

MATRIX

Problem – 73. Set Matrix Zeroes

Medium



LeetCode

leetcode.com/problems/set-matrix-zeroes

Problem

- You are given a **matrix m x n**
- When an element in the matrix is **0**, set the whole column and row to **zero**

Solution – 73. Set Matrix Zeroes

Medium



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leetcode.com/problems/set-matrix-zeroes

Solution

- Iterate through the matrix top-down
- For each column (from $\text{col} = 1$ to $n - 1$), when you **find 0**, set:
 $\text{matrix}[\text{row}][0] = 0$ \rightarrow marks that the row should be zeroed
 $\text{matrix}[0][\text{col}] = 0$ \rightarrow marks that the col should be zeroed
- If **$\text{matrix}[\text{row}][0] == 0$** , set a variable **$\text{col0} = \text{true}$** to remember if column 0 must be zeroed later
- Iterate bottom-top, right-left
- For each cell, if **$\text{matrix}[\text{row}][0] == 0$** or **$\text{matrix}[0][\text{col}] == 0$** set **$\text{matrix}[\text{row}][\text{col}] = 0$**
- It must be bottom-top, right-left to not set the first row to zero first
- Also check if col0 is true. If true, set the first column to zero:
 $\text{matrix}[\text{row}][0] = 0$

Code – 73. Set Matrix Zeroes

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Code Time: $O(m \times n)$ Space: $O(1)$ where m is the number of rows and n the number of columns. As this is an in-place implementation, there is no additional space being allocated, therefore space complexity is $O(1)$

```
void setZeroes(vector<vector<int>>& matrix) {
    int m = matrix.size();
    int n = matrix[0].size();
    bool col0 = false;

    for (int row = 0; row < m; ++row) {
        if (matrix[row][0] == 0) col0 = true;
        for (int col = 1; col < n; ++col) {
            if (matrix[row][col] == 0) {
                matrix[row][0] = 0;
                matrix[0][col] = 0;
            }
        }
    }

    for (int row = m - 1; row >= 0; --row) {
        for (int col = n - 1; col >= 1; --col) {
            if (matrix[row][0] == 0 || matrix[0][col] == 0) {
                matrix[row][col] = 0;
            }
        }
        if (col0) {
            matrix[row][0] = 0;
        }
    }
}
```

Problem – 54. Spiral Matrix

Medium



LeetCode

leetcode.com/problems/spiral-matrix

Problem Statement / Solution / Code Time: $O(-)$ Space: $O(-)$

■ ...

1 →	2 →	3
4 →	5	↓ 6
↑ 7	← 8 ←	↓ 9

Problem – 48. Rotate Image

Medium



LeetCode

leetcode.com/problems/rotate-image

Problem Statement / Solution / Code Time: $O(-)$ Space: $O(-)$

■ ...