



Matrix pattern-based problem that are mostly asked 10 interview question  
give input and output of problem.



Sure! Matrix-based problems are quite common in technical interviews. Here are ten classic matrix-related problems along with their input and output:

### 1. Rotate Matrix by 90 Degrees

- **Problem:** Rotate a given  $n \times n$  matrix by 90 degrees clockwise.
- **Input:**

csharp

Copy code

```
[  
  [1, 2, 3],  
  [4, 5, 6],  
  [7, 8, 9]  
]
```



Get citation

- **Output:**

csharp

Copy code

```
[  
  [7, 4, 1],  
  [8, 5, 2],  
  [9, 6, 3]  
]
```

### 2. Spiral Order Matrix

- **Problem:** Given an  $m \times n$  matrix, return all elements of the matrix in spiral order.
- **Input:**

csharp

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```
[  
  [1, 2, 3],  
  [4, 5, 6],  
  [7, 8, 9]  
]
```



- **Output:** `[1, 2, 3, 6, 9, 8, 7, 4, 5]`

### 3. Search in 2D Matrix

- **Problem:** Given a  $m \times n$  matrix and a target value, return whether the target exists in the matrix.
- **Input:**

csharp

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```
matrix = [  
  [1, 4, 7, 11],  
  [2, 5, 8, 12],  
  [3, 6, 9, 16],  
  [10, 13, 14, 17]  
]  
target = 5
```



- **Output:** `true`

### 4. Find the Peak Element

- **Problem:** In a  $2D$  matrix, find the peak element (an element which is greater than or equal to its neighbors).
- **Input:**

csharp

Copy code

```
[
```

```
[1, 4, 3],  
[5, 6, 2],  
[7, 8, 9]  
]
```

- **Output:** `8` (one of the peaks in this matrix)

#### 5. Maximum Size Submatrix with All 1s

- **Problem:** Given a binary matrix, find the maximum size square submatrix with all 1s.

- **Input:**

```
csharp Copy code  
  
[  
  [0, 1, 1, 0, 1],  
  [1, 1, 1, 1, 0],  
  [0, 1, 1, 1, 0],  
  [0, 0, 1, 0, 1]  
]
```

- **Output:** `3` (size of the largest square submatrix)

#### 6. Matrix Diagonal Sum

- **Problem:** Calculate the sum of the diagonals of a matrix.

- **Input:**

```
csharp Copy code  
  
[  
  [1, 2, 3],  
  [4, 5, 6],  
  [7, 8, 9]  
]
```

- **Output:** `25` (sum of primary diagonal [1, 5, 9] and secondary diagonal [3, 5, 7])

#### 7. Set Matrix Zeroes

- **Problem:** Set entire row and column to zero if an element in the matrix is zero.

- **Input:**

```
csharp Copy code  
  
[  
  [1, 2, 3],  
  [4, 0, 6],  
  [7, 8, 9]  
]
```

- **Output:**

```
csharp Copy code  
  
[  
  [1, 0, 3],  
  [0, 0, 0],  
  [7, 0, 9]  
]
```

#### 8. Maximal Rectangle

- **Problem:** Given a binary matrix, find the maximal rectangle containing only 1s and return its area.

- **Input:**

```
csharp Copy code  
  
[  
  [1, 0, 1, 0, 0],  
  [1, 0, 1, 1, 1],  
  [1, 1, 1, 1, 1],  
  [1, 0, 0, 1, 0]  
]
```

- **Output:** `6`

9. Find the Median in a Matrix



- **Problem:** Find the median of the matrix elements.
- **Input:**

csharp Copy code

```
[
  [1, 3, 5],
  [2, 6, 9],
  [3, 6, 9]
]
```

- **Output:** `5`

10. Check for Symmetric Matrix

- **Problem:** Determine if a matrix is symmetric (i.e., the matrix is equal to its transpose).
- **Input:**

csharp Copy code

```
[
  [1, 2, 3],
  [2, 4, 5],
  [3, 5, 6]
]
```



- **Output:** `true`

These problems test a range of skills including matrix manipulation, traversal, and optimization.



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