Cycle E

Program

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

class BuildCalculator extends JFrame implements ActionListener {
    JFrame actualWindow;
    JPanel resultPanel, buttonPanel, infoPanel;
    JTextField resultTxt;
    JButton btn_digits[] = new JButton[10];
    JButton btn_plus, btn_minus, btn_mul, btn_div, btn_equal, btn_dot, btn_clear;
    char eventFrom;
    JLabel expression, appTitle;
    double oparand_1 = 0, operand_2 = 0;
    String operator = "=";

    BuildCalculator() {
        Font txtFont = new Font("SansSerif", Font.BOLD, 20);
        Font titleFont = new Font("SansSerif", Font.BOLD, 30);
        Font expressionFont = new Font("SansSerif", Font.BOLD, 15);
        actualWindow = new JFrame("Calculator");
        resultPanel = new JPanel();
        buttonPanel = new JPanel();
        infoPanel = new JPanel();
        actualWindow.setLayout(new GridLayout(3, 1));
        buttonPanel.setLayout(new GridLayout(4, 4));
        infoPanel.setLayout(new GridLayout(3, 1));
        actualWindow.setResizable(false);
        appTitle = new JLabel("My Calculator");
        appTitle.setFont(titleFont);
        expression = new JLabel("Expression shown here");
        expression.setFont(expressionFont);
        resultTxt = new JTextField(15);
        resultTxt.setBorder(null);
        resultTxt.setPreferredSize(new Dimension(15, 50));
        resultTxt.setFont(txtFont);
        resultTxt.setHorizontalAlignment(SwingConstants.RIGHT);
        for (int i = 0; i < 10; i++)  {
            btn_digits[i] = new JButton("" + i);
            btn_digits[i].addActionListener(this);
        }
        btn_plus = new JButton("+");
        btn_plus.addActionListener(this);
        btn_minus = new JButton("-");
        btn_minus.addActionListener(this);
        btn_mul = new JButton("*");
        btn_mul.addActionListener(this);
        btn_div = new JButton("/");
        btn_div.addActionListener(this);
```

```java
      btn_dot = new JButton(".");
      btn_dot.addActionListener(this);
      btn_equal = new JButton("=");
      btn_equal.addActionListener(this);
      btn_clear = new JButton("Clear");
      btn_clear.addActionListener(this);

      resultPanel.add(appTitle);
      resultPanel.add(resultTxt);
      resultPanel.add(expression);
      for (int i = 0; i < 10; i++) {
         buttonPanel.add(btn_digits[i]);
      }
      buttonPanel.add(btn_plus);
      buttonPanel.add(btn_minus);
      buttonPanel.add(btn_mul);
      buttonPanel.add(btn_div);
      buttonPanel.add(btn_dot);
      buttonPanel.add(btn_equal);
      infoPanel.add(btn_clear);
      actualWindow.add(resultPanel);
      actualWindow.add(buttonPanel);
      actualWindow.add(infoPanel);
      actualWindow.setSize(300, 450);
      actualWindow.setVisible(true);
   }

   public void actionPerformed(ActionEvent e) {
      eventFrom = e.getActionCommand().charAt(0);
      String buildNumber;
      if (Character.isDigit(eventFrom)) {
         buildNumber = resultTxt.getText() + eventFrom;
         resultTxt.setText(buildNumber);
      }
      else if (e.getActionCommand() == ".") {
         buildNumber = resultTxt.getText() + eventFrom;
         resultTxt.setText(buildNumber);
      }
      else if (eventFrom != '=') {
         oparand_1 = Double.parseDouble(resultTxt.getText());
         operator = e.getActionCommand();
         expression.setText(oparand_1 + " " + operator);
         resultTxt.setText("");
      }
      else if (e.getActionCommand() == "Clear") {
         resultTxt.setText("");
      }
      else {
         operand_2 = Double.parseDouble(resultTxt.getText());

         expression.setText(expression.getText() + " " + operand_2);
         switch (operator) {
```

```java
            case "+":
                resultTxt.setText("" + (oparand_1 + operand_2));
                break;
            case "-":
                resultTxt.setText("" + (oparand_1 - operand_2));
                break;
            case "*":
                resultTxt.setText("" + (oparand_1 * operand_2));
                break;
            case "/":
                try {
                    if (operand_2 == 0)
                        throw new ArithmeticException();
                    resultTxt.setText("" + (oparand_1 / operand_2));
                    break;
                } catch (ArithmeticException ae) {
                    JOptionPane.showMessageDialog(actualWindow, "Divisor can not be ZERO");
                }
            }
        }
    }
}

class Calc2 {
    public static void main(String[] args) {
        new BuildCalculator();
    }
}
```
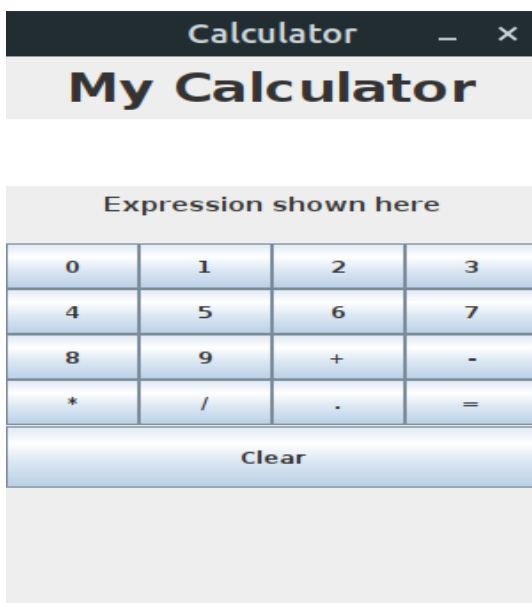
Output

Program

```java
import javax.swing.*;
import javax.swing.event.*;
import java.awt.*;
import java.awt.event.*;

class A extends JFrame implements ItemListener {
    public JLabel l1, l2;
    public JRadioButton r1, r2, r3;
    public ButtonGroup bg;
    public JPanel p, p1;
    public A() {
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setLayout(new GridLayout(2, 1));
        setSize(800, 400);
        p = new JPanel(new FlowLayout());
        p1 = new JPanel(new FlowLayout());
        l1 = new JLabel();
        Font f = new Font("Verdana", Font.BOLD, 60);
        l1.setFont(f);
        add(l1);
        p.add(l1);
        add(p);
        l2 = new JLabel("Select Lights");
        p1.add(l2);
        JRadioButton r1 = new JRadioButton("Red Light");
        r1.setBackground(Color.red);
        p1.add(r1);
        r1.addItemListener(this);
        JRadioButton r2 = new JRadioButton("Yellow Light");
        r2.setBackground(Color.YELLOW);
        p1.add(r2);
        r2.addItemListener(this);
        JRadioButton r3 = new JRadioButton("Green Light");
        r3.setBackground(Color.GREEN);
        p1.add(r3);
        r3.addItemListener(this);
        add(p1);
        bg = new ButtonGroup();
        bg.add(r1);
        bg.add(r2);
        bg.add(r3);
        setVisible(true);
    }

    public void itemStateChanged(ItemEvent i) {
        JRadioButton jb = (JRadioButton) i.getSource();
        switch (jb.getText()) {
        case "Red Light": {
            l1.setText("BULB");
```

```
            l1.setForeground(Color.RED);
        }
        break;
        case "Yellow Light": {
            l1.setText("BULB");
            l1.setForeground(Color.YELLOW);
        }
        break;
        case "Green Light": {
            l1.setText("BULB");
            l1.setForeground(Color.GREEN);
        }
        break;
        }
    }
}

public class TLights {
    public static void main(String[] args) {
        A a = new A();
    }
}
```

Output