

SIMPLE CALCULATOR USING JAVA AWT

INTERN INFORMATION:

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INTRODUCTION

The simple Calculator is a Java Swing application that provides a graphical user interface for performing basic arithmetic calculations. This calculator features a colorful design with buttons for digits, mathematical operations, and special functions.

The project aims to demonstrate GUI programming in Java, event handling, and basic arithmetic expression evaluation. It provides users with a visually appealing calculator interface where they can input mathematical expressions and obtain results in real-time.

Importance and Advantages

- **User-Friendly Interface:** The Colorful Calculator offers a familiar calculator interface that users can interact with easily.
- **Real-Time Calculation:** Users can see their input and results displayed dynamically as they perform calculations.
- **Educational Purposes:** This project helps in learning about GUI development, event-driven programming, and basic arithmetic expression parsing.

Main Advantage of Using AWT in Java

The main advantage of using AWT (Abstract Window Toolkit) in Java for this project is its simplicity and platform independence. AWT provides a basic set of GUI components that can be used to build graphical applications across different operating systems without external dependencies.

TECHNICAL SKILLS USED

Programming Language: Java

GUI Library: AWT (Abstract Window Toolkit), Java Swing

Development Environment: VS Code

Arithmetic Expression Parsing: Implementing a simple arithmetic expression evaluator to compute results.

IMPLEMENTATION

Calculator: Main class representing the calculator application.

evaluateExpression(String expression): Method to evaluate a given arithmetic expression and return the result.

actionPerformed(ActionEvent e): Event handler for button clicks, responsible for processing user input.

CODE EXPLANATION

The chatbot code is structured into:

GUI Setup: Initializes and configures the JFrame layout with a display field (JTextField) and a button panel (JPanel).

Button Creation: Creates calculator buttons for digits, operators, and special functions using JButton components.

Event Handling: Implements ActionListener to capture button clicks and execute corresponding actions.

Expression Evaluation: Implements a custom arithmetic expression parser (evaluateExpression) using a recursive descent approach.

FUNCTIONALITY OF THE TECHNOLOGIES

Button Clicks: Each button on the calculator triggers an action (e.g., digit input, operator selection, calculation).

Expression Parsing: Converts user input into a structured arithmetic expression and evaluates it to produce a result.

Error Handling: Handles division by zero and other arithmetic errors gracefully, displaying appropriate messages.

USAGE

1. Compile and run the ColorfulCalculator.java file.
2. Use the calculator interface to input mathematical expressions.
3. Press buttons to input digits, operators, and perform calculations.
4. The result of the calculation will be displayed dynamically in the display field.

CONCLUSION

The Colorful Calculator project showcases the implementation of a basic calculator using Java Swing. It emphasizes event-driven programming, GUI design, and arithmetic expression parsing. This project is ideal for beginners looking to practice Java GUI development and learn about handling user input for interactive applications.

EXECUTION AND OUTPUT

Execution:

Compile the ColorfulCalculator.java file.

Run the compiled ColorfulCalculator class.

Output:

The calculator GUI window will appear with a display field and buttons.

Input arithmetic expressions by clicking buttons for digits and operators.

Press the "=" button to evaluate the expression and display the result in the display field.

Special functions like clear (C), backspace (<-), and square root ($\sqrt{}$) can also be utilized for additional functionalities.

