Calculator Program in C

In this topic, we will discuss how we write a calculator program in the C programming language. A Calculator is a small electronic device used to perform various arithmetic operations like addition, subtraction, multiplication, division, percentage, etc. It makes our calculations easier and faster. It is a portable device that can use anywhere to perform simple mathematical operations. We use a scientific or sophisticated calculator in some situations, where we need to solve complex calculations like trigonometry functions, exponential operators, degrees, radians, log functions, hyperbolic functions etc. Let's discuss the various ways to create a calculator program in the C language.

Algorithm of Calculator Program

Step 1: Declare local variables n1, n2, res, opt. For example, where n1 and n2 take two numeric values, res will store results and opt variable define the operator symbols.

Step 2: Print the Choice (Addition, Subtraction, multiplication, division, etc.

Step 3: Enter the Choice

Step 4: Takes two numbers, n1 and n2

Step 5: Switch case jump to an operator selected by the user

Step 6: Store result into res variable.

Step 7: Display the operation result

Step 8: Exit from the program.

Different ways to create a Calculator Program in C

Following are the different ways to write a Calculator Program in the C language.

1. Calculator Program in C using the switch statement

2. Calculator Program in C using if else if statement
3. Calculator Program in C using do-while loop and switch statement
4. Calculator Program in C using function and switch statement

Example 1: Calculator Program in C using the switch statement

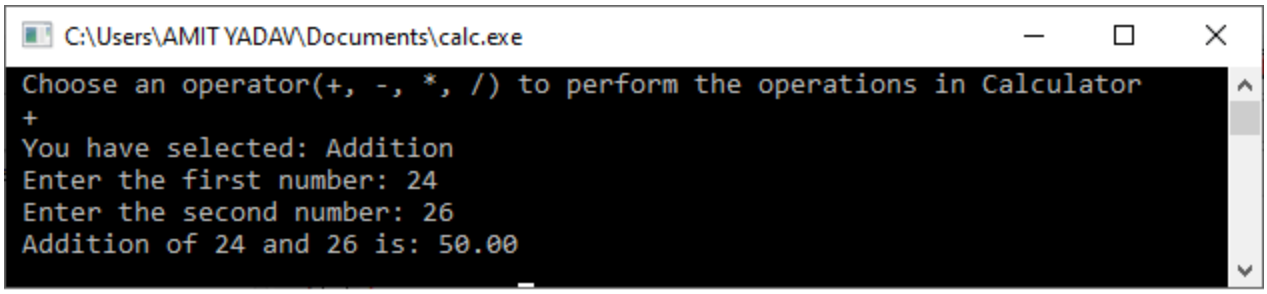
Let's write a program to create a Calculator program using switch statement

program.c

```
#include <stdio.h>
int main()
{
   // declare local variables
   char opt;
   int n1, n2;
   float res;
   printf (" Choose an operator(+, -, *, /) to perform the operation in C Calculator \n ");
   scanf ("%c", &opt); // take an operator
   if (opt == '/' )
   {
      printf (" You have selected: Division");
   }
   else if (opt == '*')
   {
      printf (" You have selected: Multiplication");
    }

   else if (opt == '-')
   {
      printf (" You have selected: Subtraction");
    }
      else if (opt == '+')
   {
      printf (" You have selected: Addition");
    }
   printf (" \n Enter the first number: ");
   scanf(" %d", &n1); // take fist number
   printf (" Enter the second number: ");
   scanf (" %d", &n2); // take second number

   switch(opt)
   {
      case '+':
         res = n1 + n2; // add two numbers
```

```
36.             printf (" Addition of %d and %d is: %.2f", n1, n2, res);
37.             break;
38.
39.         case '-':
40.             res = n1 - n2; // subtract two numbers
41.             printf (" Subtraction of %d and %d is: %.2f", n1, n2, res);
42.             break;
43.
44.         case '*':
45.             res = n1 * n2; // multiply two numbers
46.             printf (" Multiplication of %d and %d is: %.2f", n1, n2, res);
47.             break;
48.
49.         case '/':
50.             if (n2 == 0)   // if n2 == 0, take another number
51.             {
52.                 printf (" \n Divisor cannot be zero. Please enter another value ");
53.                 scanf ("%d", &n2);
54.                 }
55.             res = n1 / n2; // divide two numbers
56.             printf (" Division of %d and %d is: %.2f", n1, n2, res);
57.             break;
58.         default:  /* use default to print default message if any condition is not satisfied */
59.             printf (" Something is wrong!! Please check the options ");
60.     }
61.     return 0;
62. }
```

Output:



Example 2: Calculator Program in C using if else if statement

Let's consider an example to write a simple Calculator program in C using if else if statement.

