Practice programs

1. Write a program in C to display the first 10 natural numbers.
Expected Output :
1 2 3 4 5 6 7 8 9 10

2. Write a C program to compute the sum of the first 10 natural numbers.
Expected Output :
The first 10 natural number is :
1 2 3 4 5 6 7 8 9 10
The Sum is : 55

3. Write a program in C to display n terms of natural numbers and their sum.
Test Data : 7
Expected Output :
The first 7 natural number is :
1 2 3 4 5 6 7
The Sum of Natural Number upto 7 terms : 28

4. Write a program in C to read 10 numbers from the keyboard and find their sum and average.
Test Data :
Input the 10 numbers :
Number-1 :2
...
Number-10 :2
Expected Output :
The sum of 10 no is : 55
The Average is : 5.500000

5. Write a program in C to display the cube of the number up to an integer.
Test Data :
Input number of terms : 5
Expected Output :
Number is : 1 and cube of the 1 is :1
Number is : 2 and cube of the 2 is :8
Number is : 3 and cube of the 3 is :27

Number is : 4 and cube of the 4 is :64
Number is : 5 and cube of the 5 is :125

6. Write a program in C to display the multiplication table for a given integer.
Test Data :
Input the number (Table to be calculated) : 15
Expected Output :
15 X 1 = 15
...
...
15 X 10 = 150

7. Write a program in C to display the multiplier table vertically from 1 to n.
Test Data :
Input upto the table number starting from 1 : 8
Expected Output :
Multiplication table from 1 to 8
1x1 = 1, 2x1 = 2, 3x1 = 3, 4x1 = 4, 5x1 = 5, 6x1 = 6, 7x1 = 7, 8x1 = 8
...
1x10 = 10, 2x10 = 20, 3x10 = 30, 4x10 = 40, 5x10 = 50, 6x10 = 60, 7x10 = 70, 8x10 = 80

8. Write a C program to display the n terms of odd natural numbers and their sum.
Test Data
Input number of terms : 10
Expected Output :
The odd numbers are :1 3 5 7 9 11 13 15 17 19
The Sum of odd Natural Number upto 10 terms : 100

9. Write a program in C to display a pattern like a right angle triangle using an asterisk.

The pattern like :

*
**
***
****

10. Write a C program to display a pattern like a right angle triangle with a number.

The pattern like :

```
1
12
123
1234
```

11. Write a program in C to make such a pattern like a right angle triangle with a number which will repeat a number in a row.

The pattern like :

```
 1
 22
 333
 4444
```

12. Write a program in C to make such a pattern like a right angle triangle with the number increased by 1.

The pattern like :

```
  1
  2 3
  4 5 6
  7 8 9 10
```

13. Write a program in C to make a pyramid pattern with numbers increased by 1.

```
   1
  2 3
 4 5 6
7 8 9 10
```

14. Write a C program to make such a pattern as a pyramid with an asterisk.

```
   *
  * *
 * * *
* * * *
```

15. Write a C program to calculate the factorial of a given number.
Test Data :
Input the number : 5
Expected Output :
The Factorial of 5 is: 120

16. Write a C program to display the sum of n terms of even natural numbers.
Test Data :
Input number of terms : 5
Expected Output :
The even numbers are :2 4 6 8 10
The Sum of even Natural Number upto 5 terms : 30

17. Write a C program to make such a pattern like a pyramid with a number which will repeat the number in the same row.

```
   1
  2 2
 3 3 3
4 4 4 4
```

18. Write a program in C to find the sum of the series [1-X^2/2!+X^4/4!- .....].
Test Data :
Input the Value of x :2
Input the number of terms : 5
Expected Output :
the sum = -0.415873
Number of terms = 5
value of x = 2.000000

19. Write a program in C to display the n terms of a harmonic series and their sum.
1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms
Test Data :
Input the number of terms : 5
Expected Output :
1/1 + 1/2 + 1/3 + 1/4 + 1/5 +
Sum of Series upto 5 terms : 2.283334

20. Write a C program to display the pattern as a pyramid using asterisks, with each row containing an odd number of asterisks.

```
  *
 ***
*****
```

21. Write a program in C to display the sum of the series [9 + 99 + 999 + 9999 ...].
Test Data :
Input the number or terms :5
Expected Output :
9 99 999 9999 99999
The sum of the saries = 111105

22. Write a program in C to print Floyd's Triangle.

1
01
101
0101
10101

23. Write a program in C to find the sum of the series [x - x^3 + x^5 + ...].
Test Data :
Input the value of x :3
Input number of terms : 5
Expected Output :
The sum is : 16.375000

