#48

Rotate Image

Akhtamov Azimjon **2024299010**

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Problem Definition (1)

- **Source**: Leetcode 
- Title: **Merge Intervals**
- Difficulty: **medium**
- Type: **Matrix**

Problem Definition (1)

48. Rotate Image

Medium | Topics | Companies

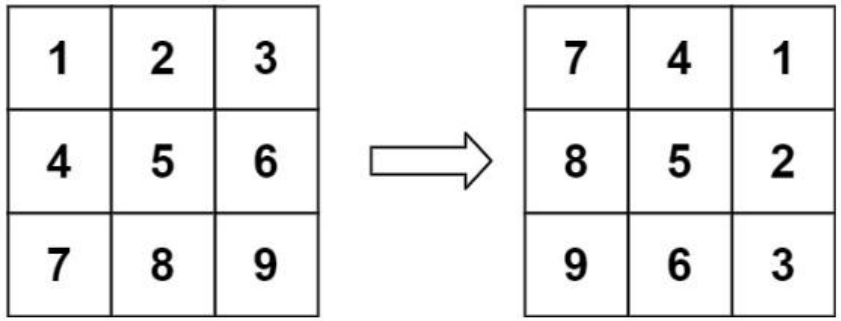
You are given an `n x n` 2D `matrix` representing an image, rotate the image by **90** degrees (clockwise).

You have to rotate the image **in-place**, which means you have to modify the input 2D matrix directly. **DO NOT** allocate another 2D matrix and do the rotation.

Constraints:

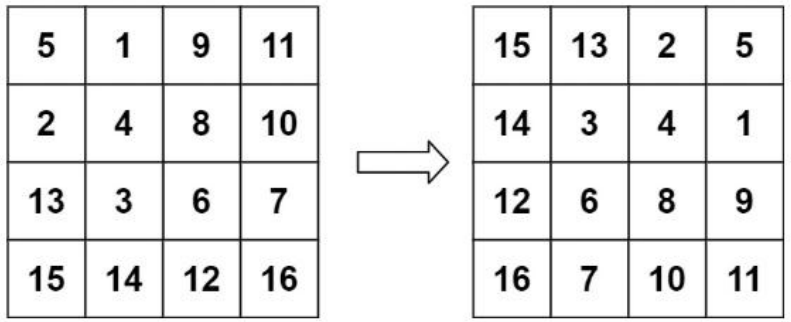
- `n == matrix.length == matrix[i].length`
- `1 <= n <= 20`
- `-1000 <= matrix[i][j] <= 1000`

Example 1:



Input: matrix = [[1,2,3],[4,5,6],[7,8,9]]
Output: [[7,4,1],[8,5,2],[9,6,3]]

Example 2:



Input: matrix = [[5,1,9,11],[2,4,8,10],[13,3,6,7],[15,14,12,16]]
Output: [[15,13,2,5],[14,3,4,1],[12,6,8,9],[16,7,10,11]]

