

5. Write a C program that takes two numbers, x and y, as input and stores them in separate variables. The program should then read a single character representing an operator (+, -, *, or /). It should perform the corresponding arithmetic operation (x op y), display the result, and then wait for another operator input. If the user enters 'q' instead of one of the four operators, the program should terminate.

Description:

This program allows the user to perform arithmetic operations on two numbers x and y. The program follows these steps:

- The user enters two numbers, x and y.
- The program then repeatedly asks the user to enter an operator (+, -, *, or /).
- It performs the corresponding arithmetic operation (**x op y**) and displays the result.
- The program continues to take operator inputs and perform calculations.
- If the user enters 'q', the program terminates.

This program uses a **loop and switch-case structure** to handle multiple operations until the user decides to quit.

Algorithm:

Step 1: Start

Step 2: Declare variables x, y, operator, and result.

Step 3: Prompt the user to enter two numbers (x and y).

Step 4: Read and store the values of x and y.

Step 5: Repeat until the user enters 'q':

- Prompt the user to enter an operator (+, -, *, /) or 'q' to quit.
- Read the operator.
- **Using a switch-case or if-else:**
- If operator == '+', compute result = x + y and display the result.
- If operator == '-', compute result = x - y and display the result.
- If operator == '*', compute result = x * y and display the result.
- If operator == '/', check if y is not zero:
- If $y \neq 0$, compute result = x / y and display the result.

- Otherwise, print an error message for division by zero.
- If operator == 'q', exit the loop.
- Otherwise, display an “Invalid operator” message.

Step 6: Print “Program terminated” when the loop ends.

Step 7: Stop.

Source Code:

```
#include <stdio.h>

int main() {
    int x, y, result;
    char op;

    // Taking input for numbers
    printf("Enter two numbers: ");
    scanf("%d %d", &x, &y);

    while (1) {
        // Taking input for operator
        printf("Enter an operator (+, -, *, /) or 'q' to quit: ");
        scanf(" %c", &op);

        // Check for exit condition
        if (op == 'q') {
            printf("Exiting program.\n");
            break;
        }

        // Perform arithmetic operation using switch
        switch (op) {
            case '+':
                result = x + y;
                printf("Result: %d + %d = %d\n", x, y, result);
                break;
            case '-':
                result = x - y;
                printf("Result: %d - %d = %d\n", x, y, result);
                break;
            case '*':
                result = x * y;
                printf("Result: %d * %d = %d\n", x, y, result);
```

```

        break;
    case '/':
        if (y != 0) {
            result = x / y;
            printf("Result: %d / %d = %d\n", x, y, result);
        } else {
            printf("Error: Division by zero is not allowed.\n");
        }
        break;
    default:
        printf("Invalid operator. Please enter +, -, *, /, or 'q'
to quit.\n");
    }
}

return 0;
}

```

Sample Output:

```

Enter two numbers: 9 3
Enter an operator (+, -, *, /) or q to quit
+
Result: 9 + 3 = 12
Enter an operator (+, -, *, /) or q to quit
-
Result: 9 - 3 = 6
Enter an operator (+, -, *, /) or q to quit
*
Result: 9 * 3 = 27
Enter an operator (+, -, *, /) or q to quit
/
Result: 9 / 3 = 3
Enter an operator (+, -, *, /) or q to quit
q
Exiting program.

```