

Explanation of SimpleGUI Java Program

1. ****Import statements****

- javax.swing.* provides GUI components like JFrame, JButton, JLabel, JTextField.
- java.awt.* gives layout managers (GridLayout) and color utilities.
- java.awt.event.* enables event handling such as button clicks.

2. ****Class Declaration****

- The program is inside a class called SimpleGUI which defines how the program behaves.

3. ****Main Method****

- The public static void main(String[] args) method is the entry point for execution.

4. ****Creating the Window****

- JFrame creates the application window.
- setSize() defines width and height.
- setDefaultCloseOperation() closes the app when you press X.
- setLayout(new GridLayout(5,2,10,10)) divides the window into 5 rows and 2 columns.

5. ****Creating Labels****

- JLabel displays text. The result label is centered using SwingConstants.CENTER.

6. ****Text Fields****

- JTextField allows the user to type in the two numbers.

7. ****Buttons****

- JButton creates clickable buttons for Add, Subtract, Multiply, Divide, and Clear.

8. ****Action Listeners****

- Each button uses addActionListener() with an ActionListener that runs when clicked.
- The listener reads text input, converts it to double, performs the calculation, and updates the resultLabel.
- Invalid input (like letters) triggers a NumberFormatException, displaying "Invalid input!".
- The Divide button checks for division by zero.
- The Clear button resets the fields and result label.

9. ****Adding Components to Frame****

- All components are added to the JFrame in sequence.
- GridLayout arranges them row-by-row.

10. ****Display the Frame****

- frame.setVisible(true) makes the window visible.

Summary:

This SimpleGUI Java program is a basic calculator built using Swing. It demonstrates:

- GUI component creation and layout
- Event handling through ActionListeners
- Input validation and user feedback.