

## Problem 1: Print a Right-Angle Triangle of Stars

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a right-angle triangle pattern of stars (\*). Each row should contain an increasing number of stars, starting from 1 star in the first row.

**Example 1: Input:**  $n = 4$

**Output:**

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

---

## Problem 2: Print a Square of Stars

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a square pattern of stars (\*). Each row and column should have the same number of stars.

**Example 1: Input:**  $n = 5$

**Output:**

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

---

## Problem 3: Print a Pyramid Pattern

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a pyramid pattern with stars (\*). The pyramid should have a single peak and each row should have an increasing number of stars, centered horizontally.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

## Problem 4: Print a Diamond Pattern

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a diamond pattern with stars (\*). The pattern should include a single peak in the middle with symmetric rows above and below it.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

## Problem 5: Print a Hollow Square of Stars

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a hollow square pattern with stars (\*). The border of the square should be filled with stars while the inner part should be empty.

**Example 1: Input:**  $n = 5$

**Output:**

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

---

## Problem 6: Print a Number Triangle

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a right-angle triangle pattern with numbers. Each row should contain an increasing sequence of numbers starting from 1.

**Example 1: Input:**  $n = 4$

**Output:**

```
1
12
123
1234
```

---

### Problem 7: Print an Inverted Triangle Pattern

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print an inverted triangle pattern with stars (\*). Each row should contain decreasing numbers of stars from the top row.

**Example 1: Input:**  $n = 5$

**Output:**

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

---

### Problem 8: Print a Diamond Pattern with Numbers

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a diamond pattern with numbers. The pattern should have a peak in the middle with symmetric rows above and below it.

**Example 1: Input:**  $n = 3$

**Output:**

```
1
121
12321
121
1
```

---

### Problem 9: Print a Right-Angle Triangle of Numbers

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a right-angle triangle pattern with increasing numbers. Each row should contain a continuous sequence of increasing numbers.

**Example 1: Input:**  $n = 4$

**Output:**

```
1
23
456
78910
```

---

### Problem 10: Print a Pyramid Pattern with Numbers

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a pyramid pattern with increasing numbers. Each row should have an increasing sequence of numbers, centered horizontally.

**Example 1: Input:**  $n = 3$

**Output:**

```
  1
 232
34543
```

---

### Problem 11: Print a Pattern of Alternating 0s and 1s

**Difficulty:** Medium

**Topics:** Matrix Pattern

**Hint:** Print a matrix where elements alternate between 0 and 1. The pattern should alternate both row-wise and column-wise.

**Example 1: Input:**  $n = 4$

**Output:**

```
0101
1010
0101
1010
```

---

### Problem 12: Print a Pascal's Triangle

**Difficulty:** Medium

**Topics:** Matrix Pattern

**Hint:** Print Pascal's Triangle up to  $N$  rows. Each row should be constructed based on the sum of the elements directly above it in the previous row.

**Example 1: Input:**  $n = 4$

**Output:**

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

---

### Problem 13: Print a Pattern of Consecutive Numbers

**Difficulty:** Medium

**Topics:** Matrix Pattern

**Hint:** Print a matrix of consecutive numbers starting from 1, filling rows sequentially.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 14: Print a Star Pattern with Increasing Width

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern where each row has an increasing width of stars.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 15: Print a Right-Angle Triangle Pattern with Characters

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a right-angle triangle pattern using characters. Each row should contain the same character repeated according to the row number.

**Example 1: Input:**  $n = 3$

**Output:**

```
A
BB
CCC
```

---

### Problem 16: Print a Checkerboard Pattern

**Difficulty:** Medium

**Topics:** Matrix Pattern

**Hint:** Print a checkerboard pattern with two different characters alternating.

**Example 1: Input:**  $n = 4$

**Output:**

```
XOXOXO
OXOXOX
XOXOXO
OXOXOX
```

---

### Problem 17: Print a Pyramid Pattern of Increasing Stars

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pyramid pattern where each row increases in the number of stars.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 18: Print a Border Pattern with Numbers

**Difficulty:** Medium

**Topics:** Matrix Pattern

**Hint:** Print a border pattern using numbers. The border should be filled with numbers, and the inner part should be empty.

