শিক্ষা নিয়ে গড়বো দেশ তথ্য-প্রযুক্তির বাংলাদেশ

Bangabandhu Sheikh Mujibur Rahman Digital University, Bangladesh

Software Development Project-02

COURSE NO. PROG 112: Object Oriented Programming Sessional

SUBMITTED BY

Name-Mobashira Mehajabin Arpita(2101008)
Srabonee Paul Tuli(2101015)
Mehrin Farzana(2101013)
Department of IRE
Session :2021-2022
Bangabandhu Sheikh Mujibur Rahman Digital University, Bangladesh

SUBMITTED TO

Md.Toukir Ahmed
Lecturer
Department of IRE, BDU
Bangabandhu Sheikh Mujibur Rahman Digital University, Bangladesh

Date of Submission: 6 November,2023

Project title: Car Racing Game.

Name of team members	Portion of code in the project
1. Srabonee Paul Tuli	41-149
2. Mehrin Farzana	153-293
3. Mobashira Mehajabin Arpita	294-433

Code:

```
//package cargame;
import java.awt.Color;
import java.awt.Font;
import java.awt.Graphics;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.event.KeyEvent;
import java.awt.event.KeyListener;
import java.io.IOException;
import java.util.Random;
import java.util.concurrent.TimeUnit;
import javax.imageio.ImageIO;
import javax.swing.ImageIcon;
import javax.swing.JFrame;
import javax.swing.Timer;

// this class is used to build the graphics and the game logic
class CarGame extends JFrame implements KeyListener,ActionListener
{

    private int xpos=300; // x position of the car
    private int ypos=700; // y position of the car
    private ImageIcon car; // car image
    private Timer timer; // timer to update the screen
    Random random=new Random(); // random number generator
```

```
    private int num1=400,num2=0,num3=0; // x position of the obstacles
    private int tree1ypos=400,tree2ypos=-200,tree3ypos=-
500,tree4ypos=100,tree5ypos=-300,tree6ypos=500; // y position of the obstacles
    private int roadmove=0; // y position of the road
    private int carxpos[]={100,200,300,400,500}; // x position of the car
    private int carypos[]= {-240,-480,-720,-960,-1200}; // y position of the
car
    private int cxpos1=0,cxpos2=2,cxpos3=4; // x position of the car
    private int
cypos1=random.nextInt(5),cypos2=random.nextInt(5),cypos3=random.nextInt(5); //
y position of the car
    int y1pos=carypos[cypos1],y2pos=carypos[cypos2],y3pos=carypos[cypos3]; // y
position of the car
    private ImageIcon car1,car2,car3; // car image
    private int score=0,delay=100,speed=90; // score,delay and speed of the
game
    private ImageIcon tree1,tree2,tree3; // tree image
    private boolean rightrotate=false,gameover=false,paint=false; // boolean
variables to control the game logic and the graphics


    // constructor to initialize the game
    public CarGame(String title)
    {
        super(title); // call the constructor of the parent class JFrame
        setBounds(300,10,700,700); // set the position and size of the frame
        setVisible(true); // make the frame visible
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE); // close the frame when
the close button is clicked
        setLayout(null); // set the layout of the frame to null
        addKeyListener(this); // add the key listener to the frame
        setFocusable(true); // set the focus to the frame
        setResizable(false); // set the frame to be non resizable


    }
```

```
// this method is used to paint the graphics on the screen
public void paint(Graphics g)
{
    g.setColor(new Color(0X82CD47)); // set the color of the grass
    g.fillRect(0, 0, 700, 700);  // draw the grass
    g.setColor(new Color(0X9F8772)); // set the color of the road
    g.fillRect(90,0,10,700); // draw the road
    g.fillRect(600, 0, 10, 700);
    g.fillRect(100, 0, 500, 700);

// draw the road lines
if(roadmove==0)
{
    for(int i=0; i<=700; i+=100)
    {   // draw the road lines
        g.setColor(Color.white);
        g.fillRect(350, i,10, 70); //

    }
    roadmove=1; // set the roadmove to 1
}
else if(roadmove==1)
{ // draw the road lines again for the next frame
    for(int i=50; i<=700; i+=100)
    {
        g.setColor(Color.white);
        g.fillRect(350, i,10, 70);
    }
    roadmove=0; // set the roadmove to 0
}

try {
```

```
        tree1=new ImageIcon(ImageIO.read(getClass().getResource("tree.png")));
// load the tree image
    } catch (IOException e) {
        e.printStackTrace();
    }

    try {
        tree2=new ImageIcon(ImageIO.read(getClass().getResource("tree.png")));
// load the tree image
    } catch (IOException e) {
        e.printStackTrace();
    }

    try {
