Documentation for Calculator Program

1. Overview:

This document provides detailed documentation for the Calculator Program implemented in Python. The program allows users to perform basic arithmetic operations such as addition, subtraction, multiplication, and division.

2. Program Structure:

The calculator program consists of the following components:

- Functions for arithmetic operations (add, subtract, multiply, divide)
- A main loop function (calc) that displays a menu, accepts user input, and performs operations

3. Function Descriptions:

a) add(x, y):

- Parameters: x (float), y (float)
- Returns: The sum of x and y - Example: add(5, 2) -> 7

b) subtract(x, y):

- Parameters: x (float), y (float)
- Returns: The difference between x and y - Example: subtract(10, 4) -> 6

c) multiply(x, y):

- Parameters: x (float), y (float)
- Returns: The product of x and y
- Example: multiply(3, 4) -> 12

d) divide(x, y):

- Parameters: x (float), y (float)
- Returns: The division of x by y if y != 0; otherwise, displays an error message
- Example: divide(10, 2) -> 5.0

4. **Main Function (calc):**

- Displays a menu for the user with options:
  1. Addition
  2. Subtraction
  3. Multiplication
  4. Division
  5. Exit
- Executes the selected operation based on user input
- Handles invalid input and division by zero errors

5. **Program Flow:**

- The program continuously runs in a loop until the user selects the "Exit" option.
- After every operation, the result is displayed and the menu is shown again.

6. **Example Run:**

Input:
Enter choice: 1

Enter first number: 5

Enter second number: 2.8

Output:

Result: 7.8

Input:

Enter choice: 4
Enter first number: 20

Enter second number: 25

Output:

Result: 0.8

7. **Error Handling:**

- Invalid menu input: Displays an error message "Invalid choice! Please enter 1-5." -

Division by zero: Displays an error message "Error: Division by zero!"

8. **Conclusion:**

This calculator program is a simple, efficient tool for basic arithmetic operations.

It demonstrates the use of functions, loops, conditionals, and error handling in Python.