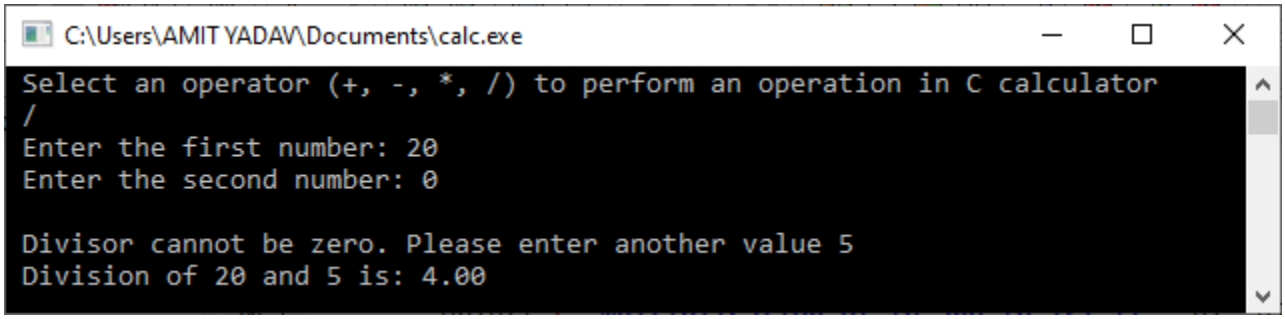
program2.c

```
1. #include <stdio.h>
```

```c
int main()
{
    // declare local variables
    char opt;
    int n1, n2;
    float res;
    printf (" Select an operator (+, -, *, /) to perform an operation in C calculator \n ");
    scanf ("%c", &opt); // take an operator
    printf (" Enter the first number: ");
    scanf(" %d", &n1); // take fist number
    printf (" Enter the second number: ");
    scanf (" %d", &n2); // take second number

    if (opt == '+')
    {
        res = n1 + n2; // add two numbers
        printf (" Addition of %d and %d is: %f", n1, n2, res);
    }

    else if (opt == '-')
    {
        res = n1 - n2; // subtract two numbers
        printf (" Subtraction of %d and %d is: %f", n1, n2, res);
    }

    else if (opt == '*')
    {
        res = n1 * n2; // multiply two numbers
        printf (" Multiplication of %d and %d is: %f", n1, n2, res);
    }

    else if (opt == '/')
    {
        if (n2 == 0)   // if n2 == 0, take another number
        {
            printf (" \n Divisor cannot be zero. Please enter another value ");
            scanf ("%d", &n2);
        }
        res = n1 / n2; // divide two numbers
        printf (" Division of %d and %d is: %.2f", n1, n2, res);
    }
    else
    {
        printf(" \n You have entered wrong inputs ");
    }
```

```
    return 0;
}
```

Output:



Example 3: Calculator Program in C using do while loop and switch statement

Let's create a Calculator program using do while loop and switch case statement in C