24. Write a program in C to find the sum of the series [x - x^3 + x^5 + ...].
Test Data :
Input the value of x :2
Input number of terms : 5
Expected Output :
The values of the series:
2
-8
32
-128
512

The sum = 410

25. Write a C program that displays the n terms of square natural numbers and their sum.
1 4 9 16 ... n Terms
Test Data :
Input the number of terms : 5
Expected Output :
The square natural upto 5 terms are :1 4 9 16 25
The Sum of Square Natural Number upto 5 terms = 55

26. Write a program in C to find the sum of the series 1 +11 + 111 + 1111 + .. n terms.
Test Data :
Input the number of terms : 5
Expected Output :
1 + 11 + 111 + 1111 + 11111
The Sum is : 12345

27. Write a C program to check whether a given number is a 'Perfect' number or not.
Test Data :
Input the number : 56
Expected Output :
The positive divisor : 1 2 4 7 8 14 28
The sum of the divisor is : 64
So, the number is not perfect.

28. Write a C program to find the 'Perfect' numbers within a given number of ranges.
Test Data :
Input the starting range or number : 1
Input the ending range of number : 50
Expected Output :
The Perfect numbers within the given range : 6 28

29. Write a C program to check whether a given number is an Armstrong number or not.
Test Data :
Input a number: 153
Expected Output :

153 is an Armstrong number.

30. Write a C program to find the Armstrong number for a given range of number.
Test Data :
Input starting number of range: 1
Input ending number of range : 1000
Expected Output :
Armstrong numbers in given range are: 1 153 370 371 407

31. Write a program in C to display a pattern like a diamond.

```
   *
  ***
 *****
*******
*********
*******
 *****
  ***
   *
```

32. Write a C program to determine whether a given number is prime or not.
Test Data :
Input a number: 13
Expected Output :
13 is a prime number.

33. Write a C program to display Pascal's triangle.
Test Data :
Input number of rows: 5
Expected Output :

```
      1
    1   1
  1   2   1
1   3   3   1
1   4   6   4   1
```

34. Write a program in C to find the prime numbers within a range of numbers.
Test Data :

Input starting number of range: 1
Input ending number of range : 50
Expected Output :
The prime number between 1 and 50 are :
2 3 5 7 11 13 17 19 23 29 31 37 41 43 47

35. Write a program in C to display the first n terms of the Fibonacci series.
Fibonacci series 0 1 2 3 5 8 13 .....
Test Data :
Input number of terms to display : 10
Expected Output :
Here is the Fibonacci series upto to 10 terms :
0 1 1 2 3 5 8 13 21 34

36. Write a C program to display a such a pattern for n rows using a number that starts with 1 and each row will have a 1 as the first and last number.

```
  1
 121
12321
```

37. Write a program in C to display a given number in reverse order.
Test Data :
Input a number: 12345
Expected Output :
The number in reverse order is : 54321

38. Write a C program to check whether a number is a palindrome or not.
Test Data :
Input a number: 121
Expected Output :
121 is a palindrome number.

39. Write a program in C to find the number and sum of all integers between 100 and 200 which are divisible by 9.
Expected Output :
Numbers between 100 and 200, divisible by 9 :
108 117 126 135 144 153 162 171 180 189 198

The sum : 1683

40. Write a C program to display the pyramid pattern using the alphabet.

```
    A
   A B A
  A B C B A
 A B C D C B A
```

41. Write a program in C to convert a decimal number into binary without using an array.
Test Data :
Input a decimal number: 25
Binary number equivalent to said decimal number is: 00000000000000000000000000001 1001

42. Write a C program to convert a binary number into a decimal number without using array, function and while loop.
Test Data :
Input a binary number :1010101
Expected Output :
The Binary Number : 1010101
The equivalent Decimal Number : 85

43. Write a C program to find the HCF (Highest Common Factor) of two numbers.
Test Data:
Input 1st number for HCF: 24
Input 2nd number for HCF: 28
Expected Output :
HCF of 24 and 28 is : 4

44. Write a C program to find the LCM of any two numbers using HCF.
Test Data:
Input 1st number for LCM: 15
Input 2nd number for LCM: 20
Expected Output :
The LCM of 15 and 20 is : 60

45. Write a program in C to find the LCM of any two numbers.
Test Data:
Input 1st number for LCM: 15
Input 2nd number for LCM: 20
Expected Output:
The LCM of 15 and 20 is : 60

46. Write a C program to convert a binary number into a decimal number using the math function.
Test Data :
Input the binary number :1010100
Expected Output :
The Binary Number : 1010100
The equivalent Decimal Number is : 84

47. Write a C program to check whether a number is a Strong Number or not.
Test Data :
Input a number to check whether it is Strong number: 15
Expected Output :
15 is not a Strong number.

