Variable Description

This is a program written in C that implements a simple scientific calculator. The program presents the user with a menu of operations to choose from, and based on the user's choice, it performs the corresponding operation on one or two input numbers.

Here's a brief description of the variables used in the program:

- **choice** is an integer variable that stores the user's choice of operation.
- **num1** and **num2** are double-precision floating-point variables that store the input numbers for the selected operation.
- **result** is a double-precision floating-point variable that stores the result of the selected operation.

Function Description

This is a program written in the C programming language that implements a scientific calculator. It presents the user with a menu of six options for mathematical operations, which include addition, subtraction, multiplication, division, exponentiation, and finding the square root of a number. The user selects an operation by entering a number corresponding to the operation, and then enters the required input for the selected operation. The program then performs the selected operation and displays the result to the user.

The program uses double-precision floating-point variables to store input and output values, and the math.h library for performing mathematical operations such as exponentiation and finding square roots. The program makes use of a switch statement to determine which operation to perform based on the user's input. If the user enters an invalid option, the program will display a message informing the user that their choice was invalid. Finally, the program returns 0 to indicate successful execution.

File Description

This is a C program for a scientific calculator. It allows the user to choose from several operations including addition, subtraction, multiplication, division, exponentiation, and square root. The program prompts the user to enter the appropriate values and then calculates and displays the result.

The program starts by including the standard input-output library `stdio.h` and the math library `math.h`. The `main()` function is then defined and several variables are declared, including the user's choice (`choice`), the two input values (`num1` and `num2`), and the result of the calculation (`result`).

The user is then presented with a menu of choices using `printf()` statements. The user's choice is read using the `scanf()` function and stored in the `choice` variable. The program then uses a `switch` statement to determine which calculation to perform based on the user's choice.

For each calculation, the program prompts the user to enter the appropriate values using `printf()` statements and reads the input values using `scanf()` function. The calculation is performed using the appropriate math function (`+` for addition, `-` for subtraction, `*` for multiplication, `/` for division, `pow()` for exponentiation, and `sqrt()` for square root), and the result is stored in the `result` variable. Finally, the result is displayed using a `printf()` statement.

If the user enters an invalid choice, the program displays an error message using a `printf()` statement and the program ends.

The `return` statement at the end of the `main()` function indicates that the program has completed successfully.

Output

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

PS C:\Users\aritr\onedrive\desktop\all-c\basic> gcc calculator.c
PS C:\Users\aritr\onedrive\desktop\all-c\basic> .\a.exe
Welcome to the Scientific Calculator!
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Exponentiation
6. Square Root
Enter your choice: 3
Enter two numbers to multiply: 7 8
Result: 56.000000
PS C:\Users\aritr\onedrive\desktop\all-c\basic>
```

Source Code

```c
#include <stdio.h>
#include <math.h>

int main() {
    int choice;
    double num1, num2, result;

    printf("Welcome to the Scientific Calculator!\n");
    printf("1. Addition\n");
    printf("2. Subtraction\n");
    printf("3. Multiplication\n");
    printf("4. Division\n");
    printf("5. Exponentiation\n");
    printf("6. Square Root\n");
    printf("Enter your choice: ");
    scanf("%d", &choice);

    switch(choice) {
        case 1:
            printf("Enter two numbers to add: ");
            scanf("%lf %lf", &num1, &num2);
            result = num1 + num2;
            printf("Result: %lf\n", result);
            break;
        case 2:
            printf("Enter two numbers to subtract: ");
            scanf("%lf %lf", &num1, &num2);
            result = num1 - num2;
```

```c
29            printf("Result: %lf\n", result);
30            break;
31        case 3:
32            printf("Enter two numbers to multiply: ");
33            scanf("%lf %lf", &num1, &num2);
34            result = num1 * num2;
35            printf("Result: %lf\n", result);
36            break;
37        case 4:
38            printf("Enter two numbers to divide: ");
39            scanf("%lf %lf", &num1, &num2);
40            result = num1 / num2;
41            printf("Result: %lf\n", result);
42            break;
43        case 5:
44            printf("Enter a number and its exponent: ");
45            scanf("%lf %lf", &num1, &num2);
46            result = pow(num1, num2);
47            printf("Result: %lf\n", result);
48            break;
49        case 6:
50            printf("Enter a number to find its square root: ");
51            scanf("%lf", &num1);
52            result = sqrt(num1);
53            printf("Result: %lf\n", result);
54            break;
55        default:
```

```c
56            printf("Invalid choice.\n");
57            break;
58    }
59
60    return 0;
61 }
```