# Assignment-5

## 22610011-Anuja Suntnur

1. Write a program to create a simple calculator with basic +, -, /, * using java swing elements.

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

public class SimpleCalculator extends JFrame implements ActionListener {
   private JTextField textField;
   private JButton[] numberButtons;
   private JButton[] functionButtons;
   private JButton addButton, subButton, mulButton, divButton;
   private JButton equalsButton, clearButton;
   private JPanel panel;

   private String currentInput;
   private double firstNumber, secondNumber, result;
   private char operator;

   public SimpleCalculator() {
       setTitle("Simple Calculator");
       setSize(400, 500);
       setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       setLocationRelativeTo(null);
       setResizable(false);

       currentInput = "";
       firstNumber = 0;
       secondNumber = 0;
       result = 0;
       operator = ' ';
```

```
        textField = new JTextField();
        textField.setEditable(false);
        textField.setHorizontalAlignment(SwingConstants.RIGHT);

        numberButtons = new JButton[10];
        for (int i = 0; i < 10; i++) {
            numberButtons[i] = new JButton(String.valueOf(i));
            numberButtons[i].addActionListener(this);
        }

        addButton = new JButton("+");
        subButton = new JButton("-");
        mulButton = new JButton("*");
        divButton = new JButton("/");

        functionButtons = new JButton[]{addButton, subButton, mulButton,
divButton};

        for (JButton button : functionButtons) {
            button.addActionListener(this);
        }

        equalsButton = new JButton("=");
        equalsButton.addActionListener(this);

        clearButton = new JButton("C");
        clearButton.addActionListener(this);

        panel = new JPanel();
        panel.setLayout(new GridLayout(5, 4, 10, 10));

        panel.add(textField);
        panel.add(clearButton);

        for (int i = 1; i <= 9; i++) {
            panel.add(numberButtons[i]);
        }

        panel.add(addButton);
```

```
        panel.add(numberButtons[0]);
        panel.add(subButton);
        panel.add(mulButton);
        panel.add(divButton);
        panel.add(equalsButton);

        add(panel);

        setVisible(true);
    }

    @Override
    public void actionPerformed(ActionEvent e) {
        String command = e.getActionCommand();

        if (Character.isDigit(command.charAt(0))) {
            currentInput += command;
            textField.setText(currentInput);
        } else if (command.equals("+") || command.equals("-") ||
command.equals("*") || command.equals("/")) {
            firstNumber = Double.parseDouble(currentInput);
            operator = command.charAt(0);
            currentInput = "";
        } else if (command.equals("=")) {
            secondNumber = Double.parseDouble(currentInput);
            switch (operator) {
                case '+':
                    result = firstNumber + secondNumber;
                    break;
                case '-':
                    result = firstNumber - secondNumber;
                    break;
                case '*':
                    result = firstNumber * secondNumber;
                    break;
                case '/':
                    if (secondNumber != 0)
                        result = firstNumber / secondNumber;
                    else
                        textField.setText("Error");
```

```
                    break;
            }
            textField.setText(String.valueOf(result));
            currentInput = "";
        } else if (command.equals("C")) {
            currentInput = "";
            firstNumber = 0;
            secondNumber = 0;
            result = 0;
            operator = ' ';
            textField.setText("");
        }
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(SimpleCalculator::new);
    }
}
```

Output -:


Simple Calculator
C
1
2
3
4
5
6
7
8
9
+
0
-
*
/
=

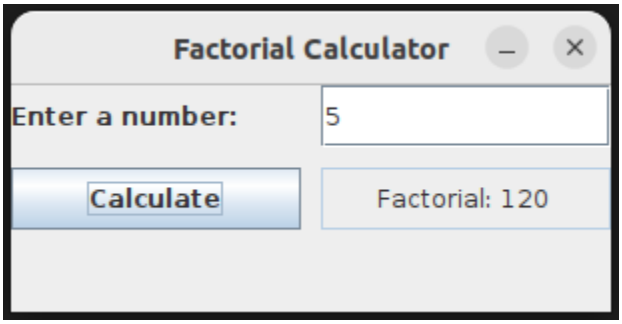
2. Write a java program using swing to display number and factorial of that number.

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

public class FactorialCalculator extends JFrame implements ActionListener
{
   private JTextField numberField, factorialField;
   private JButton calculateButton;

   public FactorialCalculator() {
       setTitle("Factorial Calculator");
       setSize(300, 150);
       setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       setLocationRelativeTo(null);
       setResizable(false);

       JPanel panel = new JPanel();
       panel.setLayout(new GridLayout(3, 1, 10, 10));

       JLabel enterLabel = new JLabel("Enter a number:");
       numberField = new JTextField(10);

       calculateButton = new JButton("Calculate");
       calculateButton.addActionListener(this);

       factorialField = new JTextField(10);
       factorialField.setEditable(false);
       factorialField.setHorizontalAlignment(SwingConstants.CENTER);

       panel.add(enterLabel);
       panel.add(numberField);
       panel.add(calculateButton);
       panel.add(factorialField);
```