*****A number is called strong number if sum of the factorial of its digit is equal to number itself. So, 145 is a Strong number.**

48. Write a C program to find Strong Numbers within a range of numbers.
Test Data:
Input starting range of number : 1
Input ending range of number: 200
Expected Output :
The Strong numbers are :
1 2 145

49. Write a C program to find the sum of an A.P. series.
Test Data:
Input the starting number of the A.P. series: 1

Input the number of items for the A.P. series: 10
Input the common difference of A.P. series: 4
Expected Output :
The Sum of the A.P. series are :
1 + 5 + 9 + 13 + 17 + 21 + 25 + 29 + 33 + 37 = 190

50. Write a program in C to convert a decimal number into octal without using an array.
Test Data:
Enter a number to convert : 79
Expected Output :
The Octal of 79 is 117.

51. Write a C program to convert an octal number to a decimal without using an array.
Test Data :
Input an octal number (using digit 0 - 7) :745
Expected Output :
The Octal Number : 745
The equivalent Decimal Number : 485

52. Write a C program to find the sum of the G.P. series.
Test Data :
Input the first number of the G.P. series: 3
Input the number or terms in the G.P. series: 5
Input the common ratio of G.P. series: 2
Expected Output :
The numbers for the G.P. series:
3.000000 6.000000 12.000000 24.000000 48.000000
The Sum of the G.P. series : 93.000000

53. Write a C program to convert a binary number to octal.
Test Data :
Input a binary number :1001
Expected Output :
The Binary Number : 1001
The equivalent Octal Number : 11

54. Write a program in C to convert an octal number into binary.
Test Data :
Input an octal number (using digit 0 - 7) :57
Expected Output :
The Octal Number : 57
The equivalent Binary Number : 101111

55. Write a C program to convert a decimal number to hexadecimal.
Test Data :
Input any Decimal number: 79
Expected Output :
The equivalent Hexadecimal Number : 4F

56. Write a program in C to check whether a number can be expressed as the sum of two prime.
Test Data :
Input a positive integer: 16
Expected Output :
16 = 3 + 13
16 = 5 + 11

57. Write a C program to print a string in reverse order.(without using inbuilt function)
Test Data :
Input a string to reverse : Welcome
Expected Output :
Reversed string is: emocleW

58. Write a C program to find the length of a string without using the library function.
Test Data :
Input a string : welcome
Expected Output :
The string contains 7 number of characters.
So, the length of the string welcome is: 7

59. Write a C program to print the Armstrong numbers from 1 to 2000.

Array and Function

1.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.

2. 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

3. Write a program in C to print all perfect numbers in a 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

4. Write a program in C to copy the elements of one array into another array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 15
element - 1 : 10
element - 2 : 12
Expected Output :
The elements stored in the first array are :

15 10 12
The elements copied into the second array are :
15 10 12

5. Write a program in C to count the total number of duplicate elements in an array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 5
element - 1 : 1
element - 2 : 1
Expected Output :
Total number of duplicate elements found in the array is : 1

6. Write a program in C to print all unique elements in an array.
Test Data :
Print all unique elements of an array:

Input the number of elements to be stored in the array: 4
Input 4 elements in the array :
element - 0 : 3
element - 1 : 2
element - 2 : 2
element - 3 : 5
Expected Output :
The unique elements found in the array are:
3 5

7. Write a program in C to merge two arrays of the same size sorted in descending order.
Test Data :
Input the number of elements to be stored in the first array :3
Input 3 elements in the array :
element - 0 : 1
element - 1 : 2
element - 2 : 3
Input the number of elements to be stored in the second array :3
Input 3 elements in the array :

element - 0 : 1
element - 1 : 2
element - 2 : 3
Expected Output :
The merged array in decending order is :
3 3 2 2 1 1

8. Write a program in C to count the frequency of each element of an array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 25
element - 1 : 12
element - 2 : 43
Expected Output :
The frequency of all elements of an array :
25 occurs 1 times
12 occurs 1 times
43 occurs 1 times

9. Write a program in C to find the maximum and minimum elements in an array.
Test Data :
Input the number of elements to be stored in the array :3
Input 3 elements in the array :
element - 0 : 45
element - 1 : 25
element - 2 : 21
Expected Output :
Maximum element is : 45
Minimum element is : 21

10. Write a program in C to separate odd and even integers into separate arrays.
Test Data :
Input the number of elements to be stored in the array :5
Input 5 elements in the array :
element - 0 : 25
element - 1 : 47

element - 2 : 42
element - 3 : 56
element - 4 : 32
Expected Output :
The Even elements are :
42 56 32
The Odd elements are :
25 47

