1. Write a program in C to show the simple structure of a function.
Expected Output :
The total is : 11

2. Write a program in C to find the square of any number using the function.
Test Data :
Input any number for square : 20
Expected Output :
The square of 20 is : 400.00

3. Write a program in C to swap two numbers using function.
Test Data :
Input 1st number : 2
Input 2nd number : 4
Expected Output :
Before swapping: n1 = 2, n2 = 4
After swapping: n1 = 4, n2 = 2

4. Write a program in C to check a given number is even or odd using the function.
Test Data :
Input any number : 5
Expected Output :
The entered number is odd.

5. Write a program in C to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 using the function.
Expected Output :
The sum of the series is : 34

6. Write a program in C to convert decimal number to binary number using the function.
Test Data :
Input any decimal number : 65
Expected Output :
The Binary value is : 1000001

7. Write a program in C to check whether a number is a prime number or not using the function.
Test Data :
Input a positive number : 5
Expected Output :
The number 5 is a prime number.

8. Write a program in C to get the largest element of an array using the function.
Test Data :
Input the number of elements to be stored in the array :5
Input 5 elements in the array :
element - 0 : 1
element - 1 : 2
element - 2 : 3
element - 3 : 4
element - 4 : 5
Expected Output :
The largest element in the array is : 5

9. Write a program in C to check armstrong and perfect numbers using the function.

Test Data :

Input any number: 371

Expected Output :

The 371 is an Armstrong number.

The 371 is not a Perfect number.

10. Write a program in C to print all perfect numbers in given range using the function.

Test Data :

Input lowest search limit of perfect numbers : 1

Input lowest search limit of perfect numbers : 100

Expected Output :

The perfect numbers between 1 to 100 are :

6 28

11. Write a program in C to check whether two given strings are an anagram.

Test Data :

Input the first String : spare

Input the second String : pears

Expected Output :

spare and pears are Anagram.

Recursion Based Question

1. Write a program in C to print first 50 natural numbers using recursion.
Expected Output :

```
 The natural numbers are : 1  2  3
  4  5  6  7  8  9  10  11  12  13
  14  15  16  17  18  19  20  21
22  23  24  25  26  27  28  29  30
  31  32  33  34  35  36  37  38
39  40  41  42  43  44  45  46  47
  48  49  50
```

2. Write a program in C to calculate the sum of numbers from 1 to n using recursion.
Test Data :
Input the last number of the range starting from 1 : 5
Expected Output :

```
The sum of numbers from 1 to 5 :
15
```

3. Write a program in C to Print Fibonacci Series using recursion.
Test Data :
Input number of terms for the Series (< 20) : 10
Expected Output :

```
 Input number of terms for the Series (< 20) :
10
 The Series are :
 1  1  2  3  5  8  13  21  34  55
```

4. Write a program in C to print the array elements using recursion.
Test Data :
Input the number of elements to be stored in the array :6
Input 6 elements in the array :
element - 0 : 2
element - 1 : 4
element - 2 : 6
element - 3 : 8
element - 4 : 10
element - 5 : 12
Expected Output :

```
The elements in the array are : 2  4  6  8  10
12
```

5. Write a program in C to count the digits of a given number using recursion.
Test Data :
Input a number : 50
Expected Output :

```
The number of digits in the number is :  2
```

6. Write a program in C to find the sum of digits of a number using recursion.
Test Data :
Input any number to find sum of digits: 25
Expected Output :

```
The Sum of digits of 25 = 7
```

7. Write a program in C to find GCD of two numbers using recursion.
Test Data :
Input 1st number: 10
Input 2nd number: 50
Expected Output :

```
The GCD of 10 and 50 is: 10
```

8. Write a program in C to get the largest element of an array using recursion.
Test Data :
Input the number of elements to be stored in the array :5
Input 5 elements in the array :
element - 0 : 5
element - 1 : 10
element - 2 : 15
element - 3 : 20
element - 4 : 25
Expected Output :

```
Largest element of an array is: 25
```

9. Write a program in C to reverse a string using recursion.
Test Data :
Input any string: w3resource
Expected Output :

```
The reversed string is: ecruoser3w
```

10. Write a program in C to find the Factorial of a number using recursion.
Test Data :

Input a number : 5
Expected Output :

```
The Factorial of 5 is : 120
```

11. Write a program in C to convert a decimal number to binary using recursion.
Test Data :
Input any decimal number : 66
Expected Output :

```
The Binary value of decimal no. 66 is : 1000010
```

12. Write a program in C to check a number is a prime number or not using recursion.
Test Data :
Input any positive number : 7
Expected Output :

```
The number 7 is a prime number.
```

13. Write a program in C to find the LCM of two numbers using recursion.
Test Data :
Input 1st number for LCM : 4
Input 2nd number for LCM : 6
Expected Output :

```
The LCM of 4 and 6 :  12
```

14. Write a program in C to print even or odd numbers in given range using recursion.
Test Data :

Input the range to print starting from 1 : 10
Expected Output :

```
All even numbers from 1 to 10 are : 2  4  6  8
10
All odd numbers from 1 to 10 are : 1  3  5  7  9
```

15. Write a program in C to multiply two matrix using recursion.
Test Data :
Input number of rows for the first matrix : 2
Input number of columns for the first matrix : 1
Input number of rows for the second matrix : 1
Input number of columns for the second matrix : 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [1],[0] : 2
Input elements in the second matrix :
element - [0],[0] : 3
element - [0],[1] : 4
Expected Output :

```
Here is the elements of First matrix :

 1
 2
 Here is the elements of Second matrix :

 3       4
 The multiplication of two matrix is :

 3       4
 6       8
```

16. Write a program in C to Check whether a given String is Palindrome or not.
Test Data :
Input a word to check for palindrome : mom
Expected Output :

```
The entered word is a palindrome.
```

17. Write a program in C to calculate the power of any number using recursion.
Test Data :
Input the base value : 2
Input the value of power : 6
Expected Output :

```
The value of 2 to the power of 6 is : 64
```

18. Write a program in C to find the Hailstone Sequence of a given number.
Test Data :
Input any number (positive) to start for Hailstone Sequence : 13
Expected Output :

```
The hailstone sequence starting at 13 is :
13  40  20  10  5  16  8  4  2 1
The length of the sequence is 10.
```

19. Write a program in C to copy One string to another using recursion.
Test Data :
Input the string to copy : w3resource
Expected Output :

```
The string successfully copied.
```

```
The first string is : w3resource
The copied string is : w3resource
```

20. Write a program in C to find the first capital letter in a string using recursion.

Test Data :

Input a string to including one or more capital letters : testString

Expected Output :

```
The first capital letter appears in the string testString is S.
```

21. Write a program in C for binary search using recursion.

Test Data :

Input the number of elements to store in the array :3

Input 3 numbers of elements in the array in ascending order :

element - 0 : 15

element - 1 : 25

element - 2 : 35

Input the number to search : 35

Expected Output :

```
The search number found in the array.
```