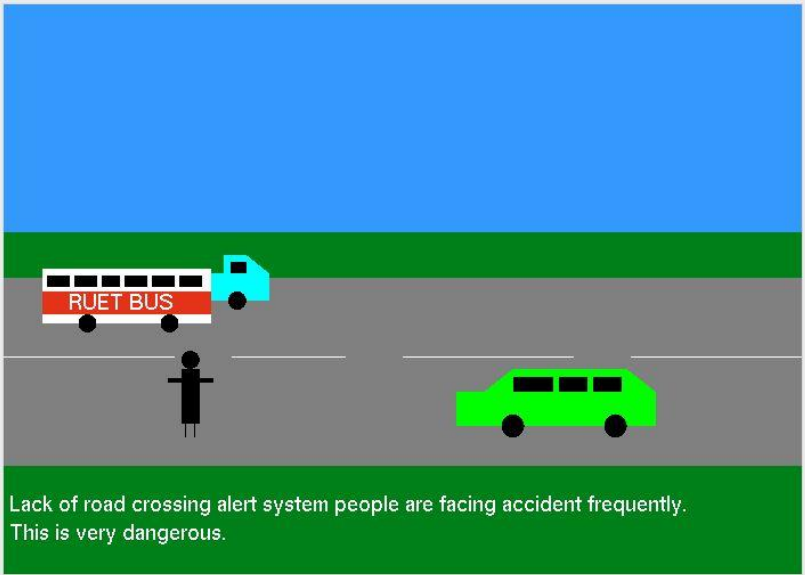
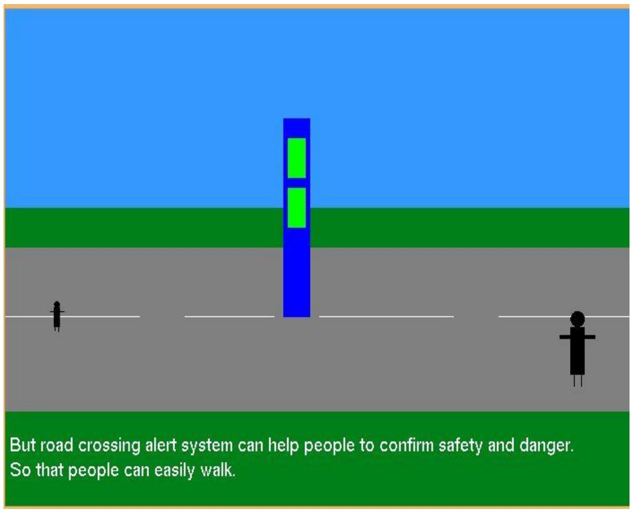
Output

This animation shows road accident prevention for busy road by latest technology.

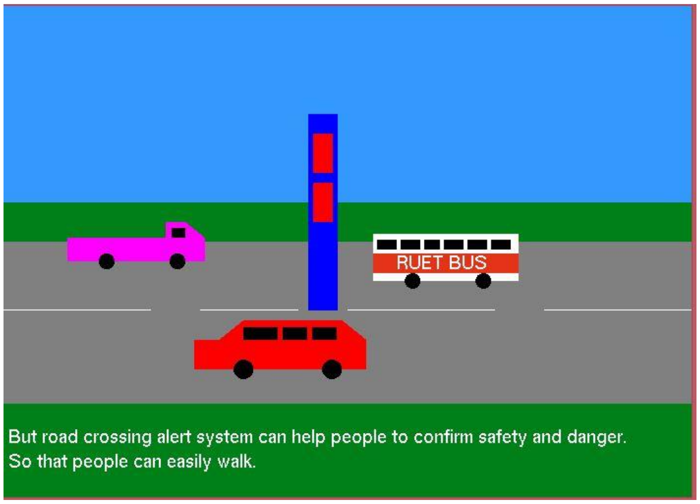


Lack of road crossing alert system people are facing accident frequently.
This is very dangerous.

I have proposed a road crossing alert system that will give signal for only people. So that when there is red signal, it will be risky to cross road but when there is green signal people can cross the road.