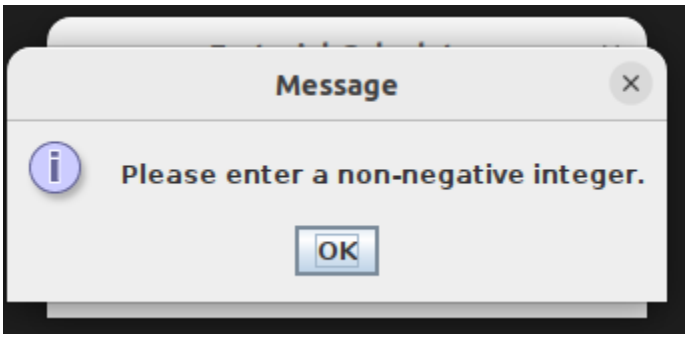
```
        add(panel);

        setVisible(true);
    }

    @Override
    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == calculateButton) {
            try {
                int number = Integer.parseInt(numberField.getText());
                if (number >= 0) {
                    long factorial = calculateFactorial(number);
                    factorialField.setText("Factorial: " + factorial);
                } else {
                    JOptionPane.showMessageDialog(this, "Please enter a
non-negative integer.");
                    factorialField.setText("");
                }
            } catch (NumberFormatException ex) {
                JOptionPane.showMessageDialog(this, "Invalid input. Please
enter a valid integer.");
                factorialField.setText("");
            }
        }
    }

    private long calculateFactorial(int n) {
        if (n == 0 || n == 1) {
            return 1;
        } else {
            long result = 1;
            for (int i = 2; i <= n; i++) {
                result *= i;
            }
            return result;
        }
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(FactorialCalculator::new);
```

```
    }
}
```

Output:




Output after entering a negative number :



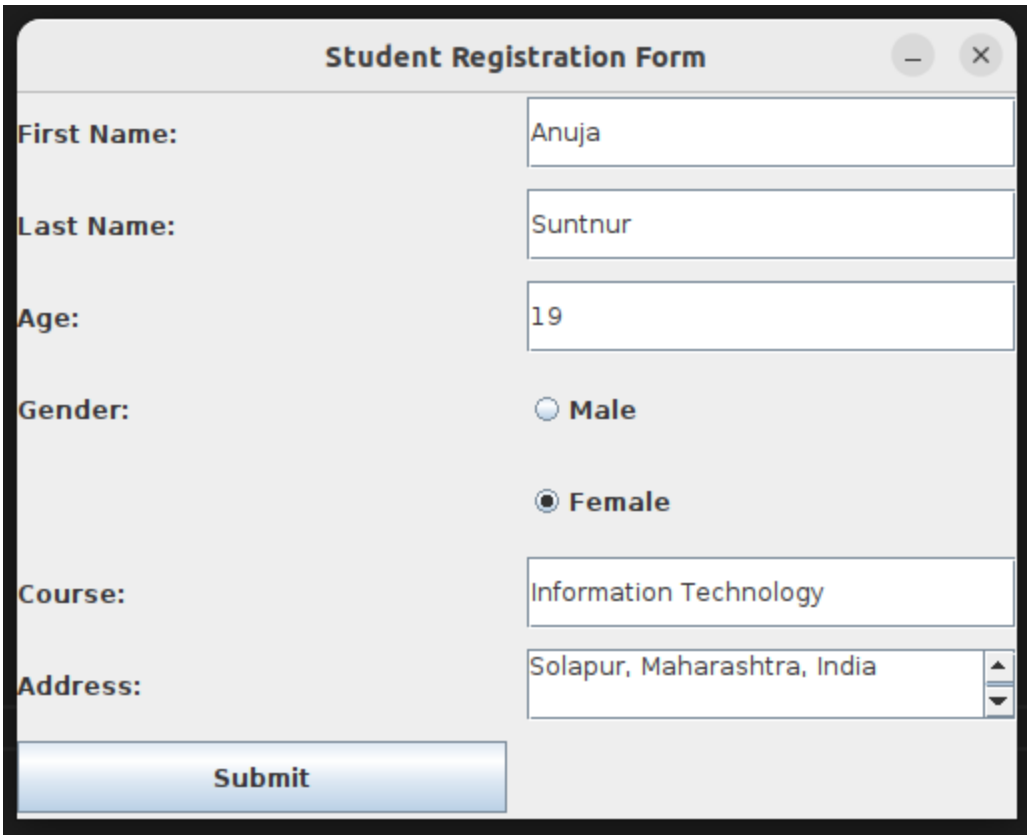
3. Write a program to create a registration form for student admission.

