

Company-Based 2D Array Questions

◆ Basic-Level (Service Companies: TCS, Infosys, Wipro)

1. **Print Matrix in Spiral Order** (TCS NQT, Infosys)
 - Given a 2D array, print it in spiral form.
2. **Transpose of a Matrix** (Capgemini, Accenture)
 - Convert rows into columns.
3. **Diagonal Sum of Matrix** (TCS NQT)
 - Print the sum of primary and secondary diagonals.
4. **Row with Maximum Sum** (Infosys)
 - Find the row index which has the maximum sum of elements.
5. **Symmetric Matrix Check** (Capgemini)
 - Check whether $\text{matrix} == \text{transpose}(\text{matrix})$.

◆ Intermediate-Level (Product + Tier 1 Service Companies)

6. **Search in a Sorted 2D Matrix** (Amazon, Microsoft, Infosys)
 - Matrix is sorted row-wise and column-wise → Search efficiently.
7. **Rotate Matrix by 90 Degrees** (Amazon, TCS Digital)

- Rotate a square matrix clockwise by 90°.

8. **Boundary Traversal of a Matrix** (Cognizant, TCS)

- Print all boundary elements in clockwise order.

9. **Matrix Multiplication** (Capgemini, Wipro)

- Multiply two given matrices.

10. **Snake Pattern Printing** (Infosys)

- Print matrix in zig-zag row-wise pattern.

◆ **Advanced-Level (FAANG, Product Companies: Google, Amazon, Flipkart, Adobe)**

11. **Spiral Matrix II (Leetcode 59)** (Amazon, Microsoft)

- Fill an $n \times n$ matrix in spiral order with numbers $1 \rightarrow n^2$.

12. **Set Matrix Zeroes (Leetcode 73)** (Google, Adobe)

- If any element = 0, set entire row & column = 0.

13. **Maximal Rectangle in Binary Matrix (Leetcode 85)** (Amazon, Google)

- Given 0s and 1s $\rightarrow$ Find largest rectangle containing only 1s.

14. **Largest Square of 1s in Matrix (Leetcode 221)** (Microsoft, Adobe)

- Find the size of the largest square submatrix with all 1s.

15. **Word Search in 2D Board (Leetcode 79)** (Amazon, Google)

- Search a word by moving horizontally/vertically in a 2D char board.

16. Rotate Matrix Layers (Ring Rotation) (Adobe, Flipkart)

- Rotate each "ring" of the matrix independently.

17. Diagonal Traversal (Leetcode 498) (Microsoft, Amazon)

- Traverse matrix diagonally in zigzag order.

18. Minimum Path Sum (Leetcode 64) (Google, Amazon)

- Find min cost path from top-left to bottom-right using DP.

19. Search a Word in Character Grid (Amazon, Paytm)

- Given 2D grid of characters, search for given word in all 8 directions.

20. Spiral Order Traversal with Anti-Clockwise Printing (Flipkart)

- Print elements in anti-clockwise spiral order.

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