Level 1 – Basic Loop Logic

1. Sum of 10 numbers

2. Find factorial of a given number (n!)

3. Print sum series 1 + 4 + 9 + 16 + … + n

4. Print digits of a number in reverse order

5. Print sum of digits of a given number

6. Perform multiplication without using * operator

7. Calculate x^y without using power operator

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Level 2 – Loops with Conditional Logic (if inside loop)

8. Print numbers divisible by 2 between two numbers

9. Find factors of a given number

10. Find the sum of all divisors of a number

11. Find the GCD (Greatest Common Divisor) of two numbers

12. Find the LCM (Least Common Multiple) of two numbers

13. Check whether a number is a Perfect Number.

(A perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself. A divisor of an integer x is an integer that can divide x evenly.)

14. Check whether a number is a Harshad Number.

(An integer num which is divisible by the sum of its digits is said to be a Harshad number.)

15. Check whether a number is Prime or Not

16. Print the Fibonacci Series

17. Find the sum of series $1 - 2 + 3 - 4 + 5 - 6 + \ldots \pm n$.

Check if given number is a Happy Number or not

Check if given number is a Ugly Number or not.

(a n ugly number is a positive integer which does not have a prime factor other than 2, 3, and 5.)

1. Find the sum of 1+(1+2)+(1+2+3)+...(1+2+3+...+n)

2. Power without using multiplication and power operator

3. implement a pattern

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

4. implement a pattern

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

5. implement a pattern

```
1
2   3
4   5   6
7   8   9  10
11  12  13  14  15
```

6. Find a Largest Element in array

7. Find a Smallest Element in array

8. Search for an element in Array

9. Reverse an Array Elements

27.

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

28.

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

29.

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

30.

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

31.

```
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
```

32.

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

33.

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

34.

```
* * * * * * * *
  * * * * * * *
    * * * * *
      * * *
        *
```
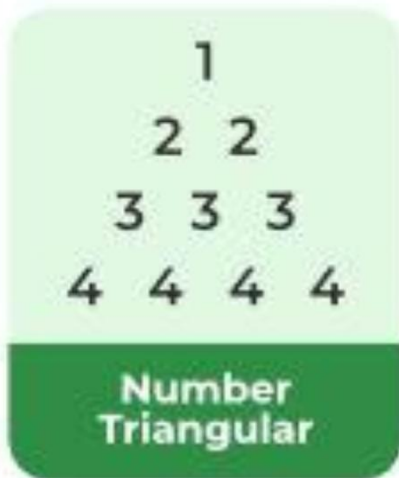
35.

```
          1
        1   1
      1   2   1
    1   3   3   1
  1   4   6   4   1
1   5   10   10   5   1
```
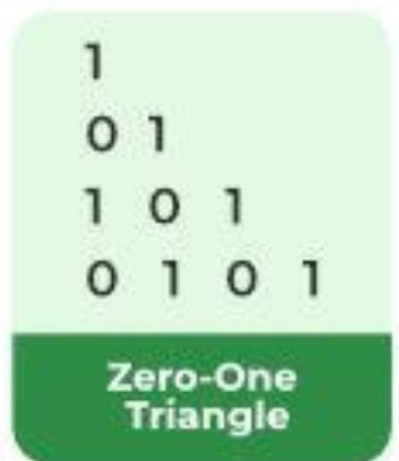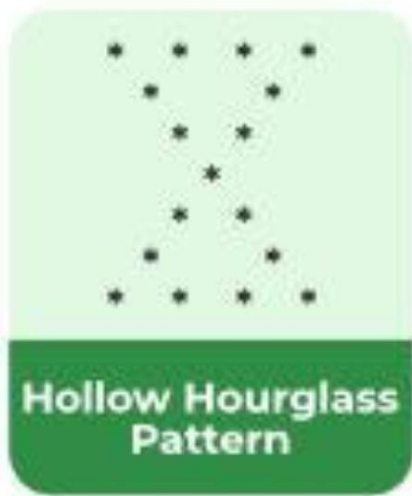
36.

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

37.

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

Number Triangular

38.

```
1
0 1
1 0 1
0 1 0 1
```

Zero-One Triangle

39.

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

Diamond Pattern

40.

Hollow Hourglass Pattern

41.

Square Hollow Pattern

42.

Butterfly
Star Pattern

43.


```
       1
      2 1 2
     3 2 1 2 3
    4 3 2 1 2 3 4
```
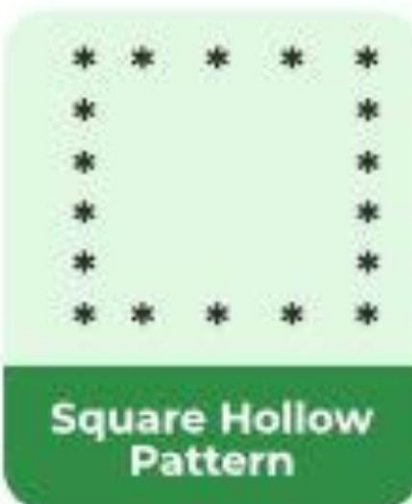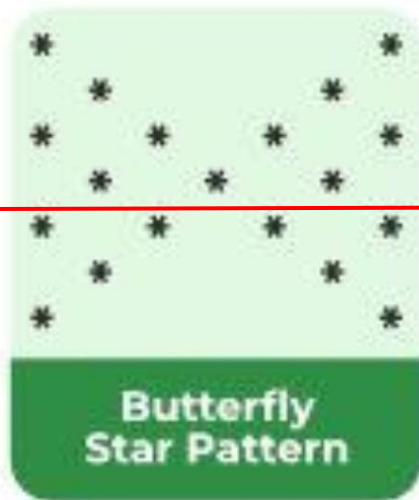
Palindrome
Triangular

Level 4

44. Write a program to input and display elements of an array.

45. Write a program to find the sum and average of elements in an array.

46. Write a program to find the maximum and minimum elements in an array.

47. Write a program to count total even and odd numbers in an array.

48. Write a program to reverse the elements of an array.

49. Write a program to copy all elements from one array to another.

50. Write a program to search a given element in an array (Linear Search).

51. Write a program to sort array elements in ascending order.

52. Write a program to find the second largest and second smallest elements in an array.

53. Write a program to insert an element at a specific position in an array.

54. Write a program to delete an element from a specific position in an array.

55. Write a program to merge two arrays into a single array.

56. Write a program to find the frequency of each element in an array.

57. Write a program to remove duplicate elements from an array.

58. Write a program to display unique elements of an array.

59. Write a program to count the total number of duplicate elements in an array.

60. Write a program to find the sum of diagonal elements of a 2D matrix.

61. Write a program to find the transpose of a matrix.

62. Write a program to multiply two matrices.

63. Write a program to find the intersection of two arrays.

64. Write a program to find the union of two arrays.

65. Write a program to rotate array elements to the left or right.

66. Write a program to sort array elements using the selection sort technique.

- **Use recursion only**
1. Write a program to find the factorial of a number.
2. Write a program to find the sum of first N natural numbers.
3. Write a program to generate the Fibonacci series up to N terms.
4. Write a program to find the sum of digits of a given number.
5. Write a program to find the power of a number (x^y) without using library functions.
6. Write a program to count the total number of digits in a given number.
7. Write a program to reverse a given number and check whether it is a palindrome.
8. Write a program to find the greatest common divisor (GCD)