 = class(TForm)
    Label1: TLabel;
    Ejumind: TEdit;
    erun: TEdit;
    Label2: TLabel;
    EKolom: TEdit;
    Label3: TLabel;
    ETbeton: TEdit;
    Label4: TLabel;
    ETlbaja: TEdit;
    Label5: TLabel;
    StringGridBeban: TStringGrid;
    Label6: TLabel;
    StringGridjoint: TStringGrid;
    Label7: TLabel;
    BNExt: TBitBtn;
    Label8: TLabel;
    Ebjbeton: TEdit;
    Ebjtanah: TEdit;
    Label10: TLabel;
    Epondasi: TEdit;
    EMtanah: TEdit;
    label9: TLabel;
    label11: TLabel;
    Label9: TLabel;
    Etitanah: TEdit;
    Label12: TLabel;
    Eebeton: TEdit;
    Label13: TLabel;
    Label14: TLabel;
    Label15: TLabel;
    Label16: TLabel;
    Label17: TLabel;
    Label18: TLabel;
    Label19: TLabel;
    Label21: TLabel;
    Eebaja: TEdit;
    Label22: TLabel;
    Label20: TLabel;
    Bbuka: TBitBtn;
    Btutup: TBitBtn;
    Bbaru: TBitBtn;
    OpenDialog1: TOpenDialog;
    Listopen: TListBox;
    Ljudul: TLabel;
    GroupBox1: TGroupBox;
    Rknm: TRadioButton;
    Rlbin: TRadioButton;
    Label23: TLabel;
    Label24: TLabel;
    Esbeton: TEdit;
    Label25: TLabel;
    Rkgm: TRadioButton;
    RLbft: TRadioButton;
    Rtonsm: TRadioButton;
    Rkipsft: TRadioButton;
    Label26: TLabel;
    Label27: TLabel;
    EKind: TEdit;
    procedure FormCreate(Sender: TObject);
```

```
    procedure BNExtClick(Sender: TObject);
    procedure BbukaClick(Sender: TObject);
    procedure EKolomChange(Sender: TObject);
    procedure BbaruClick(Sender: TObject);
    procedure BtutupClick(Sender: TObject);
    procedure RknmClick(Sender: TObject);
    procedure RlbinClick(Sender: TObject);
    procedure RkgmClick(Sender: TObject);
    procedure RtonsmClick(Sender: TObject);
    procedure RLbftClick(Sender: TObject);
    procedure RkipsltClick(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }

  end;

var
  FInput1: TFInput1;
tebal_min_pon,konstanta_fy,konstanta_fc,konstanta_geser,konstanta_berat_tul : real;

implementation

uses UnitInputdata, Ukerja, Uout, Ujumlahdiskrit;

{$R *.dfm}

procedure TFInput1.FormCreate(Sender: TObject);
begin
    StringGridjoint.ColWidths[0]:=100;
end;

procedure TFInput1.BNExtClick(Sender: TObject);
begin
    Fjdiskrit.ShowModal;
end;

procedure TFInput1.BbukaClick(Sender: TObject);
var t,u : byte;
begin
OpenDialog1.Title := 'Open To File';
OpenDialog1.Filter := 'Text File (*.Edy)| *.Edy';
OpenDialog1.DefaultExt := 'Text File (*.Edy)| *.Edy';
OpenDialog1.FileName := 'DPondasi';
If OpenDialog1.Execute then
  Listopen.Items.LoadFromFile(OpenDialog1.FileName);
    finput1.Ejumind.Text:=Listopen.Items.Strings [0];
    finput1.erun.Text:=Listopen.Items.Strings [1];
    finput1.EKolom.Text:=Listopen.Items.Strings [2];
    finput1.ETbeton.Text:=Listopen.Items.Strings [3];
    finput1.ETbaja.Text:=Listopen.Items.Strings [4];
    finput1.EKind.Text:=Listopen.Items.Strings [5];
    finput1.Eebeton.Text:=Listopen.Items.Strings [6];
    finput1.Ebjbeton.Text:=Listopen.Items.Strings [7];
    finput1.Ebjtanah.Text:=Listopen.Items.Strings [8];
    finput1.Epondasi.Text:=Listopen.Items.Strings [9];
    finput1.EMtanah.Text:=Listopen.Items.Strings [10];
    finput1.Etitanah.Text:=Listopen.Items.Strings [11];
    finput1.Eebaja.Text:=Listopen.Items.Strings [12];
    finput1.Esbeton.Text:=Listopen.Items.Strings [13];
    Fjdiskrit.Ejdtebal.Text:=Listopen.Items.Strings [14];
    Fjdiskrit.Ejdlebar.Text:=Listopen.Items.Strings [15];
    Fjdiskrit.Ejddiam.Text:=Listopen.Items.Strings [16];
    Fjdiskrit.Ejddial.Text:=Listopen.Items.Strings [17];
    Fjdiskrit.Ejdnm.Text:=Listopen.Items.Strings [18];
    Fjdiskrit.Ejdnl.Text:=Listopen.Items.Strings [19];
      for T:= 1 to (strtoint(finput1.EKolom.Text)) do
      begin
```

```
finput1.StringGridBeban.Cells[1,t]:=Listopen.Items.Strings[19+t];
end;
for T:= 1 to (strtoint(finput1.EKolom.Text)) do
begin
finput1.StringGridBeban.Cells[2,t]:=Listopen.Items.Strings[19+(strtoint(finput1.EKolom.Text))+t];
end;
for T:= 1 to (strtoint(finput1.EKolom.Text)) do
begin
finput1.StringGridBeban.Cells[3,t]:=Listopen.Items.Strings[19+(strtoint(finput1.EKolom.Text)*2)+t];
end;
for T:= 1 to (strtoint(finput1.EKolom.Text)) do
begin
finput1.StringGridBeban.Cells[4,t]:=Listopen.Items.Strings[19+(strtoint(finput1.EKolom.Text)*3)+t];
end;
for T:= 1 to (strtoint(finput1.EKolom.Text)) do
begin
finput1.StringGridBeban.Cells[5,t]:=Listopen.Items.Strings[19+(strtoint(finput1.EKolom.Text)*4)+t];
end;
for T:= 1 to (strtoint(finput1.EKolom.Text)+1) do
begin
finput1.StringGridjoint.Cells[1,t]:=Listopen.Items.Strings[19+(strtoint(finput1.EKolom.Text)*5)+t];
end;
for T:= 1 to (strtoint(finput1.EKolom.Text)+1) do
begin
finput1.StringGridjoint.Cells[2,t]:=Listopen.Items.Strings[20+(strtoint(finput1.EKolom.Text)*6)+t];
end;
 for u:= 0 to strtoint(Fjdiskrit.Ejdtebal.Text)-1 do
 begin
 fdatainput.StringInput.Cells[1,u]:=Listopen.Items.Strings[22+(strtoint(finput1.EKolom.Text)*7)+u];
 end;
 for u:= 0 to strtoint(Fjdiskrit.Ejddiam.Text)-1 do
 begin
 fdatainput.StringInput.Cells[2,u]:=Listopen.Items.Strings
[22+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+u];
 end;
 for u:= 0 to strtoint(Fjdiskrit.Ejddial.Text)-1 do
 begin
 fdatainput.StringInput.Cells[3,u]:=Listopen.Items.Strings
[22+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+u];
 end;
 for u:= 0 to strtoint(Fjdiskrit.Ejdlebar.Text)-1 do
 begin
 fdatainput.StringInput.Cells[4,u]:=Listopen.Items.Strings
[22+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+u];
 end;
 for u:= 0 to strtoint(Fjdiskrit.Ejdnm.Text)-1 do
 begin
 fdatainput.StringInput.Cells[5,u]:=Listopen.Items.Strings
[22+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+strtoint(Fjdiskrit.Ejdlebar.Text)+u];
 end;
 for u:= 0 to strtoint(Fjdiskrit.Ejdnl.Text)-1 do
 begin
 fdatainput.StringInput.Cells[6,u]:=Listopen.Items.Strings
[22+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+strtoint(Fjdiskrit.Ejdlebar.Text)+strtoint(Fjdiskrit.Ejdnm.Text)+u];
 end;
   fkerja.Ehbeton.Text:=Listopen.Items.Strings
[22+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+strtoint(Fjdiskrit.Ejdlebar.Text)+strtoint(Fjdiskrit.Ejdnm.Text)+strtoint(Fjdiskrit.Ejdnl.Text)];
   fkerja.Ehbaja.Text:=Listopen.Items.Strings
[23+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+strtoint(Fjdiskrit.Ejdlebar.Text)+strtoint(Fjdiskrit.Ejdnm.Text)+strtoint(Fjdiskrit.Ejdnl.Text)];
   fkerja.Epmati.Text:=Listopen.Items.Strings
[24+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+strtoint(Fjdiskrit.Ejdlebar.Text)+strtoint(Fjdiskrit.Ejdnm.Text)+strtoint(Fjdiskrit.Ejdnl.Text)];
```

```
        fkerja.Epinalti.Text:=Listopen.Items.Strings
[25+(strtoint(finput1.EKolom.Text)*7)+strtoint(Fjdiskrit.Ejdtebal.Text)+strtoint(Fjdiskrit.Ejddiam.Text)+strtoint(Fjdiskrit.Ejdd
ial.Text)+strtoint(Fjdiskrit.Ejdlebar.Text)+strtoint(Fjdiskrit.Ejdnm.Text)+strtoint(Fjdiskrit.Ejdnl.Text)];
end;

procedure TFInput1.EKolomChange(Sender: TObject);
var i : Byte;
begin
 with StringGridBeban do
   begin
     RowCount:=StrToInt(EKolom.Text)+1;
     Cells [0,0] := 'Kolom Ke ';
     Cells [1,0] := 'Gaya -X';
     Cells [2,0] := 'Gaya -Y';
     Cells [3,0] := 'Momen Z';
     Cells [4,0] := 'panjang';
     Cells [5,0] := 'lebar';
   end;
   for i:=1 to StringGridBeban.RowCount+1 do
     StringGridBeban.Cells[0,i]:=IntToStr(i);

   with StringGridjoint do
   begin
     RowCount:=StrToInt(EKolom.Text)+2;
     Cells [0,0] := 'joint';
     Cells [1,0] := 'Jarak';
     Cells [2,0] := 'Jumlah Pias';
   end;
   for i:=1 to StringGridjoint.RowCount+1 do
   begin
     if i=1 then
     StringGridjoint.Cells[0,1]:='Tepi Kiri-'+IntToStr(i)
     else if i=StringGridjoint.RowCount-1 then
     StringGridjoint.Cells[0,i]:=IntToStr(i-1)+'-Tepi Kanan'
     else
     StringGridjoint.Cells[0,i]:=IntToStr(i-1)+'-'+IntToStr(i);
   end;
end;

procedure TFInput1.BbaruClick(Sender: TObject);
var u : byte;
begin
finput1.Ejumind.Text:='';
finput1.erun.Text:='';
finput1.EKolom.Text:='0';
finput1.ETbeton.Text:='';
finput1.ETbaja.Text:='';
finput1.Ebeton.Text:='';
finput1.Ebjbeton.Text:='';
finput1.Ebjtanah.Text:='';
finput1.Epondasi.Text:='';
finput1.EMtanah.Text:='';
finput1.Etitanah.Text:='';
finput1.Ebaja.Text:='';
finput1.Esbeton.Text:='';
Fjdiskrit.Ejdtebal.Text:='';
Fjdiskrit.Ejdlebar.Text:='';
Fjdiskrit.Ejddiam.Text:='';
Fjdiskrit.Ejddial.Text:='';
Fjdiskrit.Ejdnm.Text:='';
Fjdiskrit.Ejdnl.Text:='';
for u:=1 to 255 do
begin
finput1.StringGridBeban.Cells[1,u]:='';
finput1.StringGridBeban.Cells[2,u]:='';
finput1.StringGridBeban.Cells[3,u]:='';
finput1.StringGridBeban.Cells[4,u]:='';
finput1.StringGridBeban.Cells[5,u]:='';
finput1.StringGridjoint.Cells[1,u]:='';
```

```
finput1.StringGridjoint.Cells[2,u]:='';
end;
for u:= 0 to 31 do
begin
fdatainput.StringInput.Cells[1,u]:='';
fdatainput.StringInput.Cells[2,u]:='';
fdatainput.StringInput.Cells[3,u]:='';
fdatainput.StringInput.Cells[4,u]:='';
fdatainput.StringInput.Cells[5,u]:='';
fdatainput.StringInput.Cells[6,u]:='';
end;
fkerja.Ehbeton.Text:='';
fkerja.Ehbaja.Text:='';
fkerja.Epmati.Text:='';
fkerja.Epinalti.Text:='';
fout.List1.Clear;
end;

procedure TFInput1.BtutupClick(Sender: TObject);
begin
close;
Fjdiskrit.close;
fdatainput.Close;
fkerja.Close;
fout.List1.Clear;
fout.Close;
end;

procedure TFInput1.RknmClick(Sender: TObject);
begin
label13.Caption:='m';
label14.Caption:='KN/m3';
label15.Caption:='KN/m3';
label16.Caption:='KN/m2';
label17.Caption:='KN/m2';
label18.Caption:='KN/m2';
label19.Caption:='KN/m2';
label20.Caption:='KN/m2/m';
label22.Caption:='KN/m2';
label25.Caption:='m';
fkerja.Label5.Caption:='Kg/m3';
fkerja.Label6.Caption:='Rp/Kg';
fkerja.Label3.Caption:='Persen';
tebal_min_pon:=0.150;
konstanta_fy:=400000;
konstanta_fc:=30000;
konstanta_geser:=5.12;
konstanta_berat_tul:=7850;
    with fdatainput.StringGridtetap do
    begin
        Cells[0,0]:='No (m)';
        Cells[1,0]:='t (m)';
        Cells[2,0]:='diam (m)';
        Cells[3,0]:='dial (m)';
        Cells[4,0]:='b (m)';
        Cells[5,0]:='nm (m)';
        Cells[6,0]:='nl (m)';
    end;
end;

procedure TFInput1.RIbinClick(Sender: TObject);
begin
label13.Caption:='in';
label14.Caption:='lb/in3';
label15.Caption:='lb/in3';
label16.Caption:='lb/in2';
label17.Caption:='lb/in2';
label18.Caption:='lb/in2';
label19.Caption:='lb/in2';
```

```
label20.Caption:='lb/in2/in';
label22.Caption:='lb/in2';
label25.Caption:='in';
fkerja.Label5.Caption:='Kg/in3';
fkerja.Label6.Caption:='Rp/Kg';
fkerja.Label3.Caption:='Persen';
tebal_min_pon:=5.91;
konstanta_fy:=58000;
konstanta_fc:=4350;
konstanta_geser:=2;
konstanta_berat_tul:=0.1286885246;
   with fdatainput.StringGridtetap do
   begin
      Cells[0,0]:='No (in)';
      Cells[1,0]:='t (in)';
      Cells[2,0]:='diam (in)';
      Cells[3,0]:='dial (in)';
      Cells[4,0]:='b (in)';
      Cells[5,0]:='nm (in)';
      Cells[6,0]:='nl (in)';
   end;
end;

procedure TFInput1.RkgmClick(Sender: TObject);
begin
label13.Caption:='m';
label14.Caption:='Kg/m3';
label15.Caption:='Kg/m3';
label16.Caption:='Kg/m2';
label17.Caption:='Kg/m2';
label18.Caption:='Kg/m2';
label19.Caption:='Kg/m2';
label20.Caption:='Kg/m2/m';
label22.Caption:='Kg/m2';
label25.Caption:='m';
fkerja.Label5.Caption:='Kg/m3';
fkerja.Label6.Caption:='Rp/Kg';
fkerja.Label3.Caption:='Persen';
tebal_min_pon:=0.150;
konstanta_fy:=44960000;
konstanta_fc:=3372000;
konstanta_geser:=5.12;
konstanta_berat_tul:=7850;
   with fdatainput.StringGridtetap do
   begin
      Cells[0,0]:='No (m)';
      Cells[1,0]:='t (m)';
      Cells[2,0]:='diam (m)';
      Cells[3,0]:='dial (m)';
      Cells[4,0]:='b (m)';
      Cells[5,0]:='nm (m)';
      Cells[6,0]:='nl (m)';
   end;
end;

procedure TFInput1.RtonsmClick(Sender: TObject);
begin
label13.Caption:='m';
label14.Caption:='Tons/m3';
label15.Caption:='Tons/m3';
label16.Caption:='Tons/m2';
label17.Caption:='Tons/m2';
label18.Caption:='Tons/m2';
label19.Caption:='Tons/m2';
label20.Caption:='Tons/m2/m';
label22.Caption:='Tons/m2';
label25.Caption:='m';
fkerja.Label5.Caption:='Kg/m3';
fkerja.Label6.Caption:='Rp/Kg';
```

```
fkerja.Label3.Caption:='Persen';
tebal_min_pon:=0.150;
konstanta_fy:=44960;
konstanta_fc:=3372;
konstanta_geser:=5.12;
konstanta_berat_tul:=7850;
    with fdatainput.StringGridtetap do
    begin
        Cells[0,0]:='No (m)';
        Cells[1,0]:='t (m)';
        Cells[2,0]:='diam (m)';
        Cells[3,0]:='dial (m)';
        Cells[4,0]:='b (m)';
        Cells[5,0]:='nm (m)';
        Cells[6,0]:='nl (m)';
    end;
end;

procedure TFInput1.RLbftClick(Sender: TObject);
begin
label13.Caption:='ft';
label14.Caption:='lb/ft3';
label15.Caption:='lb/ft3';
label16.Caption:='lb/ft2';
label17.Caption:='lb/ft2';
label18.Caption:='lb/ft2';
label19.Caption:='lb/ft2';
label20.Caption:='lb/ft2/ft';
label22.Caption:='lb/ft2';
label25.Caption:='ft';
fkerja.Label5.Caption:='Kg/ft3';
fkerja.Label6.Caption:='Rp/Kg';
fkerja.Label3.Caption:='Persen';
tebal_min_pon:=0.492;
konstanta_fy:=8360000;
konstanta_fc:=627000;
konstanta_geser:=0.08324873;
konstanta_berat_tul:=490.468;
    with fdatainput.StringGridtetap do
    begin
        Cells[0,0]:='No (ft)';
        Cells[1,0]:='t (ft)';
        Cells[2,0]:='diam (ft)';
        Cells[3,0]:='dial (ft)';
        Cells[4,0]:='b (ft)';
        Cells[5,0]:='nm (ft)';
        Cells[6,0]:='nl (ft)';
    end;
end;

procedure TFInput1.RkipsftClick(Sender: TObject);
begin
label13.Caption:='ft';
label14.Caption:='kips/ft3';
label15.Caption:='kips/ft3';
label16.Caption:='kips/ft2';
label17.Caption:='kips/ft2';
label18.Caption:='kips/ft2';
label19.Caption:='kips/ft2';
label20.Caption:='kips/ft2/ft';
label22.Caption:='kips/ft2';
label25.Caption:='ft';
fkerja.Label5.Caption:='Kg/ft3';
fkerja.Label6.Caption:='Rp/Kg';
fkerja.Label3.Caption:='Persen';
tebal_min_pon:=0.492;
konstanta_fy:=8360;
konstanta_fc:=627;
konstanta_geser:=0.08324873;
```

```
konstanta_berat_tul:=490.468;
    with fdatainput.StringGridtetap do
    begin
        Cells[0,0]:='No (ft)';
        Cells[1,0]:='t (ft)';
        Cells[2,0]:='diam (ft)';
        Cells[3,0]:='dial (ft)';
        Cells[4,0]:='b (ft)';
        Cells[5,0]:='nm (ft)';
        Cells[6,0]:='nl (ft)';
    end;
end;

end.
```

```
unit Ujumlahdiskrit;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, StdCtrls;

type
  TFjdiskrit = class(TForm)
    Label1: TLabel;
    Label2: TLabel;
    Label3: TLabel;
    Label4: TLabel;
    Label5: TLabel;
    Ejdtebal: TEdit;
    Ejdlebar: TEdit;
    Ejddiam: TEdit;
    Ejddial: TEdit;
    Ejdnm: TEdit;
    Ejdnl: TEdit;
    BNext: TButton;
    Label6: TLabel;
    procedure BNextClick(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }
  end;

var
  Fjdiskrit: TFjdiskrit;

implementation

uses UnitInputdata;

{$R *.dfm}

procedure TFjdiskrit.BNextClick(Sender: TObject);
begin
fdatainput.Show;
end;

end.
```

```
unit UnitInputdata;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, Grids, ExtCtrls, StdCtrls, Buttons, DB, DBTables;

type
  TFDataInput = class(TForm)
    StringInput: TStringGrid;
    BLanjut: TBitBtn;
    StringGridtetap: TStringGrid;
    procedure FormCreate(Sender: TObject);
    procedure BLanjutClick(Sender: TObject);

  private
    { Private declarations }
  public
    { Public declarations }
    function decimal2biner(x,test:integer):string;
    function bin2des(s:string; tes:integer):integer;
    function jumlah_pias:integer;
    procedure variabel;
    procedure panjang;
    procedure matrik;
    procedure tebal;
    procedure rand;
    procedure lebar;
    procedure beban_titik_kumpul;
    procedure momen_gaya_jepit_ujung;
    procedure dia_memanjang;
    procedure dia_melintang;
    procedure jumlah_tulangan_memanjang;
    procedure jumlah_tulangan_melintang;
    procedure InversMatriksSfi;
    procedure jumlah_gaya_momen;
    procedure Perkalian_matrik_df;
    procedure hasil_gaya_ujung_batang;
    procedure momen_ultimit;
    procedure geser_ultimit;
  end;

var
FDataInput: TFDataInput;
angka,jp,jpias,jtum,Nb,Md,jumlah          : Byte;
biner                                     : string;
arrangka                                  : array[1..255] of string;
arrbiner                                  : array[1..2501] of string;
arrbiners                                 : array[1..2501,1..255] of string;
l                                         : array[1..255] of real;
b,ae,aj                                   : array[1..2501,1..255] of real;
nm,nl                                     : array[1..2501,1..255] of integer;
sfi                                       : array[1..2501,1..255,1..255] of real;
sm                                        : array[1..6,1..6] of real;
t,diam,dial,mutump,mulap                  : array[1..2501] of real;
df,afc                                    : array[1..2501,1..1,1..255] of real;
pki,pka,mlki,mlka,dfi,vu,mu               : array[1..2501,1..255] of real;
am                                        : array[1..2501,1..255,1..6] of real;
smi                                       : array[1..2501,1..255,1..6,1..6] of real;
aml,dmi                                   : array[1..2501,1..255,1..1,1..6] of real;
sd                                        : array[1..255,1..6,1..6] of real;
Ebeton,Ebaja,bet,dpondasi,selimut_beton   : real;
bjbeton,bjtanah,fc,fy                     : real;
sem1,sem2,sem3,sem4,kf1,kf2,kf3 kf4,kf5,kf6  : real;
bs,bm,bl,bst,bmt,blt                      : integer;
jum                                       : word;
```

```
implementation

uses UInput1, Ukerja, Ujumlahdiskrit;

{$R *.dfm}

function TFDataInput.decimal2biner(x,test:integer):string;
var
  i      : word;
  bin    : string;
  a      : byte;
begin
  if test<=2 then a:=1
  else if test<=4 then a:=2
  else if test<=8 then a:=3
  else if test<=16 then a:=4
  else if test<=32 then a:=5
  else if test<=64 then a:=6
  else if test<=128 then a:=7
  else a:=9;
  test:=test div 2;
       bin:='';
       for i:=1 to a do
       begin
       if (x and test) = test then
         bin :=bin+'1'
       else bin:=bin+'0';
        test:=test shr 1;
       end;
  decimal2biner:=bin;
End;

function tfdatainput.bin2des(s:string; tes:integer):integer;
var
i    : word;
des  : integer;
a    : byte;
  begin
  des:=0;
  if tes<=2 then a:=1
  else if tes<=4 then a:=2
  else if tes<=8 then a:=3
  else if tes<=16 then a:=4
  else if tes<=32 then a:=5
  else if tes<=64 then a:=6
  else if tes<=128 then a:=7
  else a:=9;
  for i:=1 to a do
    begin
    des:=des shl 1;
    if s[i]='1' then
    des:=des+1
    else
    des:=des
    end;
  bin2des:=des;
end;

function tfdatainput.jumlah_pias:integer;
var i    : byte;
begin
    jpias:=0;
    for i:=1 to finput1.StringGridjoint.RowCount-1 do
    begin
    jpias := jpias+(strtoint(finput1.StringGridjoint.Cells[2,i]));
    end;
    jumlah_pias:=jpias;
end;
```

```
procedure tfdatainput.variabel;
begin
jp:=jumlah_pias*2;
jtum:= Jp+1;
jum:=StrToInt(FInput1.Ejumind.Text);
Nb:=6;
Md:=6;
Ebeton:= strtofloat(finput1.Eebeton.Text);
Ebaja:= strtofloat(finput1.Eebaja.Text);
bet:=strtofloat(finput1.EMtanah.text);
dpondasi:=strtofloat(finput1.Epondasi.Text);
bjbeton:=strtofloat(finput1.Ebjbeton.Text);
bjtanah:=strtofloat(finput1.Ebjtanah.Text);
fc:=strtofloat(finput1.ETbeton.Text);
fy:=strtofloat(finput1.ETbaja.Text);
selimut_beton:=strtofloat(finput1.Esbeton.Text);
end;


procedure TFDataInput.FormCreate(Sender: TObject);
var i : Byte;
begin
   for i:=0 to StringInput.RowCount+1 do
   stringinput.Cells[0,i]:=IntToStr(i);
end;


procedure TFDataInput.rand;
var x,y     : Byte;
i           : word;
begin
randomize;
   for i:=1 to jum do
   begin
      biner:='';
      for x:=1 to (((jumlah_pias+1))+strtoint(finput1.EKolom.Text)+5) do
      begin
      if x=1 then y:=(strtoint(fjdiskrit.Ejdtebal.Text))
      else if x=2 then y:=(strtoint(fjdiskrit.Ejddiam.Text))
      else if x=3 then y:=(strtoint(fjdiskrit.Ejddial.Text))
      else if x<=(3+(jumlah_pias+1)) then y:=(strtoint(fjdiskrit.Ejdlebar.Text))
      else if x<=(5+(jumlah_pias+1)) then y:=(strtoint(fjdiskrit.Ejdnm.Text))
      else y:=(strtoint(fjdiskrit.Ejdnl.Text));
       random;
       angka:=random(y);
       arrangka[x]:=decimal2biner(angka,y);
       biner:=biner+decimal2biner(angka,y);
       arrbiners[i,x]:=arrangka[x];
      end;
      arrbiner[i]:=biner;
   end;
end;

procedure tfdatainput.panjang;
var dd,z,e,f,j  : byte;
aa,bb,cc        : real;
begin
f:=0;
   if Strtofloat(FInput1.StringGridjoint.Cells[2,1])>0 then
   for j :=1 to (finput1.StringGridjoint.RowCount-1) do
   begin
    if strtoint(FInput1.StringGridjoint.Cells[2,j])>0 then
    begin
    aa := ((Strtofloat(FInput1.StringGridjoint.Cells [2,j]))*2);
    bb := Strtofloat(FInput1.StringGridjoint.Cells [1,j]);
    cc := bb/aa;
    dd := (Strtoint(FInput1.StringGridjoint.Cells [2,j])*2);
      if j=1 then f:=0
      else
```

```
        f:=f+ (strtoint(finput1.StringGridjoint.Cells[2,j-1])*2);
            for z:=1 to dd do
            begin
            c:=z+f;
            l[c]:= cc;
            end;
        end
      else
      end
    else
    for j :=2 to (finput1.StringGridjoint.RowCount-1) do
    begin
     if strtoint(FInput1.StringGridjoint.Cells[2,j])>0 then
     begin
     aa := ((Strtofloat(FInput1.StringGridjoint.Cells [2,j]))*2);
     bb := Strtofloat(FInput1.StringGridjoint.Cells [1,j]);
     cc := bb/aa;
     dd := (Strtoint(FInput1.StringGridjoint.Cells [2,j])*2);
       begin
       if j=2 then f:=0
       else
       f:=f+ (strtoint(finput1.StringGridjoint.Cells[2,j-1])*2);
       end;
           for z:=1 to dd do
           begin
           c:=z+f;
           l[c]:= cc;
           end;
      end
      else
    end;
end;


procedure tfdatainput.tebal;
var  dt      : byte;
i,kos        :word;
begin
for kos:=1 to jum do
begin
t[kos]:=0;
end;
    for i:=1 to jum do
    begin
    dt:= bin2des(arrbiners[i,1],(strtoint(fjdiskrit.Ejdtebal.Text)));
    t[i]:=strtofloat(stringinput.Cells[1,dt]);
    end;
end;

procedure tfdatainput.lebar;
var   i,kos,kosj    : word;
k                   : byte;
begin
for kos:=1 to jum do
begin
    for kosj:=1 to jp do
    begin
    b[kos,kosj]:=0;
    end;
end;

    for i:=1 to jum do
    begin
       for k:=1 to jumlah_pias do
       begin
       bs:=bin2des(arrbiners[i,(3+k)],(strtoint(fjdiskrit.Ejdlebar Text)));
       if k=1 then
       b[i,1]:=strtofloat(stringinput.Cells[4,bs])
       else
```

```
        b[i,2*(k-1)]:=strtofloat(stringinput.Cells[4,bs]);
        b[i,(2*(k-1)+1)]:=strtofloat(stringinput.Cells[4,bs]);
        end;
        bst:=bin2des(arrbiners[i,(3+jumlah_pias+1)],(strtoint(fjdiskrit.Ejdlebar.Text)));
        b[i,jp]:=strtofloat(stringinput.Cells[4,bst]);
    end;
end;

procedure tfdatainput.jumlah_tulangan_memanjang;
var  i,kos,kosj   : word;
k               : byte;
begin
for kos:=1 to jum do
begin
    for kosj:=1 to jp do
    begin
    nm[kos,kosj]:=0;
    end;
end;
    for i:=1 to jum do
    begin
        for k:=1 to 2 do
        begin
        bm:=bin2des(arrbiners[i,(3+(jumlah_pias+1)+k)],(strtoint(fjdiskrit.Ejdnm.Text)));
        nm[i,k]:=strtoint(stringinput.Cells[5,bm])
        end;
    end;
end;

procedure tfdatainput.jumlah_tulangan_melintang;
var  i,kos,kosj   : word;
k               : byte;
begin
for kos:=1 to jum do
begin
    for kosj:=1 to strtoint(finput1.EKolom.Text) do
    begin
    nl[kos,kosj]:=0;
    end;
end;
    for i:=1 to jum do
    begin
        for k:=1 to strtoint(finput1.EKolom.Text) do
        begin
        bl:=bin2des(arrbiners[i,(5+(jumlah_pias+1)+k)],(strtoint(fjdiskrit.Ejdnl.Text)));
        nl[i,k]:=strtoint(stringinput.Cells[6,bl]);
        end;
    end;
end;

procedure tfdatainput.dia_memanjang;
var  da      : byte;
i,kos        :word;
begin
for kos:=1 to jum do
begin
diam[kos]:=0;
end;
    for i:=1 to jum do
    begin
    da:= bin2des(arrbiners[i,2],(strtoint(fjdiskrit.Ejddiam.Text)));
    diam[i]:=strtofloat(stringinput.Cells[2,da]);
    end;
end;

procedure tfdatainput.dia_melintang;
var  di      : byte;
i,kos        :word;
begin
```

```
for kos:=1 to jum do
begin
dial[kos]:=0;
end;
    for i:=1 to jum do
    begin
    di:= bin2des(arrbiners[i,3],(strtoint(Ijdiskrit.Ejddial.Text)));
    dial[i]:=strtofloat(stringinput.Cells[3,di]);
    end;
end;

procedure tfdatainput.matrik;
var  k,mj,mk,id2,id1,item,pk,pb,pkk,pbb,n1,n2,kosj,kosk : byte;
i,kos                                    : word;
begin
for kos:=1 to jum do
begin
    for kosj:=1 to jtum*3 do
    begin
        for kosk:=1 to jtum*3 do
        begin
        sfl[kos,kosj,kosk]:=0;
        end;
    end;
end;
  for i:=1 to jum do
  begin
    for k:=1 to jp do
    begin
    scm1:=(4*Ebeton*(1/12*b[i,k]*t[i]*t[i]*t[i]))/(l[k]);
    scm2:=(1.5*scm1)/(l[k]);
    scm3:=(2*scm2)/(l[k]);
    scm4:=Ebeton*b[i,k]*t[i]/l[k];
    kf1:=b[i,k]*bet/(l[k])*((13/35)*(l[k]*l[k])+1.2);
    kf2:=b[i,k]*bet*((11/210)*(l[k]*l[k])+0.1);
    kf3:=b[i,k]*bet/(l[k])*((9/70)*(l[k]*l[k])-1.2);
    kf4:=b[i,k]*bet*((-13/420)*(l[k]*l[k])+0.1);
    kf5:=b[i,k]*bet*((l[k]*l[k]*l[k])/105+2/15*(l[k]));
    kf6:=b[i,k]*bet*((-1/140)*(l[k]*l[k]*l[k])-(1/30)*(l[k]));
    sm[1,1]:=scm4;
    sm[1,2]:=0;
    sm[1,3]:=0;
    sm[1,4]:=-scm4;
    sm[1,5]:=0;
    sm[1,6]:=0;
    sm[2,2]:=scm3+kf1;
    sm[2,3]:=scm2+kf2;
    sm[2,4]:=0;
    sm[2,5]:=-scm3+kf3;
    sm[2,6]:=scm2+kf4;
    sm[3,3]:=scm1+kf5;
    sm[3,4]:=0;
    sm[3,5]:=-scm2-kf4;
    sm[3,6]:=scm1/2+kf6;
    sm[4,4]:=scm4;
    sm[4,5]:=0;
    sm[4,6]:=0;
    sm[5,5]:=scm3+kf1;
    sm[5,6]:=-scm2-kf2;
    sm[6,6]:=scm1+kf5;
        for mj:= 1 to md do
        begin
            for mk:=1 to md do
            begin
            id1:=(3*(k-1))+mj;
            id2:=(3*(k-1))+mk;
            n1:=mj;
            n2:=mk;
                if n1>n2 then
```

```
                begin
                item:=n1;
                n1:=n2;
                n2:=item;
                end
                else
                begin
                n1:=n1;
                n2:=n2;
                end;
                    smi[i,k,mj,mk]:=sm[n1,n2];
                    sfi[i,id1,id2]:=sfi[i,id1,id2]+sm[n1,n2];
                    end;
        end;
    end;
    for pkk:= (jtum*3-2) to (jtum*3-1) do
    begin
        for pbb:= 1 to (jtum*3) do
        begin
        sfi[i,pkk,pbb]:=sfi[i,pkk+1,pbb];
        end;
    end;
        for pkk:= 1 to (jtum*3-1) do
        begin
            for pbb:= (jtum*3-2) to (jtum*3-1) do
            begin
            sfi[i,pkk,pbb]:=sfi[i,pkk,pbb+1];
            end;
        end;
                for pk:= 1 to jtum*3-2 do
                begin
                    for pb:=1 to jtum*3-2 do
                    begin
                    sfi[i,pk,pb]:=sfi[i,pk+1,pb+1];
                    end;
                end;
 end;
end;


procedure TFdatainput.InversMatrikssfi;
var  i:word;
ji,ki,li : byte;
PIVOT, AA : real;
begin
    for i := 1 to jum do
    begin
        for ji := 1 to (jtum*3-2) do
        begin
        PIVOT := sfi[i,ji,ji];
        sfi[i,ji,ji] := 1;
            for ki := 1 to (jtum*3-2) do
            sfi[i,ji,ki] := sfi[i,ji,ki] / PIVOT;
                for li := 1 to (jtum*3-2) do
                begin
                    if li <> ji then
                    begin
                    AA := sfi[i,li,ji];
                    sfi[i,li,ji] := 0;
                    for ki:= 1 to (jtum*3-2) do
                    sfi[i,li,ki] := sfi[i,li,ki]-(AA*sfi[i,ji,ki]);
                    end;
                end;
        end;
    end;
end;
```

```
procedure tfdatainput.beban_titik_kumpul;
var i,e   : word;
j         : byte;
begin
    for i:=1 to jum do
    begin
    e:=0;
        for j:=1 to finput1.StringGridjoint.RowCount-2 do
        begin
        e:=e+strtoint(finput1.StringGridjoint.Cells[2,j]);
        Aj[i,2*3*e+1]:= strtofloat(finput1.StringGridBeban.Cells[1,j]);
        Aj[i,2*3*e+2]:= strtofloat(finput1.StringGridBeban.Cells[2,j]);
        Aj[i,2*3*e+3]:= strtofloat(finput1.StringGridBeban.Cells[3,j]);
        end;
    end;
end;

procedure tfdatainput.momen_gaya_jepit_ujung;
var  i,k  : word;
j,z,y     : byte;
wb        : real;
begin
    for i:=1 to jum do
    begin
        for j:=1 to jp do
        begin
        wb:=((((dpondasi-t[i]))*bjtanah)+(t[i]*bjbeton))*(b[i,j]);
        pki[i,j]:=-l[j]*wb/(2);
        mfki[i,j]:=-wb*l[j]*l[j]/(12);
        pka[i,j+1]:=-l[j]*wb/(2);
        mfka[i,j+1]:=wb*l[j]*l[j]/(12);
        aml[i,j,1,1]:=0;
        aml[i,j,1,2]:=-pki[i,j];
        aml[i,j,1,3]:=-mfki[i,j];
        aml[i,j,1,4]:=0;
        aml[i,j,1,5]:=-pka[i,j+1];
        aml[i,j,1,6]:=-mfka[i,j+1];
        end;
    end;
            for k:=1 to jum do
            begin
            y:=jp+1;
            pki[k,y]:=0;
            pka[k,1]:=0;
            mfki[k,y]:=0;
            mfka[k,1]:=0;
                for z:=1 to jtum do
                begin
                ae[k,(3*(z-1)+1)]:=0;
                ae[k,(3*(z-1)+2)]:=pki[k,z]+pka[k,z];
                ae[k,(3*(z-1)+3)]:=mfki[k,z]+mfka[k,z];
                end;
            end;
end;

procedure tfdatainput.jumlah_gaya_momen;
var i     : word;
j         : byte;
begin
    for i:=1 to jum do
    begin
        for j:=1 to jtum*3 do
        begin
        Afe[i,1,j]:=aj[i,j+1]+ ae[i,j+1];
        end;
            for j:=jtum*3-3 to jtum*3-1 do
            begin
            afe[i,1,j]:=afe[i,1,j+1];
            end;
```

```
    end;
end;

procedure tfdatainput.Perkalian_matrik_df;
var  i,ii,iii,iv              : word;
jpm,kpm,lpm,ul,uls,jv,kv,jj       : byte;
begin
for i:=1 to jum do
begin
    for kpm:=1 to jtum*3-2 do
    begin
        for lpm:=1 to 1 do
        begin
        df[i,lpm,kpm]:=0;
        end;
    end;
end;
    for i:=1 to jum do
    begin
        for jpm:=1 to jtum*3-2 do
        begin
            for kpm:=1 to jtum*3-2 do
            begin
                for lpm:=1 to 1 do
                begin
                df[i,lpm,kpm]:=df[i,lpm,kpm]+ sft[i,jpm,kpm]*afe[i,lpm,jpm];
                end;
            end;
        end;
    end;
        for ii:= 1 to jum do
        begin
            for ul:=jtum*3 downto jtum*3-1 do
            begin
            dft[ii,ul]:=df[ii,1,ul-2];
            end;
        dft[ii,jtum*3-2]:=0;
        end;
            for iii:= 1 to jum do
            begin
                for uls:=jtum*3-3 downto 2 do
                begin
                dft[iii,uls]:=df[iii,1,uls-1];
                end;
            end;
    for iv:=1 to jum do
    begin
        for jv:=1 to jp do
        begin
            for kv:=1 to 6 do
            begin
            jj:=(3*(jv-1))+kv;
            dmi[iv,jv,1,kv]:=dft[iv,jj];
            end;
        end;
    end;
end;

procedure tfdatainput.hasil_gaya_ujung_batang;
var i:word;
j,k,l,m,n:byte;
begin
    for i:=1 to jum do
    begin
        for j:=1 to jp do
        begin
          for k:=1 to 6 do
          begin
            for l:=1 to 6 do
```

```
            begin
              for m:=1 to 1 do
              begin
              sd[j,m,l]:=sd[j,m,l]+smi[i,j,l,k]*dmi[i,j,m,k];
              end;
            end;
          end;
            for n:=1 to 6 do
            begin
            am[i,j,n]:=aml[i,j,1,n]+sd[j,1,n];
            sd[j,1,n]:=0;
            end;
        end;
    end;
end;

procedure tfdatainput.momen_ultimit;
var i,kos     : word;
j,k,m,n       : byte;
begin
for kos:=1 to jum do
begin
mutump[kos]:=0;
mulap[kos]:=0;
end;
    for i:=1 to jum do
    begin
        for j:=1 to jp+1 do
        begin
            if j=jp+1 then
            mu[i,j]:=abs(am[i,j,6])
            else
            mu[i,j]:=abs(am[i,j,3]);
        end;
        for j:=1 to jp+1 do
        begin
            for k:=1 to strtoint(finput1.EKolom.Text) do
            begin
                m:=1;
                for n:=1 to k do
                begin
                m:=m+(2*strtoint(finput1.StringGridjoint.Cells[2,n]));
                end;
                    if j=m then
                    begin
                    if mutump[i]<mu[i,j] then
                    mutump[i]:=mu[i,j]
                    else
                    mutump[i]:=mutump[i];
                    end
                    else
                    begin
                    if mulap[i]<mu[i,j] then
                    mulap[i]:=mu[i,j]
                    else
                    mulap[i]:=mulap[i];
                    end;
            end;
        end;
    end;
end;

procedure tfdatainput.geser_ultimit;
var i,kos,kosj     : word;
j,m                : byte;
begin
for kos:=1 to jum do
begin
    for kosj:=1 to (jp) do
```

```
    begin
    vu[kos,kosj]:=0;
    end;
end;
    for i:=1 to jum do
    begin
        for j:=1 to (jumlah_pias+1) do
        begin
            if j=1 then
            begin
            vu[i,1]:=abs(am[i,j,2]);
                if vu[i,1]<= abs(am[i,j,5]) then
                vu[i,1]:=abs(am[i,j,5])
                else
                vu[i,1]:=vu[i,1];
            end
            else
            begin
            m:=2*(j-1);
                if m=jp then
                begin
                vu[i,m]:=abs(am[i,m,2]);
                  if vu[i,m]<=abs(am[i,m,5]) then
                  begin
                  vu[i,m]:=abs(am[i,m,5]);
                  end
                  else
                  begin
                  vu[i,m]:=vu[i,m];
                  end;
                end
                else
                begin
                vu[i,m]:=abs(am[i,m,2]);
                    if vu[i,m]<=abs(am[i,m,5]) then
                    begin
                    vu[i,m]:=abs(am[i,m,5]);
                    end
                    else
                    begin
                    vu[i,m]:=vu[i,m];
                    end;
                      if vu[i,m]<=abs(am[i,m+1,2]) then
                      begin
                      vu[i,m]:=abs(am[i,m+1,2]);
                      end
                      else
                      begin
                      vu[i,m]:=vu[i,m];
                      end;
                        if vu[i,m]<=abs(am[i,m+1,5]) then
                        begin
                        vu[i,m]:=abs(am[i,(m+1),5]);
                        end
                        else
                        begin
                        vu[i,m]:=vu[i,m];
                        end;
                          if vu[i,m]<=abs(am[i,m+2,2]) then
                          begin
                          vu[i,m]:=abs(am[i,(m+2),2]);
                          vu[i,m+1]:=abs(am[i,(m+2),2]);
                          end
                          else
                          begin
                          vu[i,m]:=vu[i,m];
                          vu[i,m+1]:=vu[i,m];
                          end;
                end;
```

```
            end;
        end;
    end;
end;

procedure TFDataInput.BLanjutClick(Sender: TObject);
begin
fkerja.show;
end;
end.
```