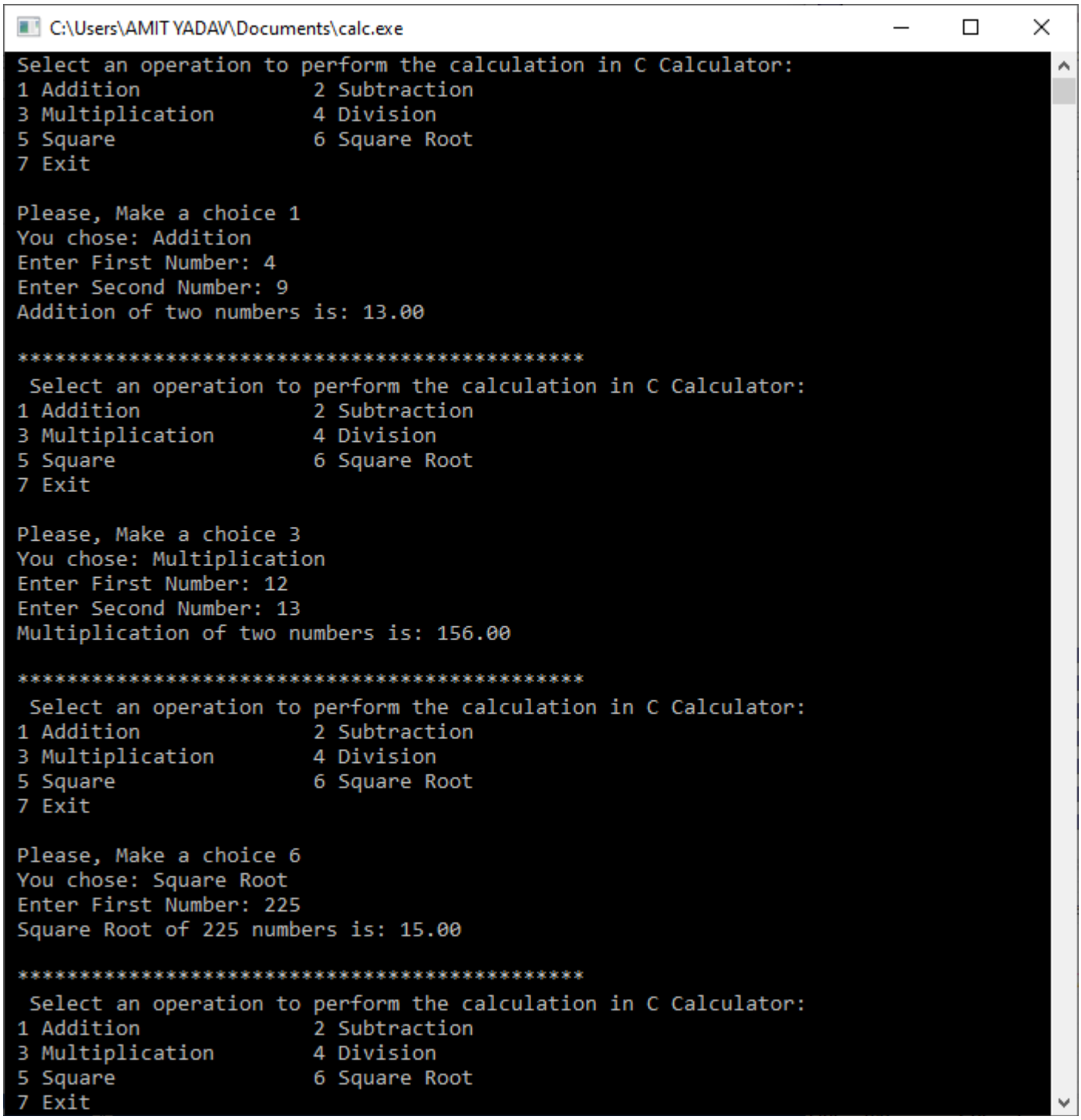
program3.c

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

int main()
{
   // declaration of local variable op;
   int op, n1, n2;
   float res;
   char ch;
   do
   {
      // displays the multiple operations of the C Calculator
      printf (" Select an operation to perform the calculation in C Calculator: ");
      printf (" \n 1 Addition  \t \t 2 Subtraction \n 3 Multiplication \t 4 Division \n 5 Square \t \t 6 Square Root \n 7 Exit \n \n Pleas
e, Make a choice ");

      scanf ("%d", &op); // accepts a numeric input to choose the operation


   // use switch statement to call an operation
   switch (op)
   {
      case 1:
         // Add two numbers
```