        tree3=new ImageIcon(ImageIO.read(getClass().getResource("tree.png")));
// load the tree image
    } catch (IOException e) {
        e.printStackTrace();
    }

    tree1.paintIcon(this, g, 0, tree1ypos); // draw the tree image on the
screen
    num1=random.nextInt(500); // generate a random number
    tree1ypos+=50; // increment the y position of the tree

    tree2.paintIcon(this, g, 0,tree2ypos ); // draw the tree image on the
screen
    tree2ypos+=50; // increment the y position of the tree

    tree3.paintIcon(this,g,0,tree3ypos); // draw the tree image on the screen
    tree3ypos+=50; // increment the y position of the tree
    tree1.paintIcon(this,g,600,tree4ypos);
    tree4ypos+=50;
    tree3.paintIcon(this, g,600,tree5ypos);
    tree5ypos+=50;
```

```
tree2.paintIcon(this, g,600,tree6ypos);
tree6ypos+=50;



if(tree1ypos>700)
{ // if the tree goes out of the screen then reset the tree
    num1=random.nextInt(500); // generate a random number
    tree1ypos=-num1; // reset the y position of the tree
}
if(tree2ypos>700)
{
    num1=random.nextInt(500);
    tree2ypos=-num1;
}
if(tree3ypos>700)
{
    num1=random.nextInt(500);
    tree3ypos=-num1;
}
if(tree4ypos>700)
{ // if the tree goes out of the screen then reset the tree
    num1=random.nextInt(500);
    tree4ypos=-num1;
}
if(tree5ypos>700)
{
    num1=random.nextInt(500);
    tree5ypos=-num1;
}
if(tree6ypos>700)
{ // if the tree goes out of the screen then reset the tree
    num1=random.nextInt(500);
    tree6ypos=-num1;
```

```
    }


        // load image for car
        try {
            car=new
ImageIcon(ImageIO.read(getClass().getResource("gamecar3.png"))); // load the
car image
        } catch (IOException e) {
            e.printStackTrace();
        }

        // car=new ImageIcon("gamecar1.png");
        car.paintIcon(this,g,xpos,ypos); // draw the car image on the screen

        ypos-=40;
        if(ypos<500)
        {
        ypos=500;
        }

        // load the opponent image for car
        try {
            car1=new
ImageIcon(ImageIO.read(getClass().getResource("gamecar1.png")));
        } catch (IOException e) {
                e.printStackTrace();
        }
        // load the opponent image for car
        try {
            car2=new
ImageIcon(ImageIO.read(getClass().getResource("gamecar2.png")));
        } catch (IOException e) {
                e.printStackTrace();
```

```
        }
        // load the opponent image for car
        try {
            car3=new
ImageIcon(ImageIO.read(getClass().getResource("gamecar4.png")));
        } catch (IOException e) {
                e.printStackTrace();
        }


        car1.paintIcon(this, g, carxpos[cxpos1], y1pos); // draw the opponent
car image on the screen
        car2.paintIcon(this, g, carxpos[cxpos2], y2pos);
        car3.paintIcon(this, g, carxpos[cxpos3], y3pos);
        y1pos+=50; // increment the y position of the opponent car
        y2pos+=50;
        y3pos+=50;
        if(y1pos>700)
        { // if the opponent car goes out of the screen then reset the opponent
car
            cxpos1=random.nextInt(5); // generate a random number
            cypos1=random.nextInt(5);
            y1pos=carypos[cypos1]; // reset the y position of the opponent car


        }
        if(y2pos>700)
        { // if the opponent car goes out of the screen then reset the opponent
car
            cxpos2++;
            if(cxpos2>4)
            {
                cxpos2=0;
            }


            cxpos2=random.nextInt(5);
```

```
        cypos2=random.nextInt(5);
        y2pos=carypos[cypos2];

    }
    if(y3pos>700)
    {
        cxpos3++;
        if(cxpos3>4)
        {
            cxpos3=0;
        }
        cxpos3=random.nextInt(5);
        cypos3=random.nextInt(5);
        y3pos=carypos[cypos3];
    }

    if(cxpos1==cxpos2 && cypos1>-100 && cypos2>-100)
    {
        cxpos1-=1;
        if(cxpos1<0)
        {
            cxpos1+=2;
        }
    }
    if(cxpos1==cxpos3&& cypos1>-100 && cypos3>-100)
    {
        cxpos3-=1;
        if(cxpos3<0)
        {
            cxpos3+=2;
        }
    }
    if(cxpos2==cxpos3&& cypos3>-100 && cypos2>-100)
```

```
{
    cxpos2-=1;
    if(cxpos2<0)
    {
        cxpos2+=2;
    }
}
if(cxpos1<2 && cxpos2<2 && cxpos3<2)
{
    if(cxpos1==0 && cxpos2==0 && cxpos3==1)
    {
        cxpos3++;
        cxpos2++;
    }
    else if(cxpos1==0 && cxpos2==1 && cxpos3==0)
    {
        cxpos3++;
        cxpos2++;
    }
    else if(cxpos1==1 && cxpos2==0 && cxpos3==0)
    {
        cxpos1++;