```
unit Ukerja;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, StdCtrls;

type
  TFkerja = class(TForm)
    Label1: TLabel;
    Label2: TLabel;
    Ebeton: TEdit;
    Ebaja: TEdit;
    brun: TButton;
    Label4: TLabel;
    Epmati: TEdit;
    Label5: TLabel;
    Label6: TLabel;
    Label3: TLabel;
    Epinalti: TEdit;
    Label7: TLabel;
    procedure brunClick(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }
    procedure kendala1_tegangan_ijin_tanah;
    procedure Kendala2_tebal_pondasi;
    procedure kendala3_rasio_penulangan_min;
    procedure kendala4_rasio_penulangan_mak;
    procedure kendala5_geser;
    procedure kendala6_momen_memanjang;
    procedure kendala7_lentur;
    procedure kendala8_momen_melintang;
    procedure kendala9_geser_pons;
    procedure kendala_total;
    procedure tujuan;
    procedure fitness;
    procedure tukar(var fit1,fit2:real; var arrbiner1,arrbiner2:string; var ktotal1,ktotal2:real; var ft1,ft2:real);
    procedure urut_quicksort(l,r:word);
    procedure seleksi_alami;
    procedure konvergensi;
    function sequentialsearch(acak1,sem1:word):integer;
    procedure kawin_silang;
    procedure tampilan_hasil;
    procedure tampilan_data_input;
    procedure tampilan_data_diskrit;
  end;

var
  Fkerja: TFkerja;
k1,k2,k3,k4,k5,k6,k7,k8,k9,ktotal,ft,fit     : array [1..2501] of real;
lj,bj,bi,nli,p,vup                          : array [1..2501,1..255] of real;
dm,dl,ast,qs,asl,al,betac,betao,pj          : real;
konvergen                                   : word;
data                                        : array [1..2501] of word;
igen                                        : integer;
runke,tt,tl,tdm,tdl,tnm,tnl                 : byte;
mulai,selesai,da,db,dc,dd,de,df             : string;
sama                                        : array [1..255] of string;

implementation

uses UInput1, UnitInputdata, Uout, Ujumlahdiskrit;

{$R *.dfm}
procedure tfkerja.kendala1_tegangan_ijin_tanah;
var  i,kos              : word;
```

```
j                   : byte;
kend1,tterjadi      : real;
begin
for kos:=1 to jum do
begin
k1[kos]:=0;
end;
    for i:=1 to jum do
    begin
        for j:=1 to (jp+1) do
        begin
        tterjadi:=-(strtofloat(finput1.EMtanah.Text))*dft[i,(2+((j-1)*3))];
        kend1:=(tterjadi/strtofloat(finput1.Ettitanah.Text))-1;
            if kend1 <= 0 then
            k1[i]:=k1[i]
            else
            k1[i]:=abs(k1[i])+abs(kend1);
        end;
    end;
end;

procedure tfkerja.Kendala2_tebal_pondasi;
var i,kos     : word;
kend2         :real;
begin
for kos:=1 to jum do
begin
k2[kos]:=0;
end;
    for i:=1 to jum do
    begin
    kend2:=((t[i]-selimut_beton-diam[i])/tebal_min_pon)-1;
    if kend2 >= 0 then
    k2[i]:=0
    else
    k2[i]:=abs(kend2);
    end;
end;

procedure tfkerja.kendala3_rasio_penulangan_min;
var i,kos     : word;
j,k           : byte;
ast,rho,kend3  : real;
begin
for kos:=1 to jum do
begin
k3[kos]:=0;
end;
    for i:=1 to jum do
    begin
        for j:=1 to jp do
        begin
            for k:=1 to 2 do
            begin
            Ast:=3.141592654*diam[i]*diam[i]*nm[i,k]/4;
            dm:=t[i]-selimut_beton-0.5*diam[i];
            rho:=ast/(b[i,j]*dm);
                if fy=konstanta_fy then
                begin
                kend3:=(rho/0.0018)-1;
                end
                else if fy>=konstanta_fy then
                begin
                kend3:=(rho/(0.0018*konstanta_fy/fy))-1;
                end
                else
                begin
                kend3:=(rho/0.002)-1;
                end;
```

```
begin
    for j:=1 to strtoint(finput1.EKolom.Text) do
    begin
    dm:=t[i]-selimut_beton-0.5*diam[i];
       m:=1;
       for k:=1 to j do
        begin
         if strtoint(finput1.StringGridjoint.Cells[2,k])=0 then
         m:=1
         else
         m:=m+2*strtoint(finput1.StringGridjoint.Cells[2,k]);
        end;
         atotal:=0;
         for n:=1 to jp do
         begin
         atotal:=atotal+b[i,n]*l[n];
         end;
           if strtoint(finput1.StringGridjoint.Cells[2,j]) or strtoint(finput1.StringGridjoint.Cells[2,j+1])=0 then
           begin
           vup[i,j]:=vu[i,m];
           vu[i,m]:=vu[i,m]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
           vu[i,m-1]:=vu[i,m-1]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
           end
           else
           begin
           vup[i,j]:=vu[i,m];
           vu[i,m]:=vu[i,m]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
           vu[i,m-1]:=vu[i,m-1]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
           end;
       end;
    end;
for i:=1 to jum do
begin
    for j:=1 to jp do
    begin
    dm:=t[i]-selimut_beton-0.5*diam[i];
    kend5:=((konstanta_geser*b[i,j]*dm*sqrt(fc))/(vu[i,j]/0.85))-1;
       if kend5 >= 0 then
       k5[i]:=k5[i]
       else
       k5[i]:=abs(k5[i])+abs(kend5);
    end;
end;
end;

procedure tfkerja.kendala6_momen_memanjang;
var i,kos    : word;
j,k          :byte;
a,kend6      :real;
begin
for kos:=1 to jum do
begin
k6[kos]:=0;
end;
    for i:=1 to jum do
    begin
       for j:=1 to jp do
       begin
          for k:=1 to 2 do
          begin
          if k=1 then
          begin
          Ast:=3.141592654*diam[i]*diam[i]*nm[i,k]/4;
          dm:=t[i]-selimut_beton-0.5*diam[i];
          a:=ast*(fy)/(0.85*fc*b[i,j]);
```

```
begin
    for j:=1 to strtoint(finput1.EKolom.Text) do
    begin
    dm:=t[i]-selimut_beton-0.5*diam[i];
        m:=1;
        for k:=1 to j do
        begin
          if strtoint(finput1.StringGridjoint.Cells[2,k])=0 then
          m:=1
          else
          m:=m+2*strtoint(finput1.StringGridjoint.Cells[2,k]);
        end;
          atotal:=0;
          for n:=1 to jp do
          begin
          atotal:=atotal+b[i,n]*l[n];
          end;
            if strtoint(finput1.StringGridjoint.Cells[2,j]) or strtoint(finput1.StringGridjoint.Cells[2,j+1])=0 then
            begin
            vup[i,j]:=vu[i,m];
            vu[i,m]:=vu[i,m]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
            vu[i,m-1]:=vu[i,m-1]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
            end
            else
            begin
            vup[i,j]:=vu[i,m];
            vu[i,m]:=vu[i,m]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
            vu[i,m-1]:=vu[i,m-1]-((-
strtofloat(finput1.StringGridBeban.Cells[2,j])/(atotal))*b[i,m]*(dm+strtofloat(finput1.StringGridBeban.Cells[4,j])/2));
            end;
      end;
    end;
for i:=1 to jum do
begin
    for j:=1 to jp do
    begin
    dm:=t[i]-selimut_beton-0.5*diam[i];
    kend5:=((konstanta_geser*b[i,j]*dm*sqrt(fc))/(vu[i,j]/0.85))-1;
      if kend5 >= 0 then
      k5[i]:=k5[i]
      else
      k5[i]:=abs(k5[i])+abs(kend5);
    end;
end;
end;

procedure tfkerja.kendala6_momen_memanjang;
var  i,kos    : word;
j,k          :byte;
a,kend6      :real;
begin
for kos:=1 to jum do
begin
k6[kos]:=0;
end;
    for i:=1 to jum do
    begin
        for j:=1 to jp do
        begin
            for k:=1 to 2 do
            begin
            if k=1 then
            begin
            Ast:=3.141592654*diam[i]*diam[i]*nm[i,k]/4;
            dm:=t[i]-selimut_beton-0.5*diam[i];
            a:=ast*(fy)/(0.85*fc*b[i,j]);
```

```
            else
            begin
            lj[i,j]:=(strtofloat(finput1.StringGridBeban.Cells[4,j]))+dm;
            p[i,j]:=strtofloat(finput1.StringGridBeban.Cells[2,j]);
            end;
        end;
    end;
    for k:=1 to jum do
    begin
        for li:=1 to strtoint(finput1.EKolom.Text) do
        begin
            m:=0;
            for n:=1 to li do
            begin
             if strtoint(finput1.StringGridjoint.Cells[2,n])=0 then
             m:=1
             else
             m:=2*(strtoint(finput1.StringGridjoint.Cells[2,n]));
            end;
        bi[k,li]:=b[k,m];
        bj[k,li]:=(bi[k,li]/2)-(strtofloat(finput1.StringGridBeban.Cells[5,li])/2);
        end;
    end;
    for k:=1 to jum do
    begin
        for li:=1 to strtoint(finput1.EKolom.Text) do
        begin
        asl:=3.141592654*dial[k]*dial[k]*nl[k,li]/4;
        dl:=t[k]-selimut_beton-0.5*dial[k];
        al:=(asl*fy)/(0.85*fc*lj[k,li]);
        qs:=(-p[k,li])/(bi[k,li]);
        kend8:=(asl*fy*(dl-al/2)/(qs*bj[k,li]*bj[k,li]/2))-1;
        if kend8>=0 then
        k8[k]:=k8[k]
        else
        k8[k]:=abs(k8[k])+abs(kend8);
        end;
    end;
end;

procedure tfkerja.kendala9_geser_pons;
var  i,kos        : word;
j,ada,m,k         : byte;
kend9             : real;
begin
for kos:=1 to jum do
begin
k9[kos]:=0;
end;
    for i:=1 to jum do
    begin
     pj:=0;
     for k:=1 to jp do
     begin
     pj:=pj+l[k];
     end;
        for j:=1 to strtoint(finput1.EKolom.Text) do
        begin
        dm:=t[i]-selimut_beton-0.5*diam[i];
        if strtofloat(finput1.StringGridBeban.Cells[4,j])>strtofloat(finput1.StringGridBeban.Cells[5,j]) then
        betac:=strtofloat(finput1.StringGridBeban.Cells[4,j])/strtofloat(finput1.StringGridBeban.Cells[5,j])
        else
        betac:=strtofloat(finput1.StringGridBeban.Cells[5,j])/strtofloat(finput1.StringGridBeban.Cells[4,j]);
         if strtoint(finput1.StringGridjoint.Cells[2,j])=0 then
         ada:=2
         else if strtoint(finput1.StringGridjoint.Cells[2,j+1])=0 then
         ada:=2
         else
         ada:=1;
```

```
            m:=1;
            for k:=1 to j do
            begin
            m:=m+strtoint(finput1.StringGridjoint.Cells[2,k]);
            end;

betao:=2*(dm+strtofloat(finput1.StringGridBeban.Cells[5,j]))+2*(dm/ada+strtofloat(finput1.StringGridBeban.Cells[4,j]));
            vup[i,j]:=vup[i,j]-((-strtofloat(finput1.StringGridBeban.Cells[2,j])/(b[i,2*(m-
1)+1]*pj)))*(strtofloat(finput1.StringGridBeban.Cells[4,j])+dm/ada)*(strtofloat(finput1.StringGridBeban.Cells[5,j])+dm);
            if betac > 2 then
            kend9:=(((2+(4/betac))*(sqrt(fc))*betao*dm)/(vup[i,j]/0.85))-1
            else
            kend9:=((4*(sqrt(fc))*betao*dm)/(vup[i,j]/0.85))-1;
               if kend9 >= 0 then
               k9[i]:=k9[i]
               else
               k9[i]:=abs(k9[i])+abs(kend9);
         end;
      end;
end;

procedure tfkerja.kendala_total;
var  i,kos    : word;
begin
for kos:=1 to jum do
begin
ktotal[kos]:=0;
end;
   for i:=1 to jum do
   begin
   ktotal[i]:=k1[i]+k2[i]+k3[i]+k4[i]+k5[i]+k6[i]+k7[i]+k8[i]+k9[i];
   end;
end;

procedure tfkerja.tujuan;
var  i,kos    : word;
j,k,m,n       : byte;
ftsem,ftl     : real;
begin
for kos:=1 to jum do
begin
ft[kos]:=0;
end;
   for i:=1 to jum do
   begin
      ftsem:=0;
      for j:=1 to jp do
      begin

ftsem:=ftsem+(b[i,j]*t[i]*l[j]*(strtofloat(fkerja.Ehbeton.Text))+(diam[i]*diam[i]*(0.75*(nm[i,1]+nm[i,2]))*l[j]*3.141592654/4
*konstanta_berat_tul*strtofloat(fkerja.Ehbaja.Text)));
      end;
         ftl:=0;
         for k:=1 to strtoint(finput1.EKolom.Text) do
         begin
            m:=1;
            for n:=1 to k do
            begin
            m:=m+(2*strtoint(finput1.StringGridjoint.Cells[2,n]));
            end;

ftl:=ftl+(dia[i]*dia[i]*(0.75*(nl[i,k]))*b[i,m]*3.141592654/4*konstanta_berat_tul*strtofloat(fkerja.Ehbaja.Text));
         end;
   ft[i]:=ftsem+ftl;
   end;
end;
```

```
procedure tfkerja.fitness;
var  i,kos      : word;
begin
for kos:=1 to jum do
begin
fit[kos]:=0;
end;
    for i:=1 to jum do
    begin
    fit[i]:=10000000/(ft[i]+(strtofloat(epinalti.Text))*ktotal[i]);
    end;
end;

procedure tfkerja.tukar(var fit1,fit2:real; var arrbiner1,arrbiner2 string; var ktotal1,ktotal2:real; var ft1,ft2:real);
var temp,ktotaltemp,fttemp      : real;
arrtemp                         : string;
begin
temp:=fit1;
fit1:=fit2;
fit2:=temp;
arrtemp:=arrbiner1;
arrbiner1:=arrbiner2;
arrbiner2:=arrtemp;
ktotaltemp:=ktotal1;
ktotal1:=ktotal2;
ktotal2:=ktotaltemp;
fttemp:=ft1;
ft1:=ft2;
ft2:=fttemp;
end;

procedure tfkerja.urut_quicksort(l,r:word);
var i,j:word;
x :real;
begin
    x:=fit[(l+r) div 2)];
    i:=l;
    j:=r;
        while (i<=j) do
        begin
            while(fit[i]>x) do
            inc(i);
            while (fit[j]<x) do
            dec(j);
        if (i<=j) then
        begin
        tukar(fit[i],fit[j],arrbiner[i],arrbiner[j],ktotal[i],ktotal[j],ft[i],ft[j]);
        inc(i);
        dec(j);
        end;
        end;
            if (l<j) then urut_quicksort(l,j);
            if (i<r) then urut_quicksort(i,r);
end;

procedure tfkerja.konvergensi;
var i     : word;
begin
   konvergen:=0;
   for i:=1 to jum do
   begin
        if arrbiner[1]=arrbiner[i] then
        begin
        konvergen:=konvergen+1;
        end
        else
        begin
        konvergen:=konvergen;
        end;
```

```
  end;
end;

procedure tfkerja.seleksi_alami;
var i        : word;
jganti       : word;
begin
   jganti:=(strtoint(fkerja.f:pmati.Text))*jum div 100;
   if Jganti<=1 then
   jganti:=1
   else
   jganti:=jganti;
      for i:=1 to jganti do
      begin
      fit[jum-(i-1)]:=fit[i];
      arrbiner[jum-(i-1)]:=arrbiner[i];
      end;
end;

function tfkerja.sequentialsearch(acak1,sem1:word):integer;
var i   : word;
ketemu   : boolean;
begin
   ketemu:=false;
   i:=1;
   while (not ketemu) and (i<sem1) do
   begin
      if data[i] = acak1 then
      ketemu:=true
      else
      inc(i);
   end;
   if ketemu then
   sequentialsearch:=0
   else
   sequentialsearch:=acak1;
end;

procedure tfkerja.kawin_silang;
var sem,acak,i,j,k       : word;
pot1,pot2,ptem,jstr,s,ss   : byte;
strtemp                  : string;
begin
randomize;
sem:=1;
   while sem<=(jum div 2) do
    if sem=1 then
    begin
      repeat
       random;
       data[sem]:=random(jum+1);
      until data[sem]<>0;
      inc(sem);
    end
    else
      begin
          repeat
             random;
             acak:=random(jum+1);
          until acak<>0;
      if sequentialsearch(acak,sem)=acak then
      begin
      data[sem]:=acak;
      inc(sem);
      end
      else
      sem:=sem;
   end;
      for i:=jum div 2 downto 1 do
```

```
begin
tukar(fit[i],fit[(data[i])],arrbiner[i],arrbiner[(data[i])],ktotal[i],ktotal[(data[i])],ft[i],ft[(data[i])]);
end;
    for j:=1 to (jum div 2) do
    begin
    if strtoint(fjdiskrit.Ejdtebal.Text)<=2 then tt:=1
    else if strtoint(fjdiskrit.Ejdtebal.Text)<=4 then tt:=2
    else if strtoint(fjdiskrit.Ejdtebal.Text)<=8 then tt:=3
    else if strtoint(fjdiskrit.Ejdtebal.Text)<=16 then tt:=4
    else if strtoint(fjdiskrit.Ejdtebal.Text)<=32 then tt:=5
    else if strtoint(fjdiskrit.Ejdtebal.Text)<=64 then tt:=6
    else if strtoint(fjdiskrit.Ejdtebal.Text)<=128 then tt:=7
    else tt:=8;
    if strtoint(fjdiskrit.Ejddiam.Text)<=2 then tdm:=1
    else if strtoint(fjdiskrit.Ejddiam.Text)<=4 then tdm:=2
    else if strtoint(fjdiskrit.Ejddiam.Text)<=8 then tdm:=3
    else if strtoint(fjdiskrit.Ejddiam.Text)<=16 then tdm:=4
    else if strtoint(fjdiskrit.Ejddiam.Text)<=32 then tdm:=5
    else if strtoint(fjdiskrit.Ejddiam.Text)<=64 then tdm:=6
    else if strtoint(fjdiskrit.Ejddiam.Text)<=128 then tdm:=7
    else tdm:=8;
    if strtoint(fjdiskrit.Ejddial.Text)<=2 then tdl:=1
    else if strtoint(fjdiskrit.Ejddial.Text)<=4 then tdl:=2
    else if strtoint(fjdiskrit.Ejddial.Text)<=8 then tdl:=3
    else if strtoint(fjdiskrit.Ejddial.Text)<=16 then tdl:=4
    else if strtoint(fjdiskrit.Ejddial.Text)<=32 then tdl:=5
    else if strtoint(fjdiskrit.Ejddial.Text)<=64 then tdl:=6
    else if strtoint(fjdiskrit.Ejddial.Text)<=128 then tdl:=7
    else tdl:=8;
    if strtoint(fjdiskrit.Ejdlebar.Text)<=2 then tl:=1
    else if strtoint(fjdiskrit.Ejdlebar.Text)<=4 then tl:=2
    else if strtoint(fjdiskrit.Ejdlebar.Text)<=8 then tl:=3
    else if strtoint(fjdiskrit.Ejdlebar.Text)<=16 then tl:=4
    else if strtoint(fjdiskrit.Ejdlebar.Text)<=32 then tl:=5
    else if strtoint(fjdiskrit.Ejdlebar.Text)<=64 then tl:=6
    else if strtoint(fjdiskrit.Ejdlebar.Text)<=128 then tl:=7
    else tl:=8;
    if strtoint(fjdiskrit.Ejdnm.Text)<=2 then tnm:=1
    else if strtoint(fjdiskrit.Ejdnm.Text)<=4 then tnm:=2
    else if strtoint(fjdiskrit.Ejdnm.Text)<=8 then tnm:=3
    else if strtoint(fjdiskrit.Ejdnm.Text)<=16 then tnm:=4
    else if strtoint(fjdiskrit.Ejdnm.Text)<=32 then tnm:=5
    else if strtoint(fjdiskrit.Ejdnm.Text)<=64 then tnm:=6
    else if strtoint(fjdiskrit.Ejdnm.Text)<=128 then tnm:=7
    else tnm:=8;
    if strtoint(fjdiskrit.Ejdnl.Text)<=2 then tnl:=1
    else if strtoint(fjdiskrit.Ejdnl.Text)<=4 then tnl:=2
    else if strtoint(fjdiskrit.Ejdnl.Text)<=8 then tnl:=3
    else if strtoint(fjdiskrit.Ejdnl.Text)<=16 then tnl:=4
    else if strtoint(fjdiskrit.Ejdnl.Text)<=32 then tnl:=5
    else if strtoint(fjdiskrit.Ejdnl.Text)<=64 then tnl:=6
    else if strtoint(fjdiskrit.Ejdnl.Text)<=128 then tnl:=7
    else tnl:=8;
        repeat
        random;
        pot1:=random(tt+tdm+tdl+2*tnm+strtoint(finput1.ekolom.text)*tnl+(fdatainput.jumlah_pias+1)*tl+1);
        pot2:=random(5+strtoint(finput1.ekolom.text)*tnl+(fdatainput.jumlah_pias+1)+1);
        until (pot1 and pot2)<>0;
            if pot2<pot1 then
            begin
            ptem:=pot1;
            pot1:=pot2;
            pot2:=ptem;
            end;
      k:=(j-1)*2+1;
      begin
      jstr:=pot2-pot1;
      strtemp:=copy(arrbiner[k],pot1,jstr);
      delete(arrbiner[k],pot1,jstr);
```

```
            insert(copy(arrbiner[k+1],pot1,jstr),arrbiner[k],pot1);
            delete(arrbiner[k+1],pot1,jstr);
            insert(strtemp,arrbiner[k+1],pot1);
            end;
          end;
      for i:=1 to jum do
      begin
      for j:=1 to ((fdatainput.jumlah_pias+1)+strtoint(finput1.EKolom.Text)+5) do
      begin
      arrbiners[i,j]:='';
      end;
          arrbiners[i,1]:=copy(arrbiner[i],1,tt);
          arrbiners[i,2]:=copy(arrbiner[i],1+tt,tdm);
          arrbiners[i,3]:=copy(arrbiner[i],1+tt+tdm,tdl);
          for s:=4 to (fdatainput.jumlah_pias+1)+3 do
          begin
          arrbiners[i,s]:=copy(arrbiner[i],1+tt+tdm+tdl+(tl*(s-4)),tl);
          end;
          arrbiners[i,((fdatainput.jumlah_pias+1)+4)]:=copy(arrbiner[i],1+tt+tdm+tdl+(tl*(fdatainput.jumlah_pias+1)),tnm);

arrbiners[i,((fdatainput.jumlah_pias+1)+5)]:=copy(arrbiner[i],1+tt+tdm+tdl+(tl*(fdatainput.jumlah_pias+1))+tnm,tnm);
          for ss:=((fdatainput.jumlah_pias+1)+6) to (strtoint(finput1.EKolom.Text)+((fdatainput.jumlah_pias+1)+5)) do
          begin
          arrbiners[i,ss]:=copy(arrbiner[i],1+tt+tdm+tdl+(tl*(fdatainput.jumlah_pias+1))+tnm*2+(tnl*(ss-
(((fdatainput.jumlah_pias+1)+6))),tnl);
          end;
      end;
end;

procedure tfkerja.tampilan_hasil;
var s : byte;
begin
    with fout.list1.items do
    begin
    add('Run Ke                  '+'='+' '+(inttostr(runke)));
    add('jumlah individu         '+'='+' '+(inttostr(jum)));
    add('Konvergen Pada Generasi Ke '+'='+' '+(inttostr(igen)));
    add('Parameter Pinalti       '+'='+' '+(fkerja.Epinalti.Text));
    add('Fitnes                  '+'='+' '+(floattostr(fit[1])));
    add('Pelanggaran Kendala     '+'='+' '+(floattostr(ktotal[1])));
    add('Fungsi Tujuan           '+'='+' '+(floattostr(ft[1])));
    add('string                  '+'='+' '+(arrbiner[1]));
    add('t    '+'='+' '+(fdatainput.stringinput.cells[1,(fdatainput.bin2des(arrbiners[1,1],(strtoint(fjdiskrit.Ejdtebal.Text))))]));
    add('diam '+'='+' '+(fdatainput.stringinput.cells[2,(fdatainput.bin2des(arrbiners[1,2],(strtoint(fjdiskrit.Ejddiam.Text))))]));
    add('dial '+'='+' '+(fdatainput.stringinput.cells[3,(fdatainput.bin2des(arrbiners[1,3],(strtoint(fjdiskrit.Ejddial.Text))))]));
    for s:= 1 to (fdatainput.jumlah_pias+1) do
    begin
    add('b'+inttostr(s)+'  '+'='+'
'+(fdatainput.StringInput.Cells[4,(fdatainput.bin2des(arrbiners[1,3+s],(strtoint(fjdiskrit.Ejdlebar.Text))))]));
    end;
    for s:= 1 to 2 do
    begin
    add('nm'+inttostr(s)+'  '+'='+'
'+(fdatainput.StringInput.Cells[5,(fdatainput.bin2des(arrbiners[1,3+(fdatainput.jumlah_pias+1)+s],(strtoint(fjdiskrit.Ejdnm.Text
))))]));
    end;
    for s:= 1 to (strtoint(finput1.EKolom.Text)) do
    begin
    add('nl'+inttostr(s)+'  '+'='+'
'+(fdatainput.StringInput.Cells[6,(fdatainput.bin2des(arrbiners[1,5+(fdatainput.jumlah_pias+1)+s],(strtoint(fjdiskrit.Ejdnl.Text)
))))]));
    end;
    add('Jam Mulai  '+'='+' '+mulai);
    add('Jam Selesai '+'='+' '+selesai);
    add('');
    end;
end;

procedure tfkerja.tampilan_data_input;
```

```
VAR T,u : Byte;
begin
fout.Listdinput.Clear;
with fout.Listdinput.items do
    begin
    add(finput1.Ejumind.Text);
    add(finput1.erun.Text);
    add(finput1.EKolom.Text);
    add(finput1.ETbeton.Text);
    add(finput1.ETlbaja.Text);
    add(finput1.EKind.Text);
    add(finput1.Eebeton.Text);
    add(finput1.Ebjbeton.Text);
    add(finput1.Ebjtanah.Text);
    add(finput1.Epondasi.Text);
    add(finput1.EMtanah.Text);
    add(finput1.Etitanah.Text);
    add(finput1.Eebaja.Text);
    add(finput1.Esbeton.Text);
    add(Fjdiskrit.Ejdtebal.Text);
    add(Fjdiskrit.Ejdlebar.Text);
    add(Fjdiskrit.Ejddiam.Text);
    add(Fjdiskrit.Ejddial.Text);
    add(Fjdiskrit.Ejdnm.Text);
    add(Fjdiskrit.Ejdnl.Text);
      for T:= 1 to (strtoint(finput1.EKolom.Text)) do
      begin
      add(finput1.StringGridBeban.Cells[1,t]);
      end;
      for T:= 1 to (strtoint(finput1.EKolom.Text)) do
      begin
      add(finput1.StringGridBeban.Cells[2,t]);
      end;
      for T:= 1 to (strtoint(finput1.EKolom.Text)) do
      begin
      add(finput1.StringGridBeban.Cells[3,t]);
      end;
      for T:= 1 to (strtoint(finput1.EKolom.Text)) do
      begin
      add(finput1.StringGridBeban.Cells[4,t]);
      end;
      for T:= 1 to (strtoint(finput1.EKolom.Text)) do
      begin
      add(finput1.StringGridBeban.Cells[5,t]);
      end;
      for T:= 1 to (strtoint(finput1.EKolom.Text)+1) do
      begin
      add(finput1.StringGridjoint.Cells[1,t]);
      end;
      for T:= 1 to (strtoint(finput1.EKolom.Text)+1) do
      begin
      add(finput1.StringGridjoint.Cells[2,t]);
      end;
       for u:= 0 to strtoint(Fjdiskrit.Ejdtebal.Text)-1 do
       begin
       add(fdatainput.StringInput.Cells[1,u]);
       end;
       for u:= 0 to strtoint(Fjdiskrit.Ejddiam.Text)-1 do
       begin
       add(fdatainput.StringInput.Cells[2,u]);
       end;
       for u:= 0 to strtoint(Fjdiskrit.Ejddial.Text)-1 do
       begin
       add(fdatainput.StringInput.Cells[3,u]);
       end;
       for u:= 0 to strtoint(Fjdiskrit.Ejdlebar.Text)-1 do
       begin
       add(fdatainput.StringInput.Cells[4,u]);
       end;
```

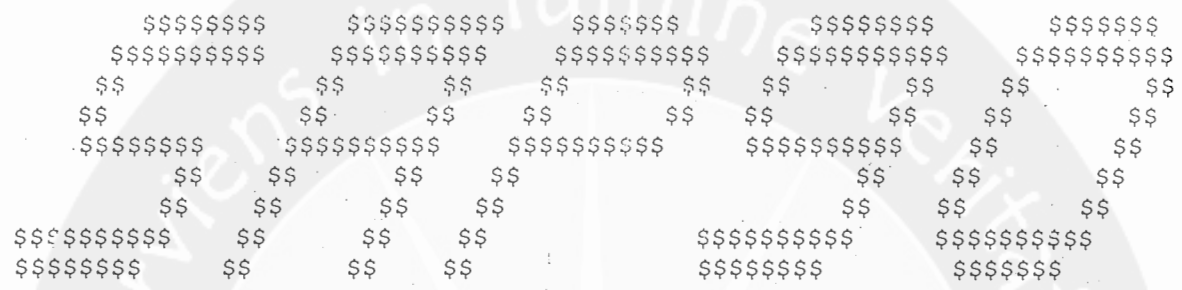
```
        for u:= 0 to strtoint(Fjdiskrit.Ejdnm.Text)-1 do
        begin
        add(fdatainput.StringInput.Cells[5,u]);
        end;
        for u:= 0 to strtoint(Fjdiskrit.Ejdnl.Text)-1 do
        begin
        add(fdatainput.StringInput.Cells[6,u]);
        end;
          add(fkerja.Ehbeton.Text);
          add(fkerja.Ehbaja.Text);
          add(fkerja.Epmati.Text);
          add(fkerja.Epinalti.Text);
    end;
end;

procedure TFkerja.tampilan_data_diskrit;
var s : byte;
begin
fout.Listdiskrit.Clear;
    with fout.Listdiskrit.items do
    begin
      da:=fdatainput.StringInput.Cells[1,0];
      db:=fdatainput.StringInput.Cells[2,0];
      dc:=fdatainput.StringInput.Cells[3,0];
      dd:=fdatainput.StringInput.Cells[4,0];
      de:=fdatainput.StringInput.Cells[5,0];
      df:=fdatainput.StringInput.Cells[6,0];
      for s:=1 to strtoint(fjdiskrit.Ejdtebal.Text)-1 do
      begin
      da:=da+','+fdatainput.StringInput.Cells[1,s];
      end;
      for s:=1 to strtoint(fjdiskrit.Ejddiam.Text)-1 do
      begin
      db:=db+','+fdatainput.StringInput.Cells[2,s];
      end;
      for s:=1 to strtoint(fjdiskrit.Ejddial.Text)-1 do
      begin
      dc:=dc+','+fdatainput.StringInput.Cells[3,s];
      end;
      for s:=1 to strtoint(fjdiskrit.Ejdlebar.Text)-1 do
      begin
      dd:=dd+','+fdatainput.StringInput.Cells[4,s];
      end;
      for s:=1 to strtoint(fjdiskrit.Ejdnm.Text)-1 do
      begin
      de:=de+','+fdatainput.StringInput.Cells[5,s];
      end;
      for s:=1 to strtoint(fjdiskrit.Ejdnl.Text)-1 do
      begin
      df:=df+','+fdatainput.StringInput.Cells[6,s];
      end;
      add('Data Diskrit');
      add('tebal :'+da);
      add('diam :'+db);
      add('dial :'+dc);
      add('lebar :'+dd);
      add('nm :'+de);
      add('nl :'+df);
    end;
end;

procedure TFkerja.brunClick(Sender: TObject);
var r,s,u,henti,terbesar      : byte;
sel                           : string;
begin
fdatainput.variabel;
repeat
begin
runke:=0;
```

```
for r:=1 to strtoint(finput1.erun.Text) do
begin
mulai:=Datetimetostr(now);
fdatainput.rand;
fdatainput.panjang;
fdatainput.tebal;
fdatainput.lebar;
fdatainput.dia_memanjang;
fdatainput.dia_melintang;
fdatainput.jumlah_tulangan_memanjang;
fdatainput.jumlah_tulangan_melintang;
fdatainput.matrik;
fdatainput.InversMatrikssfl;
fdatainput.beban_titik_kumpul;
fdatainput.momen_gaya_jepit_ujung;
fdatainput.jumlah_gaya_momen;
fdatainput.Perkalian_matrik_df;
fdatainput.hasil_gaya_ujung_batang;
fdatainput.momen_ultimit;
fdatainput.geser_ultimit;
kendala1_tegangan_ijin_tanah;
Kendala2_tebal_pondasi;
kendala3_rasio_penulangan_min;
kendala4_rasio_penulangan_mak;
kendala5_geser;
kendala6_momen_memanjang;
kendala7_lentur;
kendala8_momen_melintang;
kendala9_geser_pons;
kendala_total;
tujuan;
fitness;
urut_quicksort(1,jum);
konvergensi;
igen:=1;
   repeat
   begin
   igen:=igen+1;
   seleksi_alami;
   kawin_silang;
   fdatainput.panjang;
   fdatainput.tebal;
   fdatainput.lebar;
   fdatainput.dia_memanjang;
   fdatainput.dia_melintang;
   fdatainput.jumlah_tulangan_memanjang;
   fdatainput.jumlah_tulangan_melintang;
   fdatainput.matrik;
   fdatainput.InversMatrikssfl;
   fdatainput.beban_titik_kumpul;
   fdatainput.momen_gaya_jepit_ujung;
   fdatainput.jumlah_gaya_momen;
   fdatainput.Perkalian_matrik_df;
   fdatainput.hasil_gaya_ujung_batang;
   fdatainput.momen_ultimit;
   fdatainput.geser_ultimit;
   kendala1_tegangan_ijin_tanah;
   Kendala2_tebal_pondasi;
   kendala3_rasio_penulangan_min;
   kendala4_rasio_penulangan_mak;
   kendala5_geser;
   kendala6_momen_memanjang;
   kendala7_lentur;
   kendala8_momen_melintang;
   kendala9_geser_pons;
   kendala_total;
   tujuan;
   fitness;
   urut_quicksort(1,jum);
```

```
        konvergensi;
        end;
        until (konvergen>=(0.75*jum)) or (igen>=10000);
    selesai:=Datetimetostr(now);
    runke:=runke+1;
    tampilan_hasil;
    sama[runke]:=arrbiner[1];
    end;
  jum:=jum+strtoint(finput1.EKind.Text);
  terbesar:=0;
  for s:=1 to strtoint(finput1.erun.Text) do
  begin
  sel:=sama[s];
  henti:=0;
      for u:=1 to strtoint(finput1.erun.Text) do
      begin
      if sel=sama[u] then
      henti:=henti+1
      else
      henti:=henti;
      end;
  if terbesar>=henti then
  terbesar:=terbesar
  else
  terbesar:=henti;
  end;
 end;
 until (terbesar=strtoint(finput1.erun.Text)) or (jum>2500);
 tampilan_data_input;
 tampilan_data_diskrit;
 fout.show;
 end;
 end.
```

```
unit Uout;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, StdCtrls, Buttons;

type
  TFout = class(TForm)
    List1: TListBox;
    SaveDialog1: TSaveDialog;
    BSHasil: TBitBtn;
    Bsdata: TBitBtn;
    Btutup: TBitBtn;
    Bbaru: TBitBtn;
    SaveDialog2: TSaveDialog;
    Bsinput: TBitBtn;
    SaveDialog3: TSaveDialog;
    Listdinput: TListBox;
    Listdiskrit: TListBox;
    procedure BSHasilClick(Sender: TObject);
    procedure BsinputClick(Sender: TObject);
    procedure BsdataClick(Sender: TObject);
    procedure BbaruClick(Sender: TObject);
    procedure BtutupClick(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }
  end;

var
  Fout: TFout;

implementation

uses UInput1, UnitInputdata, Ukerja, Ujumlahdiskrit;

{$R *.dfm}

procedure TFout.BSHasilClick(Sender: TObject);
begin
SaveDialog1.Title := 'Save To File';
SaveDialog1.Filter := 'Text File (*.Txt)| *.txt';
SaveDialog1.DefaultExt := 'Text File (*.Txt)| *.txt';
SaveDialog1.FileName := 'Pondasi1';
If SaveDialog1.Execute then
  List1.Items.SaveToFile(SaveDialog1.FileName )
end;

procedure TFout.BsinputClick(Sender: TObject);
begin
SaveDialog3.Title := 'Save To File';
SaveDialog3.Filter := 'Text File (*.Edy)| *.Edy';
SaveDialog3.DefaultExt := 'Text File (*.Edy)| *.Edy';
SaveDialog3.FileName := 'DPondasi';
If SaveDialog3.Execute then
  Listdinput.items.saveToFile(SaveDialog3.FileName )
end;

procedure TFout.BsdataClick(Sender: TObject);
begin
SaveDialog2.Title := 'Save To File';
SaveDialog2.Filter := 'Text File (*.Txt)| *.txt';
SaveDialog2.DefaultExt := 'Text File (*.Txt)| *.txt';
SaveDialog2.FileName := 'DataDiskrit';
If SaveDialog2.Execute then
  Listdiskrit.Items.SaveToFile(SaveDialog2.FileName )
```

```
end;

procedure TFout.BbaruClick(Sender: TObject);
var u : byte;
begin
fout.List1.Clear;
close;
fkerja.Close;
fdatainput.Close;
Fjdiskrit close;
finput1.Show;
finput1.Ejumind.Text:='';
finput1.erun.Text:='';
finput1.EKolom.Text:='0';
finput1.ETbeton.Text:='';
finput1.ETbaja.Text:='';
finput1.Eebeton.Text:='';
finput1.Ebjbeton.Text:='';
finput1.Ebjtanah.Text:='';
finput1.Epondasi.Text:='';
finput1.EMtanah.Text:='';
finput1.Etitanah.Text:='';
finput1.Eebaja.Text:='';
finput1.Esbeton.Text:='';
Fjdiskrit.Fjdtebal.Text:='';
Fjdiskrit.Fjdlebar.Text:='';
Fjdiskrit.Ejddiam.Text:='';
Fjdiskrit.Ejddial.Text:='';
Fjdiskrit.Ejdnm.Text:='';
Fjdiskrit.Ejdnl.Text:='';
for u:=1 to 255 do
begin
finput1.StringGridBeban.Cells[1,u]:='';
finput1.StringGridBeban.Cells[2,u]:='';
finput1.StringGridBeban.Cells[3,u]:='';
finput1.StringGridBeban.Cells[4,u]:='';
finput1.StringGridBeban.Cells[5,u]:='';
finput1.StringGridjoint.Cells[1,u]:='';
finput1.StringGridjoint.Cells[2,u]:='';
end;
for u:= 0 to 31 do
begin
fdatainput.StringInput.Cells[1,u]:='';
fdatainput.StringInput.Cells[2,u]:='';
fdatainput.StringInput.Cells[3,u]:='';
fdatainput.StringInput.Cells[4,u]:='';
fdatainput.StringInput.Cells[5,u]:='';
fdatainput.StringInput.Cells[6,u]:='';
end;
fkerja.Ebbeton.Text:='';
fkerja.Ebbaja.Text:='';
fkerja.Epmati.Text:='';
fkerja.Epinalti.Text:='';
end;

procedure TFout.BtutupClick(Sender: TObject);
begin
close;
fout.List1.Clear;
fkerja.Close;
fdatainput.Close;
Fjdiskrit.close;
finput1.Close;
end;

end.
```



STRUCTURAL ANALYSIS PROGRAMS

VERSION P5.40

```
 UNIT KNm  ANALISIS PONDASI-9

SYSTEM
L=1

JOINTS
1    X=0  Y=0.00  Z=0.00
1025      Y=4.00  Z=0.00   g=1,1025,1
2049      Y=5.00  Z=0.00   g=1025,2049,1

restraints
1 2049 1    R=1,0,0,0,1,1
1 2049 2048 R=1,1,0,0,1,1

springs
1             k=0,0,112.5,0,0,0
2   512   1   k=0,0,225,0,0,0
513           k=0,0,225,0,0,0
514 1024  1   k=0,0,256.25,0,0,0
1025          k=0,0,156.25,0,0,0
1026 1536 1   k=0,0,62.5,0,0,0
1537          k=0,0,65.625,0,0,0
1538 2048 1   k=0,0,68.75,0,0,0
2049          k=0,0,34.375,0,0,0