Solution (1): Step1

$$a(i,j) = a^*(j,i)$$

i = ROW

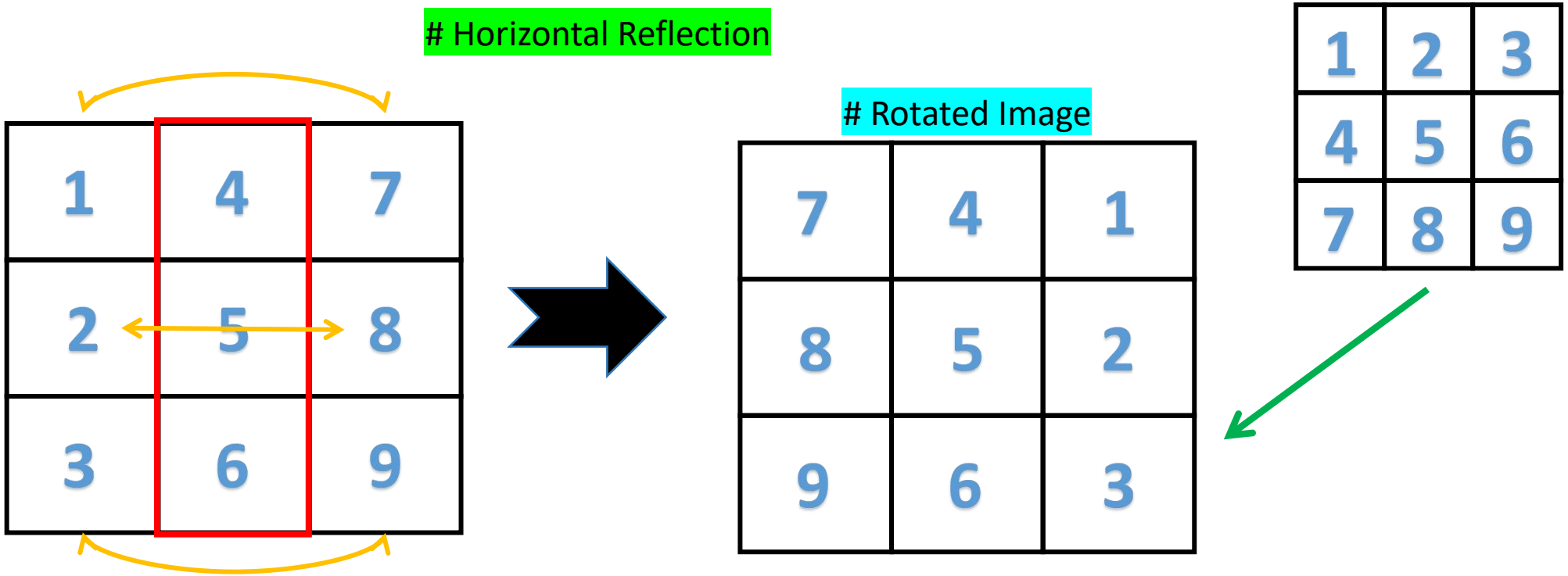
1	2	3
4	5	6
7	8	9

j = Column

Transposation

1	4	7
2	5	8
3	6	9

Solution (2): Step2



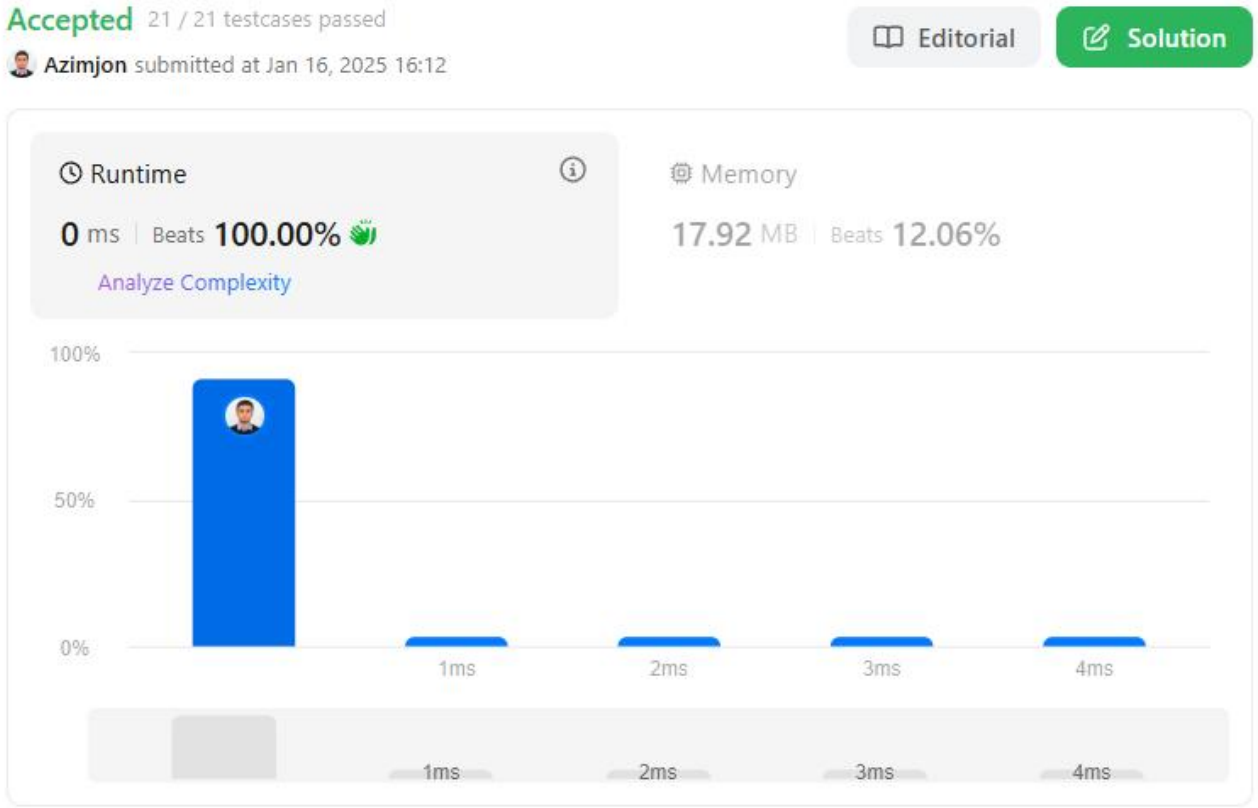
✓ I solved this problem based on Step #1 and #2