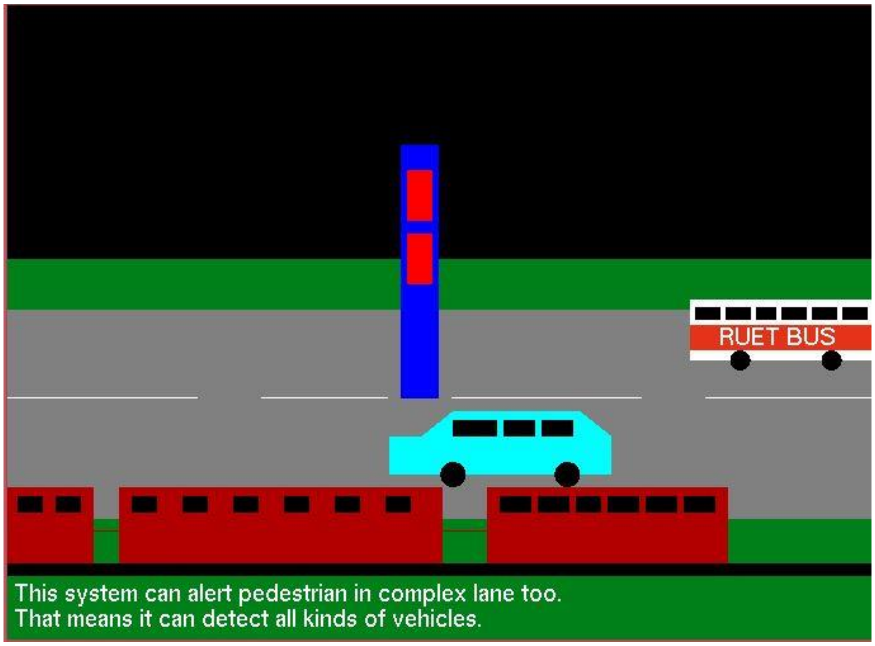


But road crossing alert system can help people to confirm safety and danger.
So that people can easily walk.



But road crossing alert system can help people to confirm safety and danger.
So that people can easily walk.

Object detection, Distance measure etc latest technologies are implemented in this system. So that it can work in complex lane too.



This system can alert pedestrian in complex lane too.
That means it can detect all kinds of vehicles.

That’s it. The animation is about 2.5 minutes. I have showed both day and night scenario. Finally, this animation teaches us that it is possible to reduce road accident by applying latest technologies.

Source Code

```
#ifdef __APPLE__
#include <GLUT/glut.h>
#else
#include <GL/glut.h>
#endif

#include <stdlib.h>
#include <math.h>

GLint keyl,keyr,flag=0;
float  counter=600.0, cnt=-
150.0,r1=0.0,g1=1.0,b1=0.0,bc=-260.0,tt=-
260.0,ms=400.0,ts=100.0,rs=100.0;
float
r2=0.0,g2=1.0,b2=1.0,r=1.0,g=0.0,b=0.0;
int c=1,d=1;

void  road();
void  grass();
void  grass2();
void  line1();
void  line2();
void  line3();
void  line4();
void  car();
void  truck();
void  bus();
void  sq();
void  text();
void  tc();
void  light();
void  light2();
void track1();


void *currentfont;
```

```
void setFont(void *font)
{
        currentfont=font;
}

void drawstring(float x,float y,float z,char
*string)
{
        char *ct;
        //displaying test
        glRasterPos3f(x,y,z);

        for(ct=string;*ct!='\0';ct++)
        {
           glColor3f(0.0,0.0,0.0);
           //renders a bitmap character
using OpenGL.

        glutBitmapCharacter(currentfont,*ct
);
        }
}

void initOpenGl()
{
   //Background Color

   glClearColor(0.2,0.6,0.99,0);
  //viewing volume
   glMatrixMode(GL_PROJECTION);
   //replace the current matrix with the
identity matrix
   glLoadIdentity();
   //define a 2D orthographic projection
matrix
   gluOrtho2D(0,700,0,500);
```