FRAME
NM=4    NL=4   nsec=1  Z=-1
C PROPERTIES ELEMEN
1 SH=R  T=0.8,1.8       w=0.8*1.8*23    E=23715000
2 SH=R  T=0.8,2.0       w=0.8*2.0*23
3 SH=R  T=0.8,2.0       w=0.8*2.0*23
4 SH=R  T=0.8,2.2       w=0.8*2.2*23
C BEBAN
1 WG=0.00,0.00,-59.4
2 WG=0.00,0.00,-66
3 WG=0.00,0.00,-66
4 WG=0.00,0.00,-72.6
C PONDASI
1,1,2           M=1          NSL=1      g=511,1,1,1     1P=3,0
513,513,514     M=2          NSL=2      g=511,1,1,1
1025,1025,1026  M=3          NSL=3      g=511,1,1,1
1537,1537,1538  M=4          NSL=4      g=511,1,1,1

loads
1    f=0,0,-1000
1025 f=0,0,-1500
```

Mr. Irsan

PROGRAM:SAP90/FILE:edy_pon9.F3F

UNIT KNm ANALISIS PONDASI-9

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
1								
	1	0.000			0.000			
		0.000	-998.620	0.000				
		0.004	-998.981	-3.902				
		0.004			0.000			
2								
	1	0.000			0.000			
		0.000	-996.222	-3.902				
		0.004	-996.583	-7.794				
		0.004			0.000			
3								
	1	0.000			0.000			
		0.000	-993.825	-7.794				
		0.004	-994.187	-11.677				
		0.004			0.000			
4								
	1	0.000			0.000			
		0.000	-991.430	-11.677				
		0.004	-991.792	-15.550				
		0.004			0.000			
5								
	1	0.000			0.000			
		0.000	-989.037	-15.550				
		0.004	-989.398	-19.414				
		0.004			0.000			
6								
	1	0.000			0.000			
		0.000	986.644	19.414				
		0.004	-987.006	-23.269				
		0.004			0.000			
7								
	1	0.000			0.000			
		0.000	-984.254	-23.269				
		0.004	-984.615	-27.114				
		0.004			0.000			
8								
	1	0.000			0.000			
		0.000	-981.864	-27.114				
		0.004	-982.226	-30.951				
		0.004			0.000			
9								
	1	0.000			0.000			
		0.000	-979.477	-30.951				
		0.004	-979.838	-34.777				
		0.004			0.000			
10								
	1	0.000			0.000			
		0.000	-977.090	-34.777				
		0.004	-977.452	-38.595				
		0.004			0.000			
11								
	1	0.000			0.000			
		0.000	-974.705	-38.595				
		0.004	-975.067	-42.403				
		0.004			0.000			
12								
	1	0.000			0.000			
		0.000	-972.322	-42.403				
		0.004	-972.683	-46.202				
		0.004			0.000			

UNIT KNm ANALISIS PONDASI-9

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
511								
	1	0.000			0.000			
		0.000	57.738	-888.754				
		0.004	57.376	-888.530				
		0.004			0.000			
512								
	1	0.000			0.000			
		0.000	59.542	-888.530				
		0.004	59.180	-888.298				
		0.004			0.000			
513								
	1	0.000			0.000			
		0.000	61.345	-888.298				
		0.004	60.944	-888.059				
		0.004			0.000			
514								
	1	0.000			0.000			
		0.000	63.409	-888.059				
		0.004	63.007	-887.812				
		0.004			0.000			
515								
	1	0.000			0.000			
		0.000	65.471	-887.812				
		0.004	65.069	-887.557				
		0.004			0.000			
516								
	1	0.000			0.000			
		0.000	67.532	-887.557				
		0.004	67.131	-887.294				
		0.004			0.000			
517								
	1	0.000			0.000			
		0.000	69.593	-887.294				
		0.004	69.191	-887.023				
		0.004			0.000			
518								
	1	0.000			0.000			
		0.000	71.653	-887.023				
		0.004	71.251	-886.744				
		0.004			0.000			
519								
	1	0.000			0.000			
		0.000	73.712	-886.744				
		0.004	73.310	-886.457				
		0.004			0.000			
520								
	1	0.000			0.000			
		0.000	75.770	-886.457				
		0.004	75.368	-886.162				
		0.004			0.000			
521								
	1	0.000			0.000			
		0.000	77.827	-886.162				
		0.004	77.426	-885.858				
		0.004			0.000			
522								
	1	0.000			0.000			
		0.000	79.884	-885.858				
		0.004	79.482	-885.547				
		0.004			0.000			

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UNIT KNm ANALISIS PONDASI-9

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
1021								
	1	0.000			0.000			
		0.000	1034.539	216.541				
		0.004	1034.138	220.581				
		0.004			0.000			
1022								
	1	0.000			0.000			
		0.000	1036.357	220.581				
		0.004	1035.956	224.629				
		0.004			0.000			
1023								
	1	0.000			0.000			
		0.000	1038.175	224.629				
		0.004	1037.774	228.683				
		0.004			0.000			
1024								
	1	0.000			0.000			
		0.000	1039.993	228.683				
		0.004	1039.591	232.745				
		0.004			0.000			
1025								
	1	0.000			0.000			
		0.000	-459.055	232.745				
		0.001	-459.156	232.297				
		0.001			0.000			
1026								
	1	0.000			0.000			
		0.000	-458.615	232.297				
		0.001	-458.715	231.849				
		0.001			0.000			
1027								
	1	0.000			0.000			
		0.000	-458.174	231.849				
		0.001	-458.274	231.401				
		0.001			0.000			
1028								
	1	0.000			0.000			
		0.000	-457.733	231.401				
		0.001	-457.834	230.954				
		0.001			0.000			
1029								
	1	0.000			0.000			
		0.000	-457.292	230.954				
		0.001	-457.393	230.508				
		0.001			0.000			
1030								
	1	0.000			0.000			
		0.000	-456.852	230.508				
		0.001	-456.952	230.061				
		0.001			0.000			
1031								
	1	0.000			0.000			
		0.000	-456.411	230.061				
		0.001	-456.511	229.616				
		0.001			0.000			
1032								
	1	0.000			0.000			
		0.000	-455.970	229.616				
		0.001	-456.071	229.170				
		0.001			0.000			

UNIT KNm ANALISIS PONDASI-9

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
1531								
	1	0.000			0.000			
		0.000	-239.319	60.340				
		0.001	-239.420	60.106				
		0.001			0.000			
1532								
	1	0.000			0.000			
		0.000	-238.892	60.106				
		0.001	-238.992	59.873				
		0.001			0.000			
1533								
	1	0.000			0.000			
		0.000	-238.464	59.873				
		0.001	-238.564	59.640				
		0.001			0.000			
1534								
	1	0.000			0.000			
		0.000	-238.036	59.640				
		0.001	-238.137	59.408				
		0.001			0.000			
1535								
	1	0.000			0.000			
		0.000	-237.609	59.408				
		0.001	-237.709	59.175				
		0.001			0.000			
1536								
	1	0.000			0.000			
		0.000	-237.181	59.175				
		0.001	-237.282	58.944				
		0.001			0.000			
1537								
	1	0.000			0.000			
		0.000	-236.727	58.944				
		0.001	-236.838	58.713				
		0.001			0.000			
1538								
	1	0.000			0.000			
		0.000	-236.257	58.713				
		0.001	-236.368	58.482				
		0.001			0.000			
1539								
	1	0.000			0.000			
		0.000	-235.787	58.482				
		0.001	-235.897	58.251				
		0.001			0.000			
1540								
	1	0.000			0.000			
		0.000	-235.317	58.251				
		0.001	-235.427	58.022				
		0.001			0.000			
1541								
	1	0.000			0.000			
		0.000	-234.847	58.022				
		0.001	-234.957	57.792				
		0.001			0.000			
1542								
	1	0.000			0.000			
		0.000	-234.377	57.792				
		0.001	-234.487	57.563				
		0.001			0.000			

UNIT KNm ANALISIS PONDASI-9

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
2041								
	1	0.000			0.000			
		0.000	-3.363	0.014				
		0.001	-3.474	0.011				
		0.001			0.000			
2042								
	1	0.000			0.000			
		0.000	-2.907	0.011				
		0.001	-3.018	0.008				
		0.001			0.000			
2043								
	1	0.000			0.000			
		0.000	-2.451	0.008				
		0.001	-2.562	0.006				
		0.001			0.000			
2044								
	1	0.000			0.000			
		0.000	-1.996	0.006				
		0.001	-2.106	0.004				
		0.001			0.000			
2045								
	1	0.000			0.000			
		0.000	-1.540	0.004				
		0.001	-1.650	0.002				
		0.001			0.000			
2046								
	1	0.000			0.000			
		0.000	1.084	0.002				
		0.001	-1.195	0.001				
		0.001			0.000			
2047								
	1	0.000			0.000			
		0.000	-0.628	0.001				
		0.001	-0.739	0.000				
		0.001			0.000			
2048								
	1	0.000			0.000			
		0.000	-0.173	0.000				
		0.001	-0.283	0.000				
		0.001			0.000			

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UNIT KNm ANALISIS PONDASI-9

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(Y)	U(Z)	R(X)
1	0.000000	-0.012270	0.001544
2	0.000000	-0.012264	0.001544
3	0.000000	-0.012257	0.001544
4	0.000000	-0.012251	0.001544
5	0.000000	-0.012244	0.001544
6	0.000000	-0.012238	0.001544
7	0.000000	-0.012232	0.001544
8	0.000000	-0.012225	0.001544
9	0.000000	-0.012219	0.001543
10	0.000000	-0.012213	0.001543
11	0.000000	-0.012206	0.001543
12	0.000000	-0.012200	0.001543
13	0.000000	-0.012193	0.001543
14	0.000000	-0.012187	0.001543
15	0.000000	-0.012181	0.001543
16	0.000000	-0.012174	0.001543
17	0.000000	-0.012168	0.001543
18	0.000000	-0.012162	0.001543
19	0.000000	-0.012155	0.001542
20	0.000000	-0.012149	0.001542
21	0.000000	-0.012143	0.001542
22	0.000000	-0.012136	0.001542
23	0.000000	-0.012130	0.001542
24	0.000000	-0.012123	0.001542
25	0.000000	-0.012117	0.001541
26	0.000000	-0.012111	0.001541
27	0.000000	-0.012104	0.001541
28	0.000000	-0.012098	0.001541
29	0.000000	-0.012092	0.001541
30	0.000000	-0.012085	0.001540
31	0.000000	-0.012079	0.001540
32	0.000000	-0.012073	0.001540
33	0.000000	-0.012066	0.001540
34	0.000000	-0.012060	0.001539
35	0.000000	-0.012054	0.001539
36	0.000000	-0.012047	0.001539
37	0.000000	-0.012041	0.001538
38	0.000000	-0.012035	0.001538
39	0.000000	-0.012028	0.001538
40	0.000000	-0.012022	0.001538
41	0.000000	-0.012016	0.001537
42	0.000000	-0.012009	0.001537
43	0.000000	-0.012003	0.001537
44	0.000000	-0.011997	0.001536
45	0.000000	-0.011990	0.001536
46	0.000000	-0.011984	0.001536
47	0.000000	-0.011978	0.001535
48	0.000000	-0.011971	0.001535
49	0.000000	-0.011965	0.001534
50	0.000000	-0.011959	0.001534
51	0.000000	-0.011952	0.001534
52	0.000000	-0.011946	0.001533
53	0.000000	-0.011940	0.001533
54	0.000000	-0.011933	0.001532
55	0.000000	-0.011927	0.001532
56	0.000000	-0.011921	0.001532
57	0.000000	-0.011915	0.001531
58	0.000000	-0.011908	0.001531
59	0.000000	-0.011902	0.001530
60	0.000000	-0.011896	0.001530
61	0.000000	-0.011889	0.001529

UNIT KNm ANALISIS PONDASI-9

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(Y)	U(Z)	R(X)
479	0.000000	-0.009740	0.000927
480	0.000000	-0.009737	0.000926
481	0.000000	-0.009733	0.000924
482	0.000000	-0.009730	0.000922
483	0.000000	-0.009726	0.000920
484	0.000000	-0.009722	0.000918
485	0.000000	-0.009719	0.000916
486	0.000000	-0.009715	0.000914
487	0.000000	-0.009712	0.000912
488	0.000000	-0.009708	0.000910
489	0.000000	-0.009705	0.000908
490	0.000000	-0.009701	0.000906
491	0.000000	-0.009698	0.000905
492	0.000000	-0.009694	0.000903
493	0.000000	-0.009691	0.000901
494	0.000000	-0.009687	0.000899
495	0.000000	-0.009684	0.000897
496	0.000000	-0.009680	0.000895
497	0.000000	-0.009677	0.000893
498	0.000000	-0.009673	0.000891
499	0.000000	-0.009670	0.000889
500	0.000000	-0.009666	0.000887
501	0.000000	-0.009663	0.000885
502	0.000000	-0.009659	0.000884
503	0.000000	-0.009656	0.000882
504	0.000000	-0.009652	0.000880
505	0.000000	-0.009649	0.000878
506	0.000000	-0.009646	0.000876
507	0.000000	-0.009642	0.000874
508	0.000000	-0.009639	0.000872
509	0.000000	-0.009635	0.000870
510	0.000000	-0.009632	0.000868
511	0.000000	-0.009629	0.000866
512	0.000000	-0.009625	0.000864
513	0.000000	-0.009622	0.000863
514	0.000000	-0.009619	0.000861
515	0.000000	-0.009615	0.000859
516	0.000000	-0.009612	0.000857
517	0.000000	-0.009609	0.000856
518	0.000000	-0.009605	0.000854
519	0.000000	-0.009602	0.000852
520	0.000000	-0.009599	0.000851
521	0.000000	-0.009595	0.000849
522	0.000000	-0.009592	0.000847
523	0.000000	-0.009589	0.000845
524	0.000000	-0.009586	0.000844
525	0.000000	-0.009582	0.000842
526	0.000000	-0.009579	0.000840
527	0.000000	-0.009576	0.000839
528	0.000000	-0.009573	0.000837
529	0.000000	-0.009569	0.000835
530	0.000000	-0.009566	0.000833
531	0.000000	-0.009563	0.000832
532	0.000000	-0.009560	0.000830
533	0.000000	-0.009556	0.000828
534	0.000000	-0.009553	0.000827
535	0.000000	-0.009550	0.000825
536	0.000000	-0.009547	0.000823
537	0.000000	-0.009544	0.000822
538	0.000000	-0.009540	0.000820
539	0.000000	-0.009537	0.000818
540	0.000000	-0.009534	0.000816

UNIT KNm ANALISIS PONDASI-9

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(Y)	U(Z)	R(X)
1001	0.000000	-0.008686	0.000369
1002	0.000000	-0.008685	0.000369
1003	0.000000	-0.008684	0.000370
1004	0.000000	-0.008683	0.000370
1005	0.000000	-0.008682	0.000370
1006	0.000000	-0.008681	0.000370
1007	0.000000	-0.008680	0.000371
1008	0.000000	-0.008679	0.000371
1009	0.000000	-0.008678	0.000371
1010	0.000000	-0.008676	0.000372
1011	0.000000	-0.008675	0.000372
1012	0.000000	-0.008674	0.000372
1013	0.000000	-0.008673	0.000373
1014	0.000000	-0.008672	0.000373
1015	0.000000	-0.008671	0.000373
1016	0.000000	-0.008670	0.000374
1017	0.000000	-0.008668	0.000374
1018	0.000000	-0.008667	0.000375
1019	0.000000	-0.008666	0.000375
1020	0.000000	-0.008665	0.000375
1021	0.000000	-0.008664	0.000376
1022	0.000000	-0.008663	0.000376
1023	0.000000	-0.008662	0.000377
1024	0.000000	-0.008661	0.000377
1025	0.000000	-0.008659	0.000378
1026	0.000000	-0.008659	0.000378
1027	0.000000	-0.008659	0.000378
1028	0.000000	-0.008658	0.000378
1029	0.000000	-0.008658	0.000378
1030	0.000000	-0.008657	0.000378
1031	0.000000	-0.008657	0.000378
1032	0.000000	-0.008657	0.000378
1033	0.000000	-0.008656	0.000378
1034	0.000000	-0.008656	0.000379
1035	0.000000	-0.008655	0.000379
1036	0.000000	-0.008655	0.000379
1037	0.000000	-0.008655	0.000379
1038	0.000000	-0.008654	0.000379
1039	0.000000	-0.008654	0.000379
1040	0.000000	-0.008653	0.000379
1041	0.000000	-0.008653	0.000379
1042	0.000000	-0.008652	0.000379
1043	0.000000	-0.008652	0.000379
1044	0.000000	-0.008652	0.000380
1045	0.000000	-0.008651	0.000380
1046	0.000000	-0.008651	0.000380
1047	0.000000	-0.008650	0.000380
1048	0.000000	-0.008650	0.000380
1049	0.000000	-0.008650	0.000380
1050	0.000000	-0.008649	0.000380
1051	0.000000	-0.008649	0.000380
1052	0.000000	-0.008648	0.000380
1053	0.000000	-0.008648	0.000381
1054	0.000000	-0.008648	0.000381
1055	0.000000	-0.008647	0.000381
1056	0.000000	-0.008647	0.000381
1057	0.000000	-0.008646	0.000381
1058	0.000000	-0.008646	0.000381
1059	0.000000	-0.008646	0.000381
1060	0.000000	-0.008645	0.000381
1061	0.000000	-0.008645	0.000381
1062	0.000000	-0.008644	0.000382

UNIT KNm ANALISIS PONDASI-9

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(Y)	U(Z)	R(X)
1541	0.000000	-0.008444	0.000411
1542	0.000000	-0.008444	0.000411
1543	0.000000	-0.008444	0.000411
1544	0.000000	-0.008443	0.000411
1545	0.000000	-0.008443	0.000411
1546	0.000000	-0.008442	0.000411
1547	0.000000	-0.008442	0.000412
1548	0.000000	-0.008442	0.000412
1549	0.000000	-0.008441	0.000412
1550	0.000000	-0.008441	0.000412
1551	0.000000	-0.008440	0.000412
1552	0.000000	-0.008440	0.000412
1553	0.000000	-0.008439	0.000412
1554	0.000000	-0.008439	0.000412
1555	0.000000	-0.008439	0.000412
1556	0.000000	-0.008438	0.000412
1557	0.000000	-0.008438	0.000412
1558	0.000000	-0.008437	0.000412
1559	0.000000	-0.008437	0.000412
1560	0.000000	-0.008436	0.000412
1561	0.000000	-0.008436	0.000412
1562	0.000000	-0.008436	0.000412
1563	0.000000	-0.008435	0.000412
1564	0.000000	-0.008435	0.000412
1565	0.000000	-0.008434	0.000412
1566	0.000000	-0.008434	0.000412
1567	0.000000	-0.008434	0.000412
1568	0.000000	-0.008433	0.000412
1569	0.000000	-0.008433	0.000412
1570	0.000000	-0.008432	0.000412
1571	0.000000	-0.008432	0.000412
1572	0.000000	-0.008431	0.000412
1573	0.000000	-0.008431	0.000412
1574	0.000000	-0.008431	0.000412
1575	0.000000	-0.008430	0.000412
1576	0.000000	-0.008430	0.000412
1577	0.000000	-0.008429	0.000412
1578	0.000000	-0.008429	0.000412
1579	0.000000	-0.008429	0.000412
1580	0.000000	-0.008428	0.000412
1581	0.000000	-0.008428	0.000412
1582	0.000000	-0.008427	0.000412
1583	0.000000	-0.008427	0.000412
1584	0.000000	-0.008426	0.000412
1585	0.000000	-0.008426	0.000412
1586	0.000000	-0.008426	0.000412
1587	0.000000	-0.008425	0.000412
1588	0.000000	-0.008425	0.000412
1589	0.000000	-0.008424	0.000412
1590	0.000000	-0.008424	0.000412
1591	0.000000	-0.008424	0.000413
1592	0.000000	-0.008423	0.000413
1593	0.000000	-0.008423	0.000413
1594	0.000000	-0.008422	0.000413
1595	0.000000	-0.008422	0.000413
1596	0.000000	-0.008421	0.000413
1597	0.000000	-0.008421	0.000413
1598	0.000000	-0.008421	0.000413
1599	0.000000	-0.008420	0.000413
1600	0.000000	-0.008420	0.000413

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UNIT KNm ANALISIS PONDASI-9

J O I N T D I S P L A C E M E N T S

LOAD CONDITION 1 - DISPLACEMENTS "U" AND ROTATIONS "R"

JOINT	U(Y)	U(Z)	R(X)
2001	0.000000	-0.008254	0.000416
2002	0.000000	-0.008254	0.000416
2003	0.000000	-0.008253	0.000416
2004	0.000000	-0.008253	0.000416
2005	0.000000	-0.008252	0.000416
2006	0.000000	-0.008252	0.000416
2007	0.000000	-0.008252	0.000416
2008	0.000000	-0.008251	0.000416
2009	0.000000	-0.008251	0.000416
2010	0.000000	-0.008250	0.000416
2011	0.000000	-0.008250	0.000416
2012	0.000000	-0.008249	0.000416
2013	0.000000	-0.008249	0.000416
2014	0.000000	-0.008249	0.000416
2015	0.000000	-0.008248	0.000416
2016	0.000000	-0.008248	0.000416
2017	0.000000	-0.008247	0.000416
2018	0.000000	-0.008247	0.000416
2019	0.000000	-0.008247	0.000416
2020	0.000000	-0.008246	0.000416
2021	0.000000	-0.008246	0.000416
2022	0.000000	-0.008245	0.000416
2023	0.000000	-0.008245	0.000416
2024	0.000000	-0.008245	0.000416
2025	0.000000	-0.008244	0.000416
2026	0.000000	-0.008244	0.000416
2027	0.000000	-0.008243	0.000416
2028	0.000000	-0.008243	0.000416
2029	0.000000	-0.008243	0.000416
2030	0.000000	-0.008242	0.000416
2031	0.000000	-0.008242	0.000416
2032	0.000000	-0.008241	0.000416
2033	0.000000	-0.008241	0.000416
2034	0.000000	-0.008241	0.000416
2035	0.000000	-0.008240	0.000416
2036	0.000000	-0.008240	0.000416
2037	0.000000	-0.008239	0.000416
2038	0.000000	-0.008239	0.000416
2039	0.000000	-0.008239	0.000416
2040	0.000000	-0.008238	0.000416
2041	0.000000	-0.008238	0.000416
2042	0.000000	-0.008237	0.000416
2043	0.000000	-0.008237	0.000416
2044	0.000000	-0.008236	0.000416
2045	0.000000	-0.008236	0.000416
2046	0.000000	-0.008236	0.000416
2047	0.000000	-0.008235	0.000416
2048	0.000000	-0.008235	0.000416
2049	0.000000	-0.008234	0.000416

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UNIT KNm ANALISIS PONDASI-9

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 1 - FORCES "F" AND MOMENTS "M"

JOINT	F(Z)	M(X)
1	-998.6196	0.0000
2	2.7593	0.0000
3	2.7579	0.0000

UNIT KNm ANALISIS PONDASI-9

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 1 - FORCES "F" AND MOMENTS "M"

JOINT	F(Z)	M(X)
482	2.1892	0.0000
483	2.1884	0.0000
484	2.1875	0.0000
485	2.1867	0.0000
486	2.1859	0.0000
487	2.1851	0.0000
488	2.1843	0.0000
489	2.1835	0.0000
490	2.1827	0.0000
491	2.1820	0.0000
492	2.1812	0.0000
493	2.1804	0.0000
494	2.1796	0.0000
495	2.1788	0.0000
496	2.1780	0.0000
497	2.1772	0.0000
498	2.1764	0.0000
499	2.1757	0.0000
500	2.1749	0.0000
501	2.1741	0.0000
502	2.1733	0.0000
503	2.1726	0.0000
504	2.1718	0.0000
505	2.1710	0.0000
506	2.1703	0.0000
507	2.1695	0.0000
508	2.1687	0.0000
509	2.1680	0.0000
510	2.1672	0.0000
511	2.1664	0.0000
512	2.1657	0.0000
513	2.1649	0.0000
514	2.4648	0.0000
515	2.4639	0.0000
516	2.4631	0.0000
517	2.4622	0.0000
518	2.4614	0.0000
519	2.4605	0.0000
520	2.4597	0.0000
521	2.4588	0.0000
522	2.4580	0.0000
523	2.4571	0.0000
524	2.4563	0.0000
525	2.4555	0.0000
526	2.4546	0.0000
527	2.4538	0.0000
528	2.4530	0.0000
529	2.4521	0.0000
530	2.4513	0.0000
531	2.4505	0.0000
532	2.4497	0.0000
533	2.4488	0.0000
534	2.4480	0.0000
535	2.4472	0.0000
536	2.4464	0.0000
537	2.4456	0.0000
538	2.4448	0.0000
539	2.4439	0.0000
540	2.4431	0.0000
541	2.4423	0.0000
542	2.4415	0.0000
543	2.4407	0.0000

UNIT KNm ANALISIS PONDASI-9

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 1 - FORCES "F" AND MOMENTS "M"

JOINT	F(Z)	M(X)
1001	2.2259	0.0000
1002	2.2256	0.0000
1003	2.2253	0.0000
1004	2.2251	0.0000
1005	2.2248	0.0000
1006	2.2245	0.0000
1007	2.2242	0.0000
1008	2.2239	0.0000
1009	2.2236	0.0000
1010	2.2233	0.0000
1011	2.2230	0.0000
1012	2.2227	0.0000
1013	2.2225	0.0000
1014	2.2222	0.0000
1015	2.2219	0.0000
1016	2.2216	0.0000
1017	2.2213	0.0000
1018	2.2210	0.0000
1019	2.2207	0.0000
1020	2.2204	0.0000
1021	2.2201	0.0000
1022	2.2198	0.0000
1023	2.2196	0.0000
1024	2.2193	0.0000
1025	-1498.6470	0.0000
1026	0.5412	0.0000
1027	0.5412	0.0000
1028	0.5411	0.0000
1029	0.5411	0.0000
1030	0.5411	0.0000
1031	0.5411	0.0000
1032	0.5410	0.0000
1033	0.5410	0.0000
1034	0.5410	0.0000
1035	0.5410	0.0000
1036	0.5409	0.0000
1037	0.5409	0.0000
1038	0.5409	0.0000
1039	0.5409	0.0000
1040	0.5408	0.0000
1041	0.5408	0.0000
1042	0.5408	0.0000
1043	0.5408	0.0000
1044	0.5407	0.0000
1045	0.5407	0.0000
1046	0.5407	0.0000
1047	0.5407	0.0000
1048	0.5406	0.0000
1049	0.5406	0.0000
1050	0.5406	0.0000
1051	0.5406	0.0000
1052	0.5405	0.0000
1053	0.5405	0.0000
1054	0.5405	0.0000
1055	0.5404	0.0000
1056	0.5404	0.0000
1057	0.5404	0.0000
1058	0.5404	0.0000
1059	0.5403	0.0000
1060	0.5403	0.0000
1061	0.5403	0.0000
1062	0.5403	0.0000

UNIT KNm ANALISIS PONDASI-9

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 1 - FORCES "F" AND MOMENTS "M"

JOINT	F(Z)	M(X)
1480	0.5294	0.0000
1481	0.5294	0.0000
1482	0.5293	0.0000
1483	0.5293	0.0000
1484	0.5293	0.0000
1485	0.5293	0.0000
1486	0.5292	0.0000
1487	0.5292	0.0000
1488	0.5292	0.0000
1489	0.5291	0.0000
1490	0.5291	0.0000
1491	0.5291	0.0000
1492	0.5291	0.0000
1493	0.5290	0.0000
1494	0.5290	0.0000
1495	0.5290	0.0000
1496	0.5290	0.0000
1497	0.5289	0.0000
1498	0.5289	0.0000
1499	0.5289	0.0000
1500	0.5289	0.0000
1501	0.5288	0.0000
1502	0.5288	0.0000
1503	0.5288	0.0000
1504	0.5288	0.0000
1505	0.5287	0.0000
1506	0.5287	0.0000
1507	0.5287	0.0000
1508	0.5286	0.0000
1509	0.5286	0.0000
1510	0.5286	0.0000
1511	0.5286	0.0000
1512	0.5285	0.0000
1513	0.5285	0.0000
1514	0.5285	0.0000
1515	0.5285	0.0000
1516	0.5284	0.0000
1517	0.5284	0.0000
1518	0.5284	0.0000
1519	0.5284	0.0000
1520	0.5283	0.0000
1521	0.5283	0.0000
1522	0.5283	0.0000
1523	0.5283	0.0000
1524	0.5282	0.0000
1525	0.5282	0.0000
1526	0.5282	0.0000
1527	0.5281	0.0000
1528	0.5281	0.0000
1529	0.5281	0.0000
1530	0.5281	0.0000
1531	0.5280	0.0000
1532	0.5280	0.0000
1533	0.5280	0.0000
1534	0.5280	0.0000
1535	0.5279	0.0000
1536	0.5279	0.0000
1537	0.5543	0.0000
1538	0.5806	0.0000
1539	0.5806	0.0000
1540	0.5806	0.0000
1541	0.5806	0.0000

UNIT KNm ANALISIS PONDASI-9

R E A C T I O N S A N D A P P L I E D F O R C E S

LOAD CONDITION 1 - FORCES "F" AND MOMENTS "M"

JOINT	F(Z)	M(X)
2001	0.5675	0.0000
2002	0.5674	0.0000
2003	0.5674	0.0000
2004	0.5674	0.0000
2005	0.5673	0.0000
2006	0.5673	0.0000
2007	0.5673	0.0000
2008	0.5673	0.0000
2009	0.5672	0.0000
2010	0.5672	0.0000
2011	0.5672	0.0000
2012	0.5672	0.0000
2013	0.5671	0.0000
2014	0.5671	0.0000
2015	0.5671	0.0000
2016	0.5670	0.0000
2017	0.5670	0.0000
2018	0.5670	0.0000
2019	0.5670	0.0000
2020	0.5669	0.0000
2021	0.5669	0.0000
2022	0.5669	0.0000
2023	0.5668	0.0000
2024	0.5668	0.0000
2025	0.5668	0.0000
2026	0.5668	0.0000
2027	0.5667	0.0000
2028	0.5667	0.0000
2029	0.5667	0.0000
2030	0.5666	0.0000
2031	0.5666	0.0000
2032	0.5666	0.0000
2033	0.5666	0.0000
2034	0.5665	0.0000
2035	0.5665	0.0000
2036	0.5665	0.0000
2037	0.5665	0.0000
2038	0.5664	0.0000
2039	0.5664	0.0000
2040	0.5664	0.0000
2041	0.5663	0.0000
2042	0.5663	0.0000
2043	0.5663	0.0000
2044	0.5663	0.0000
2045	0.5662	0.0000
2046	0.5662	0.0000
2047	0.5662	0.0000
2048	0.5661	0.0000
2049	0.2831	0.0000
TOTAL	0.4986E+03	0.4023E-09

```
UNIT KNm  ANALISIS PONDASI

SYSTEM
L=1

JOINTS
1  X=0  Y=0.00  Z=0.00
81      Y=6.1   Z=0.00   g=1,81,1

restraints
1 81 1  R=1,0,0,0,1,1
1 81 80 R=1,1,0,0,1,1

springs
1  81 80 k=0,0,876.1857,0,0
2 '80 1  k=0,0,1752.3714,0,0,0


FRAME
NM=1     nsec=1  Z=-1
C PROPERTIES ELEMEN
1 SH=R  T=0.508,3.048  w=0    E=22408750
C PONDASI
1,1,2    M=1    g=79,1,1,1  lP=3,0

loads
9   f=0,0,-1378.7
73  f=0,0,-1378.7
```

Mr. Irsan

PROGRAM:SAP90/FILE:kasus1e.F3F

UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
1								
	1	0.000			0.000			
		0.000	20.146	0.000				
		0.076	20.146	1.536				
		0.076			0.000			
2								
	1	0.000			0.000			
		0.000	60.116	1.536				
		0.076	60.116	6.120				
		0.076			0.000			
3								
	1	0.000			0.000			
		0.000	99.764	6.120				
		0.076	99.764	13.727				
		0.076			0.000			
4								
	1	0.000			0.000			
		0.000	139.091	13.727				
		0.076	139.091	24.333				
		0.076			0.000			
5								
	1	0.000			0.000			
		0.000	178.096	24.333				
		0.076	178.096	37.913				
		0.076			0.000			
6								
	1	0.000			0.000			
		0.000	216.781	37.913				
		0.076	216.781	54.442				
		0.076			0.000			
7								
	1	0.000			0.000			
		0.000	255.144	54.442				
		0.076	255.144	73.897				
		0.076			0.000			
8								
	1	0.000			0.000			
		0.000	293.185	73.897				
		0.076	293.185	96.252				
		0.076			0.000			
9								
	1	0.000			0.000			
		0.000	-1047.795	96.252				
		0.076	-1047.795	16.358				
		0.076			0.000			
10								
	1	0.000			0.000			
		0.000	-1010.415	16.358				
		0.076	-1010.415	-60.686				
		0.076			0.000			
11								
	1	0.000			0.000			
		0.000	-973.373	-60.686				
		0.076	-973.373	-134.906				
		0.076			0.000			
12								
	1	0.000			0.000			
		0.000	-936.670	-134.906				
		0.076	-936.670	-206.327				
		0.076			0.000			

UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
13								
	1	0.000			0.000			
		0.000	-900.302	-206.327				
		0.076	-900.302	-274.975				
		0.076			0.000			
14								
	1	0.000			0.000			
		0.000	-864.266	-274.975				
		0.076	-864.266	-340.875				
		0.076			0.000			
15								
	1	0.000			0.000			
		0.000	-828.558	-340.875				
		0.076	-828.558	-404.053				
		0.076			0.000			
16								
	1	0.000			0.000			
		0.000	-793.173	-404.053				
		0.076	-793.173	-464.532				
		0.076			0.000			
17								
	1	0.000			0.000			
		0.000	-758.105	-464.532				
		0.076	-758.105	-522.338				
		0.076			0.000			
18								
	1	0.000			0.000			
		0.000	-723.348	-522.338				
		0.076	-723.348	-577.493				
		0.076			0.000			
19								
	1	0.000			0.000			
		0.000	-688.893	-577.493				
		0.076	-688.893	-630.021				
		0.076			0.000			
20								
	1	0.000			0.000			
		0.000	-654.732	-630.021				
		0.076	-654.732	-679.945				
		0.076			0.000			
21								
	1	0.000			0.000			
		0.000	-620.857	-679.945				
		0.076	-620.857	-727.285				
		0.076			0.000			
22								
	1	0.000			0.000			
		0.000	-587.258	-727.285				
		0.076	-587.258	-772.063				
		0.076			0.000			
23								
	1	0.000			0.000			
		0.000	-553.924	-772.063				
		0.076	-553.924	-814.300				
		0.076			0.000			
24								
	1	0.000			0.000			
		0.000	-520.845	-814.300				
		0.076	-520.845	-854.014				
		0.076			0.000			

UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
25								
	1	0.000			0.000			
		0.000	-488.008	-854.014				
		0.076	-488.008	-891.225				
		0.076			0.000			
26								
	1	0.000			0.000			
		0.000	-455.403	-891.225				
		0.076	-455.403	-925.949				
		0.076			0.000			
27								
	1	0.000			0.000			
		0.000	-423.015	-925.949				
		0.076	423.015	-958.204				
		0.076			0.000			
28								
	1	0.000			0.000			
		0.000	-390.833	-958.204				
		0.076	-390.833	-988.005				
		0.076			0.000			
29								
	1	0.000			0.000			
		0.000	-358.843	-988.005				
		0.076	-358.843	-1015.367				
		0.076			0.000			
30								
	1	0.000			0.000			
		0.000	-327.031	-1015.367				
		0.076	-327.031	-1040.303				
		0.076			0.000			
31								
	1	0.000			0.000			
		0.000	-295.383	-1040.303				
		0.076	-295.383	-1062.826				
		0.076			0.000			
32								
	1	0.000			0.000			
		0.000	-263.884	-1062.826				
		0.076	-263.884	-1082.948				
		0.076			0.000			
33								
	1	0.000			0.000			
		0.000	-232.519	-1082.948				
		0.076	-232.519	-1100.677				
		0.076			0.000			
34								
	1	0.000			0.000			
		0.000	-201.274	-1100.677				
		0.076	-201.274	-1116.024				
		0.076			0.000			
35								
	1	0.000			0.000			
		0.000	-170.132	-1116.024				
		0.076	-170.132	-1128.997				
		0.076			0.000			
36								
	1	0.000			0.000			
		0.000	-139.078	-1128.997				
		0.076	-139.078	-1139.601				
		0.076			0.000			

UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
37								
	1	0.000			0.000			
		0.000	-108.096	-1139.601				
		0.076	-108.096	-1147.844				
		0.076			0.000			
38								
	1	0.000			0.000			
		0.000	-77.171	-1147.844				
		0.076	-77.171	-1153.728				
		0.076			0.000			
39								
	1	0.000			0.000			
		0.000	-46.287	-1153.728				
		0.076	-46.287	-1157.257				
		0.076			0.000			
40								
	1	0.000			0.000			
		0.000	-15.426	-1157.257				
		0.076	-15.426	-1158.434				
		0.076			0.000			
41								
	1	0.000			0.000			
		0.000	15.426	-1158.434				
		0.076	15.426	-1157.257				
		0.076			0.000			
42								
	1	0.000			0.000			
		0.000	46.287	-1157.257				
		0.076	46.287	-1153.728				
		0.076			0.000			
43								
	1	0.000			0.000			
		0.000	77.171	-1153.728				
		0.076	77.171	-1147.844				
		0.076			0.000			
44								
	1	0.000			0.000			
		0.000	108.096	-1147.844				
		0.076	108.096	-1139.601				
		0.076			0.000			
45								
	1	0.000			0.000			
		0.000	139.078	-1139.601				
		0.076	139.078	-1128.997				
		0.076			0.000			
46								
	1	0.000			0.000			
		0.000	170.132	-1128.997				
		0.076	170.132	-1116.024				
		0.076			0.000			
47								
	1	0.000			0.000			
		0.000	201.274	-1116.024				
		0.076	201.274	-1100.677				
		0.076			0.000			
48								
	1	0.000			0.000			
		0.000	232.519	-1100.677				
		0.076	232.519	-1082.948				
		0.076			0.000			

UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
49								
	1	0.000			0.000			
		0.000	263.884	-1082.948				
		0.076	263.884	-1062.826				
		0.076			0.000			
50								
	1	0.000			0.000			
		0.000	295.383	-1062.826				
		0.076	295.383	-1040.303				
		0.076			0.000			
51								
	1	0.000			0.000			
		0.000	327.031	-1040.303				
		0.076	327.031	-1015.367				
		0.076			0.000			
52								
	1	0.000			0.000			
		0.000	358.843	-1015.367				
		0.076	358.843	-988.005				
		0.076			0.000			
53								
	1	0.000			0.000			
		0.000	390.833	-988.005				
		0.076	390.833	-958.204				
		0.076			0.000			
54								
	1	0.000			0.000			
		0.000	423.015	-958.204				
		0.076	423.015	-925.949				
		0.076			0.000			
55								
	1	0.000			0.000			
		0.000	455.403	-925.949				
		0.076	455.403	-891.225				
		0.076			0.000			
56								
	1	0.000			0.000			
		0.000	488.008	-891.225				
		0.076	488.008	-854.014				
		0.076			0.000			
57								
	1	0.000			0.000			
		0.000	520.845	-854.014				
		0.076	520.845	-814.300				
		0.076			0.000			
58								
	1	0.000			0.000			
		0.000	553.924	-814.300				
		0.076	553.924	-772.063				
		0.076			0.000			
59								
	1	0.000			0.000			
		0.000	587.258	-772.063				
		0.076	587.258	-727.285				
		0.076			0.000			
60								
	1	0.000			0.000			
		0.000	620.857	-727.285				
		0.076	620.857	-679.945				

0.076 0.000

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UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

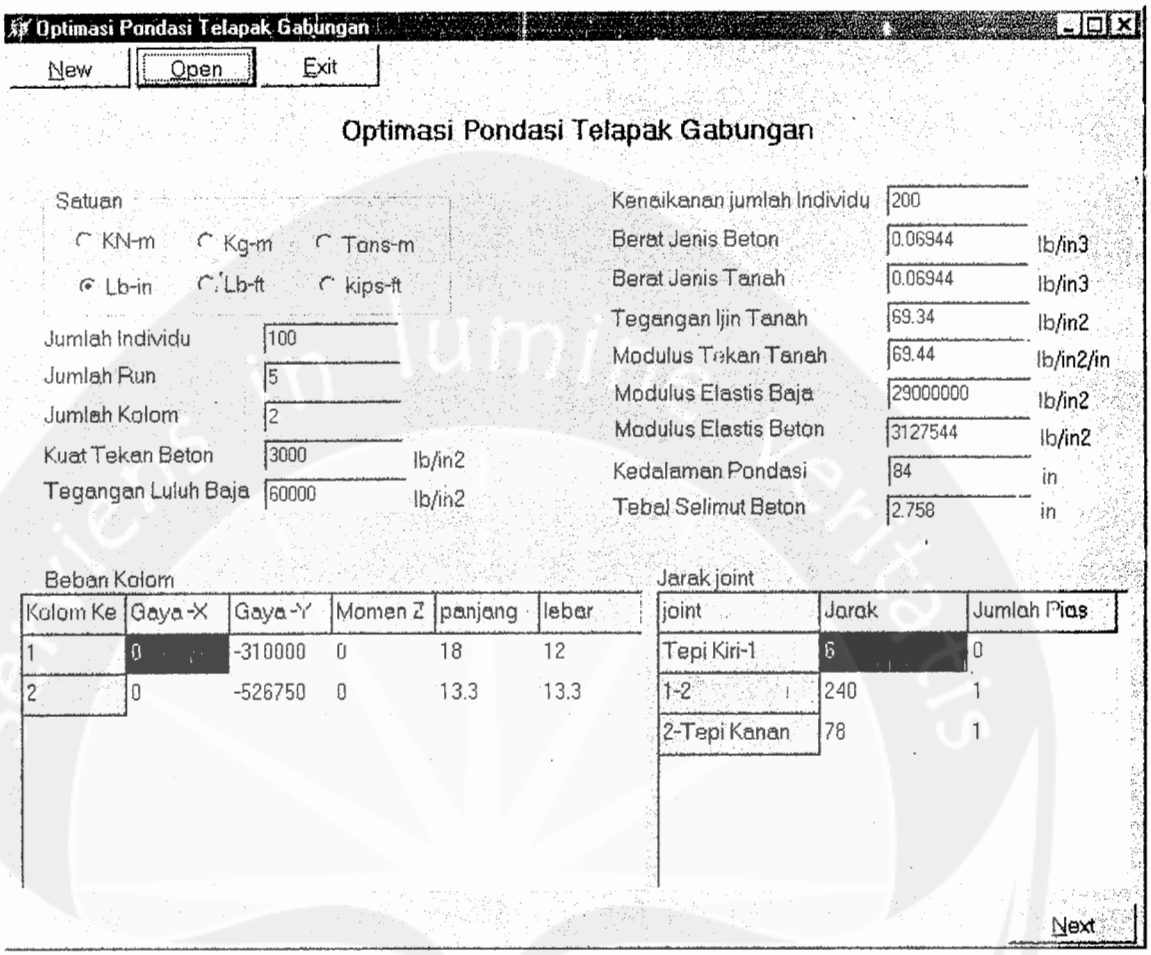
ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
61								
	1	0.000			0.000			
		0.000	654.732	-679.945				
		0.076	654.732	-630.021				
		0.076			0.000			
62								
	1	0.000			0.000			
		0.000	688.893	-630.021				
		0.076	688.893	-577.493				
		0.076			0.000			
63								
	1	0.000			0.000			
		0.000	723.348	-577.493				
		0.076	723.348	-522.338				
		0.076			0.000			
64								
	1	0.000			0.000			
		0.000	758.105	-522.338				
		0.076	758.105	-464.532				
		0.076			0.000			
65								
	1	0.000			0.000			
		0.000	793.173	-464.532				
		0.076	793.173	-404.053				
		0.076			0.000			
66								
	1	0.000			0.000			
		0.000	828.558	-404.053				
		0.076	828.558	-340.875				
		0.076			0.000			
67								
	1	0.000			0.000			
		0.000	864.266	-340.875				
		0.076	864.266	-274.975				
		0.076			0.000			
68								
	1	0.000			0.000			
		0.000	900.302	-274.975				
		0.076	900.302	-206.327				
		0.076			0.000			
69								
	1	0.000			0.000			
		0.000	936.670	-206.327				
		0.076	936.670	-134.906				
		0.076			0.000			
70								
	1	0.000			0.000			
		0.000	973.373	-134.906				
		0.076	973.373	-60.686				
		0.076			0.000			
71								
	1	0.000			0.000			
		0.000	1010.415	-60.686				
		0.076	1010.415	16.358				
		0.076			0.000			
72								
	1	0.000			0.000			
		0.000	1047.795	16.358				
		0.076	1047.795	96.252				

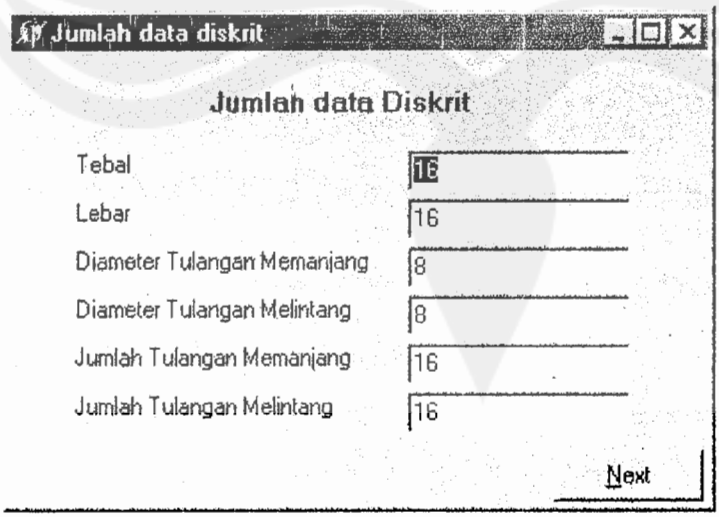
0.076 0.000

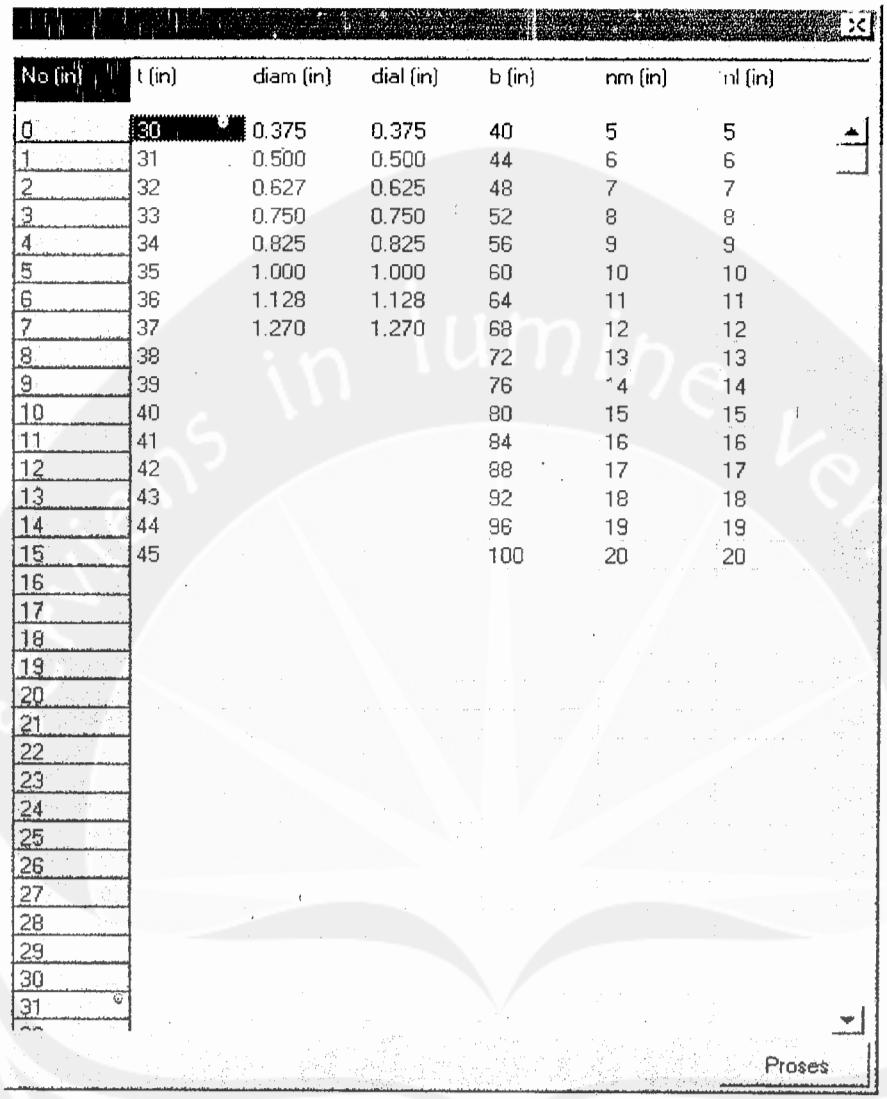
UNIT KNm ANALISIS PONDASI

F R A M E E L E M E N T F O R C E S

ELT ID	LOAD COND	DIST ENDI	1-2 PLANE SHEAR	1-2 PLANE MOMENT	AXIAL FORCE	1-3 PLANE SHEAR	1-3 PLANE MOMENT	AXIAL TORQ
73								
	1	0.000			0.000			
		0.000	-293.185	96.252				
		0.076	-293.185	73.897				
		0.076			0.000			
74								
	1	0.000			0.000			
		0.000	-255.144	73.897				
		0.076	-255.144	54.442				
		0.076			0.000			
75								
	1	0.000			0.000			
		0.000	-216.781	54.442				
		0.076	-216.781	37.913				
		0.076			0.000			
76								
	1	0.000			0.000			
		0.000	-178.096	37.913				
		0.076	-178.096	24.333				
		0.076			0.000			
77								
	1	0.000			0.000			
		0.000	-139.091	24.333				
		0.076	-139.091	13.727				
		0.076			0.000			
78								
	1	0.000			0.000			
		0.000	-99.764	13.727				
		0.076	-99.764	6.120				
		0.076			0.000			
79								
	1	0.000			0.000			
		0.000	-60.116	6.120				
		0.076	-60.116	1.536				
		0.076			0.000			
80								
	1	0.000			0.000			
		0.000	-20.146	1.536				
		0.076	-20.146	0.000				
		0.076			0.000			

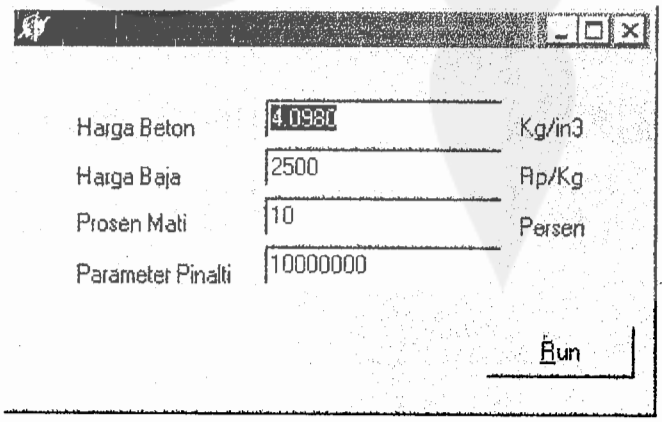

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu
100
Jumlah Run
5
Jumlah Kolom
2
Kuat Tekan Beton
3000
lb/in2
Tegangan Luluh Baja
60000
lb/in2
Kenaikanan jumlah Individu
200
Berat Jenis Beton
0.06944
lb/in3
Berat Jenis Tanah
0.06944
lb/in3
Tegangan Ijin Tanah
69.34
lb/in2
Modulus Tekan Tanah
69.44
lb/in2/in
Modulus Elastis Baja
29000000
lb/in2
Modulus Elastis Beton
3127544
lb/in2
Kedalaman Pondasi
84
in
Tebal Selimut Beton
2.758
in
Beban Kolom
Kolom Ke
Gaya -X
Gaya -Y
Momen Z
panjang
lebar
1
0
-310000
0
18
12
2
0
-526750
0
13.3
13.3
Jarak joint
joint
Jarak
Jumlah Pias
Tepi Kiri-1
6
0
1-2
240
1
2-Tepi Kanan
78
1
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal
16
Lebar
16
Diameter Tulangan Memanjang
8
Diameter Tulangan Melintang
8
Jumlah Tulangan Memanjang
16
Jumlah Tulangan Melintang
16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                          = 1
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 57
Parameter Pinalti               = 10000000
Fitnes                          = 1.84734010396943
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5413188.38827389
string                          =
10111010000100010000100011011101101001
t     = 41
diam  = 1.000
dial  = 0.375
b1    = 76
b2    = 76
b3    = 68
nm1   = 8
nm2   = 12
nl1   = 11
nl2   = 14
Jam Mulai    = 5/27/02 2:39:29 PM
Jam Selesai = 5/27/02 2:39:32 PM

Run Ke                          = 2
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 58
Parameter Pinalti               = 10000000
Fitnes                          = 1.76599604496529
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5662526.83776342
string                          =
01011010011000100100010010100101101001
t     = 35
diam  = 1.000
dial  = 0.500
b1    = 92
b2    = 96
b3    = 60
nm1   = 7
nm2   = 15
nl1   = 11
nl2   = 14
Jam Mulai    = 5/27/02 2:39:32 PM
Jam Selesai = 5/27/02 2:39:36 PM

Run Ke                          = 3
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 44
Parameter Pinalti               = 10000000
Fitnes                          = 1.79036380585217
Pelanggaran Kendala             =
0.00614745674612593
Fungsi Tujuan                   = 5523982.40352586
string                          =
10011100110101011000000001010100100000
t     = 39
diam  = 1.128
dial  = 0.750
b1    = 80
b2    = 84
b3    = 60
nm1   = 6
nm2   = 10
nl1   = 7
nl2   = 5
Jam Mulai    = 5/27/02 2:39:36 PM
Jam Selesai = 5/27/02 2:39:38 PM

Run Ke                          = 4
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 50
Parameter Pinalti               = 10000000
Fitnes                          = 1.9051020033552
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5249062.77059619
string                          =
11011000100011001100010101101100000001
t     = 43
diam  = 0.825
dial  = 0.625
b1    = 72
b2    = 72
b3    = 60
nm1   = 10
nm2   = 16
nl1   = 5
nl2   = 6
Jam Mulai    = 5/27/02 2:39:38 PM
Jam Selesai = 5/27/02 2:39:41 PM

Run Ke                          = 5
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 57
Parameter Pinalti               = 10000000
Fitnes                          = 1.87364314672897
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5337195.62204687
string                          =
11011000000100001100000101011100000111000
t     = 43
diam  = 0.825
dial  = 0.375
b1    = 76
b2    = 72
b3    = 60
nm1   = 10
nm2   = 17
nl1   = 10
nl2   = 13
Jam Mulai    = 5/27/02 2:39:41 PM
Jam Selesai = 5/27/02 2:39:44 PM

Run Ke                          = 1
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 64
Parameter Pinalti               = 10000000
Fitnes                          = 1.85087295119126
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5402855.98401761
string                          =
10101010100101010100000010011100000001
t     = 40
diam  = 1.000
dial  = 0.625
b1    = 80
b2    = 80
b3    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 6
Jam Mulai    = 5/27/02 2:39:44 PM
Jam Selesai = 5/27/02 2:39:54 PM

Run Ke                          = 2
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 78
Parameter Pinalti               = 10000000
Fitnes                          = 1.91471799888979
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5222701.20498074
string                          =
11011010010011001100000010011000000010
```