```
25.             printf (" You chose: Addition");
26.             printf ("\n Enter First Number: ");
27.             scanf (" %d", &n1);
28.             printf (" Enter Second Number: ");
29.             scanf (" %d", &n2);
30.             res = n1 + n2; // Add two numbers
31.             printf (" Addition of two numbers is: %.2f", res);
32.             break; // break the function
33.
34.         case 2:
35.             // Subtract two numbers
36.             printf (" You chose: Subtraction");
37.             printf ("\n Enter First Number: ");
38.             scanf (" %d", &n1);
39.             printf (" Enter Second Number: ");
40.             scanf (" %d", &n2);
41.             res = n1 - n2; // subtract two numbers
42.             printf (" Subtraction of two numbers is: %.2f", res);
43.             break; // break the function
44.
45.         case 3:
46.             // Multiplication of the numbers
47.             printf (" You chose: Multiplication");
48.             printf ("\n Enter First Number: ");
49.             scanf (" %d", &n1);
50.             printf (" Enter Second Number: ");
51.             scanf (" %d", &n2);
52.             res = n1 * n2; // multiply two numbers
53.             printf (" Multiplication of two numbers is: %.2f", res);
54.             break; // break the function
55.
56.         case 4:
57.             // Division of the numbers
58.             printf (" You chose: Division");
59.             printf ("\n Enter First Number: ");
60.             scanf (" %d", &n1);
61.             printf (" Enter Second Number: ");
62.             scanf (" %d", &n2);
63.             if (n2 == 0)
64.                 {
65.                     printf (" \n Divisor cannot be zero. Please enter another value ");
66.                     scanf ("%d", &n2);
67.                 }
68.             res = n1 / n2; // divide two numbers
69.             printf (" Division of two numbers is: %.2f", res);
```

```
            break; // break the function
        case 5:
            // getting square of a number
            printf (" You chose: Square");
            printf ("\n Enter First Number: ");
            scanf (" %d", &n1);

            res = n1 * n1; // get square of a number
            printf (" Square of %d number is: %.2f", n1, res);
            break; // break the function
        case 6:
            // getting the square root of the number
            printf (" You chose: Square Root");
            printf ("\n Enter First Number: ");
            scanf (" %d", &n1);

            res = sqrt(n1); // use sqrt() function to find the Square Root
            printf (" Square Root of %d numbers is: %.2f", n1, res);
            break; // break the function
        case 7:
            printf (" You chose: Exit");
            exit(0);
            break; // break the function
        default:
            printf(" Something is wrong!! ");
            break;
    }
    printf (" \n \n ********************************************** \n ");
    } while (op != 7);

    return 0;
}
```

Output:



Example 4: Calculator Program in C using function and switch statement

Let's create a Calculator program using function and switch case statement in C

program4.c