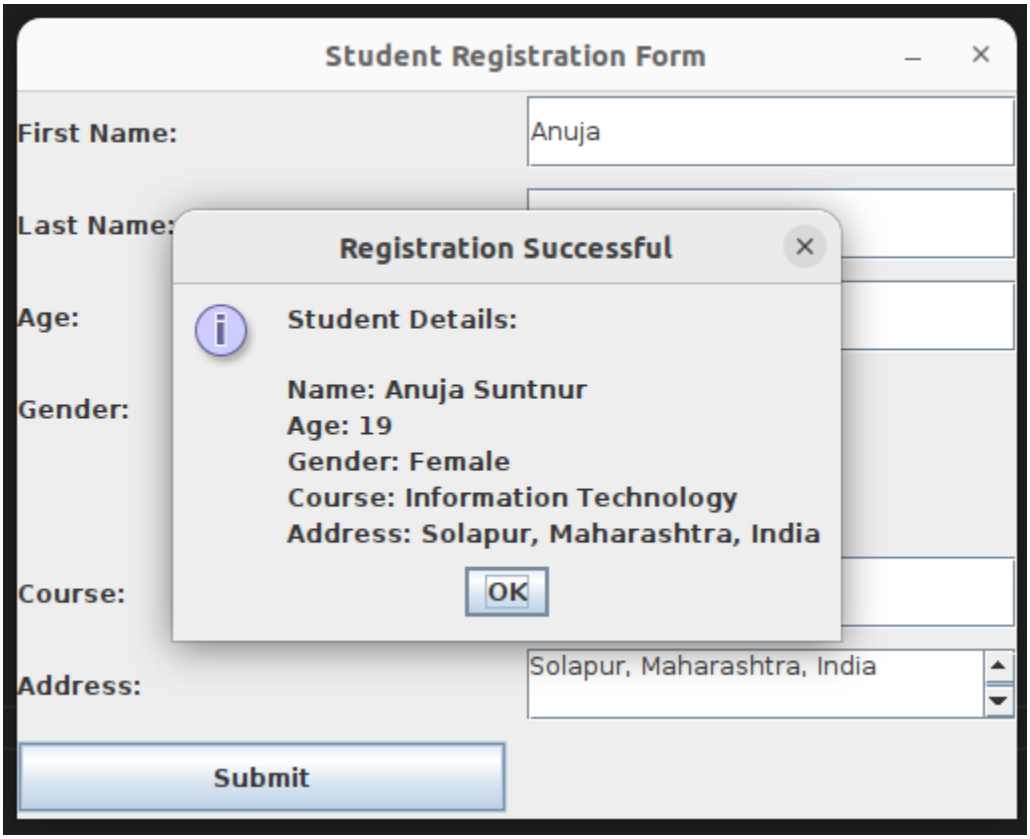
```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;

public class StudentRegistrationForm extends JFrame implements
ActionListener {
   private JTextField firstNameField, lastNameField, ageField,
courseField;
   private JRadioButton maleRadioButton, femaleRadioButton;
   private ButtonGroup genderGroup;
   private JTextArea addressArea;
   private JButton submitButton;

   public StudentRegistrationForm() {
       setTitle("Student Registration Form");
       setSize(500, 400);
       setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       setLocationRelativeTo(null);
       setResizable(false);

       JPanel panel = new JPanel();
       panel.setLayout(new GridLayout(8, 2, 10, 10));

       JLabel firstNameLabel = new JLabel("First Name:");
       firstNameField = new JTextField(20);

       JLabel lastNameLabel = new JLabel("Last Name:");
       lastNameField = new JTextField(20);

       JLabel ageLabel = new JLabel("Age:");
       ageField = new JTextField(3);

       JLabel genderLabel = new JLabel("Gender:");
       maleRadioButton = new JRadioButton("Male");
       femaleRadioButton = new JRadioButton("Female");
       genderGroup = new ButtonGroup();
```

```
        genderGroup.add(maleRadioButton);
        genderGroup.add(femaleRadioButton);

        JLabel courseLabel = new JLabel("Course:");
        courseField = new JTextField(20);

        JLabel addressLabel = new JLabel("Address:");
        addressArea = new JTextArea(3, 20);
        JScrollPane addressScrollPane = new JScrollPane(addressArea);

        submitButton = new JButton("Submit");
        submitButton.addActionListener(this);

        panel.add(firstNameLabel);
        panel.add(firstNameField);
        panel.add(lastNameLabel);
        panel.add(lastNameField);
        panel.add(ageLabel);
        panel.add(ageField);
        panel.add(genderLabel);
        panel.add(maleRadioButton);
        panel.add(new JLabel()); // Empty space for alignment
        panel.add(femaleRadioButton);
        panel.add(courseLabel);
        panel.add(courseField);
        panel.add(addressLabel);
        panel.add(addressScrollPane);
        panel.add(submitButton);

        add(panel);

        setVisible(true);
    }

    @Override
    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == submitButton) {
            String firstName = firstNameField.getText();
            String lastName = lastNameField.getText();
            int age = Integer.parseInt(ageField.getText());
```

```
            String gender = maleRadioButton.isSelected() ? "Male" :
"Female";
            String course = courseField.getText();
            String address = addressArea.getText();

            // You can perform further actions here, such as storing the
data in a database or displaying it in a message dialog
            String message = "Student Details:\n\n" +
                    "Name: " + firstName + " " + lastName + "\n" +
                    "Age: " + age + "\n" +
                    "Gender: " + gender + "\n" +
                    "Course: " + course + "\n" +
                    "Address: " + address;

            JOptionPane.showMessageDialog(this, message, "Registration
Successful", JOptionPane.INFORMATION_MESSAGE);

            // Clear the form fields after submission
            firstNameField.setText("");
            lastNameField.setText("");
            ageField.setText("");
            genderGroup.clearSelection();
            courseField.setText("");
            addressArea.setText("");
        }
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(StudentRegistrationForm::new);
    }
}
```

