In [ ]:

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

2. Write a program to find the sum of 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 to display n terms of natural number 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 to read 10 numbers from 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 to display the cube of the number upto given 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 to display the multiplication table of 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 to display the multipliaction 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 program to display the n terms of odd natural number 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 to display the pattern like right angle triangle using an asterisk.

The pattern like :

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

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

The pattern like :

```
1
12
123
1234
```

11. Write a program 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
```

12. Write a program 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
```

13. Write a program to make such a pattern like a pyramid with numbers increased by 1.

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

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

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

15. Write a 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 program 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

17. Write a 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 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 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

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

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

21. Write a program 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 to print the Floyd's Triangle.

```
1
01
101
0101
10101
```

23. Write a program 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

24. Write a program 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 program to display the n terms of square natural number 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 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 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 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

29. Write a 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 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 to display the pattern like a diamond.

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

32. Write a 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 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 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 to display the first n terms of Fibonacci series.

```
Fibonacci series 0 1 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 program 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
```

37. Write a program to display the number in reverse order.

```
Test Data :
Input a number: 12345
Expected Output :
The number in reverse order is : 54321
```

38. Write a 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 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
```

40. Write a 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
```

41. Write a program 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.
```

42. Write a 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 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
```

44. Write a program 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
```

45. Write a program 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
```

46. Write a program 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
```

47. Write a 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.
```

48. Write a 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 program to find out 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 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 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 program to find the Sum of GP 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 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 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 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 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

57. Write a program to print a string in reverse order.
Test Data :
Input a string to reverse : Welcome
Expected Output :
Reversed string is: emocleW

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