Java Assignment 22610018
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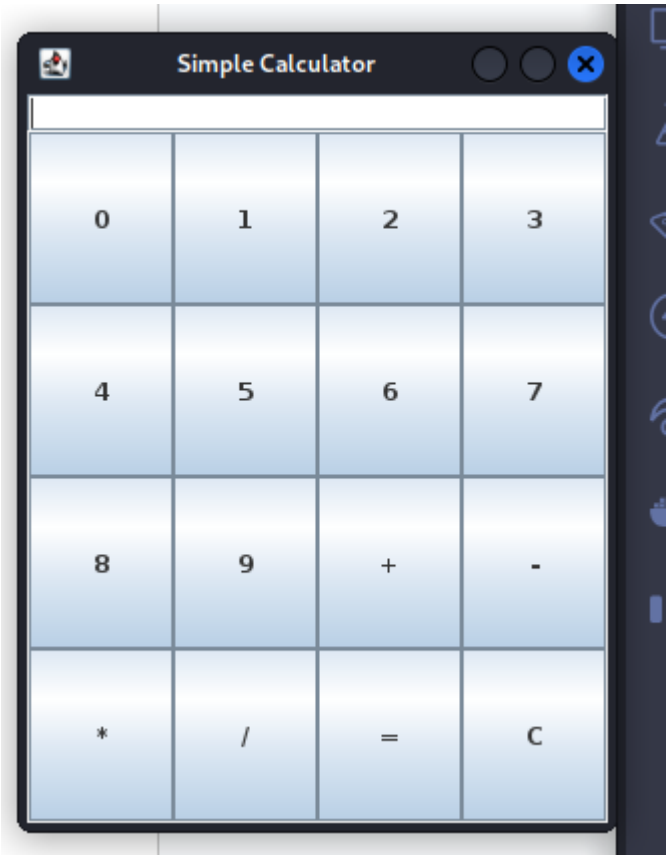
1. Write a program to create a simple calculator with basic +, -, /, *
using java swing elements.

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

public class Calculator extends JFrame implements ActionListener {
    private JTextField textField;
    private JButton[] digitButtons;
    private JButton[] operatorButtons;
    private JButton equalsButton;
    private JButton clearButton;

    private double firstOperand;
    private char operator;

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

        JPanel panel = new JPanel();
        panel.setLayout(new BorderLayout());

        textField = new JTextField();
        panel.add(textField, BorderLayout.NORTH);

        JPanel buttonPanel = new JPanel();
        buttonPanel.setLayout(new GridLayout(4, 4));

        digitButtons = new JButton[10];
        for (int i = 0; i < 10; i++) {
            digitButtons[i] = new JButton(String.valueOf(i));
            digitButtons[i].addActionListener(this);
            buttonPanel.add(digitButtons[i]);
```

```
        }

        operatorButtons = new JButton[4];
        operatorButtons[0] = new JButton("+");
        operatorButtons[1] = new JButton("-");
        operatorButtons[2] = new JButton("*");
        operatorButtons[3] = new JButton("/");
        for (JButton button : operatorButtons) {
            button.addActionListener(this);
            buttonPanel.add(button);
        }

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

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

        panel.add(buttonPanel, BorderLayout.CENTER);

        add(panel);
        setVisible(true);
    }

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

        if (Character.isDigit(command.charAt(0))) {
            textField.setText(textField.getText() + command);
        } else if (command.equals("+") || command.equals("-") ||
command.equals("*") || command.equals("/")) {
            firstOperand = Double.parseDouble(textField.getText());
            operator = command.charAt(0);
            textField.setText("");
        } else if (command.equals("=")) {
            double secondOperand =
Double.parseDouble(textField.getText());
            double result = 0;

            switch (operator) {
```

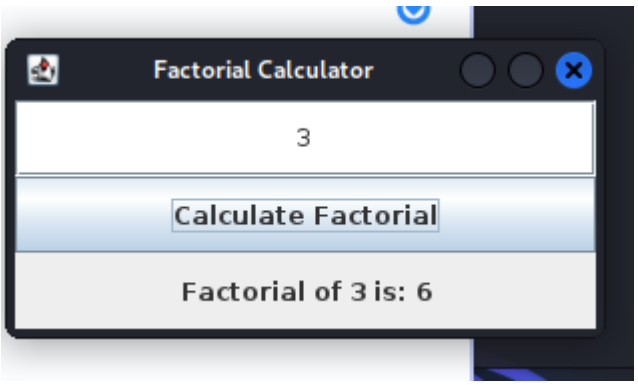
```
                case '+':
                    result = firstOperand + secondOperand;
                    break;
                case '-':
                    result = firstOperand - secondOperand;
                    break;
                case '*':
                    result = firstOperand * secondOperand;
                    break;
                case '/':
                    if (secondOperand != 0)
                        result = firstOperand / secondOperand;
                    else
                        result = Double.POSITIVE_INFINITY; // Handle
division by zero
                    break;
            }

            textField.setText(String.valueOf(result));
        } else if (command.equals("C")) {
            textField.setText("");
        }
    }

    public static void main(String[] args) {
        new Calculator();
    }
}
```



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 Factorial extends JFrame implements ActionListener {
   private JTextField numberField;
   private JButton calculateButton;
   private JLabel resultLabel;

   public Factorial() {
       setTitle("Factorial Calculator");
       setSize(300, 150);
       setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       setLocationRelativeTo(null);
       setLayout(new GridLayout(3, 1));

       numberField = new JTextField();
       numberField.setHorizontalAlignment(JTextField.CENTER);
       add(numberField);
```