**Example 1: Input:**  $n = 4$

**Output:**

```
1234
1  1
1  1
1234
```

---

### Problem 19: Print an Inverted Pyramid Pattern with Characters

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print an inverted pyramid pattern using characters. Each row should have decreasing characters from the top row.

**Example 1: Input:**  $n = 3$

**Output:**

```
CCC
BB
A
```

---

### Problem 20: Print a Cross Pattern with Stars

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a cross pattern using stars. The cross should be centered within a matrix.

**Example 1: Input:**  $n = 5$

**Output:**

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

---

### Problem 21: Print a Spiral Matrix

**Difficulty:** Hard

**Topics:** Matrix Pattern

**Hint:** Print a matrix filled with numbers in a spiral pattern. The numbers should start from 1 and increment as you move around the spiral.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

## Problem 22: Print a Diamond Pattern with Increasing Width

**Difficulty:** Hard

**Topics:** Pattern Printing

**Hint:** Print a diamond pattern where each line has increasing width of stars.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

## Problem 23: Print a Diamond Pattern with Numbers Increasing

**Difficulty:** Hard

**Topics:** Pattern Printing

**Hint:** Print a diamond pattern where numbers increase. Each row should show a symmetrical pattern with numbers increasing towards the center.

**Example 1: Input:**  $n = 3$

**Output:**

```
  1
 121
12321
 121
  1
```



## Problem 24: Print a Pattern of Increasing and Decreasing Stars

**Difficulty:** Hard

**Topics:** Pattern Printing

**Hint:** Print a pattern where stars increase to a midpoint and then decrease.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

## Problem 25: Print a Matrix with Zigzag Pattern

**Difficulty:** Hard

**Topics:** Matrix Pattern

**Hint:** Print a matrix with a zigzag pattern of numbers. The numbers should alternate direction row-wise.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

## Problem 26: Print a Pattern of Alternating Characters in Rows

**Difficulty:** Hard

**Topics:** Pattern Printing

**Hint:** Print a pattern where rows alternate between two characters.

**Example 1: Input:**  $n = 4$

**Output:**

```
ABAB
BABA
ABAB
BABA
```

---

## Problem 27: Print a Number Pyramid Pattern with Characters

**Difficulty:** Hard

**Topics:** Pattern Printing

**Hint:** Print a pyramid pattern using increasing characters, where each row increases in width and character range.

**Example 1: Input:**  $n = 3$

**Output:**

```
A
BCD
EFGHI
```

---

### Problem 28: Print a Pattern with Diagonal Lines

**Difficulty:** Hard

**Topics:** Pattern Printing

**Hint:** Print a pattern with diagonal lines using characters. Each diagonal line should be aligned properly.

**Example 1: Input:**  $n = 4$

**Output:**

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

---

### Problem 29: Print a Matrix with Diamond Pattern of Numbers

**Difficulty:** Hard

**Topics:** Matrix Pattern

**Hint:** Print a matrix where elements follow a diamond pattern with numbers.

**Example 1: Input:**  $n = 3$

**Output:**

```
1
121
12321
121
1
```

---

### Problem 30: Print a Cross Pattern of Stars with Diagonals

**Difficulty:** Hard**Topics:** Pattern Printing**Hint:** Print a cross pattern using stars with intersecting diagonals.**Example 1: Input:**  $n = 5$ **Output:**

```

* * * * *
 * * * *
  * * *
   * *
    *
   * *
  * * *
 * * * *
* * * * *

```

**Problem 31: Print a Triangular Matrix with Numbers****Difficulty:** Easy**Topics:** Pattern Printing**Hint:** Print a triangular matrix where each row contains increasing numbers. Each subsequent row should start from the next number.**Example 1: Input:**  $n = 3$ **Output:**

```

1
2 3
4 5 6

```

**Problem 32: Print a Star Pattern with Increasing and Decreasing Width****Difficulty:** Medium**Topics:** Pattern Printing**Hint:** Print a pattern with stars that increase to a midpoint and then decrease. The stars should be centered horizontally.**Example 1: Input:**  $n = 3$ **Output:**

```

  *
 ***
*****
 ***
  *

```

---

### Problem 33: Print a Pattern of Nested Squares

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern with nested squares using stars. The outermost square should be filled with stars, and each subsequent square should be smaller and centered inside the previous one.

