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**| CalculatorGUI |**

**-------------------------------------------**

**| - frame: JFrame |**

**| - inputField: JTextField |**

**| - buttonPanel: JPanel |**

**| - numberButtons: JButton[] |**

**| - clearButton: JButton |**

**| - decimalButton: JButton |**

**| - userInput: String |**

**| - selectedOperation: String |**

**| - firstOperand: double |**

**| - secondOperand: double |**

**| - result: double |**

**| - calculatorLogic: CalculatorLogic |**

**-------------------------------------------**

**| + CalculatorGUI() |**

**| + createGUI() |**

**| + handleButtonClick() |**

**| + handleClearButtonClick() |**

**| + handleDecimalButtonClick() |**

**| + updateInputField() |**

**| + setCalculatorLogic(calculatorLogic: CalculatorLogic) |**

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**-------------------------------------------**

**| CalculatorLogic |**

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**| - firstOperand: double |**

**| - secondOperand: double |**

**| - result: double |**

**| - selectedOperation: String |**

**-------------------------------------------**

**| + setFirstOperand(operand: double) |**

**| + setSecondOperand(operand: double) |**

**| + getFirstOperand(): double |**

**| + getSecondOperand(): double |**

**| + getSelectedOperation(): String |**

**| + performCalculation(): void |**

**| + validateInput(): boolean |**

**| + handleCalculationError(): void |**

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**| Main |**

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**| + main(String[] args) |**

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**Explanation:**

1. **CalculatorGUI Class:**
   * Fields:
     + frame: JFrame - Represents the main window of the app.
     + inputField: JTextField - Displays user input and output.
     + buttonPanel: JPanel - Contains calculator buttons.
     + numberButtons: JButton[] - Array storing calculator number buttons.
     + clearButton: JButton - Button to clear the calculator.
     + decimalButton: JButton - Button for decimal input.
     + userInput: String - Stores user input.
     + selectedOperation: String - Stores the selected operation.
     + firstOperand: double - Stores the first operand.
     + secondOperand: double - Stores the second operand.
     + result: double - Stores the result.
     + calculatorLogic: CalculatorLogic - Performs calculations.
   * Methods:
     + CalculatorGUI(): Constructor.
     + createGUI(): Creates and displays the GUI.
     + handleButtonClick(): Handles button clicks.
     + handleClearButtonClick(): Handles clear button click.
     + handleDecimalButtonClick(): Handles decimal button click.
     + updateInputField(): Updates the input field.
     + setCalculatorLogic(calculatorLogic: CalculatorLogic): Sets the calculator logic.
2. **CalculatorLogic Class:**
   * Fields:
     + firstOperand: double - Stores the first operand.
     + secondOperand: double - Stores the second operand.
     + result: double - Stores the result.
     + selectedOperation: String - Stores the selected operation.
   * Methods:
     + setFirstOperand(operand: double): Sets the first operand.
     + setSecondOperand(operand: double): Sets the second operand.
     + getFirstOperand(): double: Gets the first operand.
     + getSecondOperand(): double: Gets the second operand.
     + getSelectedOperation(): String: Gets the selected operation.
     + performCalculation(): void: Performs the calculation.
     + validateInput(): boolean: Validates the input.
     + handleCalculationError(): void: Handles calculation errors.
3. **Main Class:**
   * Fields:
     + None (Main class does not contain any fields).
   * Methods:
     + main(String[] args): Main method to launch the application.

**Relationships:**

* **Composition Relationship:**
  + CalculatorGUI has a composition relationship with CalculatorLogic, as CalculatorGUI contains an instance variable of type CalculatorLogic (calculatorLogic).
* **Association Relationship:**
  + Main has an association relationship with CalculatorGUI, as Main creates and uses an object of type CalculatorGUI.

This class diagram provides a visual representation of the proposed Java calculator app's structure, including the classes, fields, methods, and relationships between them.

***Take screenshots of you testing your app and include in your documentation. Include all screens.***

A screenshot of a computer

Description automatically generated