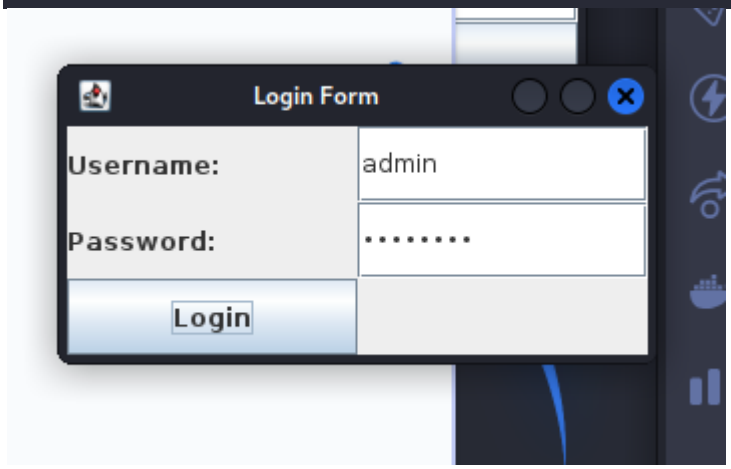
```
        calculateButton = new JButton("Calculate Factorial");
        calculateButton.addActionListener(this);
        add(calculateButton);

        resultLabel = new JLabel();
        resultLabel.setHorizontalAlignment(JLabel.CENTER);
        add(resultLabel);

        setVisible(true);
    }

    @Override
    public void actionPerformed(ActionEvent e) {
        try {
            int number = Integer.parseInt(numberField.getText());
            long factorial = calculateFactorial(number);
            resultLabel.setText("Factorial of " + number + " is: " +
factorial);
        } catch (NumberFormatException ex) {
            JOptionPane.showMessageDialog(this, "Invalid input. Please
enter a valid integer.", "Error", JOptionPane.ERROR_MESSAGE);
        }
    }

    private long calculateFactorial(int n) {
        if (n == 0 || n == 1) {
            return 1;
        } else {
            return n * calculateFactorial(n - 1);
        }
    }

    public static void main(String[] args) {
        new Factorial();
    }
}
```



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

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

public class Login extends JFrame implements ActionListener {
    private JTextField usernameField;
    private JPasswordField passwordField;
    private JButton loginButton;

    public Login() {
        setTitle("Login Form");
        setSize(300, 150);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setLocationRelativeTo(null);
        setLayout(new GridLayout(3, 2));

        JLabel usernameLabel = new JLabel("Username:");
        add(usernameLabel);

        usernameField = new JTextField();
        add(usernameField);

        JLabel passwordLabel = new JLabel("Password:");
        add(passwordLabel);

        passwordField = new JPasswordField();
        add(passwordField);

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

```
        setVisible(true);
    }

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

        // Dummy validation
        if (username.equals("admin") && password.equals("password")) {
            JOptionPane.showMessageDialog(this, "Login successful!",
"Success", JOptionPane.INFORMATION_MESSAGE);
        } else {
            JOptionPane.showMessageDialog(this, "Invalid username or
password", "Error", JOptionPane.ERROR_MESSAGE);
        }
    }

    public static void main(String[] args) {
        new Login();
    }
}
```



4.Write a program to create a registration form for student Admission.

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

```
public class Registration extends JFrame {
   private JLabel nameLabel, ageLabel, genderLabel, courseLabel;
   private JTextField nameField, ageField;
   private JComboBox<String> genderComboBox, courseComboBox;
   private JButton submitButton;

   public Registration() {
       setTitle("Student Registration Form");
       setSize(400, 250);
       setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
       setLocationRelativeTo(null);
       setLayout(new GridLayout(5, 2));

       nameLabel = new JLabel("Name:");
       nameField = new JTextField();
       add(nameLabel);
       add(nameField);

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

       genderLabel = new JLabel("Gender:");
       String[] genders = {"Male", "Female", "Other"};
       genderComboBox = new JComboBox<>(genders);
       add(genderLabel);
       add(genderComboBox);

       courseLabel = new JLabel("Course:");
       String[] courses = {"Computer Science", "Information
Technology", "Electonics", "Civil", "Mechanical","Electrcal"};
       courseComboBox = new JComboBox<>(courses);
       add(courseLabel);
       add(courseComboBox);

       submitButton = new JButton("Submit");
       submitButton.addActionListener(new ActionListener() {
           @Override
           public void actionPerformed(ActionEvent e) {
               String name = nameField.getText();
               int age = Integer.parseInt(ageField.getText());
```

```
                String gender = (String)
genderComboBox.getSelectedItem();
                String course = (String)
courseComboBox.getSelectedItem();

                JOptionPane.showMessageDialog(null,
                        "Name: " + name + "\nAge: " + age + "\nGender: "
+ gender + "\nCourse: " + course,
                        "Registration Successful",
                        JOptionPane.INFORMATION_MESSAGE);
            }
        });
        add(submitButton);

        setVisible(true);
    }

    public static void main(String[] args) {
        new Registration();
    }
}
```