**Example 1: Input:**  $n = 5$

**Output:**

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

---

### Problem 34: Print a Pattern with Increasing Characters in Columns

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern where each column contains increasing characters from A.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 35: Print a Matrix with Spiral Diagonals

**Difficulty:** Hard

**Topics:** Matrix Pattern

**Hint:** Print a matrix with numbers arranged in diagonal spirals. The numbers should fill the matrix in a diagonal spiral fashion.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 36: Print a Checkerboard Pattern with Increasing Size

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a checkerboard pattern where the size of each square increases as you move along the matrix.

**Example 1: Input:**  $n = 3$

**Output:**

```
XOX
OXO
XOX
```

---

### Problem 37: Print a Cross Pattern with Increasing Size

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a cross pattern where the size of the cross increases with each row. The pattern should be centered.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 38: Print a Pattern of Alternating Triangles

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern with alternating triangles of stars. The triangles should alternate direction.

**Example 1: Input:**  $n = 3$

**Output:**

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

```
***
*
```

---

### Problem 39: Print a Matrix with Diamond Pattern of Numbers

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a matrix where numbers form a diamond pattern. The numbers should increase and decrease symmetrically around the center.

**Example 1: Input:**  $n = 3$

**Output:**

```
  1
 121
12321
 121
  1
```

---

### Problem 40: Print a Star Pattern with Increasing Width and Centered

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern where the width of stars increases, and the stars are centered horizontally.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 41: Print a Pattern with Spiral and Zigzag

**Difficulty:** Hard

**Topics:** Matrix Pattern

**Hint:** Print a matrix with both spiral and zigzag patterns. The matrix should first fill in a spiral pattern and then in a zigzag fashion.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 42: Print a Pattern of Alternating Characters in Matrix

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a matrix where characters alternate in each cell to form a pattern.

**Example 1: Input:**  $n = 3$

**Output:**

```
ABAB
BABA
ABAB
```

---

### Problem 43: Print a Pattern with Nested Triangles

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern with nested triangles of stars. Each triangle should be centered and decrease in size.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 44: Print a Matrix with Increasing Rows and Columns

**Difficulty:** Easy

**Topics:** Matrix Pattern

**Hint:** Print a matrix where each row and column contains increasing numbers.

**Example 1: Input:**  $n = 3$

**Output:**

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

---

### Problem 45: Print a Pattern with Rows of Increasing Characters

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern where each row contains an increasing sequence of characters.

**Example 1: Input:**  $n = 3$

**Output:**

```
A
BC
DEF
```

---

### Problem 46: Print a Star Pattern with Diamond Shape and Numbers

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern with a diamond shape of stars, with numbers inside the diamond.

**Example 1: Input:**  $n = 3$

**Output:**

```
  1
 121
12321
 121
  1
```

---

### Problem 47: Print a Matrix with Cross Pattern of Numbers

**Difficulty:** Hard

**Topics:** Matrix Pattern

**Hint:** Print a matrix where the center forms a cross pattern with numbers.

**Example 1: Input:**  $n = 5$

**Output:**



```
12321
01210
01210
01210
12321
```

---

### Problem 48: Print a Pattern with Concentric Squares

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a pattern with concentric squares using stars. The outer square should be larger and each subsequent square should be centered inside.

**Example 1: Input:**  $n = 5$

**Output:**

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

---

### Problem 49: Print a Pattern of Alternating Rows and Columns of Numbers

**Difficulty:** Easy

**Topics:** Pattern Printing

**Hint:** Print a pattern with alternating rows and columns of numbers, where each row and column increases sequentially.

**Example 1: Input:**  $n = 3$

**Output:**

```
123
456
789
```

---

### Problem 50: Print a Matrix with Zigzag Pattern of Stars

**Difficulty:** Medium

**Topics:** Pattern Printing

**Hint:** Print a matrix where stars form a zigzag pattern, alternating rows in their positioning.

**Example 1: Input:**  $n = 3$

**Output:**

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