Output :


Student Registration Form
First Name:
Anuja
Last Name:
Suntnur
Age:
19
Gender:
Male
Female
Course:
Information Technology
Address:
Solapur, Maharashtra, India
Submit


Student Registration Form
First Name:
Anuja
Last Name:
Age:
Gender:
Course:
Address:
Solapur, Maharashtra, India
Submit
Registration Successful
Student Details:
Name: Anuja Suntnur
Age: 19
Gender: Female
Course: Information Technology
Address: Solapur, Maharashtra, India
OK

4. Write a program to create a login form for a website using Swing components.

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

public class LoginForm extends JFrame implements ActionListener {
   private JTextField usernameField;
   private JPasswordField passwordField;
   private JButton loginButton;
   private JLabel statusLabel;

   public LoginForm() {
       setTitle("Login Form");
       setSize(300, 200);
       setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       setLocationRelativeTo(null);
       setResizable(false);

       JPanel panel = new JPanel();
       panel.setLayout(new GridLayout(4, 1, 10, 10));

       JLabel usernameLabel = new JLabel("Username:");
       usernameField = new JTextField(20);

       JLabel passwordLabel = new JLabel("Password:");
       passwordField = new JPasswordField(20);

       loginButton = new JButton("Login");
       loginButton.addActionListener(this);

       statusLabel = new JLabel();
       statusLabel.setHorizontalAlignment(SwingConstants.CENTER);

       panel.add(usernameLabel);
       panel.add(usernameField);
       panel.add(passwordLabel);
       panel.add(passwordField);
```

```
        panel.add(loginButton);
        panel.add(statusLabel);

        add(panel);

        setVisible(true);
    }

    @Override
    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == loginButton) {
            String username = usernameField.getText();
            String password = String.valueOf(passwordField.getPassword());

            // Check if username and password match the expected
credentials
            if (isValidCredentials(username, password)) {
                statusLabel.setText("Login Successful");
                // You can add further actions here, such as opening a new
window or redirecting to another page
            } else {
                statusLabel.setText("Invalid username or password");
            }

            // Clear the password field after login attempt
            passwordField.setText("");
        }
    }

    private boolean isValidCredentials(String username, String password) {
        // In a real application, you would check against a database or
some other authentication mechanism
        // For simplicity, we're using hardcoded credentials here
        String validUsername = "admin";
        String validPassword = "admin123";

        return username.equals(validUsername) &&
password.equals(validPassword);
    }
```

```
    public static void main(String[] args) {
        SwingUtilities.invokeLater(LoginForm::new);
    }
}
```

Output: