CodeTechSolution

Task -2 :-

```
package com.codetech.CalculatorGUI;

import javax.swing.*;

import java.awt.*;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import java.io.*;

public class CalculatorGUI extends JFrame {

private JTextField display;

private double currentResult;

private String currentInput;

private char lastOperator;

public CalculatorGUI() {

setTitle("Calculator");

setSize(300, 400);

setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

setLocationRelativeTo(null);

display = new JTextField();

display.setEditable(false);

display.setHorizontalAlignment(JTextField.RIGHT);

add(display, BorderLayout.NORTH);

JPanel buttonPanel = new JPanel(new GridLayout(5, 4));

addButtons(buttonPanel);

add(buttonPanel, BorderLayout.CENTER);

currentInput = "";
```

```
currentResult = 0;

lastOperator = ' ';

initializeMenu();

setVisible(true);

}

private void addButtons(JPanel panel) {

String[] buttonLabels = {

"7", "8", "9", "/",

"4", "5", "6", "*",

"1", "2", "3", "-",

"0", ".", "=", "+",

"C", "CE", "√", "M"

};

for (String label : buttonLabels) {

JButton button = new JButton(label);

button.addActionListener(new ButtonClickListener());

panel.add(button);

}

}

private void initializeMenu() {

JMenuBar menuBar = new JMenuBar();

JMenu fileMenu = new JMenu("File");

JMenuItem saveItem = new JMenuItem("Save");

JMenuItem loadItem = new JMenuItem("Load");

JMenuItem exitItem = new JMenuItem("Exit");

saveItem.addActionListener(new ActionListener() {

@Override

public void actionPerformed(ActionEvent e) {
```

```
saveCalculatorState();

}

});

loadItem.addActionListener(new ActionListener() {

@Override

public void actionPerformed(ActionEvent e) {

loadCalculatorState();

}

});

exitItem.addActionListener(new ActionListener() {

@Override

public void actionPerformed(ActionEvent e) {

System.exit(0);

}

});

fileMenu.add(saveItem);

fileMenu.add(loadItem);

fileMenu.add(exitItem);

menuBar.add(fileMenu);

setJMenuBar(menuBar);

}

private void saveCalculatorState() {

try (ObjectOutputStream out = new ObjectOutputStream(new
FileOutputStream("calculator.dat"))) {

out.writeDouble(currentResult);

out.writeUTF(currentInput);

out.writeChar(lastOperator);

JOptionPane.showMessageDialog(null, "Calculator state saved
successfully!");
```