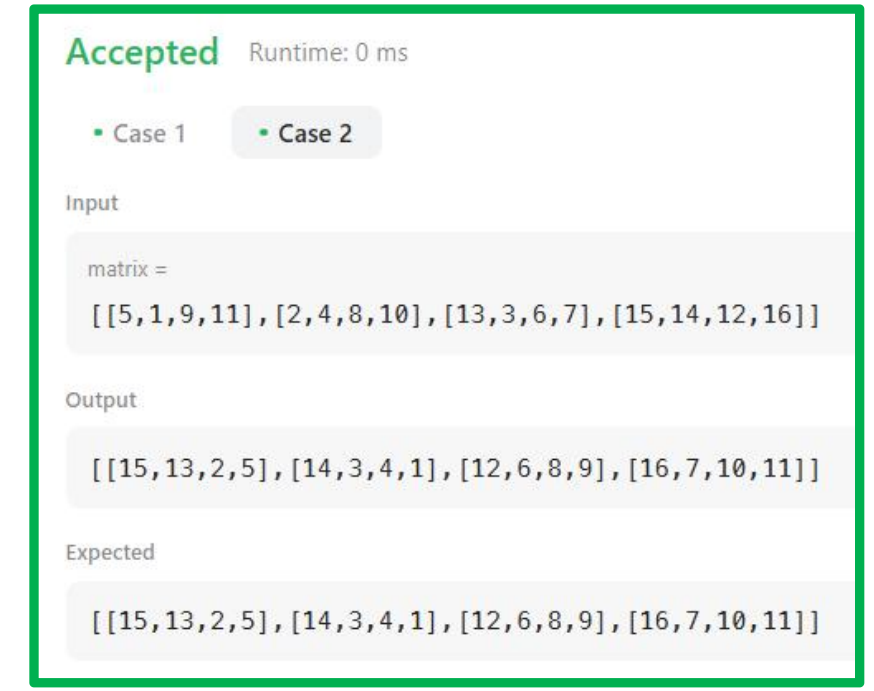
Solution (3)

Arrays & Strings > 4- Rotate Image #48.py > ...

```python
from typing import List

class Solution:
    def rotate(self, matrix: List[List[int]]) -> None:
        """
        Do not return anything, modify matrix in-place instead.
        """

        n = len(matrix) # to get matrix length

        for i in range(n):    # Transposation #STEP 1
            for j in range(i+1, n):
                matrix[i][j], matrix[j][i] =   matrix[j][i], matrix[i][j]  #reverse

        for i in range(n):    # Horizonatal Reflection #STEP 2
            for j in range(n // 2):
                matrix[i][j], matrix[i][n - 1 - j] = matrix[i][n - 1 - j],  matrix[i][j] #reverse
```

Solution (3)


Accepted 21 / 21 testcases passed
Azimjon submitted at Jan 16, 2025 16:12
Editorial
Solution
Runtime
0 ms | Beats 100.00%
Analyze Complexity
Memory
17.92 MB | Beats 12.06%
100%
50%
0%
1ms
2ms
3ms
4ms
1ms
2ms
3ms
4ms


Accepted Runtime: 0 ms
Case 1
Case 2
Input
matrix =
[[5,1,9,11],[2,4,8,10],[13,3,6,7],[15,14,12,16]]
Output
[[15,13,2,5],[14,3,4,1],[12,6,8,9],[16,7,10,11]]
Expected
[[15,13,2,5],[14,3,4,1],[12,6,8,9],[16,7,10,11]]

What I have learned

❖MATRIX:

✓I split problem into 2 steps:

Step1 - Transposation Step2 - Horizontally Reflection

I got technique kinda solving problem by seperating into steps

✓Understood logic of changing matrix indexes

Questions and Answers

Greetings