

## Arithmetic Calculator Program

The Arithmetic Calculator program is a Java application designed to perform basic arithmetic operations, including addition, subtraction, multiplication, and division. The program provides users with a simple and intuitive interface to perform mathematical calculations conveniently.

### Features: -

1. **User-Friendly Interface:** The program presents users with a menu of arithmetic operations, allowing them to select the desired operation easily.
2. **Input Validation:** User input is validated to ensure that it meets the requirements of the selected operation. Invalid inputs are handled gracefully, and informative error messages are provided to guide the user.
3. **Error Handling:** Robust error handling mechanisms are implemented to handle unexpected scenarios, such as division by zero or invalid user input. Clear and informative error messages help users understand and resolve issues effectively.
4. **Modularity:** The program is modularized to improve code maintainability and reusability. Logic is organized into separate methods or classes, making the code easier to understand, debug, and enhance in the future.
5. **User Experience:** The program prioritizes providing a smooth and intuitive user experience. Clear prompts, informative messages, and logical flow contribute to a positive interaction with the application.
6. **Documentation:** The code is well-documented with comments to explain complex logic, algorithms, or important decision points. Comprehensive documentation aids in understanding the codebase and facilitates collaboration among developers.
7. **Testing:** The program is thoroughly tested with different inputs to ensure correct behavior in various scenarios. Automated unit tests are employed to detect bugs and verify code reliability.
8. **Performance Optimization:** While the Arithmetic Calculator program is relatively simple, efforts are made to optimize performance, considering factors such as algorithm efficiency and resource usage.

### Conclusion:

The Arithmetic Calculator program provides users with a reliable tool for performing basic arithmetic calculations. With its user-friendly interface, robust error handling, and modularity, the program offers an efficient solution for mathematical operations. By prioritizing user experience, documentation, testing, and performance optimization, the program delivers a high-quality software experience to its users.

### Algorithm: -

1. **Start:** Begin the execution of the calculator.
2. **Input First Number:** Display a message asking the user to input the first number.
3. **Read First Number:** Retrieve the first number entered by the user and store it in a variable, let's call it **num1**.
4. **Input Operator:** Display a message asking the user to input the arithmetic operator (+, -, \*, /).
5. **Read Operator:** Retrieve the operator entered by the user and store it in a variable, let's call it **operator**.
6. **Input Second Number:** Display a message asking the user to input the second number.
7. **Read Second Number:** Retrieve the second number entered by the user and store it in a variable, let's call it **num2**.
8. **Perform Calculation:**
  - If the operator is '+', add **num1** and **num2** to get the result.
  - If the operator is '-', subtract **num2** from **num1** to get the result.
  - If the operator is '\*', multiply **num1** and **num2** to get the result.
  - If the operator is '/' and **num2** is not zero, divide **num1** by **num2** to get the result. If **num2** is zero, display an error message for division by zero.
9. **Display Result:** Display the result of the calculation.
10. **End:** Terminate the execution of the calculator.

This algorithm outlines the basic steps for performing arithmetic calculations. It can be implemented in any programming language by translating each step into code. You can further extend this algorithm to handle additional functionalities like handling decimals, parentheses, exponentiation, etc., based on the requirements of your calculator.