# Project No. 01

## Simple Calculator (Java Swing)

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

public class Calculator {
    private JTextField num1Field, num2Field, resultField;
    private JButton addButton, subtractButton, multiplyButton, divideButton, clearButton;

    public Calculator() {
        // Set up the frame
        JFrame frame = new JFrame("Simple Calculator");
        frame.setSize(400, 300);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setLayout(new BorderLayout());

        // Heading at the top
        JLabel headingLabel = new JLabel("Calculator", JLabel.CENTER);
        headingLabel.setFont(new Font("Arial", Font.BOLD, 22));
        headingLabel.setBorder(BorderFactory.createEmptyBorder(10, 0, 10, 0));
        frame.add(headingLabel, BorderLayout.NORTH);

        // Create the form panel
        JPanel formPanel = new JPanel(new GridLayout(5, 2, 10, 10));
        formPanel.setBorder(BorderFactory.createEmptyBorder(15, 15, 15, 15));

        // Number 1 Input
        JLabel num1Label = new JLabel("Number 1:");
```

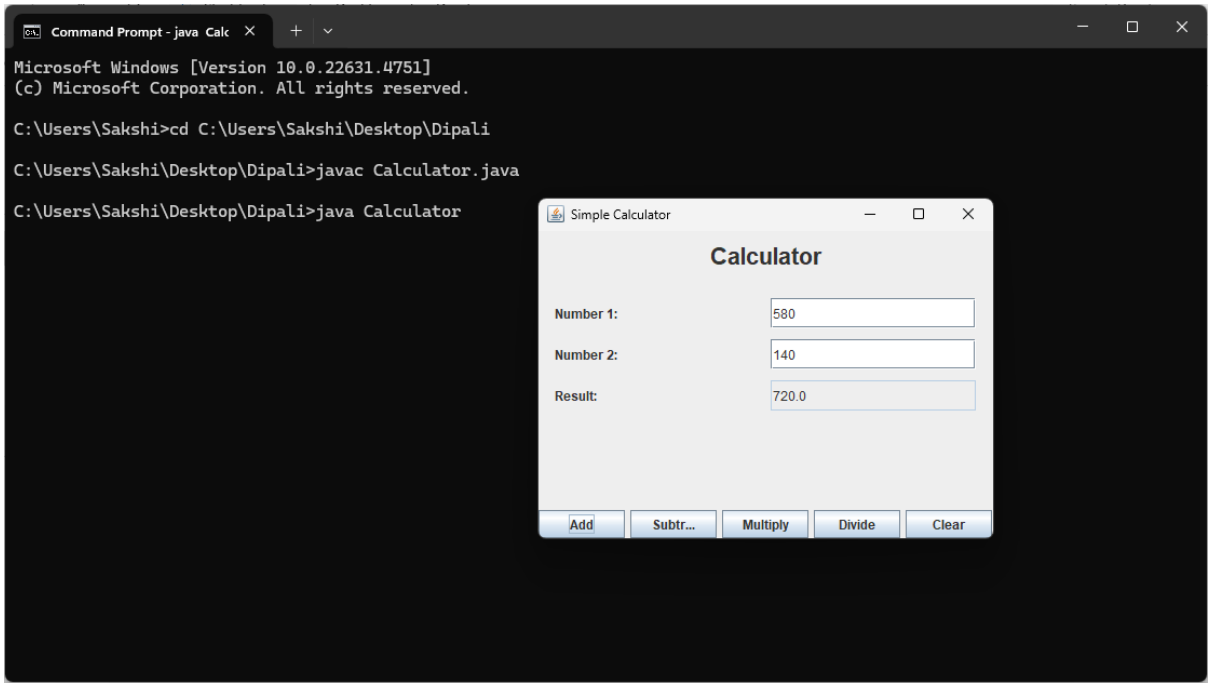
```
num1Field = new JTextField();
formPanel.add(num1Label);
formPanel.add(num1Field);

// Number 2 Input
JLabel num2Label = new JLabel("Number 2:");
num2Field = new JTextField();
formPanel.add(num2Label);
formPanel.add(num2Field);

// Result Display
JLabel resultLabel = new JLabel("Result:");
resultField = new JTextField();
resultField.setEditable(false); // Result field is read-only
formPanel.add(resultLabel);
formPanel.add(resultField);

// Operation Buttons
addButton = new JButton("Add");
subtractButton = new JButton("Subtract");
multiplyButton = new JButton("Multiply");
divideButton = new JButton("Divide");
clearButton = new JButton("Clear");

JPanel buttonPanel = new JPanel(new GridLayout(1, 5, 5, 5));
buttonPanel.add(addButton);
buttonPanel.add(subtractButton);
buttonPanel.add(multiplyButton);
buttonPanel.add(divideButton);
buttonPanel.add(clearButton);
```

```
// Add components to the frame
frame.add(formPanel, BorderLayout.CENTER);
frame.add(buttonPanel, BorderLayout.SOUTH);

// Add Action Listeners using Anonymous Inner Classes
addButton.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        handleOperation("Add");
    }
});

subtractButton.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        handleOperation("Subtract");
    }
});

multiplyButton.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        handleOperation("Multiply");
    }
});

divideButton.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        handleOperation("Divide");
    }
});
```

```
    clearButton.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            clearFields();
        }
    });

    // Make the frame visible
    frame.setVisible(true);
}

private void handleOperation(String operation) {
    try {
        double num1 = Double.parseDouble(num1Field.getText().trim());
        double num2 = Double.parseDouble(num2Field.getText().trim());
        double result = 0;

        // Traditional switch statement (Java 7 compatible)
        switch (operation) {
            case "Add":
                result = num1 + num2;
                break;
            case "Subtract":
                result = num1 - num2;
                break;
            case "Multiply":
                result = num1 * num2;
                break;
            case "Divide":
                if (num2 == 0) {
                    showError("Cannot divide by zero.");
```

```
                    return;
                }
                result = num1 / num2;
                break;
            }

            resultField.setText(String.valueOf(result));
        } catch (NumberFormatException ex) {
            showError("Please enter valid numbers.");
        }
    }

    private void showError(String message) {
        JOptionPane.showMessageDialog(null, message, "Input Error",
JOptionPane.ERROR_MESSAGE);
    }

    private void clearFields() {
        num1Field.setText("");
        num2Field.setText("");
        resultField.setText("");
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            public void run() {
                new Calculator();
            }
        });
    }
}
```

Result:


Command Prompt - java Calc
Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Sakshi>cd C:\Users\Sakshi\Desktop\Dipali
C:\Users\Sakshi\Desktop\Dipali>javac Calculator.java
C:\Users\Sakshi\Desktop\Dipali>java Calculator
Simple Calculator
Calculator
Number 1:
580
Number 2:
140
Result:
720.0
Add
Subtr...
Multiply
Divide
Clear