LAMPIRAN

Lampiran 1: *Source code* program sistem kontrol elevator sederhana

```pascal
unit Unit1;

interface

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

type
  Tarah = (arahnaik=1, arahturun=0);
  Tlantai = record
    tombolnaik: TImage;
    tombolturun: Timage;
    tombolelev: Timage;
    labelelev: Tlabel;
  end;
  TForm1 = class(TForm)
    LblLt1: TLabel;
    LblLt2: TLabel;
    LblLt3: TLabel;
    LblLt4: TLabel;
    LblLt5: TLabel;
    LblLt6: TLabel;
    LblLt7: TLabel;
    naik1: TImage;
    naik2: TImage;
    naik3: TImage;
    naik4: TImage;
    naik5: TImage;
    naik6: TImage;
    Turun7: TImage;
    Turun6: TImage;
    Turun5: TImage;
    Turun4: TImage;
    Turun3: TImage;
    Turun2: TImage;
    lbl1: TLabel;
    lbl2: TLabel;
    lbl3: TLabel;
    lbl4: TLabel;
    lbl5: TLabel;
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lbl6: TLabel;
lbl7: TLabel;
lampu1: TImage;
lampu2: TImage;
lampu3: TImage;
lampu4: TImage;
lampu5: TImage;
lampu6: TImage;
lampu7: TImage;
IndLtLft: TLabel;
IndArahLft: TImage;
Diam: TTimer;
elevnaik: TTimer;
elevturun: TTimer;
layan: TTimer;
Label1: TLabel;
timer: TTimer;
Shape1: TShape;
Shape2: TShape;
Shape3: TShape;
Shape4: TShape;
Shape5: TShape;
Shape6: TShape;
Shape7: TShape;
Shape8: TShape;
Shape9: TShape;
pintukiri: TShape;
pintukanan: TShape;
MediaPlayer1: TMediaPlayer;
procedure lbl1Click(Sender: TObject);
procedure ceknyampelantai();
procedure bukapintu();
procedure tutuppintu();
procedure naik1lantai();
procedure turun1lantai();
function carilantai(Sender: TObject):integer;
function caritarget():integer;
procedure FormCreate(Sender: TObject);
procedure naik1Click(Sender: TObject);
procedure Turun2Click(Sender: TObject);
procedure elevnaikTimer(Sender: TObject);
procedure elevturunTimer(Sender: TObject);
procedure DiamTimer(Sender: TObject);
procedure layanTimer(Sender: TObject);
procedure timerTimer(Sender: TObject);
```

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  private
    { Private declarations }

  public
    lantai: array[1..7] of Tlantai;
    posisi: integer;
    target: integer;
    arah: Tarah;
    path: string;
    naik: array[1..7] of boolean;
    turun: array[1..7] of boolean;
    car: array[1..7] of boolean;
    ting: boolean;
    { Public declarations }
  end;

var
  Form1: TForm1;

implementation

{$R *.dfm}

//variabel-variabel beserta nilai awalnya beserta keadaan
  awal
procedure TForm1.FormCreate(Sender: TObject);
var i:integer;
begin
  ting:=false;
  diam.Enabled := true;//keadaan awal adalah diam
  target := 0;//target awal 0
  posisi := 1;//posisi awal 1
  arah := arahnaik;//arah elevator awal naik
  //permintaan awalnya bernilai 0 semua
  for i := 1 to 7 do begin
    naik[i] := false;
    turun[i]:= false;
    car[i]:= false;
  end;
  //tombol naik
  lantai[1].tombolnaik:= naik1;
  lantai[2].tombolnaik:= naik2;
  lantai[3].tombolnaik:= naik3;
  lantai[4].tombolnaik:= naik4;
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lantai[5].tombolnaik:= naik5;
lantai[6].tombolnaik:= naik6;
lantai[7].tombolnaik:= nil;
//tombol turun
lantai[1].tombolturun:= nil;
lantai[2].tombolturun:= turun2;
lantai[3].tombolturun:= turun3;
lantai[4].tombolturun:= turun4;
lantai[5].tombolturun:= turun5;
lantai[6].tombolturun:= turun6;
lantai[7].tombolturun:= turun7;
//tombol car
lantai[1].tombolelev:= lampu1;
lantai[2].tombolelev:= lampu2;
lantai[3].tombolelev:= lampu3;
lantai[4].tombolelev:= lampu4;
lantai[5].tombolelev:= lampu5;
lantai[6].tombolelev:= lampu6;
lantai[7].tombolelev:= lampu7;
lantai[1].labelelev:=lbl1;
lantai[2].labelelev:=lbl2;
lantai[3].labelelev:=lbl3;
lantai[4].labelelev:=lbl4;
lantai[5].labelelev:=lbl5;
lantai[6].labelelev:=lbl6;
lantai[7].labelelev:=lbl7;
path:=extractfilepath(application.ExeName);
mediaplayer1.FileName:=path + 'Elevator bell ding.wav';
mediaplayer1.Open;
end;