Source Code

```
    //specify which matrix is the current matrix
    glMatrixMode(GL_MODELVIEW);
}

void text()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(160,130,0.0,"RUET BUS");
    glColor3f(1,1,1);
}

void credit()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(5,55,0.0,"Animated Road Crossing Alert System");
    glColor3f(1,1,1);
    drawstring(5,55,0.0,"Developed By: Ashadullah Shawon");
    glColor3f(1,1,1);
    drawstring(5,30,0.0,"Roll: 133009");
    glColor3f(1,1,1);
    drawstring(5,5,0.0,"CSE, RUET");
}

void msg()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(5,30,0.0,"This system can alert pedestrian in complex lane too.");
    glColor3f(1,1,1);
    drawstring(5,10,0.0,"That means it can detect all kinds of vehicles.");

}

void tech()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(5,30,0.0,"Object detection technology is used in this system.");
    glColor3f(1,1,1);
    drawstring(5,10,0.0,"That's why this system is reliable.");

}

void developer()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(200,355,0.0,"Animated Road Crossing Alert System");
    glColor3f(1,1,1);
    drawstring(200,315,0.0,"Developed By: Ashadullah Shawon");
    glColor3f(1,1,1);
    drawstring(200,275,0.0,"Roll: 133009");
    glColor3f(1,1,1);
    drawstring(200,235,0.0,"CSE, RUET");
}

void endmsg()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(200,355,0.0,"That's it. Be Safe and Happy");
    glColor3f(1,1,1);
    drawstring(200,315,0.0,"Thank's all for watching.");
    glColor3f(1,1,1);
    drawstring(200,275,0.0,"The End.");

}

void subtitle()
{
    setFont(GLUT_BITMAP_HELVETICA_18);
    glColor3f(1,1,1);
    drawstring(5,55,0.0,"Lack of road crossing alert system people are facing accident frequently.");
```

Source Code

```
   glColor3f(1,1,1);
   drawstring(5,30,0.0,"This is very dangerous.");
}

void subtitle2()
{
   setFont(GLUT_BITMAP_HELVETICA_18);
   glColor3f(1,1,1);
   drawstring(5,55,0.0,"But road crossing alert system can help people to confirm safety and danger.");
   glColor3f(1,1,1);
   drawstring(5,30,0.0,"So that people can easily walk.");
}

void tc()
{
   glLoadIdentity();
   glColor3f(0.0,0.0,1.0);
   glBegin(GL_POLYGON);
   glVertex2f(310,190);
   glVertex2f(310,390);
   glVertex2f(340,390);
   glVertex2f(340,190);
   glEnd();

}


void night()
{
   glLoadIdentity();
   glColor3f(0.0,0.0,1.0);
   glBegin(GL_POLYGON);
   glVertex2f(310,190);
   glVertex2f(310,390);
   glVertex2f(340,390);
   glVertex2f(340,190);
   glEnd();

}
```

```
void light()
{
   glLoadIdentity();
   glColor3f(1.0,0.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(315,330);
   glVertex2f(315,370);
   glVertex2f(335,370);
   glVertex2f(335,330);
   glEnd();
}

void light2()
{
   glLoadIdentity();
   glColor3f(0.0,1.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(315,330);
   glVertex2f(315,370);
   glVertex2f(335,370);
   glVertex2f(335,330);
   glEnd();
}

void light3()
{
   glLoadIdentity();
   glColor3f(1.0,0.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(315,280);
   glVertex2f(315,320);
   glVertex2f(335,320);
   glVertex2f(335,280);
   glEnd();
}

void light4()
{
   glLoadIdentity();
   glColor3f(0.0,1.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(315,280);
   glVertex2f(315,320);
   glVertex2f(335,320);
```

Source Code

```
   glVertex2f(335,280);
   glEnd();
}

void window(int w1,int w2)
{
   glColor3f(0.0,0.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(w1,160);
   glVertex2f(w1,185);
   glVertex2f(w2,185);
   glVertex2f(w2,160);
   glEnd();
}

void buswindow(int w1,int w2)
{
   glColor3f(0.0,0.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(w1,180);
   glVertex2f(w1,205);
   glVertex2f(w2,205);
   glVertex2f(w2,180);
   glEnd();
}


void wheel(int x,int y)
{
  float th;
  glBegin(GL_POLYGON);
  glColor3f(0,0,0);
  //circle is 360 degree
  for(int i=0;i<360;i++)
  {
     //theta in radian
     th=i*(3.1416/180);
     //drawing circle with coordinates rcosth
and rsinth
     //x and y is for shifting to correct
position
     glVertex2f(x+20*cos(th),y+20*sin(th));
  }
```

```
   glEnd();

}

void road()
{
   glLoadIdentity();
   glColor3f(0.5,0.5,0.5);
   glBegin(GL_POLYGON);
   glVertex2f(0,95);
   glVertex2f(0,260);
   glVertex2f(800,260);
   glVertex2f(800,95);
   glEnd();
}

void grass()
{
   glLoadIdentity();
   glColor3f(0.0,0.5,0.1);
   glBegin(GL_POLYGON);
   glVertex2f(0,0);
   glVertex2f(0,95);
   glVertex2f(800,95);
   glVertex2f(800,0);
   glEnd();
}

void grass2()
{
   glLoadIdentity();
   glColor3f(0.0,0.5,0.1);
   glBegin(GL_POLYGON);
   glVertex2f(0,260);
   glVertex2f(0,300);
   glVertex2f(800,300);
   glVertex2f(800,260);
   glEnd();
}

void line1()
{
   glLoadIdentity();
   glColor3f(1.0,1.0,1.0);
```