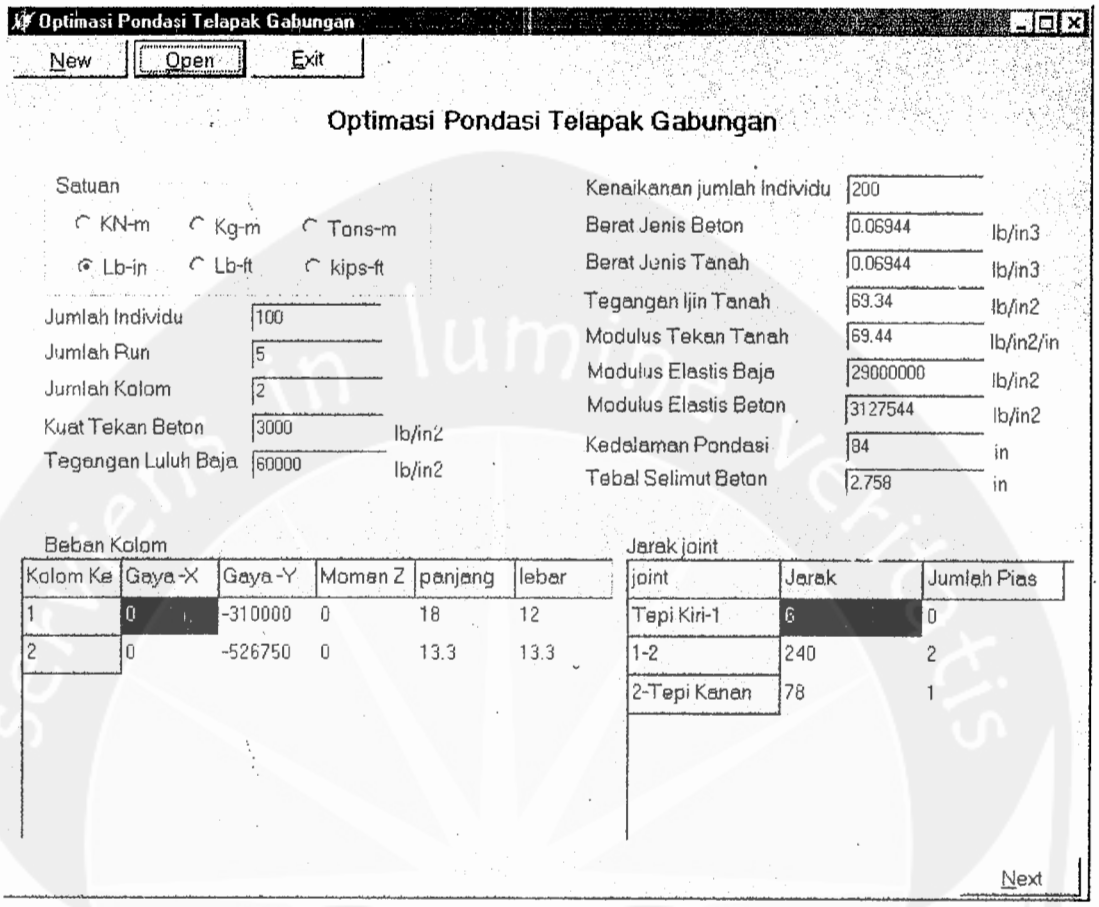
```
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
n11    = 5
n12    = 7
Jam Mulai    = 5/27/02 2:39:54 PM
Jam Selesai = 5/27/02 2:40:05 PM

Run Ke                          = 3
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 63
Parameter Pinalti               = 10000000
Fitnes                          = 1.88676780104293
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5300069.24777515
string                          =
10111100010100010000110000010000000011
t      = 41
diam   = 1.128
dial   = 0.500
b1     = 76
b2     = 76
b3     = 72
nm1    = 5
nm2    = 9
n11    = 7
n12    = 8
Jam Mulai    = 5/27/02 2:40:05 PM
Jam Selesai = 5/27/02 2:40:14 PM

Run Ke                          = 4
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 63
Parameter Pinalti               = 10000000
Fitnes                          = 1.86886947921975
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5350828.4613728
string                          =
11011000100100001100000110101100000000
t      = 43
diam   = 0.825
dial   = 0.625
b1     = 76
b2     = 72
b3     = 60
nm1    = 11
nm2    = 16
n11    = 5
n12    = 5
Jam Mulai    = 5/27/02 2:40:14 PM
Jam Selesai = 5/27/02 2:40:24 PM

Run Ke                          = 5
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 56
Parameter Pinalti               = 10000000
Fitnes                          = 1.87007012336027
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5347393.06033687
string                          =
10111010010100010000100010011100000011
t      = 41
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 76
b3     = 68
nm1    = 7
nm2    = 12
n11    = 5
n12    = 8
Jam Mulai    = 5/27/02 2:40:24 PM
Jam Selesai = 5/27/02 2:40:32 PM

Run Ke                          = 1
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 71
Parameter Pinalti               = 10000000
Fitnes                          = 1.91471799888979
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5222701.20498074
string                          =
11011010010011001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
n11    = 5
n12    = 7
Jam Mulai    = 5/27/02 2:40:32 PM
Jam Selesai = 5/27/02 2:40:50 PM

Run Ke                          = 2
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 71
Parameter Pinalti               = 10000000
Fitnes                          = 1.91471799888979
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5222701.20498074
string                          =
11011010010011001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
n11    = 5
n12    = 7
Jam Mulai    = 5/27/02 2:40:50 PM
Jam Selesai = 5/27/02 2:41.08 PM

Run Ke                          = 3
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 1.9101953373102
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5235066.69955612
string                          =
11011010100011001100000010011000000000
t      = 43
diam   = 1.000
dial   = 0.625
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
n11    = 5
n12    = 5
```

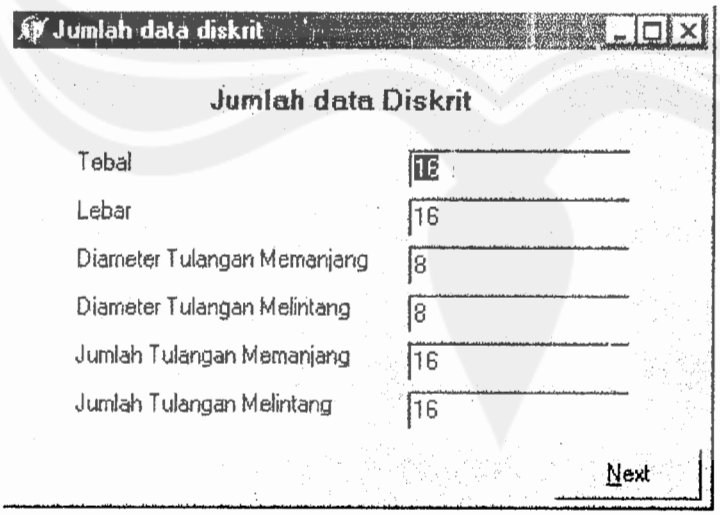
```
Jam Mulai    = 5/27/02 2:41:08 PM
Jam Selesai = 5/27/02 2:41:24 PM

Run Ke                          = 4
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 62
Parameter Pinalti               = 10000000
Fitnes                          = 1.87014882769546
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5347168.01781107
string                          =
10111010000100010000100010011101001001
t      = 41
diam   = 1.000
dial   = 0.375
b1     = 76
b2     = 76
b3     = 68
nm1    = 7
nm2    = 12
nl1    = 9
nl2    = 14
Jam Mulai    = 5/27/02 2:41:24 PM
Jam Selesai = 5/27/02 2:41:39 PM

Run Ke                          = 5
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 64
Parameter Pinalti               = 10000000
Fitnes                          = 1.91471799888979
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5222701.20498074
string                          =
11011010010011001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 2:41:39 PM
Jam Selesai = 5/27/02 2:41:55 PM

Run Ke                          = 1
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 83
Parameter Pinalti               = 10000000
Fitnes                          = 1.87007012336027
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5347393.06033687
string                          =
10111010010100010000100010011100000011
t      = 41
diam   = 1.000
dial   = 0.625
b1     = 76
b2     = 76
b3     = 68
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 2:41:55 PM
Jam Selesai = 5/27/02 2:42:23 PM

Run Ke                          = 2
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 1.88161794084642
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5314575.17645778
string                          =
11011010010100001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 2:42:23 PM
Jam Selesai = 5/27/02 2:42:47 PM

Run Ke                          = 3
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 59
Parameter Pinalti               = 10000000
Fitnes                          = 1.88161794084642
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5314575.17645778
string                          =
11011010010100C011000000100110000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 2:42:47 PM
Jam Selesai = 5/27/02 2:43:07 PM

Run Ke                          = 4
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 68
Parameter Pinalti               = 10000000
Fitnes                          = 1.91565639711151
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5220142.82679273
string                          =
11011010000011001100000010011000110111
t      = 43
diam   = 1.000
dial   = 0.375
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 8
nl2    = 13
Jam Mulai    = 5/27/02 2:43:07 PM
Jam Selesai = 5/27/02 2:43:30 PM

Run Ke                          = 5
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 63
Parameter Pinalti               = 10000000
Fitnes                          = 1.88857657866791
Pelanggaran Kendala             =
0.000297389665058656
```

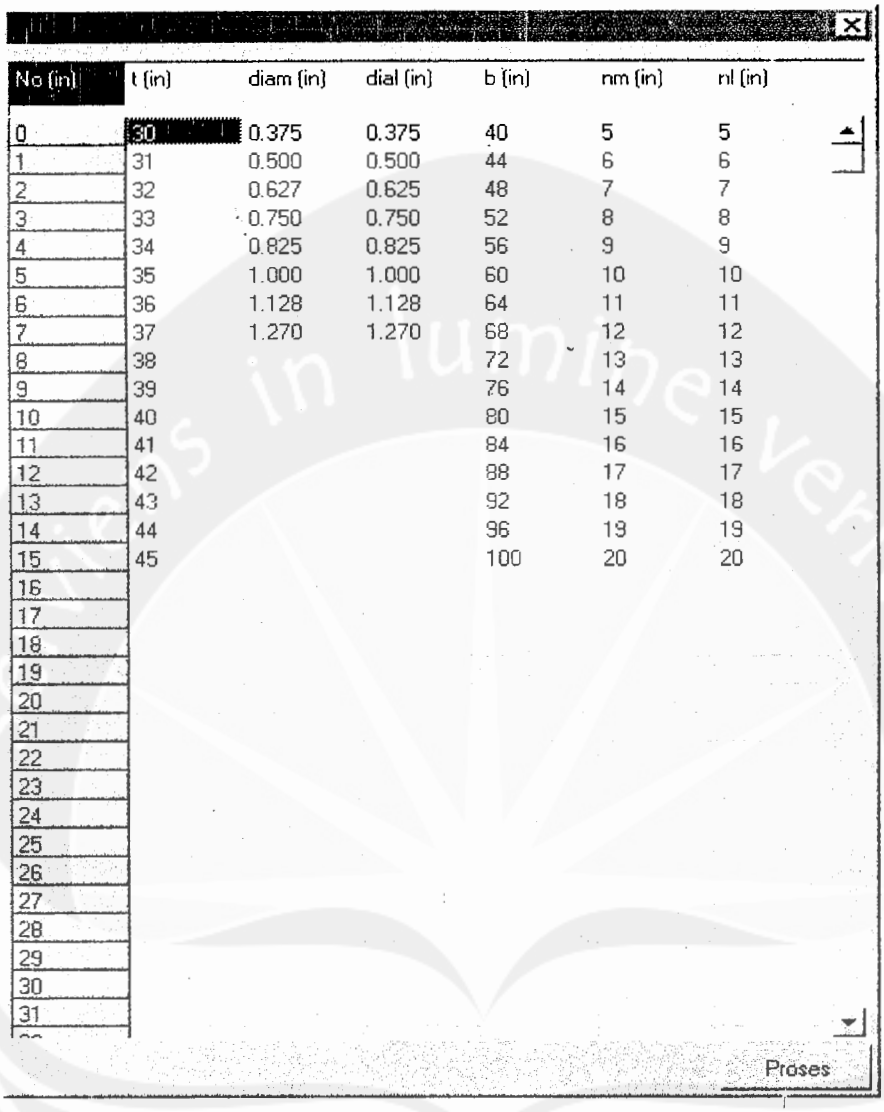
```
Fungsi Tujuan                = 5292019.22830567
string                       =
10111000100100010000010101110000000000
t      = 41
diam   = 0.825
dial   = 0.625
b1     = 76
b2     = 76
b3     = 64
nm1    = 10
nm2    = 17
nl1    = 5
nl2    = 5
Jam Mulai    = 5/27/02 2:43:30 PM
Jam Selesai = 5/27/02 2:43:51 PM

Run Ke                       = 1
jumlah individu              = 900
Konvergen Pada Generasi Ke = 60
Parameter Pinalti            = 10000000
Fitnes                       = 1.87007012336027
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 5347393.06033687
string                       =
10111010010100010000100010011100000011
t      = 41
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 76
b3     = 68
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 8
Jam Mulai    = 5/27/02 2:43:51 PM
Jam Selesai = 5/27/02 2:44:18 PM

Run Ke                       = 2
jumlah individu              = 900
Konvergen Pada Generasi Ke = 67
Parameter Pinalti            = 10000000
Fitnes                       = 1.88161794084642
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 5314575.17645778
string                       =
11011010010100001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 2:44:18 PM
Jam Selesai = 5/27/02 2:44:47 PM

Run Ke                       = 3
jumlah individu              = 900
Konvergen Pada Generasi Ke = 74
Parameter Pinalti            = 10000000
Fitnes                       = 1.91471799888979
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 5222701.20498074
string                       =
11011010010011001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 2:44:47 PM
Jam Selesai = 5/27/02 2:45:19 PM

Run Ke                       = 4
jumlah individu              = 900
Konvergen Pada Generasi Ke = 62
Parameter Pinalti            = 10000000
Fitnes                       = 1.91471799888979
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 5222701.20498074
string                       =
11011010010011001100000010011000000010
t      = 43
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 2:45:19 PM
Jam Selesai = 5/27/02 2:45:47 PM

Run Ke                       = 5
jumlah individu              = 900
Konvergen Pada Generasi Ke = 59
Parameter Pinalti            = 10000000
Fitnes                       = 1.87007012336027
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 5347393.06033687
string                       =
10111010010100010000100010011100000011
t      = 41
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 76
b3     = 72
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 2:45:47 PM
Jam Selesai = 5/27/02 2:46:12 PM

Run Ke                       = 1
jumlah individu              = 1100
Konvergen Pada Generasi Ke = 74
Parameter Pinalti            = 10000000
Fitnes                       = 1.9101953373102
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 5235066.69955612
string                       =
11011010100011001100000010011000000000
t      = 43
diam   = 1.000
dial   = 0.625
b1     = 72
b2     = 72
b3     = 60
nm1    = 7
```

```
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai   = 5/27/02 2:46:12 PM
Jam Selesai = 5/27/02 2:46:52 PM

Run Ke                      = 2
jumlah individu             = 1100
Konvergen Pada Generasi Ke = 81
Parameter Pinalti           = 10000000
Fitnes                      = 1.91471799888979
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5222701.20498074
string                      =
1101101001001100110000010011000000010
t     = 43
diam  = 1.000
dial  = 0.500
b1    = 72
b2    = 72
b3    = 60
nm1   = 7
nm2   = 11
nl1   = 5
nl2   = 7
Jam Mulai   = 5/27/02 2:46:52 PM
Jam Selesai = 5/27/02 2:47:36 PM

Run Ke                      = 3
jumlah individu             = 1100
Konvergen Pada Generasi Ke = 70
Parameter Pinalti           = 10000000
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 2:47:36 PM
Jam Selesai = 5/27/02 2:48:13 PM

Run Ke                      = 4
jumlah individu             = 1100
Konvergen Pada Generasi Ke = 73
Parameter Pinalti           = 10000000
Fitnes                      = 1.91471799888979
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5222701.20498074
string                      =
1101101001001100110000001001100000010
t     = 43
diam  = 1.000
dial  = 0.500
b1    = 72
b2    = 72
b3    = 60
nm1   = 7
nm2   = 11
nl1   = 6
nl2   = 7
Jam Mulai   = 5/27/02 2:48:13 PM
Jam Selesai = 5/27/02 2:48:53 PM

Run Ke                      = 5
jumlah individu             = 1100
Konvergen Pada Generasi Ke = 66
Parameter Pinalti           = 10000000
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 2:48:53 PM
Jam Selesai = 5/27/02 2:49:28 PM

Run Ke                      = 1
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 101
Parameter Pinalti           = 10000000
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 2:49:28 PM
Jam Selesai = 5/27/02 2:50:32 PM

Run Ke                      = 2
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 62
Parameter Pinalti           = 10000000
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 2:50:32 PM
Jam Selesai = 5/27/02 2:51:12 PM

Run Ke                      = 3
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 65
Parameter Pinalti           = 10000000
```

```
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai    = 5/27/02 2:51:12 PM
Jam Selesai = 5/27/02 2:51:53 PM

Run Ke                      = 4
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 120
Parameter Pinalti           = 10000000
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai    = 5/27/02 2:51:53 PM
Jam Selesai = 5/27/02 2:53:09 PM

Run Ke                      = 5
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 63
Parameter Pinalti           = 10000000
Fitnes                      = 1.87007012336027
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5347393.06033687
string                      =
10111010010100010000100010011100000011
t     = 41
diam  = 1.000
dial  = 0.500
b1    = 76
b2    = 76
b3    = 68
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai    = 5/27/02 2:53:09 PM
Jam Selesai = 5/27/02 2:53:50 PM
```

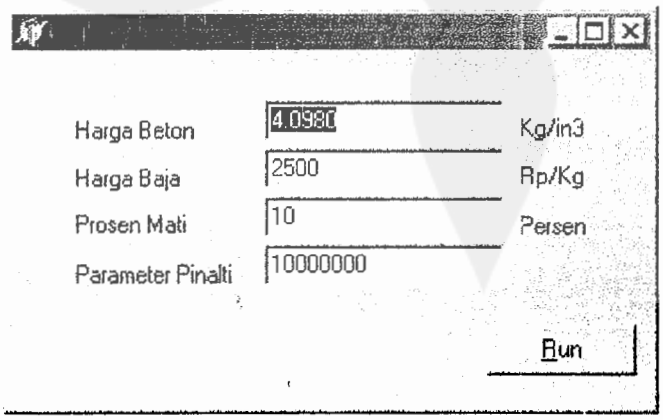

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu 100
Jumlah Run 5
Jumlah Kolom 2
Kuat Tekan Beton 3000 lb/in2
Tegangan Luluh Baja 60000 lb/in2
Kenaikanan jumlah Individu 200
Berat Jenis Beton 0.06944 lb/in3
Berat Jenis Tanah 0.06944 lb/in3
Tegangan Ijin Tanah 69.34 lb/in2
Modulus Tekan Tanah 69.44 lb/in2/in
Modulus Elastis Baja 29000000 lb/in2
Modulus Elastis Beton 3127544 lb/in2
Kedalaman Pondasi 84 in
Tebal Selimut Beton 2.758 in
Beban Kolom
Kolom Ke | Gaya -X | Gaya -Y | Momen Z | panjang | lebar
1 | 0 | -310000 | 0 | 18 | 12
2 | 0 | -526750 | 0 | 13.3 | 13.3
Jarak joint
joint | Jarak | Jumlah Pias
Tepi Kiri-1 | 6 | 0
1-2 | 240 | 2
2-Tepi Kanan | 78 | 1
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal 16
Lebar 16
Diameter Tulangan Memanjang 8
Diameter Tulangan Melintang 8
Jumlah Tulangan Memanjang 16
Jumlah Tulangan Melintang 16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                          = 1
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 59
Parameter Pinalti               = 10000000
Fitnes                          = 2.07633612047238
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4816175.90784143
string                          =
0100101010100100001000000000100111100010110
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 11
Jam Mulai    = 5/27/02 8:21:31 AM
Jam Selesai = 5/27/02 8:21:35 AM

Run Ke                          = 2
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 67
Parameter Pinalti               = 10000000
Fitnes                          = 2.06084146671312
Pelanggaran Kendala             = 0.00371431569320757
Fungsi Tujuan                   = 4815243.67704852
string                          =
1010100010010000000100000001011011000000001
t      = 40
diam   = 0.825
dial   = 0.625
b1     = 76
b2     = 60
b3     = 76
b4     = 60
nm1    = 10
nm2    = 16
nl1    = 5
nl2    = 6
Jam Mulai    = 5/27/02 8:21:35 AM
Jam Selesai = 5/27/02 8:21:40 AM

Run Ke                          = 3
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 51
Parameter Pinalti               = 10000000
Fitnes                          = 1.99343598000123
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5016464.08528948
string                          =
1000101100100000000101000000110110000000010
t      = 38
diam   = 1.000
dial   = 0.825
b1     = 92
b2     = 60
b3     = 80
b4     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:21:40 AM
Jam Selesai = 5/27/02 8:21:43 AM

Run Ke                          = 4
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 53
Parameter Pinalti               = 10000000
Fitnes                          = 2.07216178891287
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4825878.0050405
string                          =
0111110101001110000011000000010011000000011
t      = 37
diam   = 1.000
dial   = 0.625
b1     = 88
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:21:43 AM
Jam Selesai = 5/27/02 8:21:46 AM

Run Ke                          = 5
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 56
Parameter Pinalti               = 10000000
Fitnes                          = 2.06129494736038
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4851319.31886102
string                          =
0101100001100000000011100010110110010101000
t      = 35
diam   = 0.825
dial   = 0.500
b1     = 92
b2     = 60
b3     = 88
b4     = 64
nm1    = 11
nm2    = 17
nl1    = 15
nl2    = 13
Jam Mulai    = 5/27/02 8:21:46 AM
Jam Selesai = 5/27/02 8:21:50 AM

Run Ke                          = 1
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 62
Parameter Pinalti               = 10000000
Fitnes                          = 2.09828029321131
Pelanggaran Kendala             =
0.00276153898316489
Fungsi Tujuan                   = 4738192.12995187
string                          =
0100100010100000000011100100110110000000011
t      = 34
diam   = 0.825
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 68
nm1    = 11
nm2    = 17
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:21:50 AM
Jam Selesai = 5/27/02 8:22:02 AM

Run Ke                          = 2
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 65
```

```
Parameter Pinalti          = 10000000
Fitnes                     = 2.12811677687633
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4698990.25685897
string                     =
00111010101001000010000000001001110001010O
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 9
Jam Mulai    = 5/27/02 8:22:02 AM
Jam Selesai = 5/27/02 8:22:15 AM

Run Ke                     = 3
jumlah individu            = 300
Konvergen Pada Generasi Ke = 85
Parameter Pinalti          = 10000000
Fitnes                     = 2.07474621581383
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4819866.60526451
string                     =
01001011001001000010000000001001110000000O
t      = 34
diam   = 1.000
dial   = 0.825
b1     = 92
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 5
Jam Mulai    = 5/27/02 8:22:15 AM
Jam Selesai = 5/27/02 8:22:32 AM

Run Ke                     = 4
jumlah individu            = 300
Konvergen Pada Generasi Ke = 53
Parameter Pinalti          = 10000000
Fitnes                     = 2.02984104935924
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4926494.12285592
string                     =
01001010101001000010000000001001110001010O
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 9
nm2    = 12
nl1    = 6
nl2    = 9
Jam Mulai    = 5/27/02 8:22:32 AM
Jam Selesai = 5/27/02 8:22:42 AM

Run Ke                     = 5
jumlah individu            = 300
Konvergen Pada Generasi Ke = 67
Parameter Pinalti          = 10000000
Fitnes                     = 2.08682524685863
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4791968.09366445
string                     =
01011010101000000001110000001001110000001l
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:22:42 AM
Jam Selesai = 5/27/02 8:22:55 AM

Run Ke                     = 1
jumlah individu            = 500
Konvergen Pada Generasi Ke = 63
Parameter Pinalti          = 10000000
Fitnes                     = 2.07921093479662
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4809516.83768351
string                     =
10001010100110000001010000001001100000010
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 80
b4     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:22:55 AM
Jam Selesai = 5/27/02 8:23:16 AM

Run Ke                     = 2
jumlah individu            = 500
Konvergen Pada Generasi Ke = 61
Parameter Pinalti          = 10000000
Fitnes                     = 2.08518201427821
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4795744.41536774
string                     =
01001010101001000010000000001001110001001l
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 8
Jam Mulai    = 5/27/02 8:23:16 AM
Jam Selesai = 5/27/02 8:23:36 AM

Run Ke                     = 3
jumlah individu            = 500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti          = 10000000
Fitnes                     = 2.03004989057909
Pelanggaran Kendala        =
0.00152326805154801
```

```
Fungsi Tujuan              = 4910754.62965225
string                     =
0110101010100000000110000101000110000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 9
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:23:36 AM
Jam Selesai = 5/27/02 8:23:58 AM

Run Ke                     = 4
jumlah individu            = 500
Konvergen Pada Generasi Ke = 71
Parameter Pinalti          = 10000000
Fitnes                     = 2.08682524685863
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4791968.09366445
string                     =
0101101010100000000111000000100111100000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:23:58 AM
Jam Selesai = 5/27/02 8:24:21 AM

Run Ke                     = 5
jumlah individu            = 500
Konvergen Pada Generasi Ke = 75
Parameter Pinalti          = 10000000
Fitnes                     = 2.08244478010213
Pelanggaran Kendala        = 0.00152326805154801
Fungsi Tujuan              = 4786815.41965529
string                     =
0110101010100000000110000100100110000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:24:21 AM
Jam Selesai = 5/27/02 8:24:46 AM

Run Ke                     = 1
jumlah individu            = 700
Konvergen Pada Generasi Ke = 72
Parameter Pinalti          = 10000000
Fitnes                     = 2.08185545421396
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4803407.45067514
string                     =
0100101010100100000111001100100111000100011
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 88
b4     = 72
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 8
Jam Mulai    = 5/27/02 8:24:46 AM
Jam Selesai = 5/27/02 8:25:19 AM

Run Ke                     = 2
jumlah individu            = 700
Konvergen Pada Generasi Ke = 68
Parameter Pinalti          = 10000000
Fitnes                     = 2.08177431598886
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4803594.66595201
string                     =
1000101010011000000101000000100111000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 80
b4     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 5/27/02 8:25:19 AM
Jam Selesai = 5/27/02 8:25:50 AM

Run Ke                     = 3
jumlah individu            = 700
Konvergen Pada Generasi Ke = 65
Parameter Pinalti          = 10000000
Fitnes                     = 2.12811677687633
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4698990.25685897
string                     =
0011101010100100001000000000100111000101000
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 9
Jam Mulai    = 5/27/02 8:25:50 AM
Jam Selesai = 5/27/02 8:26:20 AM

Run Ke                     = 4
jumlah individu            = 700
Konvergen Pada Generasi Ke = 88
Parameter Pinalti          = 10000000
Fitnes                     = 2.08185545421396
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4803407.45067514
string                     =
0100101010100100000111001100100111000100011
```

```
t     = 34
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 60
b3    = 88
b4    = 72
nm1   = 7
nm2   = 12
nl1   = 6
nl2   = 8
Jam Mulai   = 5/27/02 8:26:20 AM
Jam Selesai = 5/27/02 8:27:01 AM

Run Ke                        = 5
jumlah individu               = 700
Konvergen Pada Generasi Ke = 63
Parameter Pinalti             = 10000000
Fitnes                        = 2.08451342546113
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4797282.60698912
string                        =
0101110010100000000111000000010100000000011
t     = 35
diam  = 1.128
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 6
nm2   = 9
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:27:01 AM
Jam Selesai = 5/27/02 8:27:30 AM

Run Ke                        = 1
jumlah individu               = 900
Konvergen Pada Generasi Ke = 74
Parameter Pinalti             = 10000000
Fitnes                        = 2.08518201427821
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4795744.41536774
string                        =
0100101010100100001000000000100111100010011
t     = 34
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 60
b3    = 92
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 6
nl2   = 8
Jam Mulai   = 5/27/02 8:27:30 AM
Jam Selesai = 5/27/02 8:28:14 AM

Run Ke                        = 2
jumlah individu               = 900
Konvergen Pada Generasi Ke = 71
Parameter Pinalti             = 10000000
Fitnes                        = 2.08244478010213
Pelanggaran Kendala           = 0.00152326805154801
Fungsi Tujuan                 = 4786815.41965529
string                        =
0110101010100000000110000100100110000000010
t     = 36
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 84
b4    = 64
nm1   = 7
nm2   = 11
nl1   = 5
nl2   = 7
Jam Mulai   = 5/27/02 8:28:14 AM
Jam Selesai = 5/27/02 8:28:56 AM

Run Ke                        = 3
jumlah individu               = 900
Konvergen Pada Generasi Ke = 66
Parameter Pinalti             = 10000000
Fitnes                        = 2.08518201427821
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4795744.41536774
string                        =
0100101010100100001000000000100111100010011
t     = 34
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 60
b3    = 92
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 6
nl2   = 8
Jam Mulai   = 5/27/02 8:28:56 AM
Jam Selesai = 5/27/02 8:29:35 AM

Run Ke                        = 4
jumlah individu               = 900
Konvergen Pada Generasi Ke = 76
Parameter Pinalti             = 10000000
Fitnes                        = 2.1168242864594
Pelanggaran Kendala           =
0.00140199017745313
Fungsi Tujuan                 = 4710037.76515918
string                        =
0110110010011100000110000000000010000000010
t     = 36
diam  = 1.128
dial  = 0.625
b1    = 88
b2    = 60
b3    = 84
b4    = 60
nm1   = 5
nm2   = 9
nl1   = 5
nl2   = 7
Jam Mulai   = 5/27/02 8:29:35 AM
Jam Selesai = 5/27/02 8:30:20 AM

Run Ke                        = 5
jumlah individu               = 900
Konvergen Pada Generasi Ke = 67
Parameter Pinalti             = 10000000
Fitnes                        = 2.08682524685863
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4791968.09366445
string                        =
0101101010100000000111000000010011100000011
t     = 35
diam  = 1.000
dial  = 0.625
```

```
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:30:20 AM
Jam Selesai = 5/27/02 8:31:00 AM

Run Ke                        = 1
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 64
Parameter Pinalti             = 10000000
Fitnes                        = 2.08177431598886
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4803594.66595201
string                        =
10001010100110000001010000001001100000000l
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 84
b2    = 60
b3    = 80
b4    = 60
nm1   = 7
nm2   = 11
nl1   = 5
nl2   = 6
Jam Mulai   = 5/27/02 8:31:00 AM
Jam Selesai = 5/27/02 8:31:47 AM

Run Ke                        = 2
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 61
Parameter Pinalti             = 10000000
Fitnes                        = 2.085523071919O2
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4794960.13956747
string                        =
10001010010110000001010000001001100000l0100
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 84
b2    = 60
b3    = 80
b4    = 60
nm1   = 7
nm2   = 11
nl1   = 6
nl2   = 9
Jam Mulai   = 5/27/02 8:31:47 AM
Jam Selesai = 5/27/02 8:32:33 AM

Run Ke                        = 3
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 69
Parameter Pinalti             = 10000000
Fitnes                        = 2.09048786004583
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4783572.38572089
string                        =
01101010100111000001100000001001l100000010
t     = 36
diam  = 1.000
dial  = 0.625
b1    = 88
b2    = 60
b3    = 84
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 7
Jam Mulai   = 5/27/02 8:32:33 AM
Jam Selesai = 5/27/02 8:33:24 AM

Run Ke                        = 4
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 76
Parameter Pinalti             = 10000000
Fitnes                        = 2.08682524685863
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4791968.09366445
string                        =
01011010101000000001110000001001110000001l
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:33:24 AM
Jam Selesai = 5/27/02 8:34:19 AM

Run Ke                        = 5
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 66
Parameter Pinalti             = 10000000
Fitnes                        = 2.12811677687633
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4698990.25685897
string                        =
00111010101001000010000000001001110001010O
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 60
b3    = 92
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 6
nl2   = 9
Jam Mulai   = 5/27/02 8:34:19 AM
Jam Selesai = 5/27/02 8:35:07 AM

Run Ke                        = 1
jumlah individu               = 1300
Konvergen Pada Generasi Ke = 93
Parameter Pinalti             = 10000000
Fitnes                        = 2.08682524685863
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4791968.09366445
string                        =
01011010101000000001110000001001110000001l
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
```

```
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:35:07 AM
Jam Selesai = 5/27/02 8:36:28 AM

Run Ke                      = 2
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 71
Parameter Pinalti           = 10000000
Fitnes                      = 2.08682524685863
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4791968.09366445
string                      =
01011010101000000001110000001001110000001l
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:36:28 AM
Jam Selesai = 5/27/02 8:37:29 AM

Run Ke                      = 3
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 66
Parameter Pinalti           = 10000000
Fitnes                      = 2.08682524685863
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4791968.09366445
string                      =
01011010101000000001110000001001110000001l
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:37:29 AM
Jam Selesai = 5/27/02 8:38:26 AM

Run Ke                      = 4
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 75
Parameter Pinalti           = 10000000
Fitnes                      = 2.08552307191902
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4794960.13956747
string                      =
10001010010110000001010000001001100001010O
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 84
b2    = 60
b3    = 80
b4    = 60
nm1   = 7
nm2   = 11
nl1   = 6
nl2   = 9
Jam Mulai   = 5/27/02 8:38:26 AM
Jam Selesai = 5/27/02 8:39:31 AM

Run Ke                      = 5
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 74
Parameter Pinalti           = 10000000
Fitnes                      = 2.08682524685863
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4791968.09366445
string                      =
01011010101000000001110000001001110000001l
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 8:39:31 AM
Jam Selesai = 5/27/02 8:40:35 AM

Run Ke                      = 1
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti           = 10000000
Fitnes                      = 2.08552307191902
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4794960.13956747
string                      =
10001010010110000001010000001001100001010O
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 84
b2    = 60
b3    = 80
b4    = 60
nm1   = 7
nm2   = 11
nl1   = 6
nl2   = 9
Jam Mulai   = 5/27/02 8:40:35 AM
Jam Selesai = 5/27/02 8:41:42 AM

Run Ke                      = 2
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 72
Parameter Pinalti           = 10000000
Fitnes                      = 2.08682524685863
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4791968.09366445
string                      =
01011010101000000001110000001001110000001l
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
```

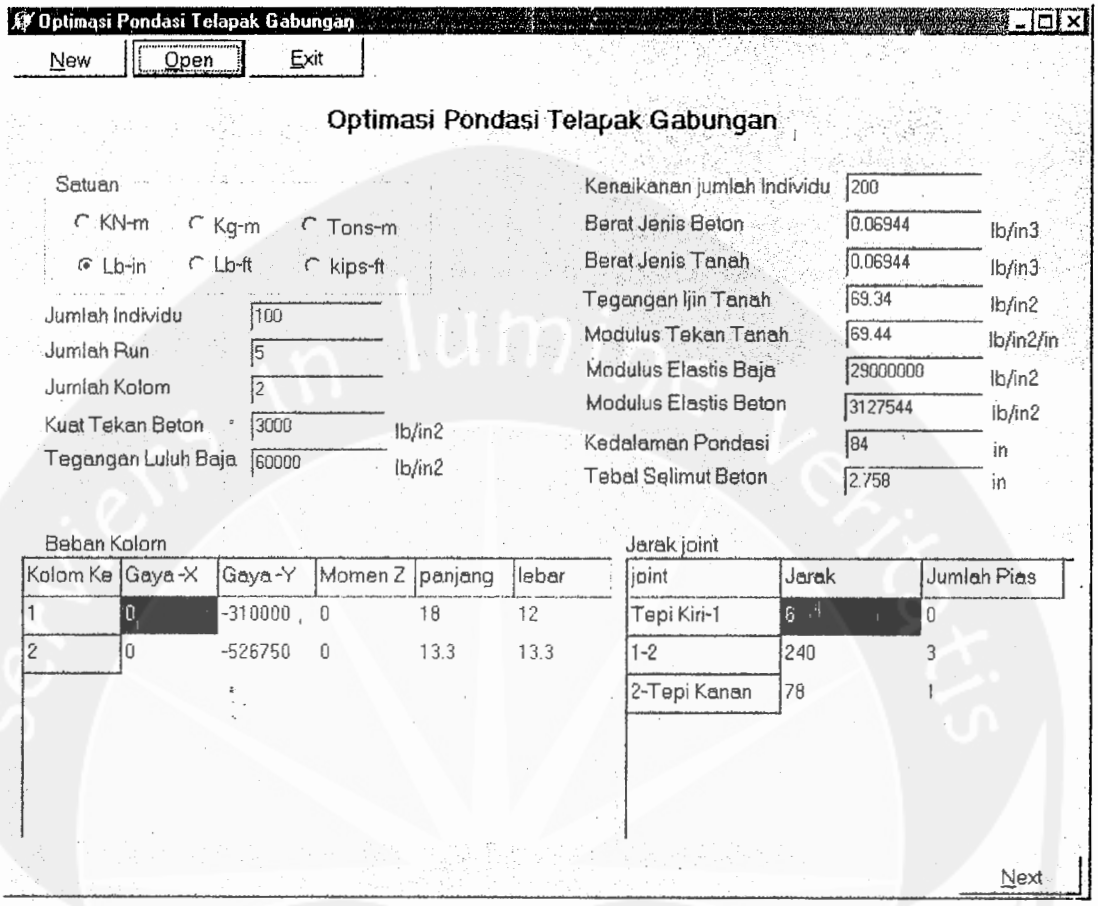
```
Jam Mulai    = 5/27/02 8:41:42 AM
Jam Selesai = 5/27/02 8:42:53 AM

Run Ke                          = 3
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 63
Parameter Pinalti               = 10000000
Fitnes                          = 2.08682524685863
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4791968.09366445
string                          =
010110101010000000011100000010011100000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:42:53 AM
Jam Selesai = 5/27/02 8:43:56 AM

Run Ke                          = 4
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 69
Parameter Pinalti               = 10000000
Fitnes                          = 2.08682524685863
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4791968.09366445
string                          =
010110101010000000011100000010011100000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:43:56 AM
Jam Selesai = 5/27/02 8:45:05 AM

Run Ke                          = 5
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 65
Parameter Pinalti               = 10000000
Fitnes                          = 2.08177431598886
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4803594.66595201
string                          =
100010101001100000010100000010011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 80
b4     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:45:05 AM
Jam Selesai = 5/27/02 8:46:09 AM

Run Ke                          = 1
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 74
Parameter Pinalti               = 10000000
Fitnes                          = 2.08177431598886
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4803594.66595201
string                          =
100010101001100000010100000010011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 80
b4     = 60
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:46:09 AM
Jam Selesai = 5/27/02 8:47:33 AM