function TForm1.carilantai(Sender: TObject): integer;
var i:integer;
begin
  for i := 1 to 7 do begin
    if lantai[i].tombolnaik = sender then break;
    if lantai[i].tombolturun = sender then break;
    if lantai[i].tombolelev = sender then break;
    if lantai[i].labelelev = sender then break;
  end;
  result := i;
end;

//tombol elevator ditekan
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procedure TForm1.lbl1Click(Sender: TObject);
var i: integer;
begin
  i := carilantai(sender);
  if posisi <> i then begin
    lantai[i].tombolelev.Picture.LoadFromFile(path +
    'tombol hidup.bmp');
    lantai[i].labelelev.Font.color:=clblack;
    car[i] := true;
  end;
end;

//Tombol naik lantai ditekan
procedure TForm1.naik1Click(Sender: TObject);
var i: integer;
begin
  i := carilantai(sender);
  lantai[i].tombolnaik.Picture.LoadFromFile(path +
  'tombol naik hidup.bmp');
  naik[i] := true;
end;

//Tombol turun lantai ditekan
procedure TForm1.Turun2Click(Sender: TObject);
var i: integer;
begin
  i := carilantai(sender);
  lantai[i].tombolturun.Picture.LoadFromFile(path +
  'tombol turun hidup.bmp');
  turun[i] := true;
end;

//Request Resolver
function TForm1.caritarget: integer;
var i,j:integer;
begin
  result := 0;
  if arah = arahnaik then
    for i := posisi to 7 do begin
      if naik[i] or car[i] then
        begin result := i; break; end;
      if i = 7 then
        for j := 7 downto 1 do begin
          if car[j] or naik[j] or turun[j] then
            begin result :=j; break; end;end;
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      end
    else
      for i := posisi downto 1 do begin
        if turun[i] or car[i] then
          begin result := i; break; end;
        if i = 1 then
          for j := 1 to 7 do
            if car[j] or naik[j] or turun[j] then
              begin result :=j; break; end;
      end;
end;

//fungsi pencari posisi elevator dan indikator elevator
car
procedure TForm1.ceknyampelantai();
begin
  case pintukiri.top of
    30  : begin posisi:=7; IndLtLft.caption:='7';
          ting:=true; end;
    130 : begin posisi:=6; IndLtLft.caption:='6';
          ting:=true; end;
    230 : begin posisi:=5; IndLtLft.caption:='5';
          ting:=true; end;
    330 : begin posisi:=4; IndLtLft.caption:='4';
          ting:=true; end;
    430 : begin posisi:=3; IndLtLft.caption:='3';
          ting:=true; end;
    530 : begin posisi:=2; IndLtLft.caption:='2';
          ting:=true; end;
    630 : begin posisi:=1; IndLtLft.caption:='1';
          ting:=true; end;
    else ting:=false;
    // variabel ting menunjukan bahwa elevator telah
       sampai pada lantai tujuan
  end;
  if arah = arahnaik then begin
    indarahlft.Visible := true;
    IndArahLft.Picture.LoadFromFile(path + 'naik.bmp');
    end
  else
    if arah = arahturun then begin
      indarahlft.Visible := true;
      IndArahLft.Picture.bitmap.LoadFromFile(path +
      'turun.bmp');
      end
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end;

//Keadaan diam
procedure TForm1.DiamTimer(Sender: TObject);
begin
  tutuppintu;//output tp
  diam.Enabled := false;
  //mencari target lantai berikutnya dengan memanggil
    request resolver
  target := caritarget;
  ceknyampelantai; //mencari posisi dari elevator