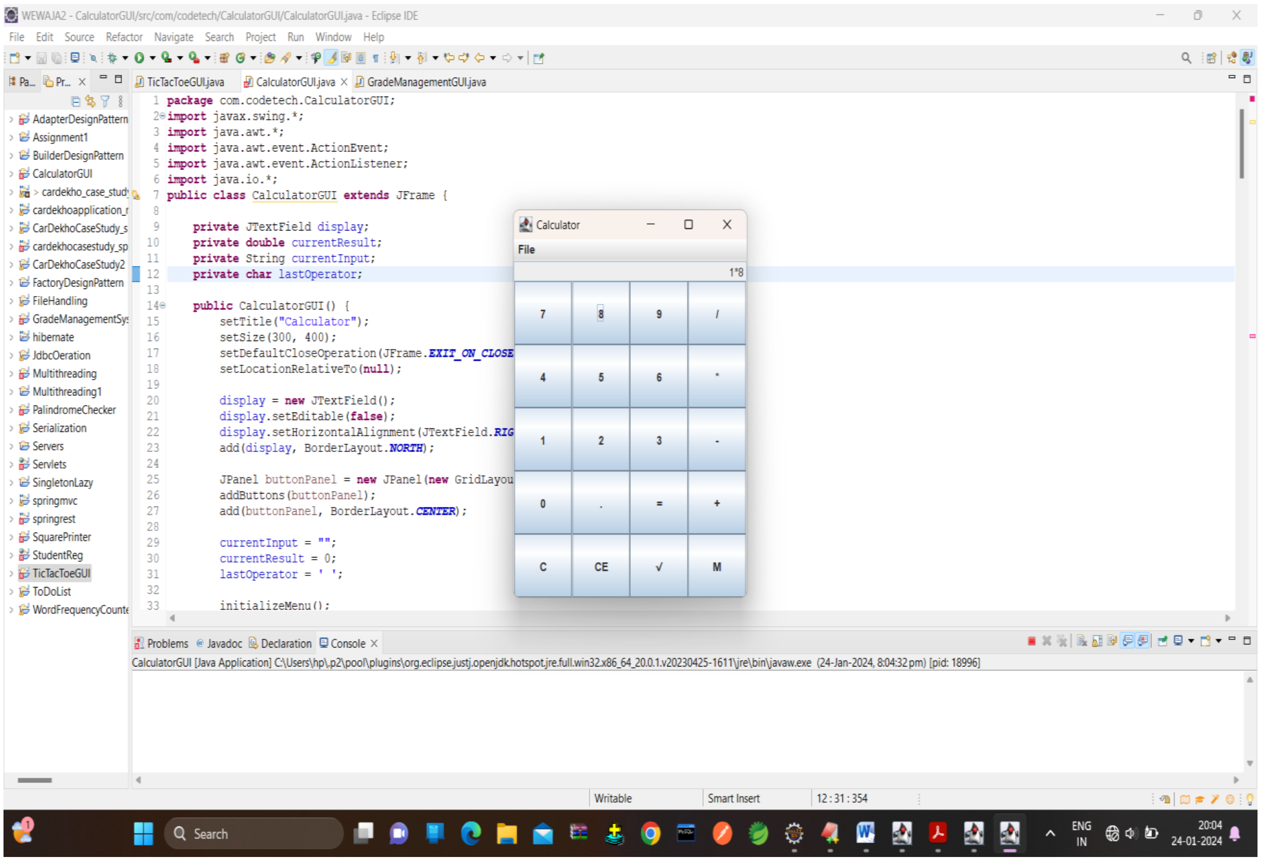
```java
} catch (IOException e) {

e.printStackTrace();

}

}

private void loadCalculatorState() {

try (ObjectInputStream in = new ObjectInputStream(new
FileInputStream("calculator.dat"))) {

currentResult = in.readDouble();

currentInput = in.readUTF();

lastOperator = in.readChar();

display.setText(currentInput);

JOptionPane.showMessageDialog(null, "Calculator state loaded
successfully!");

} catch (IOException | ClassNotFoundException e) {

e.printStackTrace();

}

}

private class ButtonClickListener implements ActionListener {

@Override

public void actionPerformed(ActionEvent e) {

JButton source = (JButton) e.getSource();

String buttonText = source.getText();

switch (buttonText) {

case "=":

calculateResult();

break;

case "C":

clearAll();

break;
```

```
case "CE":

clearEntry();

break;

case "√":

calculateSquareRoot();

break;

case "M":

memorySave();

break;

default:

processDigitOrOperator(buttonText);

break;

}

}

private void calculateResult() {

if (!currentInput.isEmpty()) {

double secondOperand = Double.parseDouble(currentInput);

switch (lastOperator) {

case '+':

currentResult += secondOperand;

break;

case '-':

currentResult -= secondOperand;

break;

case '*':

currentResult *= secondOperand;

break;

case '/':
```

```java
if (secondOperand != 0) {

currentResult /= secondOperand;

} else {

JOptionPane.showMessageDialog(null, "Cannot divide by zero!");

clearAll();

return;

}

break;

default:

currentResult = secondOperand;

break;

}

display.setText(String.valueOf(currentResult));

currentInput = "";

lastOperator = ' ';

}

}

private void clearAll() {

currentInput = "";

currentResult = 0;

lastOperator = ' ';

display.setText("");

}

private void clearEntry() {

currentInput = "";

display.setText("");

}

private void calculateSquareRoot() {
```

```
if (!currentInput.isEmpty()) {

double operand = Double.parseDouble(currentInput);

if (operand >= 0) {

currentResult = Math.sqrt(operand);

display.setText(String.valueOf(currentResult));

currentInput = "";

lastOperator = ' ';

} else {

JOptionPane.showMessageDialog(null, "Cannot calculate square root of a
negative number!");

clearAll();

}

}

}

private void memorySave() {

if (!currentInput.isEmpty()) {

double value = Double.parseDouble(currentInput);

currentResult = value;

display.setText(String.valueOf(currentResult));

currentInput = "";

lastOperator = ' ';

}

}

private void processDigitOrOperator(String input) {

currentInput += input;

display.setText(currentInput);

if ("+-*/".indexOf(input) != -1) {

lastOperator = input.charAt(0);
```

```java
}

}

}

public static void main(String[] args) {

SwingUtilities.invokeLater(new Runnable() {

@Override

public void run() {

new CalculatorGUI();

}

});

}

}
```



WEWAJA2 - CalculatorGUI/src/com/codetech/CalculatorGUI/CalculatorGUI.java - Eclipse IDE

```java
package com.codetech.CalculatorGUI;
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.io.*;
public class CalculatorGUI extends JFrame {

    private JTextField display;
    private double currentResult;
    private String currentInput;
    private char lastOperator;

    public CalculatorGUI() {
        setTitle("Calculator");
        setSize(300, 400);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE
        setLocationRelativeTo(null);

        display = new JTextField();
        display.setEditable(false);
        display.setHorizontalAlignment(JTextField.RIG
        add(display, BorderLayout.NORTH);

        JPanel buttonPanel = new JPanel(new GridLayou
        addButtons(buttonPanel);
        add(buttonPanel, BorderLayout.CENTER);

        currentInput = "";
        currentResult = 0;
        lastOperator = ' ';

        initializeMenu();
```

```
CalculatorGUI [Java Application] C:\Users\hp\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_20.0.1.v20230425-1611\jre\bin\javaw.exe (24-Jan-2024, 8:04:32 pm) [pid: 18996]
```