Run Ke                          = 2
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 75
Parameter Pinalti               = 10000000
Fitnes                          = 2.12811677687633
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4698990.25685897
string                          =
001110101010010000100000000010011100010100
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 9
Jam Mulai    = 5/27/02 8:47:33 AM
Jam Selesai = 5/27/02 8:48:58 AM

Run Ke                          = 3
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 91
Parameter Pinalti               = 10000000
Fitnes                          = 2.09048786004583
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4783572.38572089
string                          =
011010101001110000011000000010011100000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 88
b2     = 60
b3     = 84
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 8:48:58 AM
Jam Selesai = 5/27/02 8:50:40 AM

Run Ke                          = 4
```

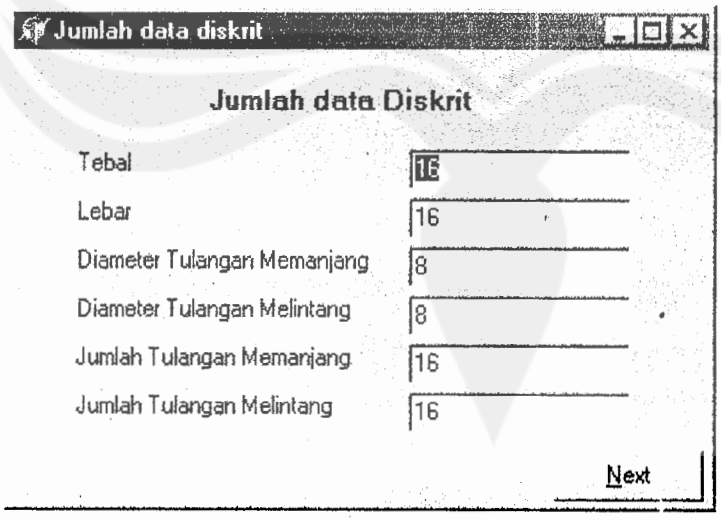
```
jumlah individu            = 1700
Konvergen Pada Generasi Ke = 80
Parameter Pinalti          = 10000000
Fitnes                     = 2.08244478010213
Pelanggaran Kendala        = 0.00152326805154801
Fungsi Tujuan              = 4786815.41965529
string                     =
01101010101000000001100001001011000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
n11    = 5
n12    = 7
Jam Mulai    = 5/27/02 8:50:40 AM
Jam Selesai = 5/27/02 8:52:10 AM

Run Ke                     = 5
jumlah individu            = 1700
Konvergen Pada Generasi Ke = 83
Parameter Pinalti          = 10000000
Fitnes                     = 2.09186043864426
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4780433.6347032
string                     =
01101010010111000001100000001001111001001l0
t      = 36
diam   = 1.000
dial   = 0.500
b1     = 88
b2     = 60
b3     = 84
b4     = 60
nm1    = 7
nm2    = 12
n11    = 7
n12    = 11
Jam Mulai    = 5/27/02 8:52:10 AM
Jam Selesai = 5/27/02 8:53:44 AM

Run Ke                     = 1
jumlah individu            = 1900
Konvergen Pada Generasi Ke = 68
Parameter Pinalti          = 10000000
Fitnes                     = 2.08682524685863
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4791968.09366445
string                     =
01011010101000000001110000001001111000000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
n11    = 5
n12    = 8
Jam Mulai    = 5/27/02 8:53:44 AM
Jam Selesai = 5/27/02 8:55:10 AM

Run Ke                     = 2
jumlah individu            = 1900
Konvergen Pada Generasi Ke = 64
Parameter Pinalti          = 10000000
Fitnes                     = 2.08682524685863
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4791968.09366445
string                     =
01011010101000000001110000001001111000000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
n11    = 5
n12    = 8
Jam Mulai    = 5/27/02 8:55:10 AM
Jam Selesai = 5/27/02 8:56:30 AM

Run Ke                     = 3
jumlah individu            = 1900
Konvergen Pada Generasi Ke = 73
Parameter Pinalti          = 10000000
Fitnes                     = 2.08518201427821
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4795744.41536774
string                     =
01001010101001000010000000001001111000100l1
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
n11    = 6
n12    = 8
Jam Mulai    = 5/27/02 8:56:30 AM
Jam Selesai = 5/27/02 8:58:02 AM

Run Ke                     = 4
jumlah individu            = 1900
Konvergen Pada Generasi Ke = 69
Parameter Pinalti          = 10000000
Fitnes                     = 2.12811677687633
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4698990.25685897
string                     =
00111010101001000010000000001001111000101O0
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
n11    = 6
n12    = 9
Jam Mulai    = 5/27/02 8:58:02 AM
Jam Selesai = 5/27/02 3:59:32 AM

Run Ke                     = 5
jumlah individu            = 1900
Konvergen Pada Generasi Ke = 61
Parameter Pinalti          = 10000000
Fitnes                     = 2.08682524685863
```

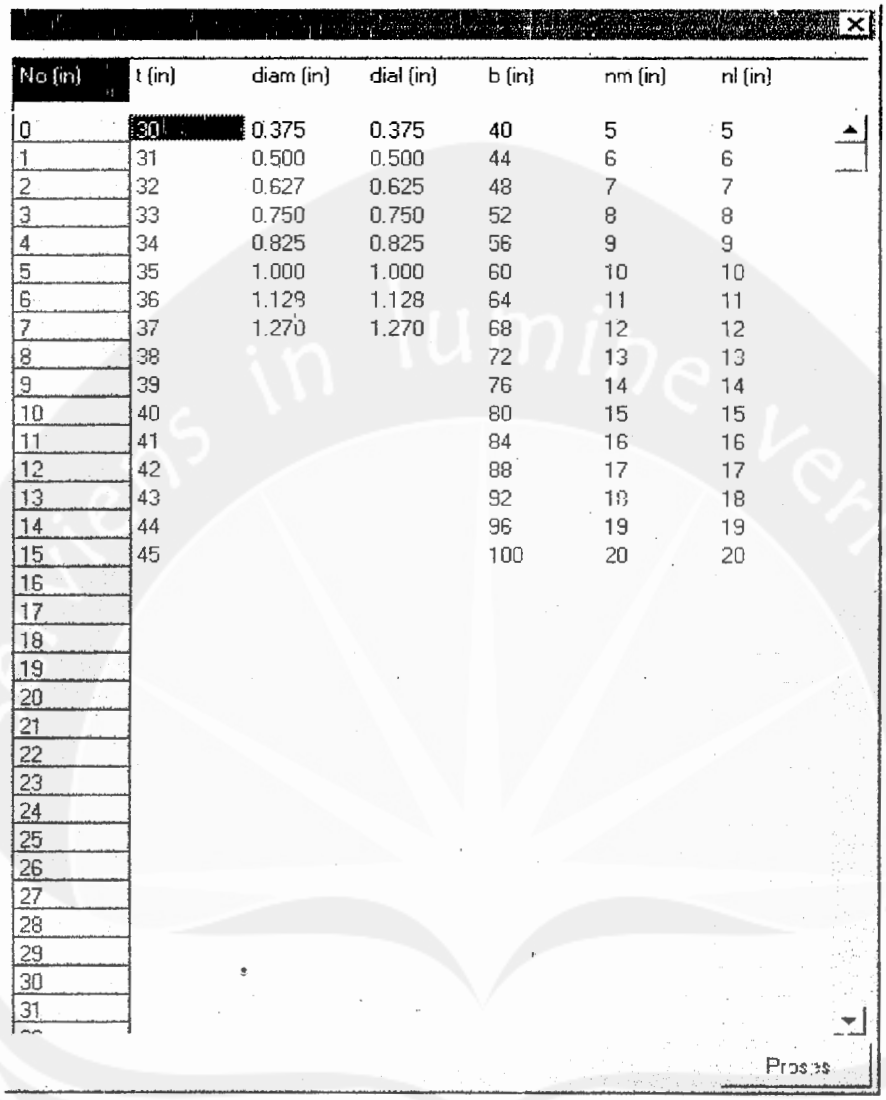
```
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4791968.09366445
string                       =
0101101010100000000111000000100111100000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 8:59:32 AM
Jam Selesai = 5/27/02 9:00:55 AM

Run Ke                       = 1
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 73
Parameter Pinalti            = 10000000
Fitnes                       = 2.08244478010213
Pelanggaran Kendala          = 0.00152326805154801
Fungsi Tujuan                = 4786815.41965529
string                       =
0110101010100000000110000100100111000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 68
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 9:00:55 AM
Jam Selesai = 5/27/02 9:02:43 AM

Run Ke                       = 2
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 68
Parameter Pinalti            = 10000000
Fitnes                       = 2.12811677687633
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4698990.25685897
string                       =
0011101010100100001000000000100111100010100
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 9
Jam Mulai    = 5/27/02 9:02:43 AM
Jam Selesai = 5/27/02 9:04:25 AM

Run Ke                       = 3
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 66
Parameter Pinalti            = 10000000
Fitnes                       = 2.08244478010213
Pelanggaran Kendala          = 0.00152326805154801
Fungsi Tujuan                = 4786815.41965529
string                       =
0110101010100000000110000100100111000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 9:04:25 AM
Jam Selesai = 5/27/02 9:06:01 AM

Run Ke                       = 4
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 63
Parameter Pinalti            = 10000000
Fitnes                       = 2.08244478010213
Pelanggaran Kendala          =
0.00152326805154801
Fungsi Tujuan                = 4786815.41965529
string                       =
0110101010100000000110000100100111000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 9:06:01 AM
Jam Selesai = 5/27/02 9:07:33 AM

Run Ke                       = 5
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 66
Parameter Pinalti            = 10000000
Fitnes                       = 2.08682524685863
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4791968.09366445
string                       =
0101101010100000000111000000100111000000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 9:07:33 AM
Jam Selesai = 5/27/02 9:09:10 AM

Run Ke                       = 1
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 74
Parameter Pinalti            = 10000000
Fitnes                       = 2.08518201427821
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4795744.41536774
```

```
string                          =
0100101010100100001000000001001110001001l
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 8
Jam Mulai    = 5/27/02 9:09:10 AM
Jam Selesai = 5/27/02 9:16:04 AM

Run Ke                          = 2
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 105
Parameter Pinalti               = 10000000
Fitnes                          = 2.08552307191902
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4794960.13956747
string                          =
1000101001011000000101000000100l1000010100
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 80
b4     = 60
nm1    = 7
nm2    = 11
nl1    = 6
nl2    = 9
Jam Mulai    = 5/27/02 9:16:04 AM
Jam Selesai = 5/27/02 9:23:56 AM

Run Ke                          = 3
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 2.08244478010213
Pelanggaran Kendala             = 0.00152326805154801
Fungsi Tujuan                   = 4786815.41965529
string                          =
0110101010100000000110000100100l1000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
nl1    = 6
nl2    = 7
Jam Mulai    = 5/27/02 9:23:56 AM
Jam Selesai = 5/27/02 9:28:10 AM

Run Ke                          = 4
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 68
Parameter Pinalti               = 10000000
Fitnes                          = 2.08518201427821
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4795744.41536774
string                          =
0100101010100100001000000000100l1100010011
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 92
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 6
nl2    = 8
Jam Mulai    = 5/27/02 9:28:10 AM
Jam Selesai = 5/27/02 9:32:22 AM

Run Ke                          = 5
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 64
Parameter Pinalti               = 10000000
Fitnes                          = 2.08682524685863
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4791968.09366445
string                          =
0101101010100000000111000000100l1100000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 88
b4     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 5/27/02 9:32:22 AM
Jam Selesai = 5/27/02 9:36:14 AM

Run Ke                          = 1
jumlah individu                 = 2500
Konvergen Pada Generasi Ke = 76
Parameter Pinalti               = 10000000
Fitnes                          = 2.08244478010213
Pelanggaran Kendala             =
0.00152326805154801
Fungsi Tujuan                   = 4786815.41965529
string                          =
0110101010100000000110000100100l1000000010
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 84
b4     = 64
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 7
Jam Mulai    = 5/27/02 9:36:14 AM
Jam Selesai = 5/27/02 10:34:05 AM

Run Ke                          = 2
jumlah individu                 = 2500
Konvergen Pada Generasi Ke = 69
Parameter Pinalti               = 10000000
Fitnes                          = 2.08682524685863
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4791968.09366445
string                          =
0101101010100000000111000000100l1100000011
t      = 35
```

```
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 10:34:05 AM
Jam Selesai = 5/27/02 11:30:52 AM

Run Ke                    = 3
jumlah individu           = 2500
Konvergen Pada Generasi Ke = 82
Parameter Pinalti         = 10000000
Fitnes                    = 2.08518201427821
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4795744.41536774
string                    =
0100101010100100001000000000100111100010011
t     = 34
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 60
b3    = 92
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 6
nl2   = 8
Jam Mulai   = 5/27/02 11:30:52 AM
Jam Selesai = 5/27/02 12:41:17 PM

Run Ke                    = 4
jumlah individu           = 2500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti         = 10000000
Fitnes                    = 2.08682524685863
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4791968.09366445
string                    =
0101101010100000000111000000100111100000011
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 12:41:17 PM
Jam Selesai = 5/27/02 1:38:07 PM

Run Ke                    = 5
jumlah individu           = 2500
Konvergen Pada Generasi Ke = 72
Parameter Pinalti         = 10000000
Fitnes                    = 2.08682524685863
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4791968.09366445
string                    =
0101101010100000000111000000100111100000011
t     = 35
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 88
b4    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 8
Jam Mulai   = 5/27/02 1:38:07 PM
Jam Selesai = 5/27/02 2:35:24 PM
```

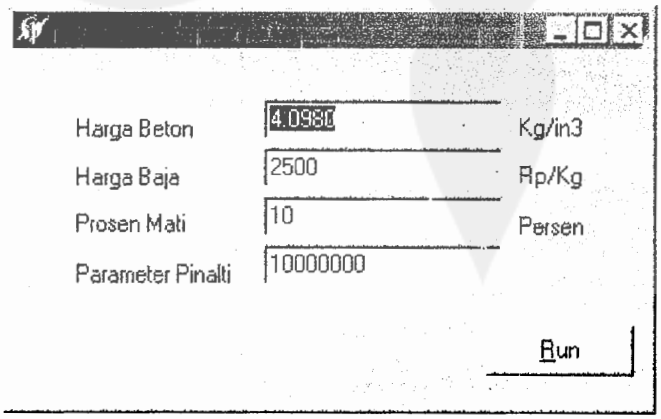

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu
100
Jumlah Run
5
Jumlah Kolom
2
Kuat Tekan Beton
3000
lb/in2
Tegangan Luluh Baja
60000
lb/in2
Kenaikanan jumlah Individu
200
Berat Jenis Beton
0.06944
lb/in3
Berat Jenis Tanah
0.06944
lb/in3
Tegangan Ijin Tanah
69.34
lb/in2
Modulus Tekan Tanah
69.44
lb/in2/in
Modulus Elastis Baja
29000000
lb/in2
Modulus Elastis Beton
3127544
lb/in2
Kedalaman Pondasi
84
in
Tebal Selimut Beton
2.758
in
Beban Kolom
Kolom Ke
Gaya-X
Gaya-Y
Momen Z
panjang
lebar
1
0
-310000
0
18
12
2
0
-526750
0
13.3
13.3
Jarak joint
joint
Jarak
Jumlah Pias
Tepi Kiri-1
0
1-2
240
3
2-Tepi Kanan
78
1
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal
16
Lebar
16
Diameter Tulangan Memanjang
8
Diameter Tulangan Melintang
8
Jumlah Tulangan Memanjang
16
Jumlah Tulangan Melintang
16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                          = 1
jumlah individu                 = 100
Konvergen Pada Generasi Ke = 53
Parameter Pinalti               = 10000000
Fitnes                          = 2.05775721600901
Pelanggaran Kendala             = 0.00249430456938371
Fungsi Tujuan                   = 4834716.7441986
string                          =
1000101001011000000010010100000010011100011000
t      = 38
diam   = 1.000
dial   = 0.500
b1     = 84
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 7
nm2    = 12
n11    = 8
n12    = 17
Jam Mulai    = 6/8/02 5:05:28 PM
Jam Selesai = 6/8/02 5:05:32 PM

Run Ke                          = 2
jumlah individu                 = 100
Konvergen Pada Generasi Ke = 55
Parameter Pinalti               = 10000000
Fitnes                          = 2.01078129351536
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4973191.28253746
string                          =
1010100000010100000001010100001000101101111100
t      = 40
diam   = 0.825
dial   = 0.375
b1     = 80
b2     = 60
b3     = 64
b4     = 80
b5     = 60
nm1    = 13
nm2    = 16
n11    = 12
n12    = 17
Jam Mulai    = 6/8/02 5:05:32 PM
Jam Selesai = 6/8/02 5:05:37 PM

Run Ke                          = 3
jumlah individu                 = 100
Konvergen Pada Generasi Ke = 57
Parameter Pinalti               = 10000000
Fitnes                          = 1.9705861293422
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5074632.2888067
string                          =
1100101000010000000001001100000101011001001000
t      = 42
diam   = 1.000
dial   = 0.375
b1     = 76
b2     = 60
b3     = 64
b4     = 72
b5     = 60
nm1    = 10
nm2    = 11
n11    = 9
n12    = 13
Jam Mulai    = 6/8/02 5:05:37 PM
Jam Selesai = 6/8/02 5:05:41 PM

Run Ke                          = 4
jumlah individu                 = 100
Konvergen Pada Generasi Ke = 57
Parameter Pinalti               = 10000000
Fitnes                          = 1.98575473815988
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5035868.63363933
string                          =
1000100010100000000011010100001000110000000010
t      = 38
diam   = 0.825
dial   = 0.625
b1     = 92
b2     = 60
b3     = 72
b4     = 80
b5     = 60
nm1    = 13
nm2    = 17
n11    = 5
n12    = 7
Jam Mulai    = 6/8/02 5:05:41 PM
Jam Selesai = 6/8/02 5:05:46 PM

Run Ke                          = 5
jumlah individu                 = 100
Konvergen Pada Generasi Ke = 63
Parameter Pinalti               = 10000000
Fitnes                          = 1.98200902812056
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 5045385.69608963
string                          =
1000100001011100000001100000011000101101000110
t      = 38
diam   = 0.825
dial   = 0.500
b1     = 88
b2     = 60
b3     = 64
b4     = 92
b5     = 64
nm1    = 13
nm2    = 16
n11    = 10
n12    = 11
Jam Mulai    = 6/8/02 5:05:46 PM
Jam Selesai = 6/8/02 5:05:51 PM

Run Ke                          = 1
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 72
Parameter Pinalti               = 10000000
Fitnes                          = 2.04614774198392
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4887232.62490524
string                          =
1000101001100000000001001010000001101100010100
t      = 38
diam   = 1.000
dial   = 0.500
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
n11    = 7
n12    = 10
Jam Mulai    = 6/8/02 5:05:51 PM
```

```
Jam Selesai = 6/8/02 5:06:08 PM

Run Ke                        = 2
jumlah individu               = 300
Konvergen Pada Generasi Ke = 72
Parameter Pinalti             = 10000000
Fitnes                        = 1.99388511815469
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 5015334.08768047
string                        =
100110101001100000001001010001010001100000010
t      = 39
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 68
b4     = 80
b5     = 64
nm1    = 9
nm2    = 11
n11    = 5
n12    = 7
Jam Mulai    = 6/8/02 5:06:08 PM
Jam Selesai = 6/8/02 5:06:26 PM

Run Ke                        = 3
jumlah individu               = 300
Konvergen Pada Generasi Ke = 67
Parameter Pinalti             = 10000000
Fitnes                        = 2.007503492514
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4981311.3836614
string                        =
011010101010000000001101110000100011100000011
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 72
b4     = 88
b5     = 60
nm1    = 9
nm2    = 12
n11    = 5
n12    = 8
Jam Mulai    = 6/8/02 5:06:26 PM
Jam Selesai = 6/8/02 5:06:42 PM

Run Ke                        = 4
jumlah individu               = 300
Konvergen Pada Generasi Ke = 79
Parameter Pinalti             = 10000000
Fitnes                        = 2.06419692470529
Pelanggaran Kendala           = 0.00249430456938371
Fungsi Tujuan                 = 4819555.98456595
string                        =
100010100101100000001001010000001001110001010O
t      = 38
diam   = 1.000
dial   = 0.500
b1     = 84
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 7
nm2    = 12
n11    = 6
n12    = 9

Jam Mulai    = 6/8/02 5:06:42 PM
Jam Selesai = 6/8/02 5:07:01 PM

Run Ke                        = 5
jumlah individu               = 300
Konvergen Pada Generasi Ke = 93
Parameter Pinalti             = 10000000
Fitnes                        = 2.08946857684964
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4785905.90487718
string                        =
010110100110010000001101 10000001001110011O111
t      = 35
diam   = 1.000
dial   = 0.500
b1     = 96
b2     = 60
b3     = 72
b4     = 88
b5     = 60
nm1    = 7
nm2    = 12
n11    = 8
n12    = 12
Jam Mulai    = 6/8/02 5:07:04 PM
Jam Selesai = 6/8/02 5:07:23 PM

Run Ke                        = 1
jumlah individu               = 500
Konvergen Pada Generasi Ke = 104
Parameter Pinalti             = 10000000
Fitnes                        = 2.0395406220171
Pelanggaran Kendala           = 0.000352672040179414
Fungsi Tujuan                 = 4899538.16197844
string                        =
011011001010000000001101100100000101000O000010
t      = 36
diam   = 1.128
dial   = 0.625
b1     = 92
b2     = 60
b3     = 72
b4     = 84
b5     = 76
nm1    = 6
nm2    = 9
n11    = 5
n12    = 7
Jam Mulai    = 6/8/02 5:07:23 PM
Jam Selesai = 6/8/02 5:08:05 PM

Run Ke                        = 2
jumlah individu               = 500
Konvergen Pada Generasi Ke = 34
Parameter Pinalti             = 10000000
Fitnes                        = 2.05936950042489
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4855855.15272359
string                        =
101010100101010000001001000000001001100001O011
t      = 40
diam   = 1.000
dial   = 0.500
b1     = 80
b2     = 60
b3     = 68
b4     = 76
b5     = 60
nm1    = 7
nm2    = 11
n11    = 6
```

```
nl2   = 8
Jam Mulai   = 6/8/02 5:08:05 PM
Jam Selesai = 6/8/02 5:08:39 PM

Run Ke                      = 3
jumlah individu             = 500
Konvergen Pada Generasi Ke  = 69
Parameter Pinalti           = 10000000
Fitnes                      = 1.99301546443078
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 5017522.5322981
string                      =
10011010010111000000010110000001000110001001O1
t     = 39
diam  = 1.000
dial  = 0.500
b1    = 88
b2    = 60
b3    = 64
b4    = 84
b5    = 60
nm1   = 9
nm2   = 11
nl1   = 7
nl2   = 10
Jam Mulai   = 6/8/02 5:08:39 PM
Jam Selesai = 6/8/02 5:09:07 PM

Run Ke                      = 4
jumlah individu             = 500
Konvergen Pada Generasi Ke  = 75
Parameter Pinalti           = 10000000
Fitnes                      = 2.06052437734981
Pelanggaran Kendala         = 0.00249430456938371
Fungsi Tujuan               = 4828190.51095048
string                      =
10001010100110000000100101000000100111000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 84
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 6
Jam Mulai   = 6/8/02 5:09:07 PM
Jam Selesai = 6/8/02 5:09:37 PM

Run Ke                      = 5
jumlah individu             = 500
Konvergen Pada Generasi Ke  = 75
Parameter Pinalti           = 10000000
Fitnes                      = 2.05936950042489
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4855855.15272359
string                      =
10101010010101000000100100000000100110000100l1
t     = 40
diam  = 1.000
dial  = 0.500
b1    = 80
b2    = 60
b3    = 68
b4    = 76
b5    = 60
nm1   = 7
nm2   = 11
nl1   = 6
nl2   = 8
Jam Mulai   = 6/8/02 5:09:37 PM
Jam Selesai = 6/8/02 5:10:08 PM

Run Ke                      = 1
jumlah individu             = 700
Konvergen Pada Generasi Ke  = 71
Parameter Pinalti           = 10000000
Fitnes                      = 2.04614774198392
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4887232.62490524
string                      =
10001010011000000000010010100000011011000100100
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
nl1   = 7
nl2   = 9
Jam Mulai   = 6/8/02 5:10:08 PM
Jam Selesai = 6/8/02 5:10:48 PM

Run Ke                      = 2
jumlah individu             = 700
Konvergen Pada Generasi Ke  = 99
Parameter Pinalti           = 10000000
Fitnes                      = 2.01371758619005
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4965939.64743585
string                      =
10001010010111000000100101001001000110001001O0
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 88
b2    = 60
b3    = 68
b4    = 80
b5    = 68
nm1   = 9
nm2   = 11
nl1   = 7
nl2   = 9
Jam Mulai   = 6/8/02 5:10:48 PM
Jam Selesai = 6/8/02 5:11:44 PM

Run Ke                      = 3
jumlah individu             = 700
Konvergen Pada Generasi Ke  = 80
Parameter Pinalti           = 10000000
Fitnes                      = 2.0755223215242
Pelanggaran Kendala         = 0.000848419688310997
Fungsi Tujuan               = 4809580.1025391
string                      =
01101000101000000000110110001001011100000000l0
t     = 36
diam  = 0.825
dial  = 0.625
b1    = 92
b2    = 60
b3    = 72
b4    = 84
b5    = 68
nm1   = 10
```

```
nm2    = 17
nl1    = 5
nl2    = 7
Jam Mulai    = 6/8/02 5:11:44 PM
Jam Selesai = 6/8/02 5:12:29 PM

Run Ke                          = 4
jumlah individu                 = 700
Konvergen Pada Generasi Ke.     = 72
Parameter Pinalti               = 10000000
Fitnes                          = 2.06052437734981
Pelanggaran Kendala             = 0.00249430456938371
Fungsi Tujuan                   = 4828190.51095048
string                          =
1000101010011000000010010100000010011100000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 5:12:29 PM
Jam Selesai = 6/8/02 5:13:10 PM

Run Ke                          = 5
jumlah individu                 = 700
Konvergen Pada Generasi Ke      = 80
Parameter Pinalti               = 10000000
Fitnes                          = 2.00271817846305
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4993213.77692509
string                          =
0110110010101100000010011100000010010000010011
t      = 36
diam   = 1.128
dial   = 0.625
b1     = 104
b2     = 60
b3     = 68
b4     = 88
b5     = 60
nm1    = 7
nm2    = 9
nl1    = 6
nl2    = 8
Jam Mulai    = 6/8/02 5:13:10 PM
Jam Selesai = 6/8/02 5:13:55 PM

Run Ke                          = 1
jumlah individu                 = 900
Konvergen Pada Generasi Ke      = 68
Parameter Pinalti               = 10000000
Fitnes                          = 2.06052437734981
Pelanggaran Kendala             = 0.00249430456938371
Fungsi Tujuan                   = 4828190.51095048
string                          =
1000101010011000000010010100000010011100000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 5:13:55 PM
Jam Selesai = 6/8/02 5:14:45 PM

Run Ke                          = 2
jumlah individu                 = 900
Konvergen Pada Generasi Ke      = 86
Parameter Pinalti               = 10000000
Fitnes                          = 2.00335962708421
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4991615.01749663
string                          =
1010101010010100000010010000000100011000000001
t      = 40
diam   = 1.000
dial   = 0.625
b1     = 80
b2     = 60
b3     = 64
b4     = 80
b5     = 60
nm1    = 9
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 5:14:45 PM
Jam Selesai = 6/8/02 5:15:48 PM

Run Ke                          = 3
jumlah individu                 = 900
Konvergen Pada Generasi Ke      = 66
Parameter Pinalti               = 10000000
Fitnes                          = 2.04407207245959
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4892195.40481624
string                          =
1000101010100000000001001010000001101l000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 5:15:48 PM
Jam Selesai = 6/8/02 5:16:36 PM

Run Ke                          = 4
jumlah individu                 = 900
Konvergen Pada Generasi Ke      = 65
Parameter Pinalti               = 10000000
Fitnes                          = 2.05872633236088
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 4857372.17366445
string                          =
0110101010100000000001101110000001001110000001l
t      = 36
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 72
b4     = 88
```

```
b5    = 60
nm1   = 7
nm2   = 12
n11   = 5
n12   = 7
Jam Mulai   = 6/8/02 5:16:36 PM
Jam Selesai = 6/8/02 5:17:23 PM

Run Ke                      = 5
jumlah individu             = 900
Konvergen Pada Generasi Ke  = 78
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:17:23 PM
Jam Selesai = 6/8/02 5:18:20 PM

Run Ke                      = 1
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 71
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:18:20 PM
Jam Selesai = 6/8/02 5:19:24 PM

Run Ke                      = 2
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 83
Parameter Pinalti           = 10000000
Fitnes                      = 2.05936950042489
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4855855.15272359
string                      =
1010101001010100000010010000000010011000010011
t     = 40
diam  = 1.000
dial  = 0.500
b1    = 80
b2    = 60
b3    = 68
b4    = 76
b5    = 60
nm1   = 7
nm2   = 11
n11   = 6
n12   = 8
Jam Mulai   = 6/8/02 5:19:24 PM
Jam Selesai = 6/8/02 5:20:38 PM

Run Ke                      = 3
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 63
Parameter Pinalti           = 10000000
Fitnes                      = 2.00921313970428
Pelanggaran Kendala         = 0.00249430456938371
Fungsi Tujuan               = 4952129.72094744
string                      =
1000101010011000000010010100001000111000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 84
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 9
nm2   = 12
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:20:38 PM
Jam Selesai = 6/8/02 5:21:34 PM

Run Ke                      = 4
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 84
Parameter Pinalti           = 10000000
Fitnes                      = 2.06321303418459
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4846809.24088488
string                      =
1000101010011100000 1001010010001001 1000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 88
b2    = 60
b3    = 68
b4    = 80
b5    = 68
nm1   = 7
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:21:34 PM
Jam Selesai = 6/8/02 5:22:49 PM

Run Ke                      = 5
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 89
Parameter Pinalti           = 10000000
Fitnes                      = 2.08893092114926
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4787137.71659733
string                      =
0101101010100100000011011100000010011100000011
t     = 36
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 60
```

```
b3    = 72
b4    = 88
b5    = 60
nm1   = 7
nm2   = 12
n11   = 5
n12   = 8
Jam Mulai   = 6/8/02 5:22:49 PM
Jam Selesai = 6/8/02 5:24:08 PM

Run Ke                      = 1
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 69
Parameter Pinalti           = 10000000
Fitnes                      = 2.05528407040287
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4865507.47120803
string                      =
1000110010011100000010010100000001010000000001
t     = 38
diam  = 1.128
dial  = 0.625
b1    = 88
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 6
nm2   = 9
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:24:08 PM
Jam Selesai = 6/8/02 5:25:21 PM

Run Ke                      = 2
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 71
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:25:21 PM
Jam Selesai = 6/8/02 5:26:37 PM

Run Ke                      = 3
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 58
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:26:37 PM
Jam Selesai = 6/8/02 5:27:38 PM

Run Ke                      = 4
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 72
Parameter Pinalti           = 10000000
Fitnes                      = 2.04900979988912
Pelanggaran Kendala         = 0.00282279672959551
Fungsi Tujuan               = 4852178.16865377
string                      =
0111101010100000000001001100000000100111000000010
t     = 37
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 84
b5    = 60
nm1   = 7
nm2   = 12
n11   = 5
n12   = 7
Jam Mulai   = 6/8/02 5:27:38 PM
Jam Selesai = 6/8/02 5:28:54 PM

Run Ke                      = 5
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 80
Parameter Pinalti           = 10000000
Fitnes                      = 2.05731741124454
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4860698.66776205
string                      =
1000110001011100000010010100000001010000100100
t     = 38
diam  = 1.128
dial  = 0.500
b1    = 88
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 6
nm2   = 9
n11   = 7
n12   = 9
Jam Mulai   = 6/8/02 5:28:54 PM
Jam Selesai = 6/8/02 5:30:19 PM

Run Ke                      = 1
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 75
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
```

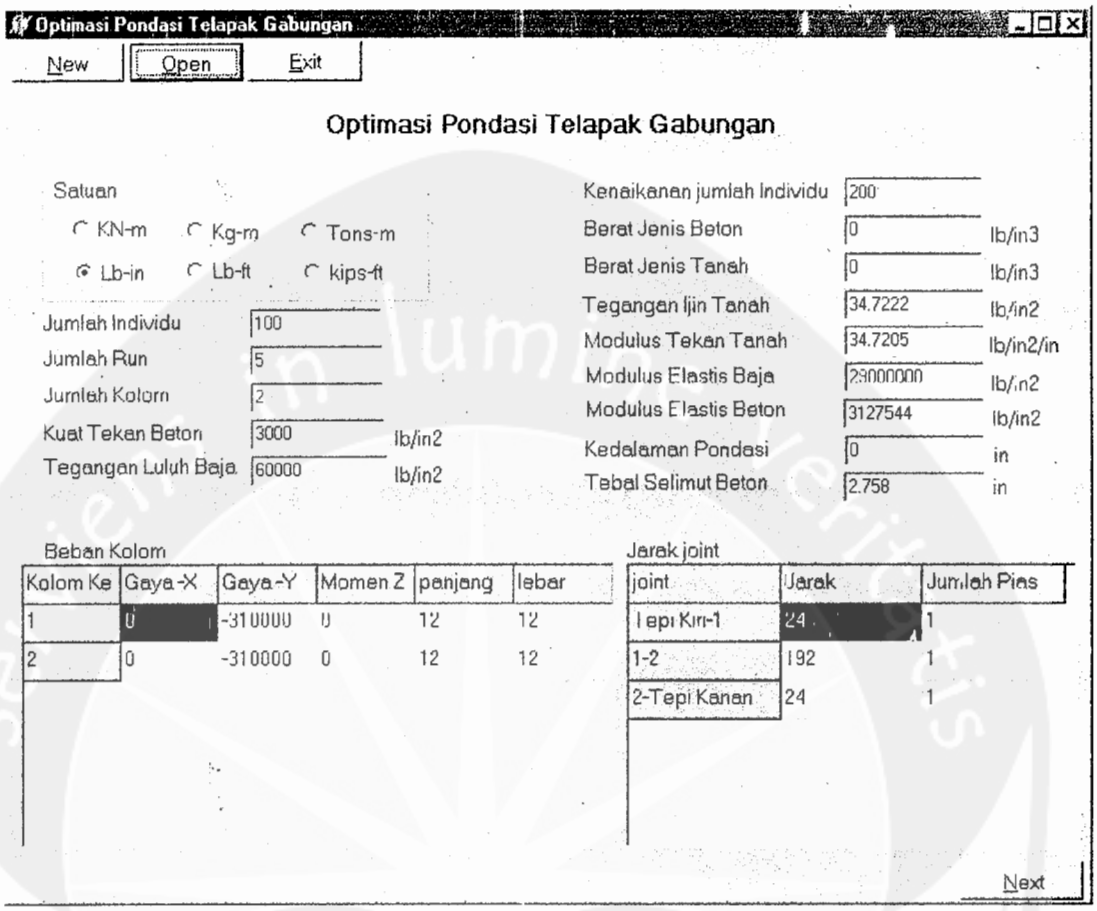
```
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:30:19 PM
Jam Selesai = 6/8/02 5:31:51 PM

Run Ke                      = 2
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 72
Parameter Pinalti           = 10000000
Fitnes                      = 2.04614774198392
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4887232.62490524
string                      =
1000101001100000000010010100000011011000100100
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 7
n12   = 9
Jam Mulai   = 6/8/02 5:31:51 PM
Jam Selesai = 6/8/02 5:33:19 PM

Run Ke                      = 3
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 62
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:33:19 PM
Jam Selesai = 6/8/02 5:34:34 PM

Run Ke                      = 4
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 72
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:34:34 PM
Jam Selesai = 6/8/02 5:36:03 PM

Run Ke                      = 5
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 66
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai   = 6/8/02 5:36:03 PM
Jam Selesai = 6/8/02 5:37:23 PM

Run Ke                      = 1
jumlah individu             = 1700
Konvergen Pada Generasi Ke = 83
Parameter Pinalti           = 10000000
Fitnes                      = 2.06419692470529
Pelanggaran Kendala         = 0.00249430456938371
Fungsi Tujuan               = 4819555.98456595
string                      =
1000101001011000000010010100000010011100010100
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 84
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 7
nm2   = 12
n11   = 6
n12   = 9
Jam Mulai   = 6/8/02 5:37:23 PM
Jam Selesai = 6/8/02 5:39:19 PM

Run Ke                      = 2
jumlah individu             = 1700
Konvergen Pada Generasi Ke = 68
Parameter Pinalti           = 10000000
Fitnes                      = 2.04407207245959
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 4892195.40481624
string                      =
1000101010100000000010010100000011011000000001
t     = 38
```

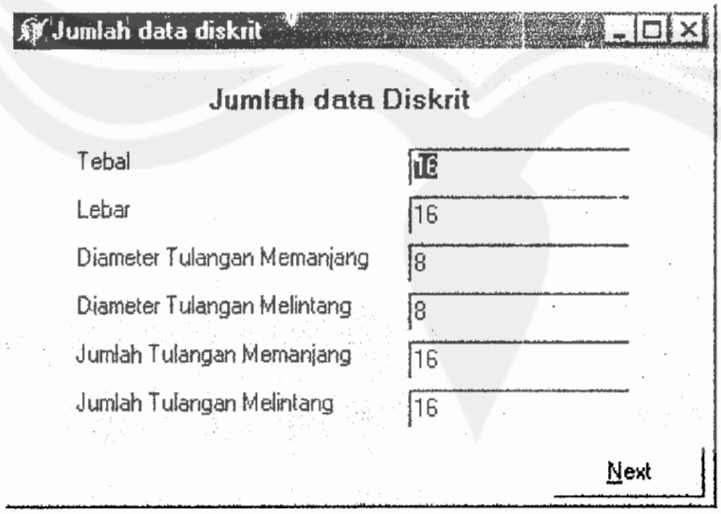
```
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
nl1   = 5
nl2   = 6
Jam Mulai    = 6/8/02 5:39:19 PM
Jam Selesai = 6/8/02 5:40:53 PM

Run Ke                        = 3
jumlah individu               = 1700
Konvergen Pada Generasi Ke = 76
Parameter Pinalti             = 10000000
Fitnes                        = 2.06321303418459
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4846809.24088488
string                        =
1000101010011100000010010100100010011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 88
b2    = 60
b3    = 68
b4    = 80
b5    = 68
nm1   = 7
nm2   = 11
nl1   = 5
nl2   = 6
Jam Mulai    = 6/8/02 5:40:53 PM
Jam Selesai = 6/8/02 5:42:38 PM

Run Ke                        = 4
jumlah individu               = 1700
Konvergen Pada Generasi Ke = 88
Parameter Pinalti             = 10000000
Fitnes                        = 2.06052437734981
Pelanggaran Kendala           = 0.00249430456938371
Fungsi Tujuan                 = 4828190.51095048
string                        =
1000101010011000000010010100000010011100000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 84
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 7
nm2   = 12
nl1   = 5
nl2   = 6
Jam Mulai    = 6/8/02 5:42:38 PM
Jam Selesai = 6/8/02 5:44:40 PM

Run Ke                        = 5
jumlah individu               = 1700
Konvergen Pada Generasi Ke = 63
Parameter Pinalti             = 10000000
Fitnes                        = 2.04407207245959
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4892195.40481624
string                        =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
nl1   = 5
nl2   = 6
Jam Mulai    = 6/8/02 5:44:40 PM
Jam Selesai = 6/8/02 5:46:07 PM

Run Ke                        = 1
jumlah individu               = 1900
Konvergen Pada Generasi Ke = 72
Parameter Pinalti             = 10000000
Fitnes                        = 2.04407207245959
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4892195.40481624
string                        =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
nl1   = 5
nl2   = 6
Jam Mulai    = 6/8/02 5:46:07 PM
Jam Selesai = 6/8/02 5:48:01 PM

Run Ke                        = 2
jumlah individu               = 1900
Konvergen Pada Generasi Ke = 68
Parameter Pinalti             = 10000000
Fitnes                        = 2.04407207245959
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4892195.40481624
string                        =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
nl1   = 5
nl2   = 6
Jam Mulai    = 6/8/02 5:48:01 PM
Jam Selesai = 6/8/02 5:49:47 PM

Run Ke                        = 3
jumlah individu               = 1900
Konvergen Pada Generasi Ke = 68
Parameter Pinalti             = 10000000
Fitnes                        = 2.04407207245959
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 4892195.40481624
```