Source Code

```
   glBegin(GL_LINE_LOOP);
   glVertex2f(0,190);
   glVertex2f(150,190);
   glEnd();

}

void line2()
{
   glLoadIdentity();
   glColor3f(1.0,1.0,1.0);
   glBegin(GL_LINE_LOOP);
   glVertex2f(200,190);
   glVertex2f(300,190);
   glEnd();

}

void line3()
{
   glLoadIdentity();
   glColor3f(1.0,1.0,1.0);
   glBegin(GL_LINE_LOOP);
   glVertex2f(350,190);
   glVertex2f(500,190);
   glEnd();

}

void line4()
{
   glLoadIdentity();
   glColor3f(1.0,1.0,1.0);
   glBegin(GL_LINE_LOOP);
   glVertex2f(550,190);
   glVertex2f(700,190);
   glEnd();

}

void car()
{

  //Bottom Part
```

```
glLoadIdentity();
counter=counter-0.05;
glColor3f(r1,g1,b1);
glTranslated(counter,80,0.0);
if(counter<-1000.00)
{

   c++;
   counter=700.0;
   //changing color
   if(c%2==0)
   {
      r1=1.0;
      g1=0.0;
      b1=0.0;

   }
   else if(c%3==0)
   {
      r1=0.0;
      g1=2.0+c;
      b1=1.0+c;
   }
   else if(c%5==0)
   {
      r1=1.0;
      g1=1.0;
      b1=0.0;
   }
   else
   {
      r1=0.0;
      g1=1.0;
      b1=0.0;
   }

}
glScaled(0.5,0.5,0.0);
glBegin(GL_POLYGON);
glVertex2f(100,100);
glVertex2f(100,160);
glVertex2f(450,160);
glVertex2f(450,100);
glEnd();
```

Source Code

```
  //Top Part
  glBegin(GL_POLYGON);
  glVertex2f(150,160);
  glVertex2f(200,200);
  glVertex2f(400,200);
  glVertex2f(450,160);

  glEnd();



  window(200,270);
  window(280,330);
  window(340,390);
  wheel(200,100);
  wheel(380,100);


}

void man(int p)
{
   glLoadIdentity();
   glColor3f(1.0,1.0,1.0);
   glScaled(0.4,0.4,0.4);
   // p is for switching man
   if(p==0)
   {
      ms=ms-0.01;
      glTranslated(ms,40,0.0);
   }
   else if(p==1)
   {
      ts=ts+0.29;
      glTranslated(280,ts,0.0);
   }
   else if(p==2)
   {


      ms=ms+0.10;
      glScaled(0.4,0.4,0.4);
      glTranslated(300,ms,0.0);
```

```
   }
   else if(p==3)
   {
      rs=rs+0.19;
      glTranslated(rs,40,0.0);
   }
   //head
   wheel(60,430);
   //body
   glBegin(GL_POLYGON);
   glVertex2f(40,290);
   glVertex2f(40,410);
   glVertex2f(80,410);
   glVertex2f(80,290);
   glEnd();

   glBegin(GL_LINE_LOOP);
   glVertex2f(50,260);
   glVertex2f(50,290);
   glEnd();

   glBegin(GL_LINE_LOOP);
   glVertex2f(70,260);
   glVertex2f(70,290);
   glEnd();

   glBegin(GL_POLYGON);
   glVertex2f(10,380);
   glVertex2f(10,390);
   glVertex2f(110,390);
   glVertex2f(110,380);
   glEnd();

}

void truck()
{

  //Bottom Part

  glLoadIdentity();
  glColor3f(r2,g2,b2);
```