        cxpos2++;
    }
}

// if the opponent car hits the player car then reset the game
if(y1pos<ypos && y1pos+175>ypos && carxpos[cxpos1]==xpos)
{
gameover=true;
}
if(y2pos<ypos && y2pos+175>ypos && carxpos[cxpos2]==xpos)
{
```

```
gameover=true;
}
if(y3pos<ypos  && y3pos+175>ypos && carxpos[cxpos3]==xpos)
{
gameover=true;
}
if(ypos<y1pos && ypos+175>y1pos && carxpos[cxpos1]==xpos)
{
gameover=true;
}
if(ypos<y2pos && ypos+175>y2pos && carxpos[cxpos2]==xpos)
{
gameover=true;
}
if(ypos<y3pos  && ypos+175>y3pos && carxpos[cxpos3]==xpos)
{
gameover=true;
}

//score
g.setColor(Color.red);
g.fillRect(120,35,220,50);
g.setColor(Color.black);
g.fillRect(125,40, 210, 40);
g.setColor(Color.red);
g.fillRect(385,35,180,50);
g.setColor(Color.black);
g.fillRect(390,40, 170, 40);
g.setColor(Color.white);
g.setFont(new Font("MV Boli",Font.BOLD,30));
g.drawString("Score : "+score, 130, 67);
g.drawString(speed+" Km/h", 400, 67);
score++; // increment the score
```

```
speed++; // increment the speed
if(speed>140)
{ // if the speed is greater than 140 then reset the speed
    speed=240-delay;

}
if(score%50==0)
{ // if the score is divisible by 50 then increase the delay
    delay-=10;
    if(delay<60)
    {
        delay=60; // set the delay to 60
    }
}
//delay
try
{

    TimeUnit.MILLISECONDS.sleep(delay); // delay the game
}
catch (InterruptedException e) {
    e.printStackTrace();
}
if(y1pos<ypos && y1pos+175>ypos && carxpos[cxpos1]==xpos)
{
gameover=true;
}
if(y2pos<ypos && y2pos+175>ypos && carxpos[cxpos2]==xpos)

{
gameover=true;
}
if(y3pos<ypos  && y3pos+175>ypos && carxpos[cxpos3]==xpos)
```

```
        {
        gameover=true;
        }
        if(gameover)
        {
        g.setColor(Color.gray);
        g.fillRect(120, 210, 460, 200);
        g.setColor(Color.DARK_GRAY);
        g.fillRect(130, 220, 440, 180);
        g.setFont(new Font("MV Boli",Font.BOLD,50));
        g.setColor(Color.red);
        g.drawString("Game Over !",210, 270);
        g.setColor(Color.white);
        g.setFont(new Font("MV Boli",Font.BOLD,30));
        g.drawString("Press Enter to Restart", 190, 340);
        if(!paint)
        {
            repaint();
            paint=true;
        }
        }
        else
        {
        repaint();
        }
    }

    public static void main(String args[])
    {
        CarGame c=new CarGame("Car Racing Game");
    }
    @Override
    public void keyPressed(KeyEvent e) {
```

```
        if(e.getKeyCode()==KeyEvent.VK_LEFT && !gameover)
        { // if the left key is pressed then move the car to the left
            xpos-=100;
            if(xpos<100)
            {
                xpos=100; // set the car to the left most position
            }


        }
        if(e.getKeyCode()==KeyEvent.VK_RIGHT&&!gameover)
        {   // if the right key is pressed then move the car to the right
            xpos+=100;
            if(xpos>500)
            {
                xpos=500; // if the car is at the right most position then
don't move it
            }
        }
        if(e.getKeyCode()==KeyEvent.VK_ENTER && gameover)
        { // if the game is over and the enter key is pressed then restart the
game
            gameover=false;
            paint=false;
            cxpos1=0;
            cxpos2=2;
            cxpos3=4;
            cypos1=random.nextInt(5); // randomize the position of the opponent
cars
            cypos2=random.nextInt(5);
            cypos3=random.nextInt(5);
            y1pos=carypos[cypos1]; // set the position of the opponent cars
            y2pos=carypos[cypos2];
            y3pos=carypos[cypos3];
```

```
            speed=90; // set the speed to 90
            score=0; // set the score to 0
            delay=100; // set the delay to 100
            xpos=300; // set the position of the player car to the center
            ypos=700;    // set the position of the player car to the bottom
        }
    }
    @Override
    public void keyReleased(KeyEvent arg0) {
        // TODO Auto-generated method stub
    }
    @Override
    public void keyTyped(KeyEvent e) {
        if(e.getKeyChar()=='a'&&!gameover)
        { // if the key pressed is 'a' then move the car left
            xpos-=100; // decrement the xpos by 100

        }
        if(e.getKeyChar()=='s'&&!gameover)
        { // if the key pressed is 's' then move the car right
            xpos+=100; // increment the xpos by 100
        }

        repaint();

    }
    @Override
    public void actionPerformed(ActionEvent arg0) {}
}
```

