**16. TRAFFIC LIGHT SIMULATION**

AIM :

Write a Java program that simulates a traffic light. The program lets the user select

one of three lights: red, yellow, or green. When a radio button is selected, the light is

turned on, and only one light can be on at a time. No light is on when the program starts.

import javax.swing.\*;

import java.awt.\*;

import java.awt.event.\*;

class TrafficLight extends JPanel implements ActionListener{

private JRadioButton r1;

private JRadioButton r2;

private JRadioButton r3;

private Color red\_c;

private Color green\_c;

private Color orange\_c;

public TrafficLight(){

setBounds(0,0,600,480);

r1 = new JRadioButton("Red");

r2 = new JRadioButton("Green");

r3 = new JRadioButton("Orange");

ButtonGroup group = new ButtonGroup();

r1.setSelected(true);

group.add(r1);

group.add(r2);

group.add(r3);

add(r1);

add(r2);

add(r3);

red\_c = Color.red;

green\_c = getBackground ();

orange\_c = getBackground();

r1.addActionListener(this);

r2.addActionListener(this);

r3.addActionListener(this);

}

public void actionPerformed(ActionEvent e)

{

if(r1.isSelected() == true){

red\_c = Color.red;

green\_c = getBackground ();

orange\_c = getBackground();

}

else if(r2.isSelected() == true){

red\_c = getBackground ();

green\_c = Color.green;

orange\_c = getBackground();

}

else if(r3.isSelected() == true){

red\_c = getBackground ();

green\_c = getBackground();

orange\_c = Color.orange;

}

repaint();

}

public void paintComponent(Graphics g){

super.paintComponent(g);

g.drawOval(50,50,50,50);

g.drawOval(50,110,50,50);

g.drawOval(50,170,50,50);

g.setColor(red\_c);

g.fillOval(50,50,50,50);

g.setColor(orange\_c);

g.fillOval(50,110,50,50);

g.setColor(green\_c);

g.fillOval(50,170,50,50);

}

}

class Test{

public static void main(String args[]){

JFrame f1 = new JFrame();

f1.setVisible(true);

f1.setSize(600,480);

f1.setLayout(null);

TrafficLight t = new TrafficLight();

f1.add(t);

}

}

15. CALCULATOR USING SWING

AIM

Write a Java program that works as a simple calculator. Arrange Buttons for digits and the + - \* % operations properly. Add a text field to display the result. Handle any possible exceptions like divide by zero. Use Java Swing.

import javax.swing.\*;

import java.awt.event.\*;

class Calculator extends JFrame implements ActionListener

{

private JTextField t1;

private JButton b1;

private JButton b2;

private JButton b3;

private JButton b4;

private JButton b5;

private JButton b6;

private JButton b7;

private JButton b8;

private JButton b9;

private JButton b10;

private JButton b11;

private JButton b12;

private JButton b13;

private JButton b14;

private JButton b15;

private JButton b16;

private Integer res;

private String operation;

public Calculator()

{

setLayout(null);

setSize(640,480);

t1 = new JTextField();

t1.setBounds(100,100,200,30);

b1 = new JButton("1");

b1.setBounds(100,140,50,30);

b2 = new JButton("2");

b2.setBounds(150,140,50,30);

b3 = new JButton("3");

b3.setBounds(200,140,50,30);

b4 = new JButton("+");

b4.setBounds(250,140,50,30);

// Third Row

b5 = new JButton("4");

b5.setBounds(100,170,50,30);

b6 = new JButton("5");

b6.setBounds(150,170,50,30);

b7 = new JButton("6");

b7.setBounds(200,170,50,30);

b8 = new JButton("-");

b8.setBounds(250,170,50,30);

// Fourth Row

b9 = new JButton("7");

b9.setBounds(100,200,50,30);

b10 = new JButton("8");

b10.setBounds(150,200,50,30);

b11 = new JButton("9");

b11.setBounds(200,200,50,30);

b12 = new JButton("\*");

b12.setBounds(250,200,50,30);

// Fourth Row

b13 = new JButton("/");

b13.setBounds(100,230,50,30);

b14 = new JButton("%");

b14.setBounds(150,230,50,30);

b15 = new JButton("=");

b15.setBounds(200,230,50,30);

b16 = new JButton("C");

b16.setBounds(250,230,50,30);

add(t1);

add(b1);

add(b2);

add(b3);

add(b4);

add(b5);

add(b6);

add(b7);

add(b8);

add(b9);

add(b10);

add(b11);

add(b12);

add(b13);

add(b14);

add(b15);

add(b16);

b1.addActionListener(this);

b2.addActionListener(this);

b3.addActionListener(this);

b4.addActionListener(this);

b5.addActionListener(this);

b6.addActionListener(this);

b7.addActionListener(this);

b8.addActionListener(this);

b9.addActionListener(this);

b10.addActionListener(this);

b11.addActionListener(this);

b12.addActionListener(this);

b13.addActionListener(this);

b14.addActionListener(this);

b15.addActionListener(this);

b16.addActionListener(this);

}

public void doAction(String op)

{

if(operation == null)

{

operation = op;

res = Integer.parseInt(t1.getText());

t1.setText("");

}

else

{

switch(operation)

{

case "+":

res = res + Integer.parseInt(t1.getText());

break;

case "-":

res = res - Integer.parseInt(t1.getText());

break;

case "/":

try{

if(t1.getText().equals("0")

{

throw new ArithmeticException("Divide by Zero");

}

res = res / Integer.parseInt(t1.getText());

}

catch(ArithmeticException e)

{

t1.setText(e.getMessage());

operation = null;

res = 0;

}

break;

case "\*": res = res \* Integer.parseInt(t1.getText());

break;

case "%": res = res % Integer.parseInt(t1.getText());

break;

}

if(op.equals("="))

{

t1.setText(res.toString());

res = 0;

operation = null;

}

else

{

operation = op;

t1.setText("");

}

}

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource()== b1)

t1.setText(t1.getText()+"1");

else if(e.getSource()== b2)

t1.setText(t1.getText()+"2");

else if(e.getSource()== b3)

t1.setText(t1.getText()+"3");

else if(e.getSource()== b5)

t1.setText(t1.getText()+"4");

else if(e.getSource()== b6)

t1.setText(t1.getText()+"5");

else if(e.getSource()== b7)

t1.setText(t1.getText()+"6");

else if(e.getSource()== b9)

t1.setText(t1.getText()+"7");

else if(e.getSource()== b10)

t1.setText(t1.getText()+"8");

else if(e.getSource()== b11)

t1.setText(t1.getText()+"9");

else if(e.getSource()== b16){

t1.setText("");

res =0;

operation = null;

}

else if(e.getSource()== b4)

{

doAction("+");

}

else if(e.getSource()== b8)

doAction("-");

else if(e.getSource()== b12)

doAction("\*");

else if(e.getSource()== b13)

doAction("/");

else if(e.getSource()== b14)

doAction("%");

else if(e.getSource()== b15)

doAction("=");

}

public static void main(String args[])

{

new Calculator().setVisible(true);

}

}

OUTPUT

