ASSIGNMENT – 5

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PROGRAM TO IMPLEMENT SIMPLE CALCULATOR

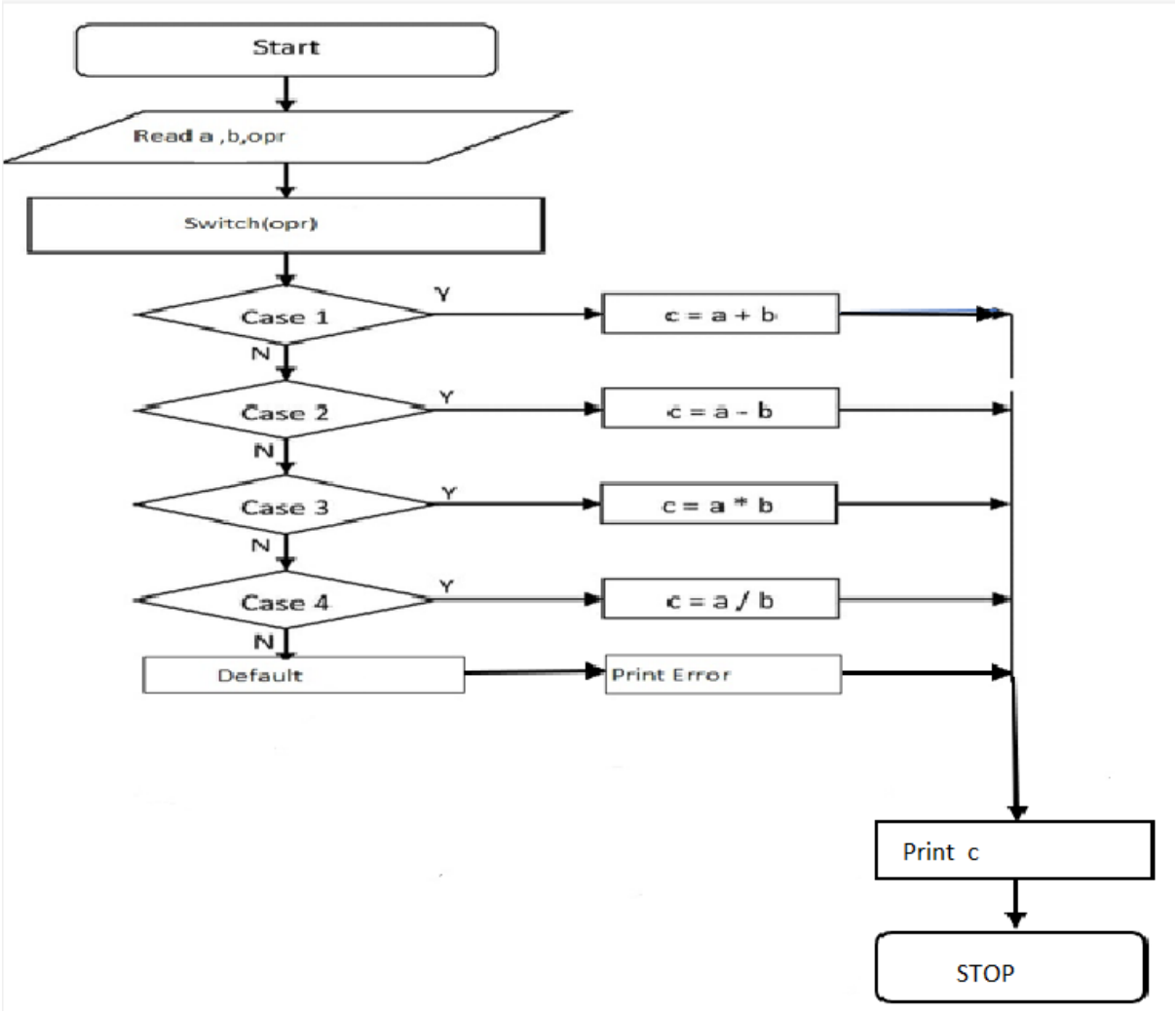
1.PROBLEM DEFINITION:

Design a simple calculator in C that performs basic arithmetic operations: addition, subtraction, multiplication, and division. The user inputs two numbers and an operator (+, -, *, /). The program performs the corresponding operation and displays the result.

2.ALGORITHAM:

- Start.
- Input the operator (+, -, *, /) from the user.
- Input two numbers from the user.
- Use a switch statement to perform the operation based on the operator:
    - Case +: Add the two numbers.
    - Case -: Subtract the second number from the first.
    - Case *: Multiply the two numbers.
    - Case /: Divide the first number by the second if the second number is not zero.
- Display the result of the operation.
- If an invalid operator is input, display an error message.
- End.

3.FLOWCHART:



4. Implementation Logic Explanation:

- The program starts by asking the user to input a valid arithmetic operator.
- Then, it prompts the user for two numbers.
- Based on the chosen operator, the program uses a switch statement to execute the corresponding operation (addition, subtraction, multiplication, or division).
- Division by zero is handled by checking if the second number is zero before performing the division.
- If the operator entered is invalid, an error message is displayed.

5. Source Code (C Program):

```
#include <stdio.h>
int main() {
    char operator;
    double a, b, c;

    // Display calculator options
    printf("Enter an operator (+, -, *, /): ");
    scanf("%c", &operator);

    // Input two numbers
    printf("Enter two numbers: ");
    scanf("%lf %lf", &a, &b);
     switch (operator) {
        case '+':
            c = a + b;
            printf("%.2lf + %.2lf = %.2lf\n", a, b, c);
            break;

        case '-':
            c = a - b;
            printf("%.2lf - %.2lf = %.2lf\n", a, b, c);
            break;

        case '*':
            c=a*b;
            printf("%.2lf * %.2lf = %.2lf\n", a, b, c);
            break;
```

```
        case '/':
            if (b!= 0) {
                c = a / b;
                printf("%.2lf / %.2lf = %.2lf\n", a, b, c);
            } else {
                printf("Error: Division by zero is not allowed.\n");
            }
            break;
    default:
            printf("Invalid operator!\n");
            break;
   }
  return 0;
}
```

6. SAMPLE INPUT AND OUTPUT:

Case 1: Addition

Input:

Enter an operator (+, -, *, /): +

Enter two numbers: 5 3

Output:

5.00 + 3.00 = 8.00

Case 2: Subtraction

Input:

Enter an operator (+, -, *, /): -

Enter two numbers: 10 4

Output:

10.00 - 4.00 = 6.00

Case 3: Multiplication

Input:

Enter an operator (+, -, *, /): *

Enter two numbers: 7 6

Output:

7.00 * 6.00 = 42.00

Case 4: Division

Input:

Enter an operator (+, -, *, /): /

Enter two numbers: 8 2

Output:

8.00 / 2.00 = 4.00

Case 5: Division by Zero

Input:

Enter an operator (+, -, *, /): /

Enter two numbers: 8 0

Output:

Error: Division by zero is not allowed.

Case 6: Invalid Operator

Input:

Enter an operator (+, -, *, /): %

Enter two numbers: 7 5

Output:

Invalid operator!