Images:

Image name: gamecar1.png

Image name: gamecar2.png

Image name: gamecar3.png

Image name:gamecar4.png

Image name: tree.png

Output:

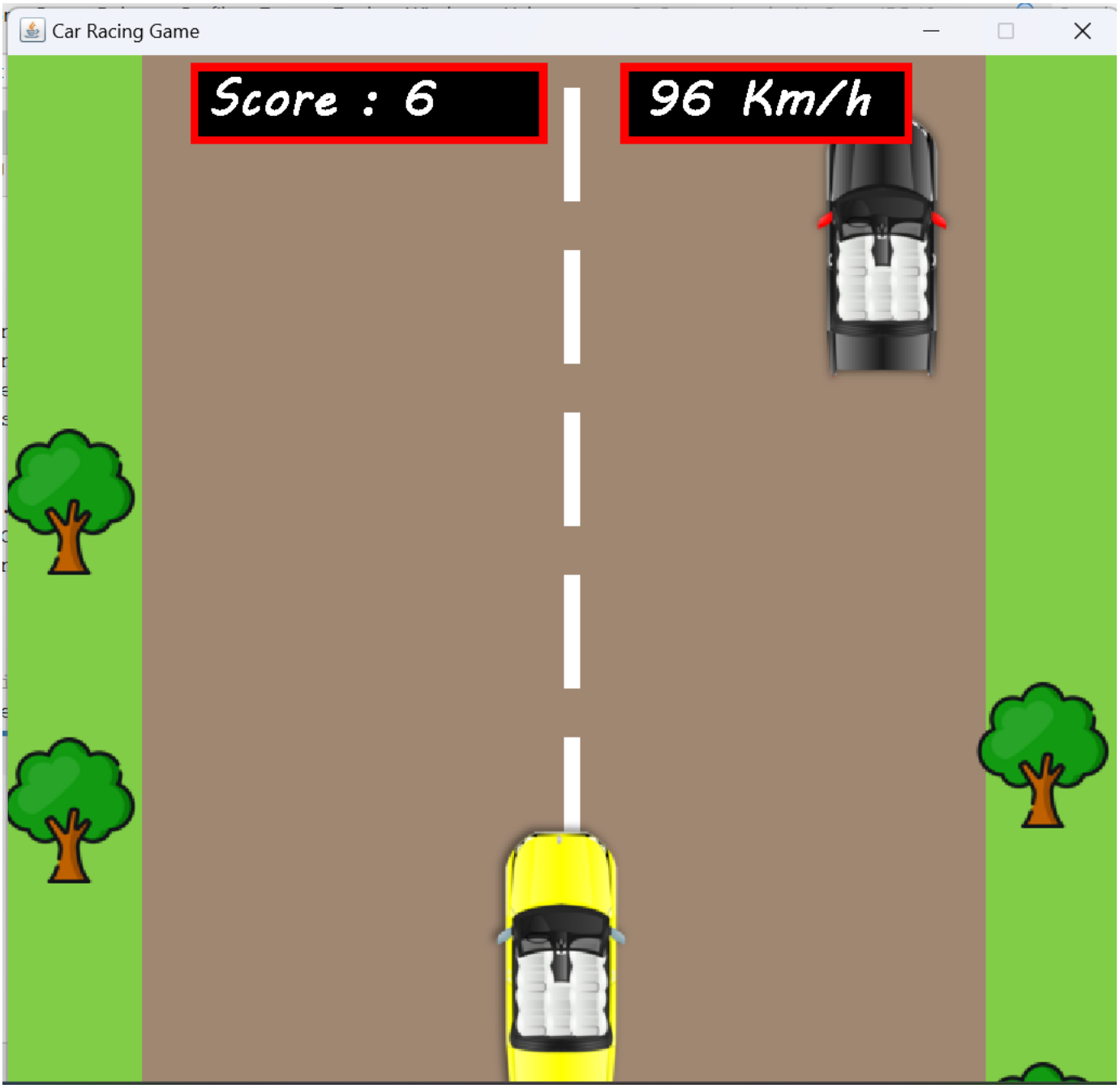

Fig1: Output window

Fig2: Output window

GitHub URL: Visit our GitHub Repo.