Source Code

```
//speed variable
cnt=cnt+0.04;
//color changing
if(cnt>1300.00)
{
   cnt=-250.0;
   d++;
   if(d%2==0)
   {
      r2=r2+d;
      g2=0.0;
      b2=1.0;

   }
   else if(d%3==0)
   {
      r2=0.0;
      g2=3.0+d;
      b2=5.0+d;
   }
   else if(d%5==0)
   {
      r2=5.0;
      g2=0.0;
      b2=1.0;
   }
   else
   {
      r2=0.0;
      g2=1.0;
      b2=0.0;
   }

}
glTranslated(cnt,200,0.0);
glScaled(0.4,0.4,0.0);
glBegin(GL_POLYGON);
glVertex2f(100,100);
glVertex2f(100,160);
glVertex2f(450,160);
glVertex2f(450,100);
glEnd();

//Top Part
```

```
  glBegin(GL_POLYGON);
  glVertex2f(350,160);
  glVertex2f(350,200);
  glVertex2f(400,200);
  glVertex2f(450,160);

  glEnd();

  window(365,400);
  wheel(200,100);
  wheel(380,100);

}

void sq()
{
  glBegin(GL_POLYGON);
  glColor3f(0.9,0.2,0.1);
  glVertex2f(100,120);
  glVertex2f(100,170);
  glVertex2f(470,170);
  glVertex2f(470,120);
  glEnd();

}

void bus()
{

  glLoadIdentity();
  bc=bc+0.05;
  glColor3f(1.0,1.0,1.0);
  glTranslated(bc,180,0.0);
  //restart from position -260
  if(bc>1300.00)
  {
     bc=-260.0;

  }
  glScaled(0.4,0.4,0.0);
  glBegin(GL_POLYGON);
  glVertex2f(100,100);
  glVertex2f(100,220);
  glVertex2f(470,220);
```

Source Code

```
  glVertex2f(470,100);
  glEnd();

  buswindow(110,160);
  buswindow(170,220);
  buswindow(230,270);
  buswindow(280,330);
  buswindow(340,390);
  buswindow(400,450);
  wheel(200,100);
  wheel(380,100);

}

void rail()
{
   glLoadIdentity();
   glColor3f(0.0,0.0,0.0);
   glBegin(GL_POLYGON);
   glVertex2f(0,50);
   glVertex2f(0,60);
   glVertex2f(850,60);
   glVertex2f(850,50);
   glEnd();
}

void train()
{
  glLoadIdentity();
  //increasing speed variable
  tt=tt+0.05;
  glColor3f(0.7,0.0,0.0);
  //move object to x axis
  glTranslated(tt,10,0.0);
  if(tt>1900.00)
  {
      tt=-260.0;

  }
  glScaled(0.5,0.5,0.0);
  glBegin(GL_POLYGON);
  glVertex2f(90,100);
  glVertex2f(90,220);
  glVertex2f(470,220);
```

```
  glVertex2f(470,100);
  glEnd();

  glBegin(GL_LINE_LOOP);
  glVertex2f(20,150);
  glVertex2f(90,150);
  glEnd();

  glBegin(GL_POLYGON);
  glVertex2f(-490,100);
  glVertex2f(-490,220);
  glVertex2f(20,220);
  glVertex2f(20,100);
  glEnd();

  glBegin(GL_LINE_LOOP);
  glVertex2f(-530,150);
  glVertex2f(-490,150);
  glEnd();

  glBegin(GL_POLYGON);
  glVertex2f(-1000,100);
  glVertex2f(-1000,220);
  glVertex2f(-530,220);
  glVertex2f(-530,100);
  glEnd();


  glBegin(GL_LINE_LOOP);
  glVertex2f(-1030,150);
  glVertex2f(-1000,150);
  glEnd();

  glBegin(GL_POLYGON);
  glVertex2f(-1500,100);
  glVertex2f(-1500,220);
  glVertex2f(-1030,220);
  glVertex2f(-1030,100);
  glEnd();

  buswindow(110,160);
  buswindow(170,220);
  buswindow(230,270);
  buswindow(280,330);
```

Source Code

```
  buswindow(340,390);
  buswindow(400,450);

  buswindow(-470,-430);
  buswindow(-390,-350);
  buswindow(-310,-270);
  buswindow(-230,-190);
  buswindow(-150,-110);
  buswindow(-70,-30);

  buswindow(-970,-930);
  buswindow(-890,-850);
  buswindow(-810,-770);
  buswindow(-730,-690);
  buswindow(-650,-610);
  buswindow(-590,-550);

  buswindow(-1460,-1420);
  buswindow(-1380,-1340);
  buswindow(-1300,-1260);
  buswindow(-1220,-1180);
  buswindow(-1140,-1100);



  //wheel(200,100);
  //wheel(380,100);

}

void display()
{

 glClear(GL_COLOR_BUFFER_BIT);

 //introducing road crossing alert system
 road();
 grass();
 grass2();
 line1();
 line2();
 line3();
 line4();
 car();
 truck();
 bus();
 sq();
 text();
 tc();
 //red signal
 light();
 light3();
 subtitle2();
 //when car crosses the area green signal
will be on and man can cross the road
 if(counter<-250)
 {
   light4();
   man(3);
 }
 //green signal when bus and truck are not
in the area
 if(bc>650 && cnt>650)
 {
    light2();
    man(2);
 }



 glutSwapBuffers();
 glFlush();


}

void display1()
{

 glClear(GL_COLOR_BUFFER_BIT);
 //introducing train
 road();
 grass();
 grass2();
 line1();
 line2();
```

