Task :5

Java Fx

Date: 14-10-2025

Write a program to add Student details to a Hashtable. The key of the Hashtable will contain an object of the StudentID class, which stores the student id. The value in the Hashtable will be an object of StudentData class which contains details of an student like ID, name and CGPA

Aim:

To create a user-defined package named mymath and design a simple calculator using JFrame, JTextField, and JButton components in Java, which performs Multiplication and Division operations.

Algorithm:

1. Package
   Name: mymath – to organize calculator-related classes.
2. Class Name:
   - Calculator – for designing the calculator GUI and performing operations.
3. Method Name:
   - actionPerformed() – handles button click events for multiplication and division.
   - main() – creates and displays the calculator window.
4. Function:
   The calculator accepts two numbers from the user through text fields and performs multiplication or division based on the button clicked.

Program:

File: Calculator.java (inside folder mymath)

```
/**
 * Package: mymath
 * Class: Calculator
 * This class creates a simple calculator GUI that performs Multiplication and Division.
 */
package mymath;

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

public class Calculator extends JFrame implements ActionListener {
```

```
JTextField num1, num2, result;
JButton multiply, divide;

// Constructor to set up GUI
public Calculator() {
   setTitle("Simple Calculator");
   setSize(350, 250);
   setLayout(new GridLayout(4, 2, 10, 10));
   setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

   // Creating labels and text fields
   add(new JLabel("Enter First Number:"));
   num1 = new JTextField();
   add(num1);

   add(new JLabel("Enter Second Number:"));
   num2 = new JTextField();
   add(num2);

   add(new JLabel("Result:"));
   result = new JTextField();
   result.setEditable(false);
   add(result);

   // Buttons for multiplication and division
   multiply = new JButton("Multiply");
   divide = new JButton("Divide");

   // Add buttons
   add(multiply);
   add(divide);

   // Add action listeners
   multiply.addActionListener(this);
   divide.addActionListener(this);

   setVisible(true);
}

// Event handling for button clicks
public void actionPerformed(ActionEvent e) {
```

```
        try {
            double n1 = Double.parseDouble(num1.getText());
            double n2 = Double.parseDouble(num2.getText());
            double res = 0;

            if (e.getSource() == multiply) {
                res = n1 * n2;
                result.setText(String.valueOf(res));
            } else if (e.getSource() == divide) {
                if (n2 == 0) {
                    result.setText("Cannot divide by zero!");
                } else {
                    res = n1 / n2;
                    result.setText(String.valueOf(res));
                }
            }
        } catch (NumberFormatException ex) {
            result.setText("Invalid input!");
        }
    }

    // Main method to run the application
    public static void main(String[] args) {
        new Calculator();
    }
}
```

Output (GUI Window):

When the program runs, a window appears with:
Enter First Number: [ ]
Enter Second Number: [ ]
Result: [ ]
[Multiply] [Divide]

Example:1
Input: 4 and 5 → Click “Multiply” → Output: 20
Example:2 :1:
Input: 10 and 2 → Click “Divide” → Output: 5
Example:3
Input: 10 and 0 → Click “Divide” → Output: Cannot divide by zero!

Result:

Thus, a user-defined package mymath was successfully created, and a simple calculator was designed using JFrame, JTextField, and JButton that performs Multiplication and Division operations.