

1716. Maximum Non Negative Product in a Matrix

Difficulty : Medium

<https://leetcode.com/problems/maximum-non-negative-product-in-a-matrix>

You are given a $m \times n$ matrix `grid`. Initially, you are located at the top-left corner $(0, 0)$, and in each step, you can only **move right or down** in the matrix.

Among all possible paths starting from the top-left corner $(0, 0)$ and ending in the bottom-right corner $(m - 1, n - 1)$, find the path with the **maximum non-negative product**. The product of a path is the product of all integers in the grid cells visited along the path.

Return the *maximum non-negative product modulo* $10^9 + 7$. If the maximum product is **negative**, return -1.

Notice that the modulo is performed after getting the maximum product.

Example 1:

-1	-2	-3
-2	-3	-3
-3	-3	-2

Input: `grid = [[-1,-2,-3],[-2,-3,-3],[-3,-3,-2]]`

Output: -1

Explanation: It is not possible to get non-negative product in the path from $(0, 0)$ to $(2, 2)$, so return -1.

Example 2:

1	-2	1
1	-2	1
3	-4	1

Input: `grid = [[1,-2,1],[1,-2,1],[3,-4,1]]`

Output: 8

Explanation: Maximum non-negative product is shown $(1 * 1 * -2 * -4 * 1 = 8)$.

Example 3:

1	3
0	-4

Input: `grid = [[1,3],[0,-4]]`

Output: 0

Explanation: Maximum non-negative product is shown ($1 * 0 * -4 = 0$).

Constraints:

- $m == \text{grid.length}$
- $n == \text{grid}[i].\text{length}$
- $1 \leq m, n \leq 15$
- $-4 \leq \text{grid}[i][j] \leq 4$