Intensive Programming Unit

1. Write a program in C to calculate the sum of three numbers with getting input in one line separated by a comma.
   Expected Output :
   Input three numbers separated by comma : 5,10,15
   The sum of three numbers : 30

2. Write a C program to find whether a given year is a leap year or not.

3. Write a C program to read the value of an integer m and display the value of n is 1 when m is larger than 0, 0 when m is 0 and -1 when m is less than 0.
   Test Data : -5
   Expected Output :
   The value of n = -1

4. Write a C program to find the largest of three numbers
   Test Data : 12 25 52
   Expected Output :
   1st Number = 12, 2nd Number = 25, 3rd Number = 52
   The 3rd Number is the greatest among three

5. Write a C program to calculate the root of a Quadratic Equation.
   Test Data : 1 5 7
   Expected Output :
   Root are imaginary;
   No solution.

6. Write a C program print total number of days in a month using switch case.
7. Write a C program to check whether an alphabet is vowel or consonant using switch case.
8. Write a C program to find maximum between two numbers using switch case.
9. Write a C program to check whether a number is even or odd using switch case.
10. Write a C program to find roots of a quadratic equation using switch case.
11. Write a C program to create Simple Calculator using switch case.

12. Write a program in C to display the pattern like right angle triangle with a number.

    The pattern like :

```
12
123
1234
```

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

    The pattern like :

```
1
22
333
4444
```

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

    The pattern like :

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

15. Write a program in C to make such a pattern like a pyramid with numbers increased by 1.

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

16. Write a program in C to make such a pattern like a pyramid with an asterisk.

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

17. 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

18. Write a program in C to display the n terms of even natural number and their sum.
    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

19. Write a program in C 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
```

20. 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

21. Write a program in C to display the n terms of 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

22. Write a program in C to display the pattern like a pyramid using asterisk and each row contain an odd number of asterisks.

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

23. 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

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

```
1
01
101
0101
10101
```

25. Write a program in C to display the sum of the series [1+x+x^2/2!+x^3/3!+....].
Test Data :
Input the value of x :3
Input number of terms : 5
Expected Output :
The sum is : 16.375000

26. 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

27. 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

28. 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.

29. Write a c program to find the perfect numbers within a given number of range.
    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

30. 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.

31. 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

32. Write a program in C to display the pattern like a diamond.

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

33. 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.

34. 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
```

35. 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

36. Write a program in C to display the first n terms of 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

37. Write a program in C to display the such a pattern for n number of rows using a number which will start with the number 1 and the first and a last number of each row will be 1.

```
  1
 121
12321
```

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

39. Write a program in C to check whether a number is a palindrome or not.
    Test Data :

Input a number: 121
Expected Output :
121 is a palindrome number.

40. Write a program in C to find the number and sum of all integer 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

41. Write a C Program to display the pattern like pyramid using the alphabet.

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

42. Write a program in C to convert a decimal number into binary without using an array.
Test Data :
Enter a number to convert : 25
Expected Output :
The Binary of 25 is 11001.

43. Write a program in C 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

44. Write a C program to find 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

45. Write a program in C to find 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

46. Write a program in C to find 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

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

48. 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.

49. Write a program in C 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

50. 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

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

52. Write a program in C to Check Whether a Number can be Express as Sum of Two Prime Numbers.
    Test Data :
    Input a positive integer: 16
    Expected Output :
    16 = 3 + 13
    16 = 5 + 11

53. Write a program in C to check Armstrong number of n digits.
    Test Data :
    Input an integer : 1634
    Expected Output :
    1634 is an Armstrong number

54. Write a program to produce the following output:

```
A B C D E F G F E D C B A
A B C D E F     F E D C B A
A B C D E         E D C B A
A B C D             D C B A
A B C                 C B A
A B                     B A
A                         A
```

55. Write a program in C to store elements in an array and print it.
    Test Data :
    Input 10 elements in the array :
    element - 0 : 1
    element - 1 : 1
    element - 2 : 2
    .....
    Expected Output :
    Elements in array are: 1 1 2 3 4 5 6 7 8 9

56. Write a program in C to read n number of values in an array and display it in reverse order.
    Test Data :
    Input the number of elements to store in the array :3
    Input 3 number of elements in the array :
    element - 0 : 2
    element - 1 : 5
    element - 2 : 7
    Expected Output :
    The values store into the array are :
    2 5 7
    The values store into the array in reverse are :
    7 5 2

57. Write a program in C to find the sum of all elements of the array.
    Test Data :
    Input the number of elements to be stored in the array :3
    Input 3 elements in the array :
    element - 0 : 2
    element - 1 : 5
    element - 2 : 8
    Expected Output :
    Sum of all elements stored in the array is : 15

58. Write a program in C to copy the elements 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

59. Write a program in C to count a 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

60. Write a program in C to print all unique 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 : 1
    element - 1 : 5
    element - 2 : 1
    Expected Output :
    The unique elements found in the array are :
    5

61. Write a program in C to merge two arrays of 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 descending order is :
    3 3 2 2 1 1

62. 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

63. Write a program in C to find the maximum and minimum element 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

64. Write a program in C to separate odd and even integers in 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

65. Write a program in C to sort elements of 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

66. Write a program in C to sort 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

67. Write a program in C to insert New value in the array (sorted list)..
Test Data :
Input the size of array : 3
Input 3 elements in the array in ascending order:
element - 0 : 5
element - 1 : 7
element - 2 : 9

Input the value to be inserted : 8
Expected Output :
The exist array list is :
5 7 9
After Insert the list is :
5 7 8 9

68. Write a program in C to insert New value 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

69. Write a program in C to delete an element at 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

70. 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

71. 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