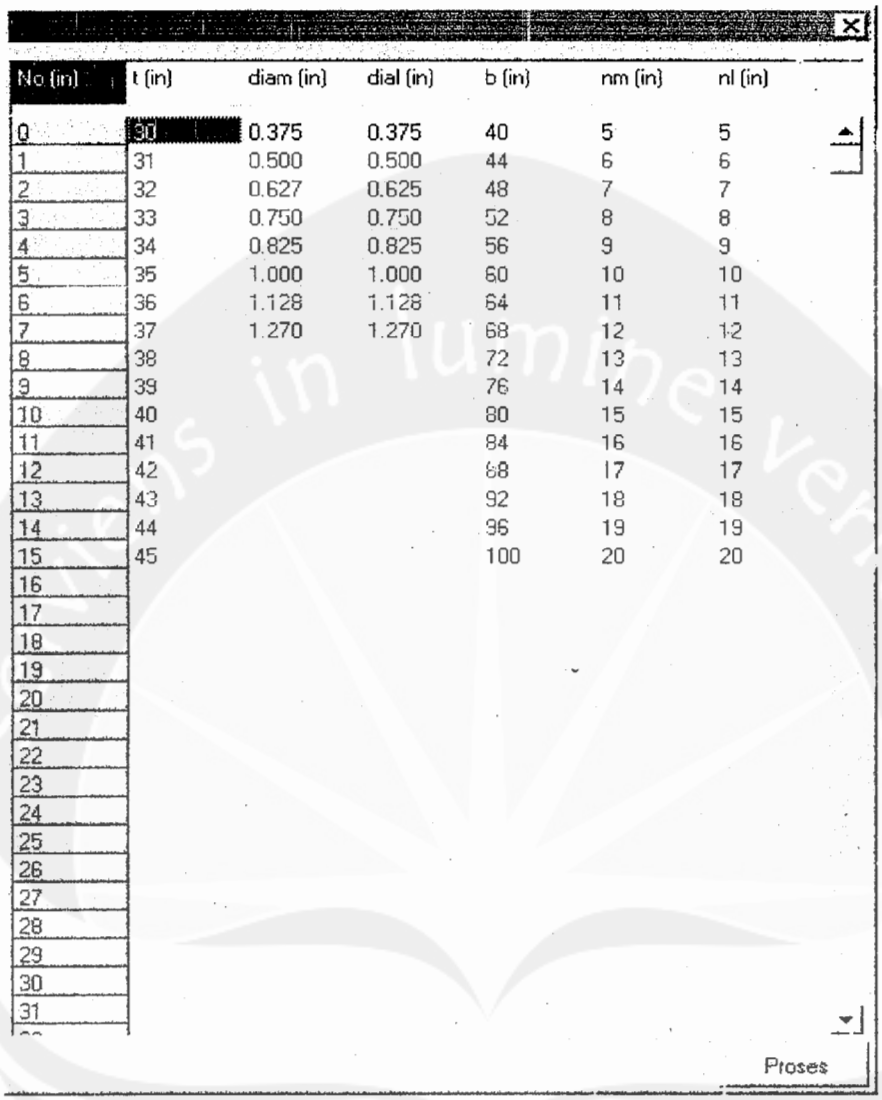
```
string                    =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai    = 6/8/02 5:49:47 PM
Jam Selesai = 6/8/02 5:51:32 PM

Run Ke                    = 4
jumlah individu           = 1900
Konvergen Pada Generasi Ke = 62
Parameter Pinalti         = 10000000
Fitnes                    = 2.01850361871051
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4954165.00981471
string                    =
1000101010100000000010010100000100011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 9
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai    = 6/8/02 5:51:32 PM
Jam Selesai = 6/8/02 5:53:08 PM

Run Ke                    = 5
jumlah individu           = 1900
Konvergen Pada Generasi Ke = 115
Parameter Pinalti         = 10000000
Fitnes                    = 2.06321303418459
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4846809.24088488
string                    =
1000101010011100000010010100100010011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 88
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 7
nm2   = 12
n11   = 5
n12   = 6
Jam Mulai    = 6/8/02 5:53:08 PM
Jam Selesai = 6/8/02 5:56:06 PM

Run Ke                    = 1
jumlah individu           = 2100
Konvergen Pada Generasi Ke = 68
Parameter Pinalti         = 10000000
Fitnes                    = 2.04407207245959
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4892195.40481624
string                    =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai    = 6/8/02 5:56:06 PM
Jam Selesai = 6/8/02 6:11:13 PM

Run Ke                    = 2
jumlah individu           = 2100
Konvergen Pada Generasi Ke = 114
Parameter Pinalti         = 10000000
Fitnes                    = 2.06419692470529
Pelanggaran Kendala       = 0.00249430456938371
Fungsi Tujuan             = 4819555.98456595
string                    =
1000101001011000000010010100000010011100010100
t     = 38
diam  = 1.000
dial  = 0.500
b1    = 84
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 7
nm2   = 12
n11   = 6
n12   = 9
Jam Mulai    = 6/8/02 6:11:13 PM
Jam Selesai = 6/8/02 6:38:37 PM

Run Ke                    = 3
jumlah individu           = 2100
Konvergen Pada Generasi Ke = 68
Parameter Pinalti         = 10000000
Fitnes                    = 2.04407207245959
Pelanggaran Kendala       = 0
Fungsi Tujuan             = 4892195.40481624
string                    =
1000101010100000000010010100000011011000000001
t     = 38
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 60
b3    = 68
b4    = 80
b5    = 60
nm1   = 8
nm2   = 11
n11   = 5
n12   = 6
Jam Mulai    = 6/8/02 6:38:37 PM
Jam Selesai = 6/8/02 6:54:49 PM

Run Ke                    = 4
jumlah individu           = 2100
Konvergen Pada Generasi Ke = 65
Parameter Pinalti         = 10000000
Fitnes                    = 2.04407207245959
```

```
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4892195.40481624
string                       =
10001010101000000000100101000000111011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 6:54:49 PM
Jam Selesai = 6/8/02 7:10:37 PM

Run Ke                       = 5
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 68
Parameter Pinalti            = 10000000
Fitnes                       = 2.04407207245959
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4892195.40481624
string                       =
10001010101000000000100101000000111011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 7:10:37 PM
Jam Selesai = 6/8/02 7:27:19 PM

Run Ke                       = 1
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 69
Parameter Pinalti            = 10000000
Fitnes                       = 2.04407207245959
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4892195.40481624
string                       =
10001010101000000000100101000000111011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 7:27:19 PM
Jam Selesai = 6/8/02 8:21:55 PM

Run Ke                       = 2
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 90
Parameter Pinalti            = 10000000
Fitnes                       = 2.08893092114926
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4787137.71659733
string                       =
01011010101001000000110111000000100111000000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 72
b4     = 88
b5     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 8
Jam Mulai    = 6/8/02 8:21:55 PM
Jam Selesai = 6/8/02 9:37:54 PM

Run Ke                       = 3
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 68
Parameter Pinalti            = 10000000
Fitnes                       = 2.04407207245959
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4892195.40481624
string                       =
10001010101000000000100101000000111011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 9:37:54 PM
Jam Selesai = 6/8/02 10:35:29 PM

Run Ke                       = 4
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 65
Parameter Pinalti            = 10000000
Fitnes                       = 2.04407207245959
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 4892195.40481624
string                       =
10001010101000000000100101000000111011000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 10:35:29 PM
Jam Selesai = 6/8/02 11:31:23 PM

Run Ke                       = 5
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 80
```

```
Parameter Pinalti          = 10000000
Fitnes                     = 2.08893092114926
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4787137.71659733
string                     =
01011010101001000000110111000000100111000000011
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 60
b3     = 72
b4     = 88
b5     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 6
Jam Mulai    = 6/8/02 11:31:23 PM
Jam Selesai = 6/9/02 12:40:04 AM

Run Ke                     = 1
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti          = 10000000
Fitnes                     = 2.04407207245959
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4892195.40481624
string                     =
10001010101000000000100101000000110110000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/9/02 12:40:05 AM
Jam Selesai = 6/9/02 2:20:00 AM

Run Ke                     = 2
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti          = 10000000
Fitnes                     = 2.04407207245959
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4892195.40481624
string                     =
10001010101000000000100101000000110110000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/9/02 2:20:00 AM
Jam Selesai = 6/9/02 4:03:01 AM

Run Ke                     = 3
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 81
Parameter Pinalti          = 10000000
Fitnes                     = 2.05528407040287
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4865507.47120803
string                     =
1.001100100111000000100101000000010100000000001
t      = 38
diam   = 1.128
dial   = 0.625
b1     = 88
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 6
nm2    = 9
nl1    = 5
nl2    = 6
Jam Mulai    = 6/9/02 4:03:01 AM
Jam Selesai = 6/9/02 6:09:03 AM

Run Ke                     = 4
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 86
Parameter Pinalti          = 10000000
Fitnes                     = 2.06052437734981
Pelanggaran Kendala        = 0.00249430456938371
Fungsi Tujuan              = 4828190.51095048
string                     =
10001010100110000000100101000000100111000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 7
nm2    = 12
nl1    = 5
nl2    = 6
Jam Mulai    = 6/9/02 6:09:03 AM
Jam Selesai = 6/9/02 8:23:56 AM

Run Ke                     = 5
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 84
Parameter Pinalti          = 10000000
Fitnes                     = 2.04407207245959
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 4892195.40481624
string                     =
10001010101000000000100101000000110110000000001
t      = 38
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 60
b3     = 68
b4     = 80
b5     = 60
nm1    = 8
nm2    = 11
nl1    = 5
nl2    = 6
Jam Mulai    = 6/9/02 8:23:56 AM
Jam Selesai = 6/9/02 10:36:30 AM
```

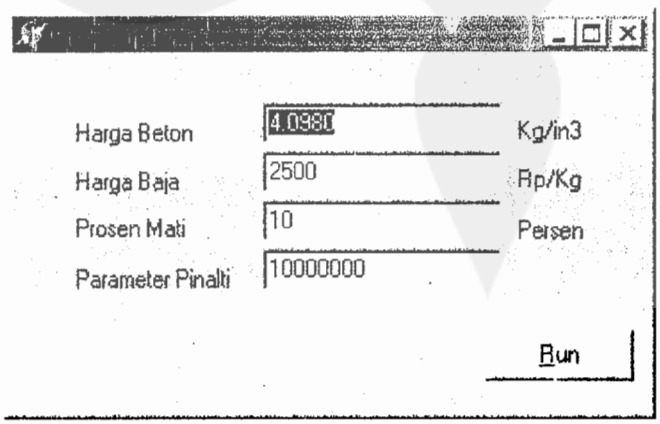

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu 100
Jumlah Run 5
Jumlah Kolom 2
Kuat Tekan Beton 3000 lb/in2
Tegangan Luluh Baja 60000 lb/in2
Kenaikanan jumlah Individu 200
Berat Jenis Beton 0 lb/in3
Berat Jenis Tanah 0 lb/in3
Tegangan Ijin Tanah 34.7222 lb/in2
Modulus Tekan Tanah 34.7205 lb/in2/in
Modulus Elastis Baja 29000000 lb/in2
Modulus Elastis Beton 3127544 lb/in2
Kedalaman Pondasi 0 in
Tebal Selimut Beton 2.758 in
Beban Kolom
Kolom Ke | Gaya-X | Gaya-Y | Momen Z | panjang | lebar
1 | 0 | -310000 | 0 | 12 | 12
2 | 0 | -310000 | 0 | 12 | 12
Jarak joint
joint | Jarak | Jumlah Pias
Tepi Kiri-1 | 24 | 1
1-2 | 192 | 1
2-Tepi Kanan | 24 | 1
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal 18
Lebar 16
Diameter Tulangan Memanjang 8
Diameter Tulangan Melintang 8
Jumlah Tulangan Memanjang 16
Jumlah Tulangan Melintang 16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                          = 1
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 61
Parameter Pinalti               = 10000000
Fitnes                          = 3.08069513498372
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3246020.64204346
string                          =
0010101010100001010101.0010001011000000010
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
n11    = 7
n12    = 7
Jam Mulai    = 5/26/02 6:30:32 PM
Jam Selesai = 5/26/02 6:30:36 PM

Run Ke                          = 2
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 56
Parameter Pinalti               = 10000000
Fitnes                          = 3.03076620507862
Pelanggaran Kendala             = 0.000223735720802587
Fungsi Tujuan                   = 3297258.32254553
string                          =
0011101010011001010100101000100110000000000
t      = 31
diam   = 1.000
dial   = 0.625
b1     = 84
b2     = 80
b3     = 76
b4     = 100
nm1    = 7
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:30:36 PM
Jam Selesai = 5/26/02 6:30:39 PM

Run Ke                          = 3
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 56
Parameter Pinalti               = 10000000
Fitnes                          = 2.95801583406276
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3380644.51340859
string                          =
0011101010110001000100110001000110000000000
t      = 31
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 76
b3     = 76
b4     = 108
nm1    = 9
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:30:39 PM
Jam Selesai = 5/26/02 6:30:43 PM

Run Ke                          = 4
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 56
Parameter Pinalti               = 10000000
Fitnes                          = 2.96413074389264
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3373670.34858506
string                          =
0010100010110001010110100001011011011000000
t      = 30
diam   = 0.825
dial   = 0.625
b1     = 108
b2     = 80
b3     = 84
b4     = 92
nm1    = 10
nm2    = 16
n11    = 11
n12    = 5
Jam Mulai    = 5/26/02 6:30:43 PM
Jam Selesai = 5/26/02 6:30:46 PM

Run Ke                          = 5
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 53
Parameter Pinalti               = 10000000
Fitnes                          = 2.94951480529761
Pelanggaran Kendala             = 0.000494916328077855
Fungsi Tujuan                   = 3385438.97175724
string                          =
0100101001011001010011111000110110001000011
t      = 32
diam   = 1.000
dial   = 0.500
b1     = 84
b2     = 80
b3     = 72
b4     = 116
nm1    = 8
nm2    = 11
n11    = 7
n12    = 8
Jam Mulai    = 5/26/02 6:30:46 PM
Jam Selesai = 5/26/02 6:30:50 PM

Run Ke                          = 1
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 60
Parameter Pinalti               = 10000000
Fitnes                          = 2.98020583926467
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3355472.92346336
string                          =
0010101001001001100101101000100111001101 00
t      = 30
diam   = 1.000
dial   = 0.500
b1     = 68
b2     = 84
b3     = 80
b4     = 100
nm1    = 7
nm2    = 12
n11    = 8
n12    = 9
Jam Mulai    = 5/26/02 6:30:50 PM
Jam Selesai = 5/26/02 6:31:01 PM

Run Ke                          = 2
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 70
Parameter Pinalti               = 10000000
```

```
Fitnes                          = 3.0662021845001
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3261363.53647871
string                          =
00101000011000010101011000100110000110011
t       = 30
diam    = 0.825
dial    = 0.500
b1      = 92
b2      = 80
b3      = 80
b4      = 92
nm1     = 9
nm2     = 17
n11     = 8
n12     = 8
Jam Mulai    = 5/26/02 6:31:01 PM
Jam Selesai = 5/26/02 6:31:15 PM

Run Ke                          = 3
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 72
Parameter Pinalti               = 10000000
Fitnes                          = 3.03027470344681
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3300030.84823479
string                          =
00101010011001010101011000001001101010000011
t       = 30
diam    = 1.000
dial    = 0.500
b1      = 96
b2      = 80
b3      = 80
b4      = 92
nm1     = 7
nm2     = 11
n11     = 13
n12     = 8
Jam Mulai    = 5/26/02 6:31:15 PM
Jam Selesai = 5/26/02 6:31:29 PM

Run Ke                          = 4
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 56
Parameter Pinalti               = 10000000
Fitnes                          = 3.06079176546561
Pelanggaran Kendala             = 0.000128516162719361
Fungsi Tujuan                   = 3265843.33526315
string                          =
00101000101010010101010111010011000000000
t       = 30
diam    = 0.825
dial    = 0.625
b1      = 100
b2      = 80
b3      = 80
b4      = 88
nm1     = 9
nm2     = 17
n11     = 6
n12     = 5
Jam Mulai    = 5/26/02 6:31:29 PM
Jam Selesai = 5/26/02 6:31:40 PM

Run Ke                          = 5
jumlah individu                 = 300
Konvergen Pada Generasi Ke = 76
Parameter Pinalti               = 10000000
Fitnes                          = 3.09461826680185
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3231416.32920514
string                          =
00111000000100010101010101001110111000100 0
t       = 31
diam    = 0.825
dial    = 0.375
b1      = 76
b2      = 80
b3      = 80
b4      = 80
nm1     = 9
nm2     = 16
n11     = 13
n12     = 13
Jam Mulai    = 5/26/02 6:31:40 PM
Jam Selesai = 5/26/02 6:31:54 PM

Run Ke                          = 1
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 66
Parameter Pinalti               = 10000000
Fitnes                          = 3.04909787520888
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3279658.57747841
string                          =
00101010101000010101011001001001 1000000000
t       = 30
diam    = 1.000
dial    = 0.625
b1      = 92
b2      = 80
b3      = 80
b4      = 96
nm1     = 7
nm2     = 11
n11     = 5
n12     = 5
Jam Mulai    = 5/26/02 6:31:54 PM
Jam Selesai = 5/26/02 6:32:15 PM

Run Ke                          = 2
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti               = 10000000
Fitnes                          = 3.06753903586993
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3259942.21526315
string                          =
00101000101000010101011000010011000000000 0
t       = 30
diam    = 0.825
dial    = 0.625
b1      = 92
b2      = 80
b3      = 80
b4      = 92
nm1     = 9
nm2     = 17
n11     = 5
n12     = 5
Jam Mulai    = 5/26/02 6:32:15 PM
Jam Selesai = 5/26/02 6:32:37 PM

Run Ke                          = 3
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 3.03076620512836
Pelanggaran Kendala             = 0.00022735715387141
Fungsi Tujuan                   = 3297258.32254553
```

```
string                          =
00111010101010010001010110001001100000000
t     = 31
diam  = 1.000
dial  = 0.625
b1    = 100
b2    = 76
b3    = 80
b4    = 84
nm1   = 7
nm2   = 11
n11   = 5
n12   = 5
Jam Mulai    = 5/26/02 6:32:37 PM
Jam Selesai = 5/26/02 6:33:00 PM

Run Ke                          = 4
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 77
Parameter Pinalti               = 10000000
Fitnes                          = 3.09688851659453
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3229047.46051253
string                          =
00111000010101010101010100001110110010010
t     = 31
diam  = 0.825
dial  = 0.500
b1    = 80
b2    = 80
b3    = 80
b4    = 76
nm1   = 8
nm2   = 16
n11   = 7
n12   = 7
Jam Mulai    = 5/26/02 6:33:00 PM
Jam Selesai = 5/26/02 6:33:24 PM

Run Ke                          = 5
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 67
Parameter Pinalti               = 10000000
Fitnes                          = 3.049097875.20888
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3279658.57747841
string                          =
00101010101001010101011000001001100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 96
b2    = 80
b3    = 80
b4    = 92
nm1   = 7
nm2   = 11
n11   = 5
n12   = 5
Jam Mulai    = 5/26/02 6:33:24 PM
Jam Selesai = 5/26/02 6:33:46 PM

Run Ke                          = 1
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 74
Parameter Pinalti               = 10000000
Fitnes                          = 3.04777704559419
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3281079.89869397
string                          =
00101010011001010101011000001001100011001l
t     = 30
diam  = 1.000
dial  = 0.500
b1    = 96
b2    = 80
b3    = 80
b4    = 96
nm1   = 7
nm2   = 11
n11   = 8
n12   = 8
Jam Mulai    = 5/26/02 6:33:46 PM
Jam Selesai = 5/26/02 6:34:20 PM

Run Ke                          = 2
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 66
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
00101010101000010101011000000101l000000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
n11   = 5
n12   = 5
Jam Mulai    = 5/26/02 6:34:20 PM
Jam Selesai = 5/26/02 6:34:50 PM

Run Ke                          = 3
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 72
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
00101010101000010101011000000101l000000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
n11   = 5
n12   = 5
Jam Mulai    = 5/26/02 6:34:50 PM
Jam Selesai = 5/26/02 6:35:22 PM

Run Ke                          = 4
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 98
Parameter Pinalti               = 10000000
Fitnes                          = 3.06199623601792
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3265843.33526315
string                          =
00101000101000010101011001010011l000000000
t     = 30
diam  = 0.825
```

```
dial  = 0.625
b1    = 104
b2    = 80
b3    = 80
b4    = 96
nm1   = 9
nm2   = 17
nl1   = 5
nl2   = 5
Jam Mulai    = 5/26/02 6:35:22 PM
Jam Selesai = 5/26/02 6:36:07 PM

Run Ke                      = 5
jumlah individu             = 700
Konvergen Pada Generasi Ke = 64
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101l000000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai    = 5/26/02 6:36:07 PM
Jam Selesai = 5/26/02 6:36:36 PM

Run Ke                      = 1
jumlah individu             = 900
Konvergen Pada Generasi Ke = 73
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101l000000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai    = 5/26/02 6:36:36 PM
Jam Selesai = 5/26/02 6:37:18 PM

Run Ke                      = 2
jumlah individu             = 900
Konvergen Pada Generasi Ke = 83
Parameter Pinalti           = 10000000
Fitnes                      = 3.06753903586993
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3259942.21526315
string                      =
00101000101000010101011000010011000000000
t     = 30
diam  = 0.825
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 9
nm2   = 17
nl1   = 5
nl2   = 5
Jam Mulai    = 5/26/02 6:37:18 PM
Jam Selesai = 5/26/02 6:38:07 PM

Run Ke                      = 3
jumlah individu             = 900
Konvergen Pada Generasi Ke = 63
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101l000000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai    = 5/26/02 6:38:07 PM
Jam Selesai = 5/26/02 6:38:44 PM

Run Ke                      = 4
jumlah individu             = 900
Konvergen Pada Generasi Ke = 87
Parameter Pinalti           = 10000000
Fitnes                      = 3.11151146973758
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3213872.13168248
string                      =
00111010100100010101010100000011000000000
t     = 31
diam  = 1.000
dial  = 0.625
b1    = 76
b2    = 80
b3    = 80
b4    = 76
nm1   = 5
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai    = 5/26/02 6:38:44 PM
Jam Selesai = 5/26/02 6:39:34 PM

Run Ke                      = 5
jumlah individu             = 900
Konvergen Pada Generasi Ke = 81
Parameter Pinalti           = 10000000
Fitnes                      = 3.03629225698504
Pelanggaran Kendala         = 0.000223735720802587
Fungsi Tujuan               = 3291253.24040979
string                      =
00111010010111001010100101000100110001000l0
t     = 31
diam  = 1.000
dial  = 0.500
b1    = 84
b2    = 80
b3    = 76
```

```
b4     = 100
nm1    = 7
nm2    = 11
nl1    = 7
nl2    = 7
Jam Mulai    = 5/26/02 6:39:34 PM
Jam Selesai = 5/26/02 6:40:22 PM

Run Ke                        = 1
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 77
Parameter Pinalti             = 10000000
Fitnes                        = 3.09197739294213
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3234176.29858045
string                        =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:40:22 PM
Jam Selesai = 5/26/02 6:41:17 PM

Run Ke                        = 2
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 73
Parameter Pinalti             = 10000000
Fitnes                        = 3.04426042134758
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3284870.08860214
string                        =
0010101001100101010101100000010011001000011
t      = 30
diam   = 1.000
dial   = 0.500
b1     = 96
b2     = 80
b3     = 80
b4     = 96
nm1    = 7
nm2    = 11
nl1    = 9
nl2    = 8
Jam Mulai    = 5/26/02 6:41:17 PM
Jam Selesai = 5/26/02 6:42:10 PM

Run Ke                        = 3
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 93
Parameter Pinalti             = 10000000
Fitnes                        = 3.06748105255848
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3260003.83658746
string                        =
0011100001010101010101010001001011001000l0
t      = 31
diam   = 0.825
dial   = 0.500
b1     = 80
b2     = 80
b3     = 80
b4     = 76
nm1    = 9
nm2    = 16
nl1    = 7
nl2    = 7
Jam Mulai    = 5/26/02 6:42:10 PM
Jam Selesai = 5/26/02 6:43:16 PM

Run Ke                        = 4
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 67
Parameter Pinalti             = 10000000
Fitnes                        = 3.09197739294213
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3234176.29858045
string                        =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:43:16 PM
Jam Selesai = 5/26/02 6:44:04 PM

Run Ke                        = 5
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 69
Parameter Pinalti             = 10000000
Fitnes                        = 3.09197739294213
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3234176.29858045
string                        =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:44:04 PM
Jam Selesai = 5/26/02 6:44:53 PM

Run Ke                        = 1
jumlah individu               = 1300
Konvergen Pada Generasi Ke = 88
Parameter Pinalti             = 10000000
Fitnes                        = 3.08431651538441
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3242209.40040379
String                        =
0010100001100101010101100101001011001100l1
t      = 30
diam   = 0.825
dial   = 0.500
b1     = 96
b2     = 80
b3     = 80
b4     = 96
nm1    = 9
nm2    = 16
nl1    = 8
```

```
nl2   = 8
Jam Mulai    = 5/26/02 6:44:53 PM
Jam Selesai = 5/26/02 6:46:09 PM

Run Ke                        = 2
jumlah individu               = 1300
Konvergen Pada Generasi Ke = 73
Parameter Pinalti             = 10000000
Fitnes                        = 3.07626235661864
Pelanggaran Kendala           = 0.000175841126743737
Fungsi Tujuan                 = 3248939.6244462
string                        =
00101010100000011001100001000001110000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 60
b2     = 84
b3     = 84
b4     = 64
nm1    = 5
nm2    = 12
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:46:09 PM
Jam Selesai = 5/26/02 6:47:11 PM

Run Ke                        = 3
jumlah individu               = 1300
Konvergen Pada Generasi Ke = 93
Parameter Pinalti             = 10000000
Fitnes                        = 3.08566921244195
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3240788.07918823
string                        =
00101000101010010101011000010010110000000
t      = 30
diam   = 0.825
dial   = 0.625
b1     = 100
b2     = 80
b3     = 80
b4     = 92
nm1    = 9
nm2    = 16
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:47:11 PM
Jam Selesai = 5/26/02 6:48:30 PM

Run Ke                        = 4
jumlah individu               = 1300
Konvergen Pada Generasi Ke = 91
Parameter Pinalti             = 10000000
Fitnes                        = 3.04909787520888
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3279658.57747841
string                        =
00101010101001010101011000001001l000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 80
b3     = 80
b4     = 92
nm1    = 7
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:48:30 PM
Jam Selesai = 5/26/02 6:49:47 PM

Run Ke                        = 5
jumlah individu               = 1300
Konvergen Pada Generasi Ke = 72
Parameter Pinalti             = 10000000
Fitnes                        = 3.04909787520888
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3279658.57747841
string                        =
00101010101001010101011000001001l000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 80
b3     = 80
b4     = 92
nm1    = 7
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:49:47 PM
Jam Selesai = 5/26/02 6:50:48 PM

Run Ke                        = 1
jumlah individu               = 1500
Konvergen Pada Generasi Ke = 86
Parameter Pinalti             = 10000000
Fitnes                        = 3.09061916058243
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3235597.61979601
string                        =
00101010011000010101011001000101100911001l
t      = 30
diam   = 1.000
dial   = 0.500
b1     = 92
b2     = 80
b3     = 80
b4     = 96
nm1    = 6
nm2    = 11
n11    = 8
n12    = 8
Jam Mulai    = 5/26/02 6:50:48 PM
Jam Selesai = 5/26/02 6:52:12 PM

Run Ke                        = 2
jumlah individu               = 1500
Konvergen Pada Generasi Ke = 69
Parameter Pinalti             = 10000000
Fitnes                        = 3.09197739294213
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3234176.29858045
string                        =
00101010101000001010101100000001011000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 6:52:12 PM
Jam Selesai = 5/26/02 6:53:20 PM
```

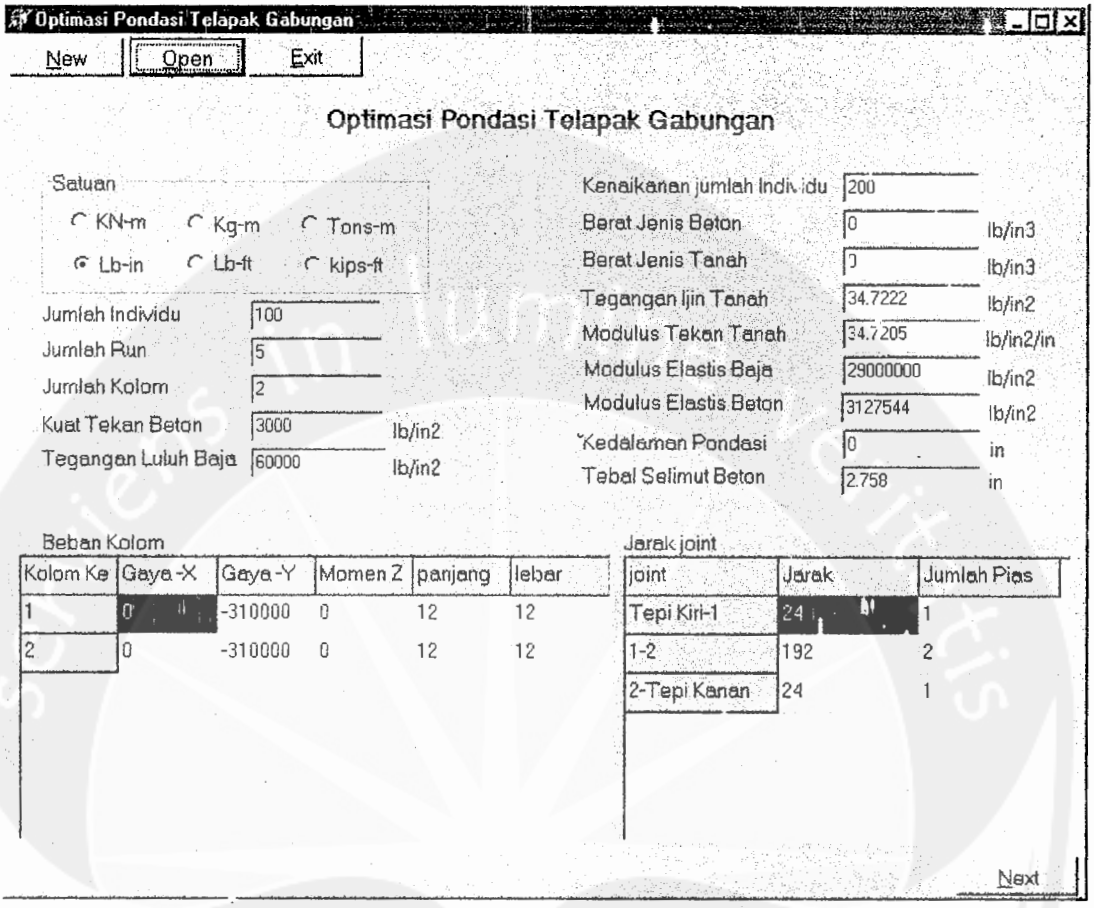
```
Run Ke                          = 3
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 78
Parameter Pinalti               = 10000000
Fitnes                          = 3.06753903586993
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3259942.21526315
string                          =
0010100010100001010101100001001100000000
t      = 30
diam   = 0.825
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 9
nm2    = 17
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:53:20 PM
Jam Selesai = 5/26/02 6:54:36 PM

Run Ke                          = 4
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 75
Parameter Pinalti               = 10000000
Fitnes                          = 3.06169665166798
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3266162.89518823
string                          =
0011100010010001010101010101001011100000000
t      = 31
diam   = 0.825
dial   = 0.625
b1     = 76
b2     = 80
b3     = 80
b4     = 80
nm1    = 9
nm2    = 16
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:54:36 PM
Jam Selesai = 5/26/02 6:55:50 PM

Run Ke                          = 5
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000010011000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:55:50 PM
Jam Selesai = 5/26/02 6:56:58 PM

Run Ke                          = 1
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 73
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000010011000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 6:56:58 PM
Jam Selesai = 5/26/02 6:58:19 PM

Run Ke                          = 2
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 95
Parameter Pinalti               = 10000000
Fitnes                          = 3.06748105255848
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3260003.83658746
string                          =
0011100001010001010101010100101100100010
t      = 31
diam   = 0.825
dial   = 0.500
b1     = 80
b2     = 80
b3     = 80
b4     = 80
nm1    = 9
nm2    = 16
nl1    = 7
nl2    = 7
Jam Mulai    = 5/26/02 6:58:19 PM
Jam Selesai = 5/26/02 7:00:05 PM

Run Ke                          = 3
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 65
Parameter Pinalti               = 10000000
Fitnes                          = 3.04909787520888
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3279658.57747841
string                          =
0010101010100101010101100000100110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 96
b2     = 80
b3     = 80
b4     = 96
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai    = 5/26/02 7:00:05 PM
Jam Selesai = 5/26/02 7:01:17 PM

Run Ke                          = 4
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 75
Parameter Pinalti               = 10000000
```

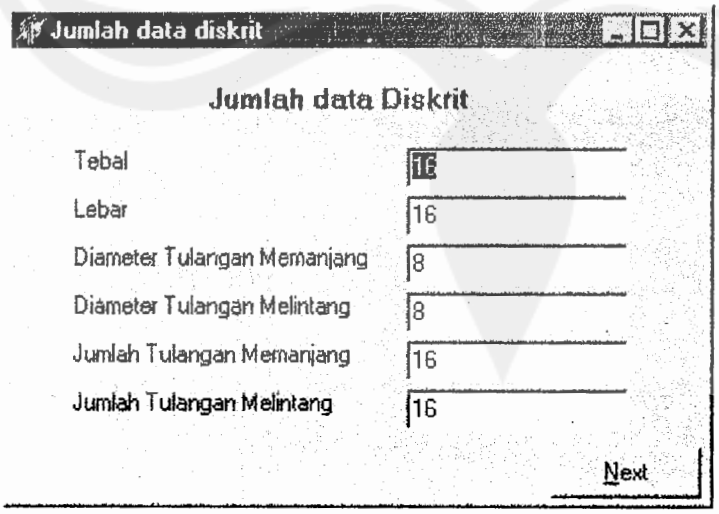
```
Fitnes                          = 3.09061916068243
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3235597.61979601
string                          =
0010101001100001010101100100011011000110011
t      = 30
diam   = 1.000
dial   = 0.500
b1     = 92
b2     = 80
b3     = 80
b4     = 96
nm1    = 6
nm2    = 11
n11    = 8
n12    = 8
Jam Mulai    = 5/26/02 7:01:17 PM
Jam Selesai = 5/26/02 7:02:40 PM

Run Ke                          = 5
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 3.04777704559419
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3281079.89869397
string                          =
0010101001100101010101100000100110001100l1
t      = 30
diam   = 1.000
dial   = 0.500
b1     = 96
b2     = 80
b3     = 80
b4     = 92
nm1    = 7
nm2    = 11
n11    = 8
n12    = 8
Jam Mulai    = 5/26/02 7:02:40 PM
Jam Selesai = 5/26/02 7:03:58 PM

Run Ke                          = 1
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 89
Parameter Pinalti               = 10000000
Fitnes                          = 3.11748581377723
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3207713.07308172
string                          =
0011101001010001010101010000000110001000l0
t      = 31
diam   = 1.000
dial   = 0.500
b1     = 76
b2     = 80
b3     = 80
b4     = 76
nm1    = 5
nm2    = 11
n11    = 7
n12    = 7
Jam Mulai    = 5/26/02 7:03:58 PM
Jam Selesai = 5/26/02 7:05:49 PM

Run Ke                          = 2
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 72
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
String                          =
0010101010100001010101100000001011000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 7:05:49 PM
Jam Selesai = 5/26/02 7:07:19 PM

Run Ke                          = 3
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 81
Parameter Pinalti               = 10000000
Fitnes                          = 3.11151146973758
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3213872.13168248
string                          =
0011101010010001010101010000000011000000000
t      = 31
diam   = 1.000
dial   = 0.625
b1     = 80
b2     = 80
b3     = 80
b4     = 76
nm1    = 5
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 7:07:19 PM
Jam Selesai = 5/26/02 7:09:00 PM

Run Ke                          = 4
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 67
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000001011000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
n11    = 5
n12    = 5
Jam Mulai    = 5/26/02 7:09:00 PM
Jam Selesai = 5/26/02 7:10:23 PM

Run Ke                          = 5
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 80
Parameter Pinalti               = 10000000
Fitnes                          = 3.09061916068243
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3235597.61979601
```

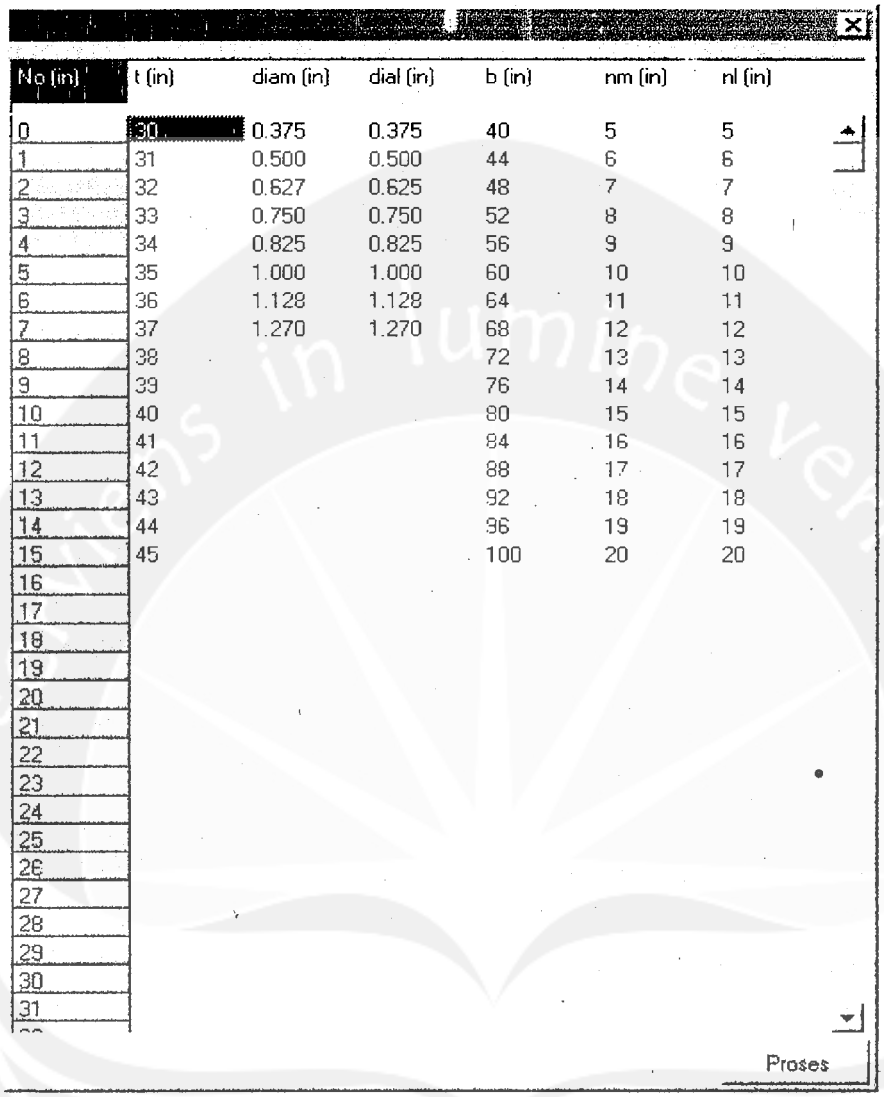
```
string                          =
0010101001100001010101100100010110001100i1
t      = 30
diam   = 1.000
dial   = 0.500
b1     = 92
b2     = 80
b3     = 80
b4     = 96
nm1    = 6
nm2    = 11
nl1    = 8
nl2    = 8
Jam Mulai   = 5/26/02 7:10:23 PM
Jam Selesai = 5/26/02 7:12:02 PM

Run Ke                          = 1
jumlah individu                 = 2100
Konvergen Pada Generasi Ke      = 87
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai   = 5/26/02 7:12:02 PM
Jam Selesai = 5/26/02 7:14:04 PM

Run Ke                          = 2
jumlah individu                 = 2100
Konvergen Pada Generasi Ke      = 66
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai   = 5/26/02 7:14:04 PM
Jam Selesai = 5/26/02 7:15:35 PM

Run Ke                          = 3
jumlah individu                 = 2100
Konvergen Pada Generasi Ke      = 88
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai   = 5/26/02 7:15:35 PM
Jam Selesai = 5/26/02 7:17:38 PM

Run Ke                          = 4
jumlah individu                 = 2100
Konvergen Pada Generasi Ke      = 72
Parameter Pinalti               = 10000000
Fitnes                          = 3.09197739294213
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3234176.29858045
string                          =
0010101010100001010101100000010110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 92
b2     = 80
b3     = 80
b4     = 92
nm1    = 6
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai   = 5/26/02 7:17:38 PM
Jam Selesai = 5/26/02 7:19:17 PM

Run Ke                          = 5
jumlah individu                 = 2100
Konvergen Pada Generasi Ke      = 64
Parameter Pinalti               = 10000000
Fitnes                          = 3.04909787520888
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3279658.57747841
string                          =
0010101010100101010101100000100110000000000
t      = 30
diam   = 1.000
dial   = 0.625
b1     = 100
b2     = 80
b3     = 80
b4     = 92
nm1    = 7
nm2    = 11
nl1    = 5
nl2    = 5
Jam Mulai   = 5/26/02 7:19:17 PM
Jam Selesai = 5/26/02 7:20:46 PM

Run Ke                          = 1
jumlah individu                 = 2300
Konvergen Pada Generasi Ke      = 88
Parameter Pinalti               = 10000000
Fitnes                          = 3.0856692124413[illegible]
Pelanggaran Kendala             = [illegible]
Fungsi Tujuan                   = [illegible]
string                          =
[illegible]
t      = 30
diam   = 0.825
```

```
dial  = 0.625
b1    = 96
b2    = 80
b3    = 80
b4    = 96
nm1   = 9
nm2   = 16
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 7:20:46 PM
Jam Selesai = 5/26/02 7:25:54 PM

Run Ke                      = 2
jumlah individu             = 2300
Konvergen Pada Generasi Ke = 75
Parameter Pinalti           = 10000000
Fitnes                      = 3.07626235661864
Pelanggaran Kendala         = 0.000175841126743737
Fungsi Tujuan               = 3248939.6244462
string                      =
00101010100000011001100001000011100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 60
b2    = 84
b3    = 84
b4    = 68
nm1   = 5
nm2   = 12
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 7:25:54 PM
Jam Selesai = 5/26/02 7:30:20 PM

Run Ke                      = 3
jumlah individu             = 2300
Konvergen Pada Generasi Ke = 77
Parameter Pinalti           = 10000000
Fitnes                      = 3.09061916068243
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3235597.61979601
string                      =
00101010011000010101011001000101100011 0011
t     = 30
diam  = 1.000
dial  = 0.500
b1    = 92
b2    = 80
b3    = 80
b4    = 96
nm1   = 6
nm2   = 11
nl1   = 8
nl2   = 8
Jam Mulai   = 5/26/02 7:30:20 PM
Jam Selesai = 5/26/02 7:34:50 PM

Run Ke                      = 4
jumlah individu             = 2300
Konvergen Pada Generasi Ke = 75
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29859045
string                      =
00101010101000010101011000000101100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 7:34:51 PM
Jam Selesai = 5/26/02 7:39:20 PM

Run Ke                      = 5
jumlah individu             = 2300
Konvergen Pada Generasi Ke = 69
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 7:39:20 PM
Jam Selesai = 5/26/02 7:43:26 PM

Run Ke                      = 1
jumlah individu             = 2500
Konvergen Pada Generasi Ke = 76
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 7:43:26 PM
Jam Selesai = 5/26/02 8:24:01 PM

Run Ke                      = 2
jumlah individu             = 2500
Konvergen Pada Generasi Ke = 69
Parameter Pinalti           = 10000000
Fitnes                      = 3.07626235661864
Pelanggaran Kendala         = 0.000175841126743737
Fungsi Tujuan               = 3248939.6244462
string                      =
00101010100000011001100001000011100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 60
b2    = 84
b3    = 84
```

```
b4    = 64
nm1   = 5
nm2   = 12
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 8:24:01 PM
Jam Selesai = 5/26/02 9:02:18 PM

Run Ke                      = 3
jumlah individu             = 2500
Konvergen Pada Generasi Ke = 61
Parameter Pinalti           = 10000000
Fitnes                      = 3.090619916068243
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3235597.61979601
string                      =
00101010011000010101011001000101100011001l
t     = 30
diam  = 1.000
dial  = 0.500
b1    = 92
b2    = 80
b3    = 80
b4    = 96
nm1   = 6
nm2   = 11
nl1   = 8
nl2   = 8
Jam Mulai   = 5/26/02 9:02:19 PM
Jam Selesai = 5/26/02 9:47:30 PM

Run Ke                      = 4
jumlah individu             = 2500
Konvergen Pada Generasi Ke = 76
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 9:47:31 PM
Jam Selesai = 5/26/02 10:40:15 PM

Run Ke                      = 5
jumlah individu             = 2500
Konvergen Pada Generasi Ke = 70
Parameter Pinalti           = 10000000
Fitnes                      = 3.09197739294213
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3234176.29858045
string                      =
00101010101000010101011000000101100000000
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 80
b3    = 80
b4    = 92
nm1   = 6
nm2   = 11
nl1   = 5
nl2   = 5
Jam Mulai   = 5/26/02 10:40:16 PM
Jam Selesai = 5/26/02 11:47:14 PM
```

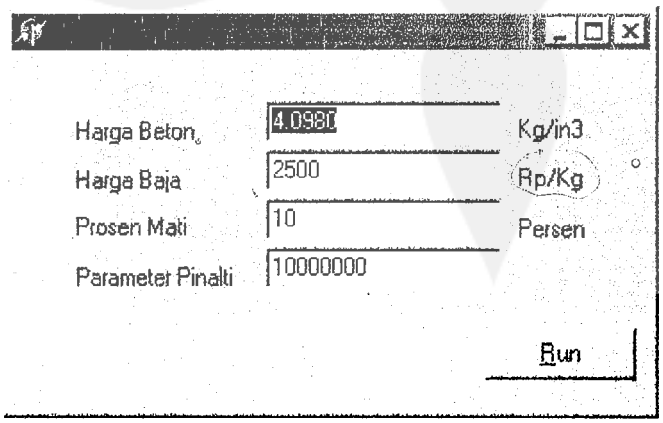

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu
100
Jumlah Run
5
Jumlah Kolom
2
Kuat Tekan Beton
3000
lb/in2
Tegangan Luluh Baja
60000
lb/in2
Kenaikanan jumlah Individu
200
Berat Jenis Beton
0
lb/in3
Berat Jenis Tanah
0
lb/in3
Tegangan Ijin Tanah
34.7222
lb/in2
Modulus Tekan Tanah
34.7205
lb/in2/in
Modulus Elastis Baja
29000000
lb/in2
Modulus Elastis Beton
3127544
lb/in2
Kedalaman Pondasi
0
in
Tebal Selimut Beton
2.758
in
Beban Kolom
Kolom Ke
Gaya -X
Gaya -Y
Momen Z
panjang
lebar
1
0
-310000
0
12
12
2
0
-310000
0
12
12
Jarak joint
joint
Jarak
Jumlah Pias
Tepi Kiri-1
24
1
1-2
192
2
2-Tepi Kanan
24
1
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal
16
Lebar
16
Diameter Tulangan Memanjang
8
Diameter Tulangan Melintang
8
Jumlah Tulangan Memanjang
16
Jumlah Tulangan Melintang
16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                          = 1
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 82
Parameter Pinalti               = 10000000
Fitnes                          = 3.22028899742047
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3105311.35808315
string                          =
0000100010111001100010011011010101101100100001
t      = 28
diam   = 0.825
dial   = 0.625
b1     = 116
b2     = 84
b3     = 68
b4     = 84
b5     = 112
nm1    = 10
nm2    = 16
n11    = 7
n12    = 6
Jam Mulai    = 6/12/02 12:09:49 PM
Jam Selesai = 6/12/02 12:09:55 PM

Run Ke                          = 2
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 64
Parameter Pinalti               = 10000000
Fitnes                          = 3.15654889727499
Pelanggaran Kendala             = 0.000865516962596402
Fungsi Tujuan                   = 3159361.65046286
string                          =
0000101001001110100000011111010011011010000001
t      = 28
diam   = 1.000
dial   = 0.500
b1     = 72
b2     = 100
b3     = 60
b4     = 88
b5     = 112
nm1    = 8
nm2    = 11
n11    = 13
n12    = 6
Jam Mulai    = 6/12/02 12:09:55 PM
Jam Selesai = 6/12/02 12:10:00 PM

Run Ke                          = 3
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 71
Parameter Pinalti               = 10000000
Fitnes                          = 3.18418769447555
Pelanggaran Kendala             = 0.00108953288464431
Fungsi Tujuan                   = 3129623.05747533
string                          =
0000100000100001110010100001000100110111001001
t      = 28
diam   = 0.825
dial   = 0.375
b1     = 92
b2     = 88
b3     = 68
b4     = 92
b5     = 76
nm1    = 9
nm2    = 18
n11    = 17
n12    = 14
Jam Mulai    = 6/12/02 12:10:00 PM
Jam Selesai = 6/12/02 12:10:06 PM

Run Ke                          = 4
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 75
Parameter Pinalti               = 10000000
Fitnes                          = 3.10201081742225
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3223715.38610879
string                          =
0000110010110001110001011111010001010100100000
t      = 28
diam   = 1.128
dial   = 0.625
b1     = 108
b2     = 88
b3     = 64
b4     = 88
b5     = 112
nm1    = 6
nm2    = 10
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 12:10:06 PM
Jam Selesai = 6/12/02 12:10:12 PM

Run Ke                          = 5
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 60
Parameter Pinalti               = 10000000
Fitnes                          = 3.17252212778666
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3152066.27320724
string                          =
0000101001111001100010100101000010011001010100
t      = 28
diam   = 1.000
dial   = 0.500
b1     = 116
b2     = 84
b3     = 68
b4     = 96
b5     = 76
nm1    = 7
nm2    = 11
n11    = 10
n12    = 9
Jam Mulai    = 6/12/02 12:10:12 PM
Jam Selesai = 6/12/02 12:10:16 PM

Run Ke                          = 1
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 76
Parameter Pinalti               = 10000000
Fitnes                          = 3.23960975720221
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3086791.54264439
string                          =
0000100010001110100000100010100101101000110000
t      = 28
diam   = 0.825
dial   = 0.625
b1     = 72
b2     = 100
b3     = 60
b4     = 92
b5     = 100
nm1    = 10
nm2    = 15
n11    = 8
n12    = 5
Jam Mulai    = 6/12/02 12:10:16 PM
```