11. Write a program in C to sort elements of an array in ascending order.
Test Data :
Input the size of array : 5
Input 5 elements in the array :
element - 0 : 2
element - 1 : 7
element - 2 : 4
element - 3 : 5
element - 4 : 9
Expected Output :
Elements of array in sorted ascending order:
2 4 5 7 9

12. Write a program in C to sort the elements of the array in descending order.
Test Data :
Input the size of array : 3
Input 3 elements in the array :
element - 0 : 5
element - 1 : 9
element - 2 : 1
Expected Output :
Elements of the array in sorted descending order:
9 5 1

13. Write a program in C to insert the values in the array (sorted list).
Test Data :
Input number of elements you want to insert (max 100): 5
Input 5 elements in the array in ascending order:

element - 0 : 2
element - 1 : 3
element - 2 : 4
element - 3 : 7
element - 4 : 8
Input the value to be inserted : 5
The existing array list is :
2 3 4 7 8
After Insert the list is :
2 3 4 5 7 8

14. Write a program in C to insert values in the array (unsorted list).
Test Data :
Input the size of array : 4
Input 4 elements in the array in ascending order:
element - 0 : 1
element - 1 : 8
element - 2 : 7
element - 3 : 10
Input the value to be inserted : 5
Input the Position, where the value to be inserted :2
Expected Output :
The current list of the array :
1 8 7 10
After Insert the element the new list is :
1 5 8 7 10

15. Write a program in C to delete an element at a desired position from an array.
Test Data :
Input the size of array : 5
Input 5 elements in the array in ascending order:
element - 0 : 1
element - 1 : 2
element - 2 : 3
element - 3 : 4
element - 4 : 5
Input the position where to delete: 3
Expected Output :

The new list is : 1 2 4 5

16. Write a program in C to find the second largest element in an array.
Test Data :
Input the size of array : 5
Input 5 elements in the array :
element - 0 : 2
element - 1 : 9
element - 2 : 1
element - 3 : 4
element - 4 : 6
Expected Output :
The Second largest element in the array is : 6

17. Write a program in C to find the second smallest element in an array.
Test Data :
Input the size of array : 5
Input 5 elements in the array (value must be <9999) :
element - 0 : 0
element - 1 : 9
element - 2 : 4
element - 3 : 6
element - 4 : 5
Expected Output :
The Second smallest element in the array is : 4

18. Write a program in C for a 2D array of size 3x3 and print the matrix.
Test Data :
Input elements in the matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [0],[2] : 3
element - [1],[0] : 4
element - [1],[1] : 5
element - [1],[2] : 6
element - [2],[0] : 7
element - [2],[1] : 8

element - [2],[2] : 9
Expected Output :
The matrix is :

1 2 3
4 5 6
7 8 9

19. Write a program in C for adding two matrices of the same size.
Test Data :
Input the size of the square matrix (less than 5): 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Expected Output :
The First matrix is :

1 2
3 4
The Second matrix is :

5 6
7 8
The Addition of two matrix is :

6 8
10 12

20. Write a program in C for the subtraction of two matrices.
Test Data :
Input the size of the square matrix (less than 5): 2

Input elements in the first matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Input elements in the second matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The First matrix is :

5 6
7 8
The Second matrix is :

1 2
3 4
The Subtraction of two matrix is :

4 4
4 4

21. Write a program in C for the multiplication of two square matrices.
Test Data :
Input the rows and columns of first matrix : 2 2
Input the rows and columns of second matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Input elements in the second matrix :
element - [0],[0] : 5
element - [0],[1] : 6
element - [1],[0] : 7
element - [1],[1] : 8
Expected Output :

The First matrix is :

1 2
3 4
The Second matrix is :

5 6
7 8
The multiplication of two matrix is :

19 22
43 50

22. Write a program in C to find the transpose of a given matrix.
Test Data :
Input the rows and columns of the matrix : 2 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The matrix is :

1 2
3 4

The transpose of a matrix is :
1 3
2 4

23. Write a program in C to find the sum of the right diagonals of a matrix.
Test Data :
Input the size of the square matrix : 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3

element - [1],[1] : 4
Expected Output :
The matrix is :
1 2
3 4
Addition of the right Diagonal elements is :5
Elements in array are:

24. Write a program in C to find the sum of the left diagonals of a matrix.
Test Data :
Input the size of the square matrix : 2
Input elements in the first matrix :
element - [0],[0] : 1
element - [0],[1] : 2
element - [1],[0] : 3
element - [1],[1] : 4
Expected Output :
The matrix is :
1 2
3 4
Addition of the left Diagonal elements is :5