  //transisi keadaan
  if target = 0 then
    diam.Enabled := true
    //jika target 0 maka kembali ke keadaan diam
  else
    if target > posisi then
      elevnaik.Enabled := true
      //jika target > posisi maka keadaan naik
    else
      if target < posisi then
        elevturun.Enabled := true
        //jika target < posisi maka keadaan turun
      else
        layan.enabled := true;
        //jika target = posisi maka keadaan bukapintu

end;

//Keadaan naik
procedure TForm1.elevnaikTimer(Sender: TObject);
begin
  ceknyampelantai;
  naik1lantai;//output k
  arah := arahnaik;//output arah naik
  //mencari target lantai berikutnya dengan memanggil
    request resolver
  target := caritarget;
  elevnaik.Enabled := false;

  //transisi keadaan
  if (target > posisi) or not ting then
    elevnaik.Enabled := true
    //masuk ke keadaan naik lagi
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    else
      layan.Enabled := true;
      //masuk ke keadaan bukapintu
  end;

  //Keadaan turun
  procedure TForm1.elevturunTimer(Sender: TObject);
  begin
    ceknyampelantai;
    turun1lantai;//output t
    arah := arahturun;//output arah turun
    //mencari target lantai berikutnya dengan memanggil
      request resolver
    target := caritarget;
    elevturun.Enabled := false;

    //transisi keadaan
    if (target < posisi)or not ting then
      elevturun.Enabled := true
//masuk ke keadaan turun lagi
    else
      layan.Enabled := true;
//masuk ke keadaan bukapintu
  end;

  //keadaan bukapintu
  procedure TForm1.layanTimer(Sender: TObject);
  begin
    layan.Enabled:=false;
    bukapintu;//output bp
    timer.Enabled := true;//masuk ke transisi timer < 10

    //mematikan lampu tombol car lantai ke-i dan menjadikan
      car(i) = 0
    car[posisi] := false;
    lantai[posisi].tombolelev.Picture.LoadFromFile(path +
    'tombol mati.bmp');
    lantai[posisi].labelelev.Font.Color:=clWhite;

    //mematikan lampu tombol naik lantai ke-i dan
      menjadikan naik(i) = 0
    naik[posisi] := false;
    if posisi <> 7 then
      lantai[posisi].tombolnaik.Picture.LoadFromFile(path +
      'tombol naik mati.bmp')
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    else
      lantai[posisi].tombolturun.Picture.LoadFromFile(path
      + 'tombol turun mati.bmp');

    //mematikan lampu tombol turun lantai ke-i dan
      menjadikan turun(i) = 0
    turun[posisi] := false;
    if posisi <> 1 then
      lantai[posisi].tombolturun.Picture.LoadFromFile(path
      + 'tombol turun mati.bmp')
    else
      lantai[posisi].tombolnaik.Picture.LoadFromFile(path +
      'tombol naik mati.bmp');
end;

//timer selama 10 detik saat keadaan bukapintu
procedure TForm1.timerTimer(Sender: TObject);
begin
  timer.enabled := false;
  diam.Enabled  := true;
end;

//animasi membuka pintu
procedure TForm1.bukapintu;
begin
  mediaplayer1.Stop;
  mediaplayer1.Play;
  while pintukanan.Width > 20 do begin
    pintukiri.width := pintukiri.width - 1;
    pintukanan.width := pintukanan.Width - 1;
    pintukanan.left:= pintukanan.left + 1;
    pintukiri.Repaint;
    pintukanan.Repaint;
    end;

end;



//animasi menutup pintu
procedure TForm1.tutuppintu;
begin
  while pintukanan.Width < 70 do begin
    pintukiri.width:=pintukiri.width + 1;
    pintukanan.width:=pintukanan.Width + 1;
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    pintukanan.left:=pintukanan.left - 1;
    pintukiri.Repaint;
    pintukanan.Repaint;
    end;
end;

//animasi naik 1 lantai
procedure TForm1.naik1lantai;
begin
  pintukanan.Top := pintukanan.Top - 5;
  pintukiri.Top  := pintukiri.Top - 5;
  pintukiri.Repaint;
  pintukanan.Repaint;
  ceknyampelantai;
end;

//animasi turun 1 lantai
procedure TForm1.turun1lantai;
begin
  pintukanan.Top := pintukanan.Top + 5;
  pintukiri.Top  := pintukiri.Top + 5;
  pintukiri.Repaint;
  pintukanan.Repaint;
  ceknyampelantai;
end;

end.
```