Jam Selesai = 6/12/02 12:10:34 PM

Run Ke = 2
jumlah individu = 300
Konvergen Pada Generasi Ke = 67
Parameter Pinalti = 10000000
Fitnes = 3.2082801900125
Pelanggaran Kendala = 0
Fungsi Tujuan = 3116934.74626386
string =
000110100110011000000010010110001001010100000
t = 29
diam = 1.000
dial = 0.500
b1 = 96
b2 = 92
b3 = 60
b4 = 96
b5 = 84
nm1 = 7
nm2 = 10
nl1 = 9
nl2 = 5
Jam Mulai = 6/12/02 12:10:34 PM
Jam Selesai = 6/12/02 12:10:50 PM

Run Ke = 3
jumlah individu = 300
Konvergen Pada Generasi Ke = 86
Parameter Pinalti = 10000000
Fitnes = 3.16456748425617
Pelanggaran Kendala = 0
Fungsi Tujuan = 3159989.4929561
string =
000010101001111000000110000111000110000010000
t = 28
diam = 1.000
dial = 0.625
b1 = 88
b2 = 92
b3 = 64
b4 = 92
b5 = 88
nm1 = 6
nm2 = 13
nl1 = 7
nl2 = 5
Jam Mulai = 6/12/02 12:10:50 PM
Jam Selesai = 6/12/02 12:11:10 PM

Run Ke = 4
jumlah individu = 300
Konvergen Pada Generasi Ke = 81
Parameter Pinalti = 10000000
Fitnes = 3.23098577319427
Pelanggaran Kendala = 2.917381676526E-5
Fungsi Tujuan = 3094738.91252867
string =
000010100110001000000101101111001001100101000 1
t = 28
diam = 1.000
dial = 0.500
b1 = 92
b2 = 92
b3 = 64
b4 = 84
b5 = 120
nm1 = 7
nm2 = 11
nl1 = 10
nl2 = 6

Jam Mulai = 6/12/02 12:11:10 PM
Jam Selesai = 6/12/02 12:11:29 PM

Run Ke = 5
jumlah individu = 300
Konvergen Pada Generasi Ke = 76
Parameter Pinalti = 10000000
Fitnes = 3.24240918370249
Pelanggaran Kendala = 0
Fungsi Tujuan = 3084126.47307551
string =
000010101010101000000010010111000101100100000 0
t = 28
diam = 1.000
dial = 0.625
b1 = 100
b2 = 96
b3 = 60
b4 = 96
b5 = 100
nm1 = 6
nm2 = 11
nl1 = 9
nl2 = 5
Jam Mulai = 6/12/02 12:11:29 PM
Jam Selesai = 6/12/02 12:11:47 PM

Run Ke = 1
jumlah individu = 500
Konvergen Pada Generasi Ke = 84
Parameter Pinalti = 10000000
Fitnes = 3.2944674909887 1
Pelanggaran Kendala = 0.000762812344195396
Fungsi Tujuan = 3027763.79569302
string =
000010001010101000000010001010010010100010 0000
t = 28
diam = 0.825
dial = 0.625
b1 = 100
b2 = 92
b3 = 60
b4 = 92
b5 = 104
nm1 = 9
nm2 = 15
nl1 = 7
nl2 = 5
Jam Mulai = 6/12/02 12:11:47 PM
Jam Selesai = 6/12/02 12:12:20 PM

Run Ke = 2
jumlah individu = 500
Konvergen Pada Generasi Ke = 98
Parameter Pinalti = 10000000
Fitnes = 3.30382713499781
Pelanggaran Kendala = 0
Fungsi Tujuan = 3026792.74410845
string =
000010000110111000000010001011010010100101000 1
t = 28
diam = 0.825
dial = 0.500
b1 = 100
b2 = 96
b3 = 60
b4 = 92
b5 = 104
nm1 = 9
nm2 = 15
nl1 = 10

```
nl2    = 6
Jam Mulai    = 6/12/02 12:12:20 PM
Jam Selesai = 6/12/02 12:12:58 PM

Run Ke                          = 3
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 82
Parameter Pinalti               = 10000000
Fitnes                          = 3.20815761057974
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3117053.84019238
string                          =
00001010100101100000100110110000100110001000000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 80
b2     = 92
b3     = 68
b4     = 84
b5     = 108
nm1    = 7
nm2    = 11
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:12:58 PM
Jam Selesai = 6/12/02 12:13:30 PM

Run Ke                          = 4
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 91
Parameter Pinalti               = 10000000
Fitnes                          = 3.29446749098871
Pelanggaran Kendala             = 0.000762812344195396
Fungsi Tujuan                   = 3027763.79569302
string                          =
00001000101010100000001000101001001010001000000
t      = 28
diam   = 0.825
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 9
nm2    = 15
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:13:30 PM
Jam Selesai = 6/12/02 12:14:06 PM

Run Ke                          = 5
jumlah individu                 = 500
Konvergen Pada Generasi Ke = 77
Parameter Pinalti               = 10000000
Fitnes                          = 3.26303976879205
Pelanggaran Kendala             = 0.000259038795640487
Fungsi Tujuan                   = 3062036.68022729
string                          =
00001010101011100000000011111110010010100100000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 88
b5     = 120
nm1    = 7
nm2    = 10
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:14:06 PM
Jam Selesai = 6/12/02 12:14:36 PM

Run Ke                          = 1
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 82
Parameter Pinalti               = 10000000
Fitnes                          = 3.27476829515041
Pelanggaran Kendala             = 0.000762812344195396
Fungsi Tujuan                   = 3046023.0355756
string                          =
00001010011010100000000100101000010110010100001
t      = 28
diam   = 1.000
dial   = 0.500
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 6
nm2    = 11
nl1    = 10
nl2    = 6
Jam Mulai    = 6/12/02 12:14:36 PM
Jam Selesai = 6/12/02 12:15:21 PM

Run Ke                          = 2
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 83
Parameter Pinalti               = 10000000
Fitnes                          = 3.25836388145152
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3069024.93516017
string                          =
00001010101011100000000100010110010010100100000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 92
b5     = 104
nm1    = 7
nm2    = 10
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:15:21 PM
Jam Selesai = 6/12/02 12:16:06 PM

Run Ke                          = 3
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 82
Parameter Pinalti               = 10000000
Fitnes                          = 3.28174975164417
Pelanggaran Kendala             = 0.000155831067211842
Fungsi Tujuan                   = 3045596.63921093
string                          =
00001000011011100000000011111100101101001010001
t      = 28
diam   = 0.825
dial   = 0.500
b1     = 104
b2     = 92
b3     = 60
b4     = 88
b5     = 116
nm1    = 10
```

```
nm2    = 15
nl1    = 10
nl2    = 6
Jam Mulai    = 6/12/02 12:16:06 PM
Jam Selesai = 6/12/02 12:16:51 PM

Run Ke                        = 4
jumlah individuo              = 700
Konvergen Pada Generasi Ke = 77
Parameter Pinalti             = 10000000
Fitnes                        = 3.2561647307456 4
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3071097.6952662
string                        =
000010101001111001000010001010000101100010000 0
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 88
b2     = 96
b3     = 60
b4     = 92
b5     = 100
nm1    = 6
nm2    = 11
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:16:51 PM
Jam Selesai = 6/12/02 12:17:34 PM

Run Ke                        = 5
jumlah individu               = 700
Konvergen Pada Generasi Ke = 87
Parameter Pinalti             = 10000000
Fitnes                        = 3.26303976879205
Pelanggaran Kendala           = 0.000259038795640487
Fungsi Tujuan                 = 3062036.68022729
string                        =
000010101010111000000001111111000010010010 0000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 88
b5     = 120
nm1    = 7
nm2    = 10
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:17:34 PM
Jam Selesai = 6/12/02 12:18:21 PM

Run Ke                        = 1
jumlah individu               = 900
Konvergen Pada Generasi Ke = 84
Parameter Pinalti             = 10000000
Fitnes                        = 3.29446749098871
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3027763.79569302
string                        =
000010001010101000000010001010010010100010000 0
t      = 28
diam   = 0.825
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 9
nm2    = 15
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 12:18:21 PM
Jam Selesai = 6/12/02 12:19:21 PM

Run Ke                        = 2
jumlah individu               = 900
Konvergen Pada Generasi Ke = 89
Parameter Pinalti             = 10000000
Fitnes                        = 3.30382713499781
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3026792.74410845
string                        =
000010000110111000000010001011010010100101000 1
t      = 28
diam   = 0.825
dial   = 0.500
b1     = 104
b2     = 92
b3     = 60
b4     = 92
b5     = 104
nm1    = 9
nm2    = 15
nl1    = 10
nl2    = 6
Jam Mulai    = 6/12/02 12:19:21 PM
Jam Selesai = 6/12/02 12:20:24 PM

Run Ke                        = 3
jumlah individu               = 900
Konvergen Pada Generasi Ke = 82
Parameter Pinalti             = 10000000
Fitnes                        = 3.29446749098871
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3027763.79569302
string                        =
000010001010101000000010001010010010100010000 0
t      = 28
diam   = 0.825
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 9
nm2    = 15
nl1    = 7
nl2    = 6
Jam Mulai    = 6/12/02 12:20:24 PM
Jam Selesai = 6/12/02 12:21:22 PM

Run Ke                        = 4
jumlah individu               = 900
Konvergen Pada Generasi Ke = 92
Parameter Pinalti             = 10000000
Fitnes                        = 3.30752860861986
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3015777.32010845
string                        =
000010000110101000000010001010010010100101000 1
t      = 28
diam   = 0.825
dial   = 0.500
b1     = 100
b2     = 92
b3     = 60
b4     = 92
```

```
b5    = 100
nm1   = 9
nm2   = 15
nl1   = 10
nl2   = 6
Jam Mulai   = 6/12/02 12:21:22 PM
Jam Selesai = 6/12/02 12:22:27 PM

Run Ke                        = 5
jumlah individu               = 900
Konvergen Pada Generasi Ke = 86
Parameter Pinalti             = 10000000
Fitnes                        = 3.29079517695603
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3038779.21969302
string                        =
000010001010111000000010001011010010100010000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 108
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:22:27 PM
Jam Selesai = 6/12/02 12:23:28 PM

Run Ke                        = 1
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 88
Parameter Pinalti             = 10000000
Fitnes                        = 3.30752860861986
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3015777.32010845
string                        =
000010000110101000000010001010010010100101000 1
t     = 28
diam  = 0.825
dial  = 0.500
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 9
nm2   = 15
nl1   = 10
nl2   = 6
Jam Mulai   = 6/12/02 12:23:28 PM
Jam Selesai = 6/12/02 12:24:45 PM

Run Ke                        = 2
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 110
Parameter Pinalti             = 10000000
Fitnes                        = 3.29446749098871
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3027763.79569302
string                        =
000010001010101000000010001010010010100010000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 104
b2    = 92
b3    = 80
b4    = 92
b5    = 100
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:24:45 PM
Jam Selesai = 6/12/02 12:26:21 PM

Run Ke                        = 3
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 104
Parameter Pinalti             = 10000000
Fitnes                        = 3.26196413011411
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3058009.51116017
string                        =
000001010101010100000001000101000010110001000 0
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:26:21 PM
Jam Selesai = 6/12/02 12:27:51 PM

Run Ke                        = 4
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 88
Parameter Pinalti             = 10000000
Fitnes                        = 3.26196413011411
Pelanggaran Kendala           = 0.000762812344195396
Fungsi Tujuan                 = 3058009.51116017
string                        =
000001010101010100000001000101000010110001000 0
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:27:51 PM
Jam Selesai = 6/12/02 12:29:08 PM

Run Ke                        = 5
jumlah individu               = 1100
Konvergen Pada Generasi Ke = 77
Parameter Pinalti             = 10000000
Fitnes                        = 3.25836388145152
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 3069024.93516017
string                        =
000001010101011100000001000101100101010100100000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 104
b2    = 92
```

```
b3    = 60
b4    = 92
b5    = 104
nm1   = 7
nm2   = 10
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:29:08 PM
Jam Selesai = 6/12/02 12:30:15 PM

Run Ke                      = 1
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 79
Parameter Pinalti           = 10000000
Fitnes                      = 3.25993652295254
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3067544.39222729
string                      =
00001010101000100000010111101100010111000100000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 92
b3    = 64
b4    = 88
b5    = 108
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:30:15 PM
Jam Selesai = 6/12/02 12:31:36 PM

Run Ke                      = 2
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 79
Parameter Pinalti           = 10000000
Fitnes                      = 3.25836388145152
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3069024.93516017
string                      =
00001010101011100000001000101100100101001000000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 108
nm1   = 7
nm2   = 10
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:31:36 PM
Jam Selesai = 6/12/02 12:32:57 PM

Run Ke                      = 3
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 93
Parameter Pinalti           = 10000000
Fitnes                      = 3.29446749098871
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3027763.79569302
string                      =
00001000101010100000001000101001001010001000000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 104
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:32:57 PM
Jam Selesai = 6/12/02 12:34:32 PM

Run Ke                      = 4
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 96
Parameter Pinalti           = 10000000
Fitnes                      = 3.29446749098871
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3027763.79569302
string                      =
00001000101010100000001000101001001010001000000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:34:32 PM
Jam Selesai = 6/12/02 12:36:11 PM

Run Ke                      = 5
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 82
Parameter Pinalti           = 10000000
Fitnes                      = 3.3205424040105
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3011556.18067764
string                      =
00001010011011100000001000101100010101010100001
t     = 28
diam  = 1.000
dial  = 0.500
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 104
nm1   = 6
nm2   = 10
nl1   = 10
nl2   = 6
Jam Mulai   = 6/12/02 12:36:11 PM
Jam Selesai = 6/12/02 12:37:35 PM

Run Ke                      = 1
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 85
Parameter Pinalti           = 10000000
Fitnes                      = 3.29446749098871
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3027763.79569302
string                      =
00001000101010100000001000101001001010001000000
t     = 28
diam  = 0.825
dial  = 0.625
```

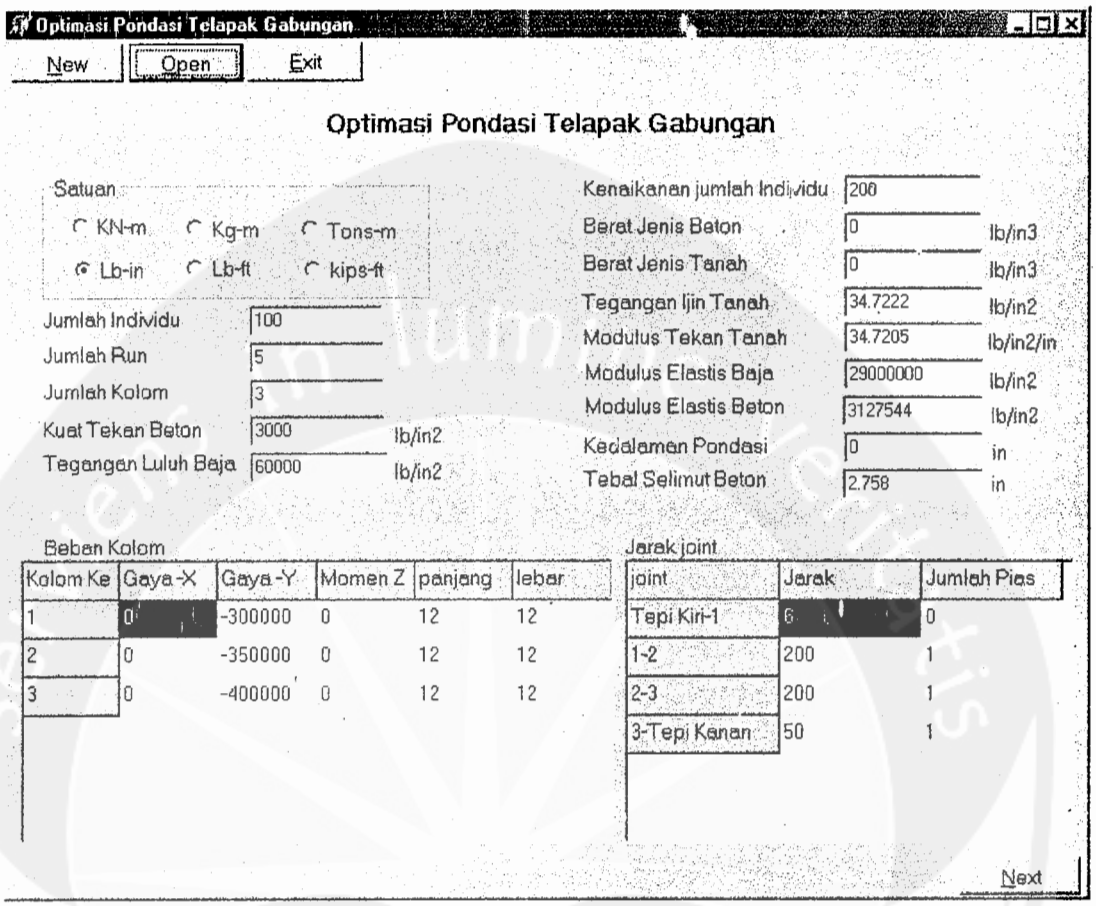
```
b1    = 100
b2    = 92
b3    = 60
b4    = 96
b5    = 88
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:37:35 PM
Jam Selesai = 6/12/02 12:39:17 PM

Run Ke                      = 2
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 92
Parameter Pinalti           = 10000000
Fitnes                      = 3.30752860861986
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3015777.32010845
string                      =
00001000011010100000001000101001001010010001
t     = 28
diam  = 0.825
dial  = 0.500
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 9
nm2   = 16
nl1   = 10
nl2   = 6
Jam Mulai   = 6/12/02 12:39:17 PM
Jam Selesai = 6/12/02 12:41:05 PM

Run Ke                      = 3
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 102
Parameter Pinalti           = 10000000
Fitnes                      = 3.24341832120162
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3083166.89667561
string                      =
00001010011100011100010110111100100110010000001
t     = 28
diam  = 1.000
dial  = 0.500
b1    = 108
b2    = 88
b3    = 64
b4    = 96
b5    = 80
nm1   = 7
nm2   = 11
nl1   = 9
nl2   = 8
Jam Mulai   = 6/12/02 12:41:05 PM
Jam Selesai = 6/12/02 12:43:06 PM

Run Ke                      = 4
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 87
Parameter Pinalti           = 10000000
Fitnes                      = 3.29446749098871
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3027763.79569302
string                      =
00001000101010100000001000101001001010000100000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:43:06 PM
Jam Selesai = 6/12/02 12:44:49 PM

Run Ke                      = 5
jumlah individu             = 1500
Konvergen Pada Generasi Ke = 83
Parameter Pinalti           = 10000000
Fitnes                      = 3.26196413011411
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3058009.51116017
string                      =
00001010101010100000001000101000010110001000000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:44:49 PM
Jam Selesai = 6/12/02 12:46:28 PM

Run Ke                      = 1
jumlah individu             = 1700
Konvergen Pada Generasi Ke = 90
Parameter Pinalti           = 10000000
Fitnes                      = 3.29446749098871
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3027763.79569302
string                      =
00001000101010100000001000101001001010000100000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:46:28 PM
Jam Selesai = 6/12/02 12:48:29 PM

Run Ke                      = 2
jumlah individu             = 1700
Konvergen Pada Generasi Ke = 84
Parameter Pinalti           = 10000000
Fitnes                      = 3.28251530323535
Pelanggaran Kendala         = 0.000155831067211842
Fungsi Tujuan               = 3044885.97860315
string                      =
00001010011011100000000011111100010010101010001
t     = 28
```

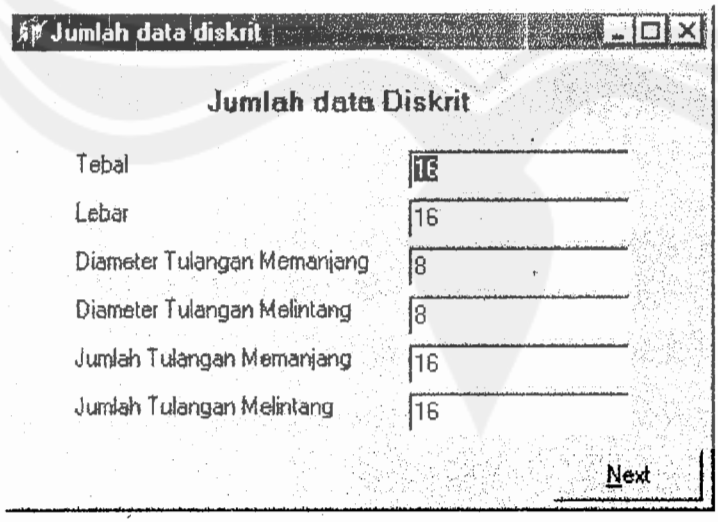
```
diam  = 1.000
dial  = 0.500
b1    = 104
b2    = 92
b3    = 60
b4    = 88
b5    = 116
nm1   = 7
nm2   = 10
nl1   = 10
nl2   = 6
Jam Mulai   = 6/12/02 12:48:29 PM
Jam Selesai = 6/12/02 12:50:22 PM

Run Ke                      = 3
jumlah individu             = 1700
Konvergen Pada Generasi Ke  = 79
Parameter Pinalti           = 10000000
Fitnes                      = 3.26196413011411
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3058009.51116017
string                      =
0000101010101010000000100010100001011000100000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 100
b2    = 92
b3    = 64
b4    = 92
b5    = 100
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:50:22 PM
Jam Selesai = 6/12/02 12:52:08 PM

Run Ke                      = 4
jumlah individu             = 1700
Konvergen Pada Generasi Ke  = 82
Parameter Pinalti           = 10000000
Fitnes                      = 3.30737850821735
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3023542.6562622
string                      =
0000101010101110000000100010110001010100100000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 108
nm1   = 6
nm2   = 10
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:52:08 PM
Jam Selesai = 6/12/02 12:53:58 PM

Run Ke                      = 5
jumlah individu             = 1700
Konvergen Pada Generasi Ke  = 96
Parameter Pinalti           = 10000000
Fitnes                      = 3.27763465990727
Pelanggaran Kendala         = 0.000155831068819667
Fungsi Tujuan               = 3049422.36214948
string                      =
0000101010111001110000100010110010010100010000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 116
b2    = 88
b3    = 60
b4    = 92
b5    = 104
nm1   = 7
nm2   = 10
nl1   = 6
nl2   = 5
Jam Mulai   = 6/12/02 12:53:58 PM
Jam Selesai = 6/12/02 12:56:07 PM

Run Ke                      = 1
jumlah individu             = 1900
Konvergen Pada Generasi Ke  = 88
Parameter Pinalti           = 10000000
Fitnes                      = 3.25993652295254
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 3067544.39222729
string                      =
0000101010100010000000101111010001011000100000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 92
b2    = 92
b3    = 64
b4    = 88
b5    = 104
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 12:56:07 PM
Jam Selesai = 6/12/02 12:58:20 PM

Run Ke                      = 2
jumlah individu             = 1900
Konvergen Pada Generasi Ke  = 87
Parameter Pinalti           = 10000000
Fitnes                      = 3.27476829515041
Pelanggaran Kendala         = 0.000762812344195396
Fungsi Tujuan               = 3046023.0355756
string                      =
0000101001101010000000100101010000101100101000 1
t     = 28
diam  = 1.000
dial  = 0.500
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 6
nm2   = 11
nl1   = 10
nl2   = 6
Jam Mulai   = 6/12/02 12:58:20 PM
Jam Selesai = 6/12/02 1:00:31 PM

Run Ke                      = 3
jumlah individu             = 1900
Konvergen Pada Generasi Ke  = 81
Parameter Pinalti           = 10000000
Fitnes                      = 3.27001785364313
Pelanggaran Kendala         = 0.000155831067211842
Fungsi Tujuan               = 3056528.96822729
```

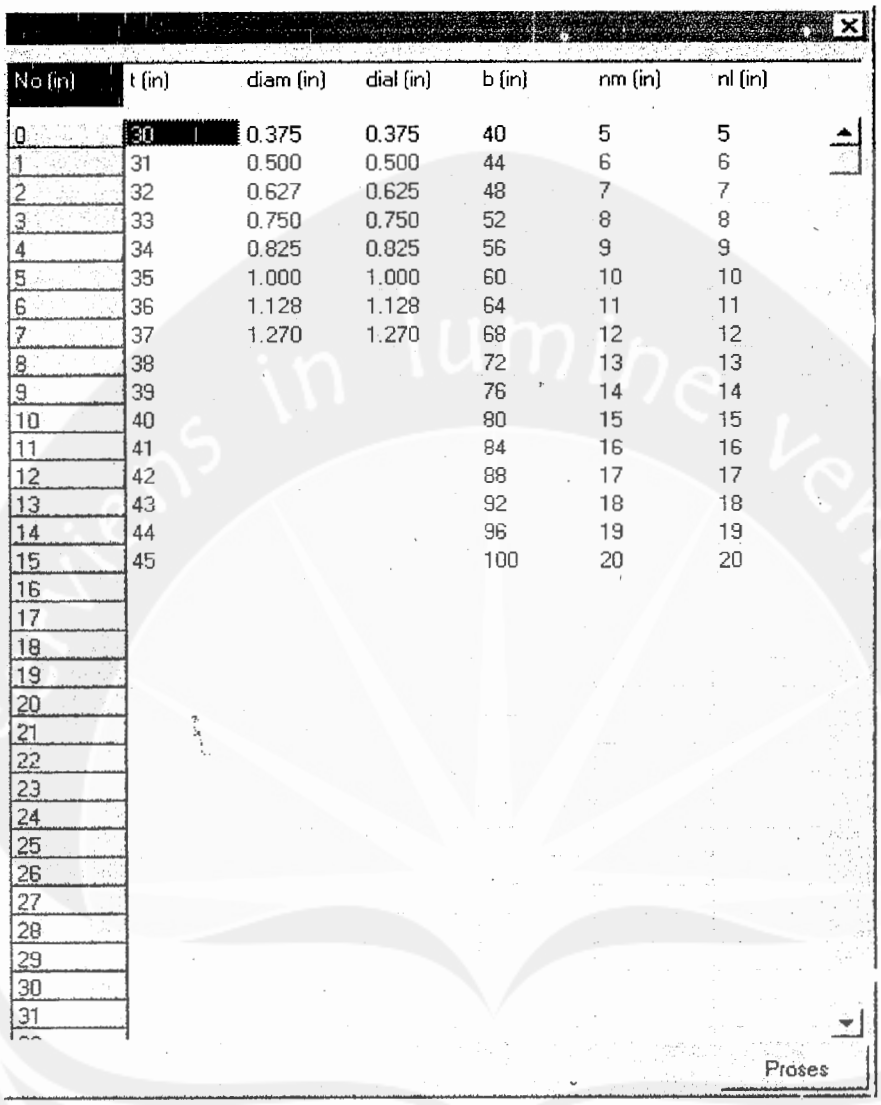
```
string                          =
00001010101011100000000111111000100101010010000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 88
b5     = 116
nm1    = 7
nm2    = 10
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 1:00:31 PM
Jam Selesai = 6/12/02 1:02:34 PM

Run Ke                          = 4
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 96
Parameter Pinalti               = 10000000
Fitnes                          = 3.25836388145152
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3069024.93516017
string                          =
00001010100111100000011000011100010110001000000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 88
b2     = 92
b3     = 64
b4     = 92
b5     = 88
nm1    = 6
nm2    = 11
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 1:02:34 PM
Jam Selesai = 6/12/02 1:04:59 PM

Run Ke                          = 5
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 98
Parameter Pinalti               = 10000000
Fitnes                          = 3.30737850821735
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3023542.6562622
string                          =
00001010101011100000001000101100010101010010000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 92
b5     = 104
nm1    = 6
nm2    = 10
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 1:04:59 PM
Jam Selesai = 6/12/02 1:07:26 PM

Run Ke                          = 1
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 107
Parameter Pinalti               = 10000000
Fitnes                          = 3.26196413011411
Pelanggaran Kendala             = 0.000762812344195396
Fungsi Tujuan                   = 3058009.51116017
string                          =
00001010101010100000001000101000010110001000000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 6
nm2    = 11
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 1:07:26 PM
Jam Selesai = 6/12/02 1:24:58 PM

Run Ke                          = 2
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 86
Parameter Pinalti               = 10000000
Fitnes                          = 3.30752860861986
Pelanggaran Kendala             = 0.000762812344195396
Fungsi Tujuan                   = 3015777.32010845
string                          =
00001000011010100000001000101001001010010010001
t      = 28
diam   = 0.825
dial   = 0.500
b1     = 100
b2     = 92
b3     = 60
b4     = 96
b5     = 88
nm1    = 9
nm2    = 15
nl1    = 10
nl2    = 6
Jam Mulai    = 6/12/02 1:24:58 PM
Jam Selesai = 6/12/02 1:39:22 PM

Run Ke                          = 3
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 84
Parameter Pinalti               = 10000000
Fitnes                          = 3.25566238664673
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 3071571.56129441
string                          =
00001010100101100000100110110000001011000100000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 88
b2     = 92
b3     = 68
b4     = 84
b5     = 100
nm1    = 6
nm2    = 11
nl1    = 7
nl2    = 5
Jam Mulai    = 6/12/02 1:39:23 PM
Jam Selesai = 6/12/02 1:53:24 PM

Run Ke                          = 4
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 99
Parameter Pinalti               = 10000000
Fitnes                          = 3.26196413011411
```

```
Pelanggaran Kendala          = 0.000762812344195396
Fungsi Tujuan                = 3058009.51116017
string                       =
000010101010101000000010001010000101100010000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 6
nm2    = 11
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 1:53:24 PM
Jam Selesai = 6/12/02 2:10:01 PM

Run Ke                       = 5
jumlah individu              = 2100
Konvergen Pada Generasi Ke = 89
Parameter Pinalti            = 10000000
Fitnes                       = 3.26196413011411
Pelanggaran Kendala          = 0.000762812344195396
Fungsi Tujuan                = 3058009.51116017
string                       =
000010101010101000000010001010000101100010000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 6
nm2    = 11
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 2:10:01 PM
Jam Selesai = 6/12/02 2:25:05 PM

Run Ke                       = 1
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 94
Parameter Pinalti            = 10000000
Fitnes                       = 3.29446749098871
Pelanggaran Kendala          = 0.000762812344195396
Fungsi Tujuan                = 3027763.79569302
string                       =
000010001010101000000010001010010010100010000
t      = 28
diam   = 0.825
dial   = 0.625
b1     = 100
b2     = 92
b3     = 60
b4     = 92
b5     = 100
nm1    = 9
nm2    = 15
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 2:25:05 PM
Jam Selesai = 6/12/02 3:47:28 PM

Run Ke                       = 2
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 84
Parameter Pinalti            = 10000000
Fitnes                       = 3.30737850821735
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 3023542.6562622
string                       =
000010101011111000000010001011000101010100100000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 92
b5     = 108
nm1    = 6
nm2    = 10
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 3:47:28 PM
Jam Selesai = 6/12/02 5:04:08 PM

Run Ke                       = 3
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 82
Parameter Pinalti            = 10000000
Fitnes                       = 3.30737850821735
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 3023542.6562622
string                       =
000010101010111000000010001011000101010100100000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 92
b5     = 108
nm1    = 6
nm2    = 10
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 5:04:09 PM
Jam Selesai = 6/12/02 6:19:11 PM

Run Ke                       = 4
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 78
Parameter Pinalti            = 10000000
Fitnes                       = 3.30737850821735
Pelanggaran Kendala          = 0
Fungsi Tujuan                = 3023542.6562622
string                       =
000010101010111000001000101011000101010100100000
t      = 28
diam   = 1.000
dial   = 0.625
b1     = 104
b2     = 92
b3     = 60
b4     = 92
b5     = 104
nm1    = 6
nm2    = 10
n11    = 7
n12    = 5
Jam Mulai    = 6/12/02 6:19:12 PM
Jam Selesai = 6/12/02 7:30:29 PM

Run Ke                       = 5
jumlah individu              = 2300
Konvergen Pada Generasi Ke = 82
```

```
Parameter Pinalti          = 10000000
Fitnes                     = 3.26196413011411
Pelanggaran Kendala        = 0.000762812344195396
Fungsi Tujuan              = 3058009.51116017
string                     =
00001010101010100000001000101000010110001000000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 100
nm1   = 6
nm2   = 11
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 7:30:29 PM
Jam Selesai = 6/12/02 8:45:27 PM

Run Ke                     = 1
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 82
Parameter Pinalti          = 10000000
Fitnes                     = 3.29446749098871
Pelanggaran Kendala        = 0.000762812344195396
Fungsi Tujuan              = 3027763.79569302
string                     =
00001000101010100000001000101001001010001000000
t     = 28
diam  = 0.825
dial  = 0.625
b1    = 100
b2    = 92
b3    = 60
b4    = 96
b5    = 68
nm1   = 9
nm2   = 15
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 8:45:27 PM
Jam Selesai = 6/12/02 10:46:56 PM

Run Ke                     = 2
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 82
Parameter Pinalti          = 10000000
Fitnes                     = 3.27001785364313
Pelanggaran Kendala        = 0.000155831067211842
Fungsi Tujuan              = 3056528.96822729
string                     =
00001010101011100000000111111000100101001000000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 88
b5    = 116
nm1   = 7
nm2   = 10
nl1   = 7
nl2   = 5
Jam Mulai   = 6/12/02 10:46:57 PM
Jam Selesai = 6/13/02 12:56:39 AM

Run Ke                     = 3
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 95
Parameter Pinalti          = 10000000
Fitnes                     = 3.3205424040105
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 3011556.18067764
string                     =
00001010011011100000000100010110001010101010001
t     = 28
diam  = 1.000
dial  = 0.500
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 108
nm1   = 6
nm2   = 10
nl1   = 10
nl2   = 6
Jam Mulai   = 6/13/02 12:56:40 AM
Jam Selesai = 6/13/02 3:28:50 AM

Run Ke                     = 4
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 75
Parameter Pinalti          = 10000000
Fitnes                     = 3.30737850821735
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 3023542.6562622
string                     =
00001010101011100000001000101100010101001000000
t     = 28
diam  = 1.000
dial  = 0.625
b1    = 104
b2    = 92
b3    = 60
b4    = 92
b5    = 104
nm1   = 6
nm2   = 10
nl1   = 7
nl2   = 5
Jam Mulai   = 6/13/02 3:28:51 AM
Jam Selesai = 6/13/02 5:31:03 AM

Run Ke                     = 5
jumlah individu            = 2500
Konvergen Pada Generasi Ke = 98
Parameter Pinalti          = 10000000
Fitnes                     = 3.30752860861986
Pelanggaran Kendala        = 0.000762812344195396
Fungsi Tujuan              = 3015777.32010345
string                     =
00001000011010100000001000101001001010010001000
t     = 28
diam  = 0.825
dial  = 0.500
b1    = 100
b2    = 92
b3    = 60
b4    = 92
b5    = 104
nm1   = 9
nm2   = 15
nl1   = 10
nl2   = 6
Jam Mulai   = 6/13/02 5:31:04 AM
Jam Selesai = 6/13/02 8:11:35 AM
```

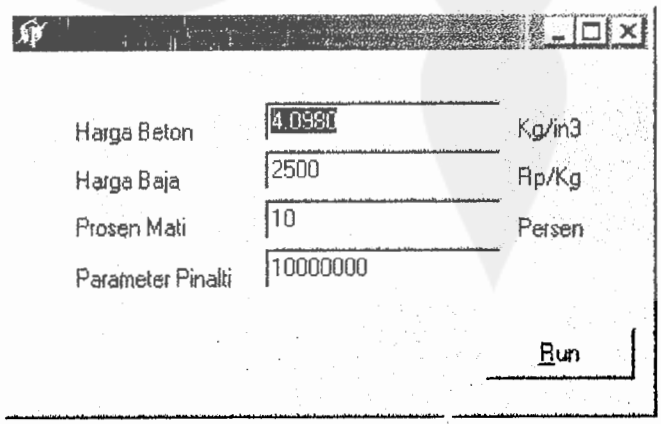

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu 100
Jumlah Run 5
Jumlah Kolom 3
Kuat Tekan Beton 3000 lb/in2
Tegangan Luluh Baja 60000 lb/in2
Kenaikanan jumlah Individu 200
Berat Jenis Beton 0 lb/in3
Berat Jenis Tanah 0 lb/in3
Tegangan Ijin Tanah 34.7222 lb/in2
Modulus Tekan Tanah 34.7205 lb/in2/in
Modulus Elastis Baja 29000000 lb/in2
Modulus Elastis Beton 3127544 lb/in2
Kedalaman Pondasi 0 in
Tebal Selimut Beton 2.758 in
Beban Kolom
Kolom Ke | Gaya -X | Gaya -Y | Momen Z | panjang | lebar
1 | 0 | -300000 | 0 | 12 | 12
2 | 0 | -350000 | 0 | 12 | 12
3 | 0 | -400000 | 0 | 12 | 12
Jarak joint
joint | Jarak | Jumlah Pias
Tepi Kiri-1 | 0 | 0
1-2 | 200 | 1
2-3 | 200 | 1
3-Tepi Kanan | 50 | 1
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal 15
Lebar 16
Diameter Tulangan Memanjang 8
Diameter Tulangan Melintang 8
Jumlah Tulangan Memanjang 16
Jumlah Tulangan Melintang 16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                          = 1
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 62
Parameter Pinalti               = 10000000
Fitnes                          = 1.43554990830766
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6965971.67547369
string                          =
01001010011100001001101000001010100101001000010
t      = 32
diam   = 1.000
dial   = 0.500
b1     = 108
b2     = 68
b3     = 84
b4     = 92
nm1    = 7
nm2    = 15
nl1    = 10
nl2    = 7
nl3    = 7
Jam Mulai    = 6/17/02 11:29:15 AM
Jam Selesai = 6/17/02 11:29:20 AM

Run Ke                          = 2
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 64
Parameter Pinalti               = 10000000
Fitnes                          = 1.41069266529157
Pelanggaran Kendala             = 0.0108876338011286
Fungsi Tujuan                   = 6979839.89766371
string                          =
01101000011011000101001110100011010100000011000
t      = 34
diam   = 0.825
dial   = 0.500
b1     = 104
b2     = 64
b3     = 84
b4     = 88
nm1    = 13
nm2    = 18
nl1    = 9
nl2    = 6
nl3    = 13
Jam Mulai    = 6/17/02 11:29:20 AM
Jam Selesai = 6/17/02 11:29:26 AM

Run Ke                          = 3
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 70
Parameter Pinalti               = 10000000
Fitnes                          = 1.4210989598736
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 7036807.6273111
string                          =
01111010101100000001011100001101110100000000000
t      = 35
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 60
b3     = 80
b4     = 108
nm1    = 8
nm2    = 12
nl1    = 9
nl2    = 5
nl3    = 5
Jam Mulai    = 6/17/02 11:29:26 AM
Jam Selesai = 6/17/02 11:29:31 AM

Run Ke                          = 4
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 65
Parameter Pinalti               = 10000000
Fitnes                          = 1.41706796692562
Pelanggaran Kendala             = 0.0054913488435695
Fungsi Tujuan                   = 7001911.0488484
string                          =
10001100011011000000111111001001000100000000000
t      = 36
diam   = 1.128
dial   = 0.500
b1     = 104
b2     = 60
b3     = 72
b4     = 120
nm1    = 7
nm2    = 9
nl1    = 9
nl2    = 5
nl3    = 5
Jam Mulai    = 6/17/02 11:29:31 AM
Jam Selesai = 6/17/02 11:29:36 AM

Run Ke                          = 5
jumlah individu                 = 100
Konvergen Pada Generasi Ke      = 66
Parameter Pinalti               = 10000000
Fitnes                          = 1.4368350759906
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6959741.00792724
string                          =
01101010011100000010000011001101111100000000010
t      = 34
diam   = 1.000
dial   = 0.500
b1     = 108
b2     = 60
b3     = 92
b4     = 72
nm1    = 8
nm2    = 12
nl1    = 13
nl2    = 5
nl3    = 7
Jam Mulai    = 6/17/02 11:29:36 AM
Jam Selesai = 6/17/02 11:29:41 AM

