Programming Fundamentals

Case study

An 8-Function Calculator

Problem Statement:

Write an 8-function calculator program that allows the user to perform addition, subtraction, multiplication, division, mode, power, factorial, square root, and quit operations.

Description:

The program must display a well described menu of eight operations, telling the user to enter **+, −, *, /, %, ^, !, #** (for square root), and **q** to specify the operation to be performed. If user input **q**, execution will terminate.

The program should ask for either one or two operands based on the selected operation, and pass these parameters to appropriate method for required functionality which will return the result after desired processing. The **main()** contains the switch statement which will generate a call to desired functionality and show the output on screen. The program should repeat this behavior until the user presses **q**.

If the Operator is:	The function should:
+	Return the sum of operand1 and operand2
-	Return the difference of operand1 and operand2
*	Return the product of operand1 and operand2
/	Return the quotient of operand1 and operand2
%	Return remainder of operand1 and operand2
^	Return $operand1^{operand2}$
!	Compute the factorial of the integer part of operand1 and return the real number equivalent
#	Return square root of operand1

Algorithm for 8-Function Calculator Problem

1. Display MENU via `cout`.
2. Read the operator from `cin`.
3. While the operator is not 'q', do the following.
    a. Display a prompt for the first operand via `cout`.
    b. Read operand1 from `cin`.
    c. If the operator is a binary operator:
        i. Display a prompt for the second operand via `cout`.
        ii. Read operand2 from `cin`.
    d. Compute result using the operator, operand1, and operand2.
    e. Output result.
    f. Read the operator from `cin`.