```
1. #include <stdio.h>
```

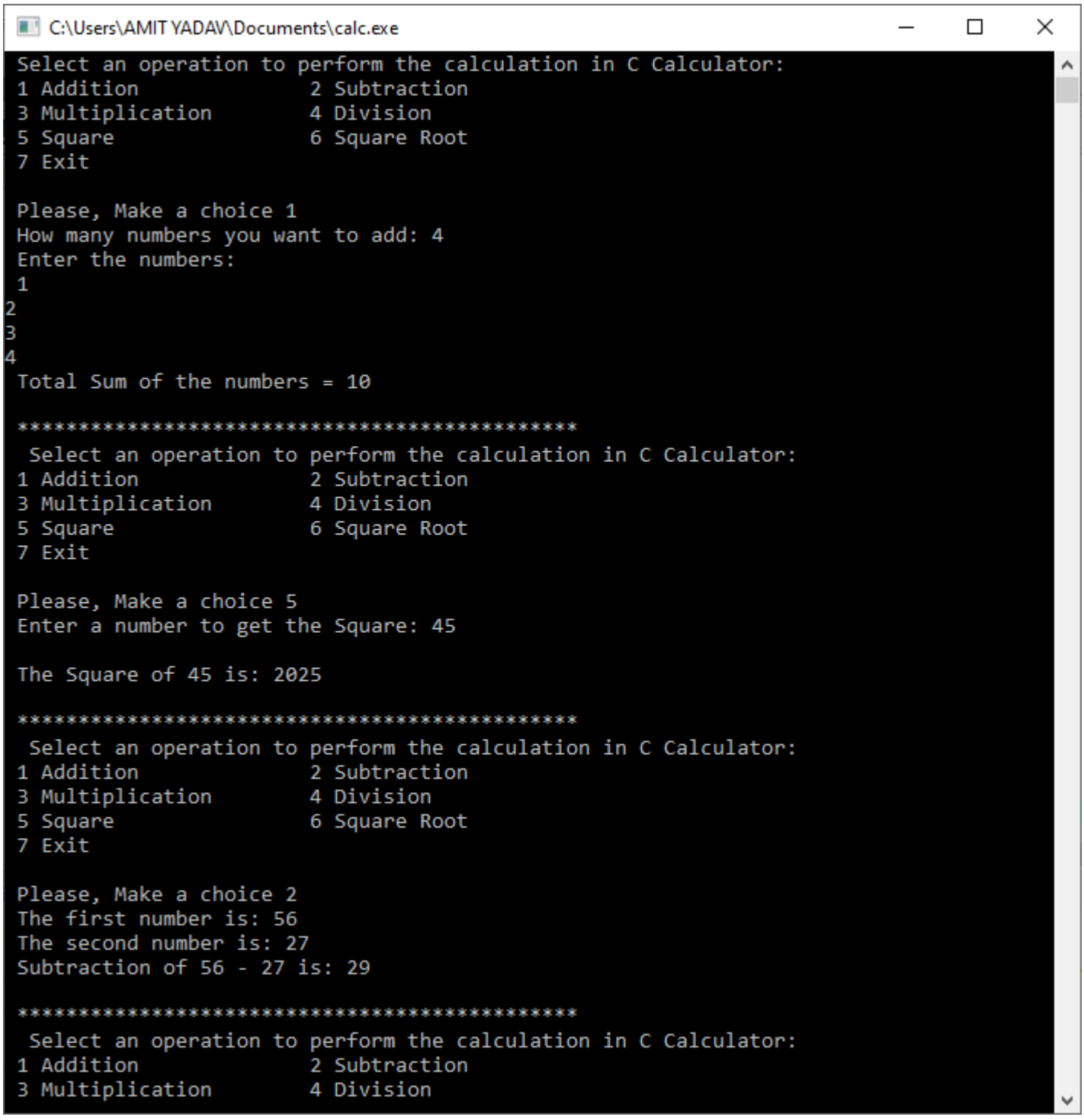
```
2.  #include <conio.h>
3.  #include <math.h>
4.  #include <stdlib.h>
5.
6.  // function declarations
7.  int addition();
8.  int subtract();
9.  int multiply();
10. int divide();
11. int sq();
12. int sqrt1();
13. void exit();
14.
15. int main()
16. {
17.    // declaration a local variable op;
18.    int op;
19.    do
20.    {
21.       // displays the multiple operations of the C Calculator
22.       printf (" Select an operation to perform the calculation in C Calculator: ");
23.       printf (" \n 1 Addition  \t \t 2 Subtraction \n 3 Multiplication \t 4 Division \n 5 Square \t \t 6 Square Root \n 7 Exit \n \n Pleas
    e, Make a choice ");
24.
25.       scanf ("%d", &op); // accepts a numeric input to choose the operation
26.
27.
28.    // use switch statement to call an operation
29.    switch (op)
30.    {
31.       case 1:
32.          addition(); /* It call the addition() function  to add the given numbers */
33.          break; // break the function
34.
35.       case 2:
36.          subtract(); /* It call the subtract() function  to subtract the given numbers */
37.          break; // break the function
38.
39.       case 3:
40.          multiply(); /* It call the multiply() function  to multiply the given numbers */
41.          break; // break the function
42.
43.       case 4:
44.          divide(); // It call the divide() function  to divide the given numbers
45.          break; // break the function
```