Source Code

```
  line3();
  line4();
  train();
  rail();
  truck();
  bus();
  sq();
  text();
  tc();
  //red signal
  light();
  light3();
  //green signal when train are not in the area
  if(tt>1400)
  {
     light4();
  }
  //green signal when bus and track are not in the area
  if(bc>650 && cnt>650)
  {
      light2();
  }
  tech();

  glutSwapBuffers();
  glFlush();

}

void display2()
{

  glClear(GL_COLOR_BUFFER_BIT);
  glClearColor(0.0,0.0,0.0,0);
  //night scene display
  road();
  grass();
  grass2();
  line1();
  line2();
  line3();
  line4();
  train();
  rail();
  car();
  truck();
  bus();
  sq();
  text();
  tc();
  light();
  light3();
  //green signal when train and car are not in the area
  if(tt>1400 && counter<-250)
  {
     light4();
  }
  //green signal when bus and track are not in the area
  if(bc>650 && cnt>650)
  {
      light2();
  }
  //describes the scene
  msg();

  glutSwapBuffers();
  glFlush();

}

void display0()
{

  glClear(GL_COLOR_BUFFER_BIT);
  //starting display
  road();
  grass();
  grass2();
  subtitle();
  line1();
  line2();
  line3();
  line4();
  car();
```

Source Code

```
  truck();
  bus();
  sq();
  text();

  //clashes with car when position of x is less
than 100
  if(counter<100)
  {
     man(1);

  }
  else
  {
     man(0);
  }

  glutSwapBuffers();
  glFlush();

}

void intro()
{
  //clears the window
  glClear(GL_COLOR_BUFFER_BIT);
  //developer information

  developer();

  glutSwapBuffers();
  glFlush();

}

void ending()
{
  //end message
  glClear(GL_COLOR_BUFFER_BIT);
  glClearColor(0.0,0.2,0.0,0);

  endmsg();

  glutSwapBuffers();
  //force execution of GL commands in finite
time
  glFlush();

}

void MyTimerFunc(int value);

int main(int argc, char **argv)
{
   glutInit(&argc,argv);

glutInitDisplayMode(GLUT_DOUBLE|GLUT_
RGBA|GLUT_DEPTH);
   //initializing window to 700*500
   glutInitWindowSize(700,500);
   //starting position of window
   glutInitWindowPosition(0,0);
   //Window title
   glutCreateWindow("Animated Road
Crossing Alert System");
   //initializing
   initOpenGl();
   //initializing display
   glutDisplayFunc(intro);
   //sets the global idle callback
   glutIdleFunc(intro);
   //switching display after 3 seconds
   glutTimerFunc(3000, MyTimerFunc, 0);
   //enters the GLUT event processing loop
   glutMainLoop();
   return 0;
}

void MyTimerFunc(int value)
{
   if (value == 0) // passed in in main
   {
     glutDisplayFunc(display0);
     glutIdleFunc(display0);

     // Change to a new display function in
25 seconds
     glutTimerFunc(25000, MyTimerFunc, 1);
```

Source Code

```
   }
   else if(value==1)
   {
     glutDisplayFunc(display);
     glutIdleFunc(display);
      //switching display after 50 seconds
     glutTimerFunc(50000, MyTimerFunc, 2);
   }
    else if(value==2)
   {
     glutDisplayFunc(display1);
     glutIdleFunc(display1);
     //switching display after 40 seconds
     glutTimerFunc(40000, MyTimerFunc, 3);

   }
    else if(value==3)
   {
     glutDisplayFunc(display2);
     glutIdleFunc(display2);
     //switching display after 40 seconds
     glutTimerFunc(40000, MyTimerFunc, 4);

   }
    else if(value==4)
   {
     glutDisplayFunc(ending);
     glutIdleFunc(ending);


   }

}
```