Run Ke                          = 1
jumlah individu                 = 300
Konvergen Pada Generasi Ke      = 69
Parameter Pinalti               = 10000000
Fitnes                          = 1.44791551038485
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6906480.33554254
string                          =
01101010011100000101001101001101110100000010001
t      = 34
diam   = 1.000
dial   = 0.500
b1     = 108
b2     = 64
b3     = 76
b4     = 112
nm1    = 8
nm2    = 12
nl1    = 9
nl2    = 6
nl3    = 6
Jam Mulai    = 6/17/02 11:29:41 AM
```

Jam Selesai = 6/17/02 11:29:57 AM

Run Ke = 2
jumlah individu = 300
Konvergen Pada Generasi Ke = 74
Parameter Pinalti = 10000000
Fitnes = 1.4703845335705
Pelanggaran Kendala = 0.00350152238921697
Fungsi Tujuan = 6765926.82336754
string =
0100101010110000011000001100101000001000000000
t = 32
diam = 1.000
dial = 0.625
b1 = 108
b2 = 64
b3 = 92
b4 = 72
nm1 = 7
nm2 = 13
nl1 = 7
nl2 = 5
nl3 = 5
Jam Mulai = 6/17/02 11:29:57 AM
Jam Selesai = 6/17/02 11:30:15 AM

Run Ke = 3
jumlah individu = 300
Konvergen Pada Generasi Ke = 73
Parameter Pinalti = 10000000
Fitnes = 1.4703845335705
Pelanggaran Kendala = 0.00350152238921697
Fungsi Tujuan = 6765926.82336754
string =
0100101010110000011000001100101000001000000000
t = 32
diam = 1.000
dial = 0.625
b1 = 108
b2 = 64
b3 = 92
b4 = 72
nm1 = 7
nm2 = 13
nl1 = 7
nl2 = 5
nl3 = 5
Jam Mulai = 6/17/02 11:30:15 AM
Jam Selesai = 6/17/02 11:30:32 AM

Run Ke = 4
jumlah individu = 300
Konvergen Pada Generasi Ke = 71
Parameter Pinalti = 10000000
Fitnes = 1.44970424381203
Pelanggaran Kendala = 0.000435675353619658
Fungsi Tujuan = 6893601.94575326
string =
0101101001110100010101110100110111010100010010
t = 33
diam = 1.000
dial = 0.500
b1 = 112
b2 = 64
b3 = 80
b4 = 112
nm1 = 8
nm2 = 12
nl1 = 10
nl2 = 6
nl3 = 7

Jam Mulai = 6/17/02 11:30:32 AM
Jam Selesai = 6/17/02 11:30:48 AM

Run Ke = 5
jumlah individu = 300
Konvergen Pada Generasi Ke = 67
Parameter Pinalti = 10000000
Fitnes = 1.44775195699116
Pelanggaran Kendala = 0
Fungsi Tujuan = 6907260.56470531
string =
0101101001110000010101110000111000010100010010
t = 33
diam = 1.000
dial = 0.500
b1 = 108
b2 = 64
b3 = 80
b4 = 108
nm1 = 8
nm2 = 13
nl1 = 10
nl2 = 9
nl3 = 7
Jam Mulai = 6/17/02 11:30:48 AM
Jam Selesai = 6/17/02 11:31:04 AM

Run Ke = 1
jumlah individu = 500
Konvergen Pada Generasi Ke = 86
Parameter Pinalti = 10000000
Fitnes = 1.45013066168578
Pelanggaran Kendala = 0.00039517144051926
Fungsi Tujuan = 6891978.60705632
string =
0110101001110000000111010100110111010000000001
t = 34
diam = 1.000
dial = 0.500
b1 = 108
b2 = 60
b3 = 88
b4 = 80
nm1 = 8
nm2 = 12
nl1 = 9
nl2 = 5
nl3 = 6
Jam Mulai = 6/17/02 11:31:04 AM
Jam Selesai = 6/17/02 11:31:37 AM

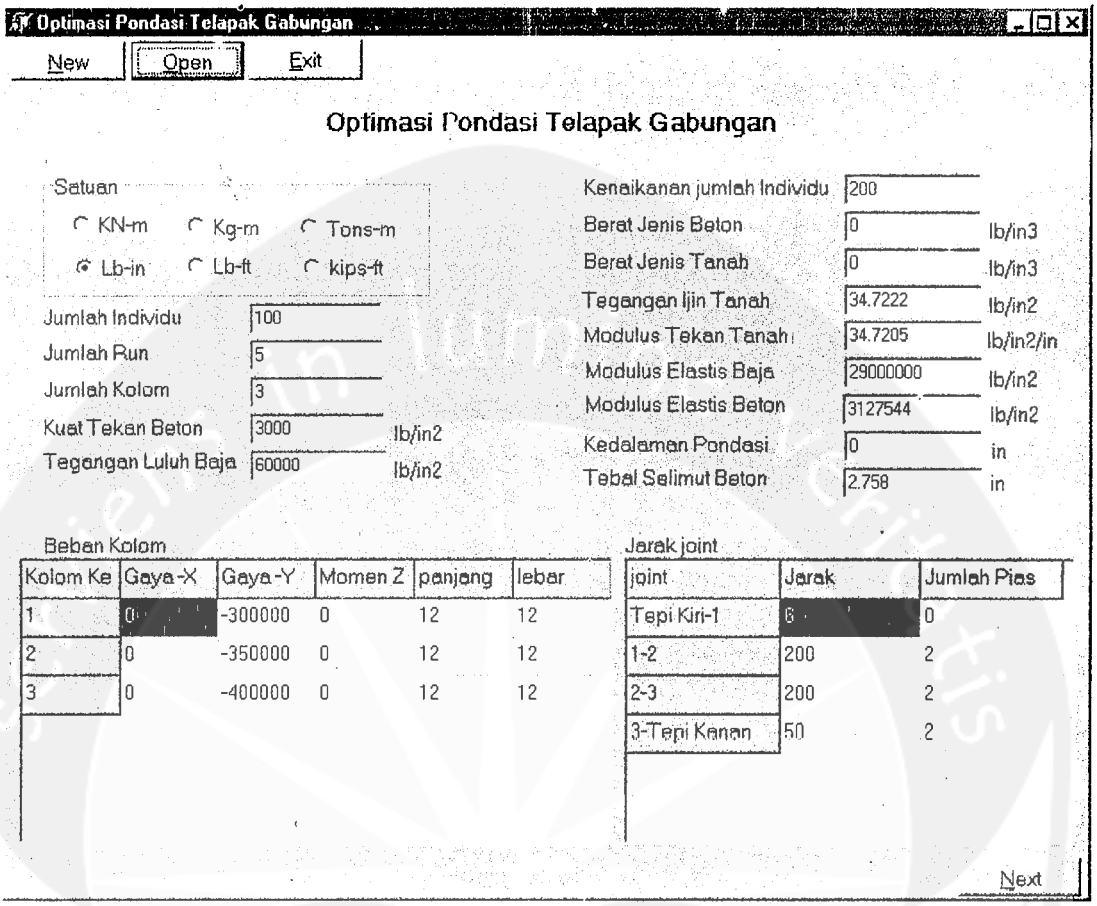
Run Ke = 2
jumlah individu = 500
Konvergen Pada Generasi Ke = 77
Parameter Pinalti = 10000000
Fitnes = 1.45780210463815
Pelanggaran Kendala = 0.00206814924429133
Fungsi Tujuan = 6838960.13393693
string =
0101101001101100100101101000101000010000010010
t = 33
diam = 1.000
dial = 0.500
b1 = 104
b2 = 68
b3 = 80
b4 = 100
nm1 = 7
nm2 = 13
nl1 = 9
nl2 = 6

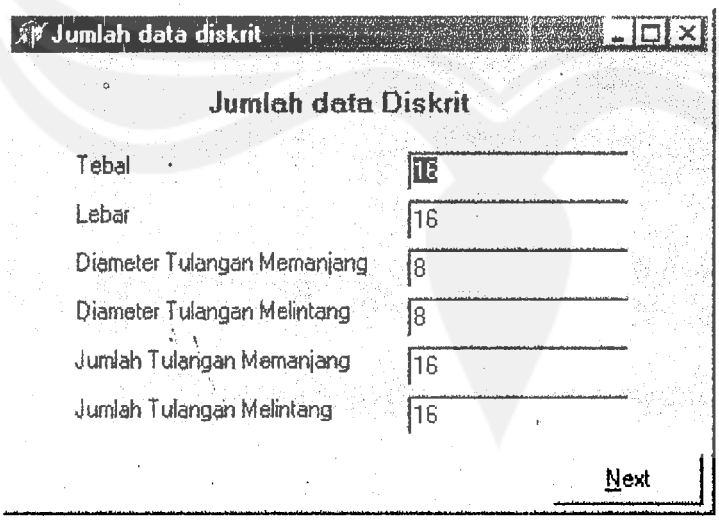
```
nl3   = 7
Jam Mulai   = 6/17/02 11:31:37 AM
Jam Selesai = 6/17/02 11:32:08 AM

Run Ke                        = 3
jumlah individu               = 500
Konvergen Pada Generasi Ke = 75
Parameter Pinalti             = 10000000
Fitnes                        = 1.44209533105511
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 6934354.3277985
string                        =
01101010101100000101001110001101110001000000000
t     = 34
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 12
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:32:08 AM
Jam Selesai = 6/17/02 11:32:37 AM

Run Ke                        = 4
jumlah individu               = 500
Konvergen Pada Generasi Ke = 86
Parameter Pinalti             = 10000000
Fitnes                        = 1.45333753184556
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 6880714.06736551
string                        =
01011010011100000101001110001110001000000010010
t     = 33
diam  = 1.000
dial  = 0.500
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 13
nl2   = 6
nl3   = 7
Jam Mulai   = 6/17/02 11:32:37 AM
Jam Selesai = 6/17/02 11:33:10 AM

Run Ke                        = 5
jumlah individu               = 500
Konvergen Pada Generasi Ke = 74
Parameter Pinalti             = 10000000
Fitnes                        = 1.4505920027236
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 6893737.16470531
string                        =
01011010011100000101011011001110000101000010010
t     = 33
diam  = 1.000
dial  = 0.500
b1    = 108
b2    = 64
b3    = 80
b4    = 104
nm1   = 8
nm2   = 13
nl1   = 10
nl2   = 6
nl3   = 7
Jam Mulai   = 6/17/02 11:33:10 AM
Jam Selesai = 6/17/02 11:33:39 AM

Run Ke                        = 1
jumlah individu               = 700
Konvergen Pada Generasi Ke = 68
Parameter Pinalti             = 10000000
Fitnes                        = 1.46976968587928
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 6803787.08043467
string                        =
01001010101100000100110100000101000001000000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 68
b3    = 84
b4    = 92
nm1   = 7
nm2   = 13
nl1   = 7
nl2   = 6
nl3   = 5
Jam Mulai   = 6/17/02 11:33:39 AM
Jam Selesai = 6/17/02 11:34:17 AM

Run Ke                        = 2
jumlah individu               = 700
Konvergen Pada Generasi Ke = 91
Parameter Pinalti             = 10000000
Fitnes                        = 1.46235810006663
Pelanggaran Kendala           = 0
Fungsi Tujuan                 = 6838270.32485708
string                        =
01011100011100000101011011000101010101000010010
t     = 33
diam  = 1.128
dial  = 0.500
b1    = 108
b2    = 64
b3    = 80
b4    = 104
nm1   = 6
nm2   = 10
nl1   = 10
nl2   = 6
nl3   = 7
Jam Mulai   = 6/17/02 11:34:17 AM
Jam Selesai = 6/17/02 11:35:07 AM

Run Ke                        = 3
jumlah individu               = 700
Konvergen Pada Generasi Ke = 75
Parameter Pinalti             = 10000000
Fitnes                        = 1.44375476215694
Pelanggaran Kendala           = 0.0094619297896712
Fungsi Tujuan                 = 6831764.78208387
string                        =
01101010011011000101001100001101111010000010001
t     = 34
diam  = 1.000
dial  = 0.500
b1    = 104
b2    = 64
b3    = 76
b4    = 108
nm1   = 8
nm2   = 12
```

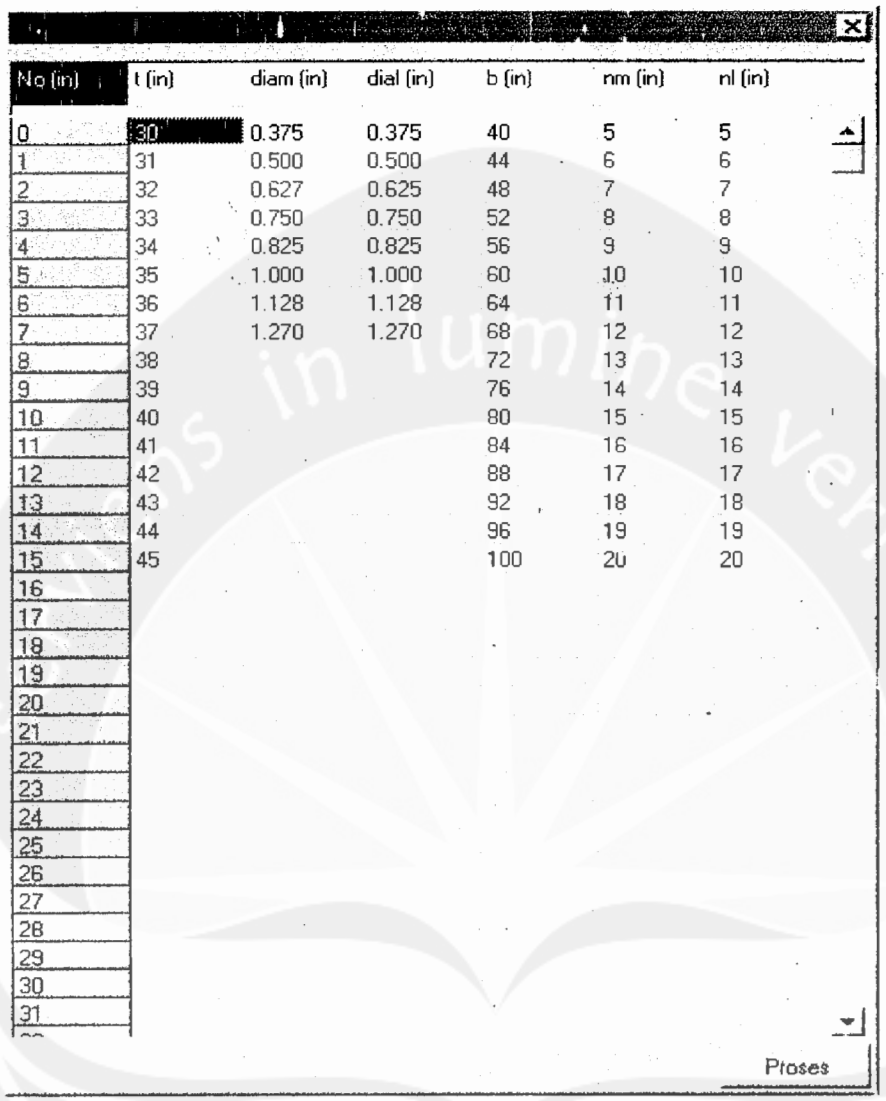
```
nl1    = 9
nl2    = 6
nl3    = 6
Jam Mulai    = 6/17/02 11:35:07 AM
Jam Selesai = 6/17/02 11:35:48 AM

Run Ke                          = 4
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 74
Parameter Pinalti               = 10000000
Fitnes                          = 1.45547968118096
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6870587.15370464
string                          =
01011010101100000101001110001110000100000000
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 64
b3     = 76
b4     = 116
nm1    = 8
nm2    = 13
nl1    = 6
nl2    = 5
nl3    = 5
Jam Mulai    = 6/17/02 11:35:48 AM
Jam Selesai = 6/17/02 11:36:28 AM

Run Ke                          = 5
jumlah individu                 = 700
Konvergen Pada Generasi Ke = 72
Parameter Pinalti               = 10000000
Fitnes                          = 1.45547968118096
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6870587.15370464
string                          =
01011010101100000101001110001110000100000000
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 64
b3     = 76
b4     = 116
nm1    = 8
nm2    = 13
nl1    = 6
nl2    = 5
nl3    = 6
Jam Mulai    = 6/17/02 11:36:28 AM
Jam Selesai = 6/17/02 11:37:08 AM

Run Ke                          = 1
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 68
Parameter Pinalti               = 10000000
Fitnes                          = 1.43733226232887
Pelanggaran Kendala             = 0.0094619297896712
Fungsi Tujuan                   = 6862714.27214177
string                          =
01101100011011000101001100000101010100000010001
t      = 34
diam   = 1.128
dial   = 0.500
b1     = 104
b2     = 64
b3     = 76
b4     = 108
nm1    = 6
nm2    = 10
nl1    = 9
nl2    = 6
nl3    = 6
Jam Mulai    = 6/17/02 11:37:08 AM
Jam Selesai = 6/17/02 11:37:56 AM

Run Ke                          = 2
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 74
Parameter Pinalti               = 10000000
Fitnes                          = 1.45378798648323
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6878582.08554217
string                          =
01011010101100000101001110001110000010000000000
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 64
b3     = 76
b4     = 116
nm1    = 8
nm2    = 13
nl1    = 7
nl2    = 5
nl3    = 5
Jam Mulai    = 6/17/02 11:37:56 AM
Jam Selesai = 6/17/02 11:38:48 AM

Run Ke                          = 3
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 60
Parameter Pinalti               = 10000000
Fitnes                          = 1.4449987674639
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6920421.12779851
string                          =
01101010101100000101001101001101110001000000000
t      = 34
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 64
b3     = 76
b4     = 112
nm1    = 8
nm2    = 12
nl1    = 6
nl2    = 5
nl3    = 5
Jam Mulai    = 6/17/02 11:38:48 AM
Jam Selesai = 6/17/02 11:39:31 AM

Run Ke                          = 4
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 70
Parameter Pinalti               = 10000000
Fitnes                          = 1.46976968587928
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6803787.08043467
string                          =
01001010101100001001101000001010000001000000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 108
b2     = 68
b3     = 84
b4     = 92
```

```
nm1   = 7
nm2   = 13
nl1   = 7
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:39:31 AM
Jam Selesai = 6/17/02 11:40:30 AM

Run Ke                      = 5
jumlah individu             = 900
Konvergen Pada Generasi Ke  = 98
Parameter Pinalti           = 10000000
Fitnes                      = 1.45013066168578
Pelanggaran Kendala         = 0.00039517144051926
Fungsi Tujuan               = 6891978.60705632
string                      =
0110101001110000000111010100110111010000000001
t     = 34
diam  = 1.000
dial  = 0.500
b1    = 108
b2    = 60
b3    = 88
b4    = 80
nm1   = 8
nm2   = 12
nl1   = 9
nl2   = 5
nl3   = 6
Jam Mulai   = 6/17/02 11:40:30 AM
Jam Selesai = 6/17/02 11:41:40 AM

Run Ke                      = 1
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 71
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:41:40 AM
Jam Selesai = 6/17/02 11:42:41 AM

Run Ke                      = 2
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 86
Parameter Pinalti           = 10000000
Fitnes                      = 1.4703845335705
Pelanggaran Kendala         = 0.00350152238921697
Fungsi Tujuan               = 6765926.82336754
string                      =
0100101010110000011000001100101000001000000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 92
b4    = 72
nm1   = 7
nm2   = 13
nl1   = 7
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:42:41 AM
Jam Selesai = 6/17/02 11:43:56 AM

Run Ke                      = 3
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 62
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:43:56 AM
Jam Selesai = 6/17/02 11:44:49 AM

Run Ke                      = 4
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 72
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 6
nl3   = 5
Jam Mulai   = 6/17/02 11:44:49 AM
Jam Selesai = 6/17/02 11:45:51 AM

Run Ke                      = 5
jumlah individu             = 1100
Konvergen Pada Generasi Ke  = 70
Parameter Pinalti           = 10000000
Fitnes                      = 1.45658704970118
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6865363.79823745
string                      =
0101101001110000010100111000111000010100010010
t     = 33
diam  = 1.000
dial  = 0.500
b1    = 108
b2    = 64
```

```
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 10
nl2   = 6
nl3   = 7
Jam Mulai   = 6/17/02 11:45:51 AM
Jam Selesai = 6/17/02 11:46:52 AM

Run Ke                      = 1
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 71
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000010000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:46:52 AM
Jam Selesai = 6/17/02 11:48:05 AM

Run Ke                      = 2
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 70
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:48:05 AM
Jam Selesai = 6/17/02 11:49:18 AM

Run Ke                      = 3
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 72
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 6
nl3   = 5
Jam Mulai   = 6/17/02 11:49:18 AM
Jam Selesai = 6/17/02 11:50:32 AM

Run Ke                      = 4
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 68
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:50:32 AM
Jam Selesai = 6/17/02 11:51:51 AM

Run Ke                      = 5
jumlah individu             = 1300
Konvergen Pada Generasi Ke = 74
Parameter Pinalti           = 10000000
Fitnes                      = 1.45547968118096
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6870587.15370464
string                      =
0101101010110000010100111000111000000100000000
t     = 33
diam  = 1.000
dial  = 0.625
b1    = 108
b2    = 64
b3    = 76
b4    = 116
nm1   = 8
nm2   = 13
nl1   = 6
nl2   = 5
nl3   = 5
Jam Mulai   = 6/17/02 11:51:51 AM
Jam Selesai = 6/17/02 11:53:08 AM
```

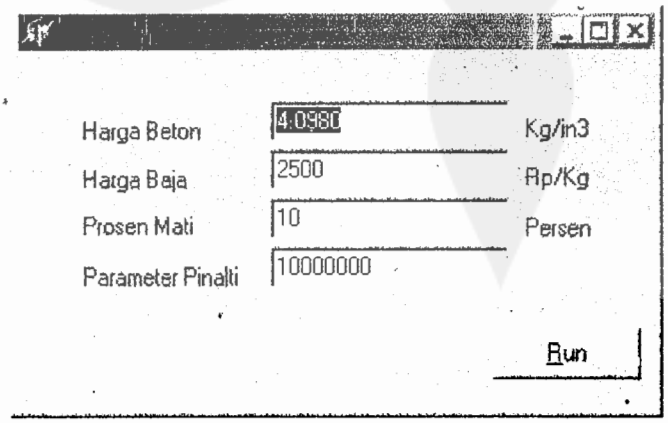

Optimasi Pondasi Telapak Gabungan
New
Open
Exit
Optimasi Pondasi Telapak Gabungan
Satuan
KN-m
Kg-m
Tons-m
Lb-in
Lb-ft
kips-ft
Jumlah Individu 100
Jumlah Run 5
Jumlah Kolom 3
Kuat Tekan Beton 3000 lb/in2
Tegangan Luluh Baja 60000 lb/in2
Kenaikanan jumlah Individu 200
Berat Jenis Beton 0 lb/in3
Berat Jenis Tanah 0 lb/in3
Tegangan Ijin Tanah 34.7222 lb/in2
Modulus Tekan Tanah 34.7205 lb/in2/in
Modulus Elastis Baja 29000000 lb/in2
Modulus Elastis Beton 3127544 lb/in2
Kedalaman Pondasi 0 in
Tebal Selimut Beton 2.758 in
Beban Kolom
Kolom Ke | Gaya-X | Gaya-Y | Momen Z | panjang | lebar
1 | 0 | -300000 | 0 | 12 | 12
2 | 0 | -350000 | 0 | 12 | 12
3 | 0 | -400000 | 0 | 12 | 12
Jarak joint
joint | Jarak | Jumlah Pias
Tepi Kiri-1 | 0 | 0
1-2 | 200 | 2
2-3 | 200 | 2
3-Tepi Kanan | 50 | 2
Next


Jumlah data diskrit
Jumlah data Diskrit
Tebal 16
Lebar 16
Diameter Tulangan Memanjang 8
Diameter Tulangan Melintang 8
Jumlah Tulangan Memanjang 16
Jumlah Tulangan Melintang 16
Next



No (in)	t (in)	diam (in)	dial (in)	b (in)	nm (in)	nl (in)
0	30	0.375	0.375	40	5	5
1	31	0.500	0.500	44	6	6
2	32	0.627	0.625	48	7	7
3	33	0.750	0.750	52	8	8
4	34	0.825	0.825	56	9	9
5	35	1.000	1.000	60	10	10
6	36	1.128	1.128	64	11	11
7	37	1.270	1.270	68	12	12
8	38			72	13	13
9	39			76	14	14
10	40			80	15	15
11	41			84	16	16
12	42			88	17	17
13	43			92	18	18
14	44			96	19	19
15	45			100	20	20
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Proses



```
Run Ke                      = 1
jumlah individu             = 100
Konvergen Pada Generasi Ke = 75
Parameter Pinalti           = 10000000
Fitnes                      = 1.42187688487971
Pelanggaran Kendala         = 0.000391470989792087
Fungsi Tujuan               = 7029042.99997158
string                      =
011010101011100101000100000100111110000100100001000
000010
t     = 34
diam  = 1.000
dial  = 0.625
b1    = 116
b2    = 80
b3    = 64
b4    = 60
b5    = 76
b6    = 120
b7    = 92
nm1   = 9
nm2   = 13
nl1   = 9
nl2   = 5
nl3   = 7
Jam Mulai    = 6/18/02 12:16:23 PM
Jam Selesai = 6/18/02 12:16:36 PM

Run Ke                      = 2
jumlah individu             = 100
Konvergen Pada Generasi Ke = 65
Parameter Pinalti           = 10000000
Fitnes                      = 1.43281864119935
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6979250.34785241
string                      =
001011001111100111010000000111111101010010011100010
010000
t     = 30
diam  = 1.128
dial  = 0.750
b1    = 116
b2    = 88
b3    = 76
b4    = 60
b5    = 88
b6    = 120
b7    = 80
nm1   = 7
nm2   = 12
nl1   = 6
nl2   = 6
nl3   = 5
Jam Mulai    = 6/18/02 12:16:36 PM
Jam Selesai = 6/18/02 12:16:45 PM

Run Ke                      = 3
jumlah individu             = 100
Konvergen Pada Generasi Ke = 70
Parameter Pinalti           = 10000000
Fitnes                      = 1.4138153904282
Pelanggaran Kendala         = 0.000417641518654088
Fungsi Tujuan               = 7068882.81708797
string                      =
011010100111100101000100010110110000101001000100000
010010
t     = 34
diam  = 1.000
dial  = 0.500
b1    = 116
b2    = 80
b3    = 64
b4    = 64
b5    = 84
b6    = 116
b7    = 64
nm1   = 9
nm2   = 13
nl1   = 13
nl2   = 6
nl3   = 7
Jam Mulai    = 6/18/02 12:16:45 PM
Jam Selesai = 6/18/02 12:16:56 PM

Run Ke                      = 4
jumlah individu             = 100
Konvergen Pada Generasi Ke = 77
Parameter Pinalti           = 10000000
Fitnes                      = 1.46154054610886
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6842095.50437963
string                      =
001010101011111011001000000100010001110010010010100
000000010
t     = 30
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 84
b3    = 76
b4    = 60
b5    = 92
b6    = 92
b7    = 116
nm1   = 9
nm2   = 14
nl1   = 9
nl2   = 5
nl3   = 7
Jam Mulai    = 6/18/02 12:16:56 PM
Jam Selesai = 6/18/02 12:17:07 PM

Run Ke                      = 5
jumlah individu             = 100
Konvergen Pada Generasi Ke = 82
Parameter Pinalti           = 10000000
Fitnes                      = 1.46377814835382
Pelanggaran Kendala         = 0
Fungsi Tujuan               = 6831636.34547086
string                      =
010011000111110110001000011000110100010001010110000
0010100
t     = 32
diam  = 1.128
dial  = 0.500
b1    = 120
b2    = 84
b3    = 68
b4    = 64
b5    = 92
b6    = 112
b7    = 72
nm1   = 6
nm2   = 10
nl1   = 13
nl2   = 6
nl3   = 9
Jam Mulai    = 6/18/02 12:17:07 PM
Jam Selesai = 6/18/02 12:17:18 PM

Run Ke                      = 1
jumlah individu             = 300
```

```
Konvergen Pada Generasi Ke = 76
Parameter Pinalti          = 10000000
Fitnes                     = 1.48124263734833
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6751088.40905477
string                     =
0011101010111101100011000010001010101000111000001100
000000
t     = 31
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 84
b3    = 72
b4    = 60
b5    = 96
b6    = 84
b7    = 116
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai   = 6/18/02 12:17:18 PM
Jam Selesai = 6/18/02 12:17:52 PM

Run Ke                     = 2
jumlah individu            = 300
Konvergen Pada Generasi Ke = 74
Parameter Pinalti          = 10000000
Fitnes                     = 1.46109742037052
Pelanggaran Kendala        = 0.000882173791393211
Fungsi Tujuan              = 6835348.85644933
string                     =
0100110010111101010010000001111010101100010110010000
000000
t     = 32
diam  = 1.128
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 88
b6    = 100
b7    = 104
nm1   = 6
nm2   = 11
nl1   = 9
nl2   = 5
nl3   = 5
Jam Mulai   = 6/18/02 12:17:52 PM
Jam Selesai = 6/18/02 12:18:24 PM

Run Ke                     = 3
jumlah individu            = 300
Konvergen Pada Generasi Ke = 75
Parameter Pinalti          = 10000000
Fitnes                     = 1.48415928717601
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6737821.26110435
string                     =
0011101010111101100011000001101100110000111000010000
000001
t     = 31
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 84
b3    = 72
b4    = 60
b5    = 84
b6    = 108
b7    = 108
nm1   = 8
nm2   = 13
nl1   = 9
nl2   = 5
nl3   = 6
Jam Mulai   = 6/18/02 12:18:24 PM
Jam Selesai = 6/18/02 12:18:56 PM

Run Ke                     = 4
jumlah individu            = 300
Konvergen Pada Generasi Ke = 78
Parameter Pinalti          = 10000000
Fitnes                     = 1.47317661330779
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6788052.36905477
string                     =
0100101010111101010010000101011110011100111000001
100000001
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 64
b5    = 80
b6    = 116
b7    = 88
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 7
nl3   = 6
Jam Mulai   = 6/18/02 12:18:56 PM
Jam Selesai = 6/18/02 12:19:30 PM

Run Ke                     = 5
jumlah individu            = 300
Konvergen Pada Generasi Ke = 80
Parameter Pinalti          = 10000000
Fitnes                     = 1.44442118540209
Pelanggaran Kendala        = 0.000995514144459531
Fungsi Tujuan              = 6913233.26167776
string                     =
0110101001111001010001000001101000111001000111010
100010001
t     = 34
diam  = 1.000
dial  = 0.500
b1    = 116
b2    = 80
b3    = 64
b4    = 60
b5    = 84
b6    = 92
b7    = 116
nm1   = 9
nm2   = 12
nl1   = 10
nl2   = 6
nl3   = 6
Jam Mulai   = 6/18/02 12:19:30 PM
Jam Selesai = 6/18/02 12:20:05 PM

Run Ke                     = 1
jumlah individu            = 500
Konvergen Pada Generasi Ke = 86
Parameter Pinalti          = 10000000
```

```
Fitnes                          = 1.47473898776642
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6780860.94078627
string                          =
0100101010111101010010000001111100011100111000010000
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 88
b6     = 108
b7     = 88
nm1    = 8
nm2    = 13
nl1    = 9
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:20:05 PM
Jam Selesai = 6/18/02 12:21:07 PM

Run Ke                          = 2
jumlah individu                 = 500
Konvergen Pada Generasi Ke      = 77
Parameter Pinalti               = 10000000
Fitnes                          = 1.4776426633904
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6767536.05439039
string                          =
0100101010111101010010000010100111010100011100000110
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 116
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:21:07 PM
Jam Selesai = 6/18/02 12:22:03 PM

Run Ke                          = 3
jumlah individu                 = 500
Konvergen Pada Generasi Ke      = 93
Parameter Pinalti               = 10000000
Fitnes                          = 1.4776426633904
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6767536.05439039
string                          =
0100101010111101010010000010100111011100001110000011
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 100
b7     = 112
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:22:03 PM
Jam Selesai = 6/18/02 12:23:11 PM

Run Ke                          = 4
jumlah individu                 = 500
Konvergen Pada Generasi Ke      = 80
Parameter Pinalti               = 10000000
Fitnes                          = 1.48708875644795
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6724548.18627366
string                          =
0100110010111101010100000100001111101000101010010
100000000
t      = 32
diam   = 1.128
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 92
b6     = 88
b7     = 112
nm1    = 6
nm2    = 10
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:23:11 PM
Jam Selesai = 6/18/02 12:24:09 PM

Run Ke                          = 5
jumlah individu                 = 500
Konvergen Pada Generasi Ke      = 78
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010100000011011001010000111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:24:09 PM
Jam Selesai = 6/18/02 12:25:06 PM

Run Ke                          = 1
jumlah individu                 = 700
Konvergen Pada Generasi Ke      = 143
Parameter Pinalti               = 10000000
Fitnes                          = 1.4749229849008
Pelanggaran Kendala             = 0
```

```
Fungsi Tujuan              = 6780015.02612189
string                     =
0100101010111101010010000010000111111010011100000011000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 92
b6    = 88
b7    = 112
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:25:06 PM
Jam Selesai = 6/18/02 12:27:32 PM

Run Ke                     = 2
jumlah individu            = 700
Konvergen Pada Generasi Ke = 88
Parameter Pinalti          = 10000000
Fitnes                     = 1.47842817898381
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6763940.34025614
string                     =
0100101010111101010010000001101110011100111000001100000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 116
b7    = 88
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:27:32 PM
Jam Selesai = 6/18/02 12:29:02 PM

Run Ke                     = 3
jumlah individu            = 700
Konvergen Pada Generasi Ke = 73
Parameter Pinalti          = 10000000
Fitnes                     = 1.47810464014861
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6765420.88318902
string                     =
0100101010111101010010000001111000111000111000000110000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 72
b4    = 60
b5    = 76
b6    = 112
b7    = 116
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:29:02 PM
Jam Selesai = 6/18/02 12:30:16 PM

Run Ke                     = 4
jumlah individu            = 700
Konvergen Pada Generasi Ke = 114
Parameter Pinalti          = 10000000
Fitnes                     = 1.47458079028822
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6781588.41201603
string                     =
0100101011111110101001000000110111001110011100000000000000
t     = 32
diam  = 1.000
dial  = 0.750
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 120
b7    = 80
nm1   = 8
nm2   = 13
nl1   = 5
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:30:16 PM
Jam Selesai = 6/18/02 12:32:13 PM

Run Ke                     = 5
jumlah individu            = 700
Konvergen Pada Generasi Ke = 81
Parameter Pinalti          = 10000000
Fitnes                     = 1.4776426633904
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6767536.05439039
string                     =
0100101010111101010010000010100110011100011100000011000000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 64
b5    = 76
b6    = 108
b7    = 116
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:32:13 PM
Jam Selesai = 6/18/02 12:33:36 PM

Run Ke                     = 1
jumlah individu            = 900
Konvergen Pada Generasi Ke = 76
Parameter Pinalti          = 10000000
Fitnes                     = 1.4776426633904
Pelanggaran Kendala        = 0
Fungsi Tujuan              = 6767536.05439039
```

```
string                          =
0100101010111101010010000101001110101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 116
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:33:36 PM
Jam Selesai = 6/18/02 12:35:16 PM

Run Ke                          = 2
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 79
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817898381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111101010010000001101110011100111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 116
b7     = 88
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:35:16 PM
Jam Selesai = 6/18/02 12:37:00 PM

Run Ke                          = 3
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 78
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207671
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:37:00 PM
Jam Selesai = 6/18/02 12:38:42 PM

Run Ke                          = 4
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 91
Parameter Pinalti               = 10000000
Fitnes                          = 1.48708875644795
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6724548.18627366
string                          =
0100110010111101010010000010001000101100010101001
100000000
t      = 32
diam   = 1.128
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 92
b6     = 92
b7     = 104
nm1    = 6
nm2    = 10
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 12:38:42 PM
Jam Selesai = 6/18/02 12:40:42 PM

Run Ke                          = 5
jumlah individu                 = 900
Konvergen Pada Generasi Ke = 110
Parameter Pinalti               = 10000000
Fitnes                          = 1.48065761293282
Pelanggaran Kendala             = 0.000828770900728415
Fungsi Tujuan                   = 6745468.13073235
string                          =
0100101001111110101001000000110110110000011110000011
100010010
t      = 32
diam   = 1.000
dial   = 0.500
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 112
b7     = 92
nm1    = 8
nm2    = 13
nl1    = 12
nl2    = 6
nl3    = 7
Jam Mulai    = 6/18/02 12:40:42 PM
Jam Selesai = 6/18/02 12:43:06 PM

Run Ke                          = 1
jumlah individu                 = 1100
Konvergen Pada Generasi Ke = 82
Parameter Pinalti               = 10000000
Fitnes                          = 1.488868287902
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6716510.84334079
```

```
string                          =
0100110010111110101001000000111110001110001010100110000000
t      = 32
diam   = 1.128
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 88
b6     = 108
b7     = 88
nm1    = 6
nm2    = 10
n11    = 8
n12    = 5
n13    = 5
Jam Mulai    = 6/18/02 12:43:06 PM
Jam Selesai = 6/18/02 12:45:19 PM

Run Ke                          = 2
jumlah individu                 = 1100
Konvergen Pada Generasi Ke = 78
Parameter Pinalti               = 10000000
Fitnes                          = 1.4776426633904
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6767536.05439039
string                          =
0100101010111110101001000010100110011100011100000110000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 108
b7     = 116
nm1    = 8
nm2    = 13
n11    = 8
n12    = 5
n13    = 5
Jam Mulai    = 6/18/02 12:45:19 PM
Jam Selesai = 6/18/02 12:47:24 PM

Run Ke                          = 3
jumlah individu                 = 1100
Konvergen Pada Generasi Ke = 79
Parameter Pinalti               = 10000000
Fitnes                          = 1.47744237042345
Pelanggaran Kendala             = 0.00535158845240113
Fungsi Tujuan                   = 6714937.626887
string                          =
0101101010111110100001000000100110011100011011100100000000
t      = 33
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 76
b3     = 68
b4     = 60
b5     = 76
b6     = 108
b7     = 116
nm1    = 8
nm2    = 12
n11    = 7
n12    = 5
n13    = 5
Jam Mulai    = 6/18/02 12:47:24 PM
Jam Selesai = 6/18/02 12:49:31 PM

Run Ke                          = 4
jumlah individu                 = 1100
Konvergen Pada Generasi Ke = 76
Parameter Pinalti               = 10000000
Fitnes                          = 1.4776426633904
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6767536.05439039
string                          =
0100101010111110101001000010100110011100011100000110000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 108
b7     = 116
nm1    = 8
nm2    = 13
n11    = 8
n12    = 5
n13    = 5
Jam Mulai    = 6/18/02 12:49:31 PM
Jam Selesai = 6/18/02 12:51:33 PM

Run Ke                          = 5
jumlah individu                 = 1100
Konvergen Pada Generasi Ke = 78
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817898381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111110101001000000110111001110011110000010000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 116
b7     = 88
nm1    = 8
nm2    = 13
n11    = 8
n12    = 5
n13    = 5
Jam Mulai    = 6/18/02 12:51:33 PM
Jam Selesai = 6/18/02 12:53:39 PM

Run Ke                          = 1
jumlah individu                 = 1300
Konvergen Pada Generasi Ke = 75
Parameter Pinalti               = 10000000
Fitnes                          = 1.47846282503639
Pelanggaran Kendala             = 0.000280258080988638
Fungsi Tujuan                   = 6760979.25439039
```

```
string                          =
0100101010111101010010000101001011111100111001001100
000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 64
b5    = 76
b6    = 104
b7    = 120
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:53:39 PM
Jam Selesai = 6/18/02 12:56:01 PM

Run Ke                          = 2
jumlah individu                 = 1300
Konvergen Pada Generasi Ke = 93
Parameter Pinalti               = 10000000
Fitnes                          = 1.47667350186702
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6771977.68318902
string                          =
0100101010111101010010000000111101,1001001110000011100
000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 88
b6    = 104
b7    = 96
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:56:01 PM
Jam Selesai = 6/18/02 12:58:58 PM

Run Ke                          = 3
jumlah individu                 = 1300
Konvergen Pada Generasi Ke = 79
Parameter Pinalti               = 10000000
Fitnes                          = 1.47810464014861
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6765420.88318902
string                          =
0100101010111101010010000001111000111000111000001100
000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 64
b5    = 76
b6    = 108
b7    = 116
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 12:58:58 PM
Jam Selesai = 6/18/02 1:01:27 PM

Run Ke                          = 4
jumlah individu                 = 1300
Konvergen Pada Generasi Ke = 79
Parameter Pinalti               = 10000000
Fitnes                          = 1.47810464014861
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6765420.88318902
string                          =
0100101010111101010010000001111000111000111000001
100000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 88
b6    = 92
b7    = 116
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 1:01:27 PM
Jam Selesai = 6/18/02 1:03:57 PM

Run Ke                          = 5
jumlah individu                 = 1300
Konvergen Pada Generasi Ke = 96
Parameter Pinalti               = 10000000
Fitnes                          = 1.47846282503639
Pelanggaran Kendala             = 0.000280258080988638
Fungsi Tujuan                   = 6760979.25439039
string                          =
0100101010111101010010000101001011111100111000001
100000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 116
b7    = 88
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 1:03:57 PM
Jam Selesai = 6/18/02 1:06:59 PM

Run Ke                          = 1
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 84
Parameter Pinalti               = 10000000
Fitnes                          = 1.47810464014861
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6765420.88318902
```

```
string                          =
0100101010111101010010000001111000111000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 88
b6     = 104
b7     = 96
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 1:06:59 PM
Jam Selesai = 6/18/02 1:10:05 PM

Run Ke                          = 2
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 93
Parameter Pinalti               = 10000000
Fitnes                          = 1.48985352807959
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6712069.21454216
string                          =
0100110010111101010010000101001100111000010101001100
000000
t      = 32
diam   = 1.128
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 108
b7     = 116
nm1    = 6
nm2    = 10
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 1:10:05 PM
Jam Selesai = 6/18/02 1:13:28 PM

Run Ke                          = 3
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 85
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 116
b7     = 88
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 1:13:28 PM
Jam Selesai = 6/18/02 1:16:34 PM

Run Ke                          = 4
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 84
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817858381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111101010010000001101111010100111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 120
b7     = 80
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 1:16:34 PM
Jam Selesai = 6/18/02 1:19:39 PM

Run Ke                          = 5
jumlah individu                 = 1500
Konvergen Pada Generasi Ke = 78
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 116
b7     = 88
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 1:19:39 PM
Jam Selesai = 6/18/02 1:22:29 PM

Run Ke                          = 1
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 79
Parameter Pinalti               = 10000000
Fitnes                          = 1.47810464014861
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6765420.88318902
```

```
string                          =
0100101010111101010010000001111000111000111000001100
000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 88
b6    = 92
b7    = 116
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 1:22:29 PM
Jam Selesai = 6/18/02 1:38:00 PM

Run Ke                          = 2
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 90
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817898381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111101010010000001101110011100111000001100
000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 116
b7    = 88
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 1:38:01 PM
Jam Selesai = 6/18/02 1:52:45 PM

Run Ke                          = 3
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 93
Parameter Pinalti               = 10000000
Fitnes                          = 1.47846282503639
Pelanggaran Kendala             = 0.000280258080988638
Fungsi Tujuan                   = 6760979.25439039
string                          =
0100101010111101010010000101001011111100111000001100
000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 120
b7    = 80
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 1:52:46 PM
Jam Selesai = 6/18/02 2:07:48 PM

Run Ke                          = 4
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 80
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101010001110000001
100000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 108
b7    = 100
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 2:07:48 PM
Jam Selesai = 6/18/02 2:20:53 PM

Run Ke                          = 5
jumlah individu                 = 1700
Konvergen Pada Generasi Ke = 89
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101010001110000001
100000000
t     = 32
diam  = 1.000
dial  = 0.625
b1    = 120
b2    = 80
b3    = 68
b4    = 60
b5    = 84
b6    = 108
b7    = 100
nm1   = 8
nm2   = 13
nl1   = 8
nl2   = 5
nl3   = 5
Jam Mulai    = 6/18/02 2:20:54 PM
Jam Selesai = 6/18/02 2:36:44 PM

Run Ke                          = 1
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 73
Parameter Pinalti               = 10000000
Fitnes                          = 1.47810464014861
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6765420.88318902
```

```
string                          =
0100101010111101010010000001111000111000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 88
b6     = 92
b7     = 116
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 2:36:45 PM
Jam Selesai = 6/18/02 4:29:55 PM

Run Ke                          = 2
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 79
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817898381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111101010010000001101110011100111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 112
b7     = 92
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 4:29:56 PM
Jam Selesai = 6/18/02 6:31:17 PM

Run Ke                          = 3
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 73
Parameter Pinalti               = 10000000
Fitnes                          = 1.47176426633904
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6767536.05439039
string                          =
0100101010111101010010000101001110101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 116
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 6:31:17 PM
Jam Selesai = 6/18/02 8:19:25 PM

Run Ke                          = 4
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 81
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817898381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111101010010000001101111010100111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 120
b7     = 80
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 8:19:25 PM
Jam Selesai = 6/18/02 10:21:40 PM

Run Ke                          = 5
jumlah individu                 = 1900
Konvergen Pada Generasi Ke = 87
Parameter Pinalti               = 10000000
Fitnes                          = 1.48985352807959
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6712069.21454216
string                          =
0100110010111101010010000101001101110000010101001
100000000
t      = 32
diam   = 1.128
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 64
b5     = 76
b6     = 112
b7     = 108
nm1    = 6
nm2    = 10
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/18/02 10:21:40 PM
Jam Selesai = 6/19/02 12:42:01 AM

Run Ke                          = 1
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 89
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
```

```
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 12:42:01 AM
Jam Selesai = 6/19/02 3:03:58 AM

Run Ke                          = 2
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 86
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 3:03:59 AM
Jam Selesai = 6/19/02 5:21:51 AM

Run Ke                          = 3
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 84
Parameter Pinalti               = 10000000
Fitnes                          = 1.47810464014861
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6765420.88318902
string                          =
0100101010111101010010000001111000111000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 88
b6     = 92
b7     = 116
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 5:21:51 AM
Jam Selesai = 6/19/02 7:37:11 AM

Run Ke                          = 4
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 77
Parameter Pinalti               = 10000000
Fitnes                          = 1.47667350186702
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6771977.68318902
string                          =
0100101010111101010010000001111100011100111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 88
b6     = 108
b7     = 88
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 7:37:11 AM
Jam Selesai = 6/19/02 9:41:07 AM

Run Ke                          = 5
jumlah individu                 = 2100
Konvergen Pada Generasi Ke = 177
Parameter Pinalti               = 10000000
Fitnes                          = 1.47842817898381
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6763940.34025614
string                          =
0100101010111101010010000001101111010100111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 120
b7     = 80
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 9:41:08 AM
Jam Selesai = 6/19/02 2:24:21 PM

Run Ke                          = 1
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 83
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
```

```
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 2:24:21 PM
Jam Selesai = 6/19/02 5:40:19 PM

Run Ke                          = 2
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 87
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 5:40:19 PM
Jam Selesai = 6/19/02 9:09:32 PM

Run Ke                          = 3
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 85
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001100
000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/19/02 9:09:33 PM
Jam Selesai = 6/20/02 12:34:19 AM

Run Ke                          = 4
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 82
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/20/02 12:34:19 AM
Jam Selesai = 6/20/02 3:52:06 AM

Run Ke                          = 5
jumlah individu                 = 2300
Konvergen Pada Generasi Ke = 76
Parameter Pinalti               = 10000000
Fitnes                          = 1.47986272207674
Pelanggaran Kendala             = 0
Fungsi Tujuan                   = 6757383.54025614
string                          =
0100101010111101010010000001101100101000111000001
100000000
t      = 32
diam   = 1.000
dial   = 0.625
b1     = 120
b2     = 80
b3     = 68
b4     = 60
b5     = 84
b6     = 108
b7     = 100
nm1    = 8
nm2    = 13
nl1    = 8
nl2    = 5
nl3    = 5
Jam Mulai    = 6/20/02 3:52:06 AM
Jam Selesai = 6/20/02 6:56:12 AM
```