```
46.
47.         case 5:
48.             sq(); // It call the sq() function  to get the square of given numbers
49.             break; // break the function
50.
51.         case 6:
52.             sqrt1(); /* It call the sqrt1() function  to get the square root of given numbers */
53.             break; // break the function
54.
55.         case 7:
56.             exit(0); // It call the exit() function  to exit from the program
57.             break; // break the function
58.
59.         default:
60.             printf(" Something is wrong!! ");
61.             break;
62.     }
63.     printf (" \n \n ********************************************** \n ");
64.     } while (op != 7);
65.
66.
67.     return 0;
68. }
69.
70.
71.
72. // function definition
73. int addition()
74. {
75.     int i, sum = 0, num, f_num; // declare a local variable
76.     printf (" How many numbers you want to add: ");
77.     scanf ("%d", &num);
78.     printf (" Enter the numbers: \n ");
79.     for (i = 1; i <= num; i++)
80.     {
81.         scanf(" %d", &f_num);
82.         sum = sum + f_num;
83.     }
84.     printf (" Total Sum of the numbers = %d", sum);
85.     return 0;
86. }
87.
88. // use subtract() function to subtract two numbers
89. int subtract()
90. {
```

```
91.     int n1, n2, res;
92.     printf (" The first number is: ");
93.     scanf ("  %d", &n1);
94.     printf (" The second number is: ");
95.     scanf ("  %d", &n2);
96.     res = n1 - n2;
97.     printf (" The subtraction of %d - %d is: %d", n1, n2, res);
98.  }
99.
100. // use multiply() function to multiply two numbers
101. int multiply()
102. {
103.    int n1, n2, res;
104.    printf (" The first number is: ");
105.    scanf ("  %d", &n1);
106.    printf (" The second number is: ");
107.    scanf ("  %d", &n2);
108.    res = n1 * n2;
109.    printf (" The multiply of %d * %d is: %d", n1, n2, res);
110. }
111.
112. // use divide() function to divide two numbers
113. int divide()
114. {
115.    int n1, n2, res;
116.    printf (" The first number is: ");
117.    scanf ("  %d", &n1);
118.    printf (" The second number is: ");
119.    scanf ("  %d", &n2);
120.
121.    if (n2 == 0)
122.    {
123.       printf (" \n Divisor cannot be zero. Please enter another value ");
124.       scanf ("%d", &n2);
125.    }
126.    res = n1 / n2;
127.    printf (" \n The division of %d / %d is: %d", n1, n2, res);
128. }
129.
130. // use sq() function to get the square of the given number
131. int sq()
132. {
133.    int n1, res;
134.    printf (" Enter a number to get the Square: ");
135.    scanf ("  %d", &n1);
```

```
136.
137.     res = n1 * n1;
138.     printf (" \n The Square of %d is: %d", n1, res);
139. }
140.
141. // use sqrt1() function to get the square root of the given number
142. int sqrt1()
143. {
144.     float res;
145.     int n1;
146.     printf (" Enter a number to get the Square Root: ");
147.     scanf ("  %d", &n1);
148.
149.     res = sqrt(n1);
150.     printf (" \n The Square Root of %d is: %f", n1, res);
151. }
```

Output:


C:\Users\AMIT YADAV\Documents\calc.exe
Select an operation to perform the calculation in C Calculator:
1 Addition 2 Subtraction
3 Multiplication 4 Division
5 Square 6 Square Root
7 Exit
Please, Make a choice 1
How many numbers you want to add: 4
Enter the numbers:
1
2
3
4
Total Sum of the numbers = 10
****
Select an operation to perform the calculation in C Calculator:
1 Addition 2 Subtraction
3 Multiplication 4 Division
5 Square 6 Square Root
7 Exit
Please, Make a choice 5
Enter a number to get the Square: 45
The Square of 45 is: 2025
****
Select an operation to perform the calculation in C Calculator:
1 Addition 2 Subtraction
3 Multiplication 4 Division
5 Square 6 Square Root
7 Exit
Please, Make a choice 2
The first number is: 56
The second number is: 27
Subtraction of 56 - 27 is: 29
****
Select an operation to perform the calculation in C Calculator:
1 Addition 2 Subtraction
3 Multiplication 4 Division