1594. Maximum Non Negative Product in a Matrix

Description

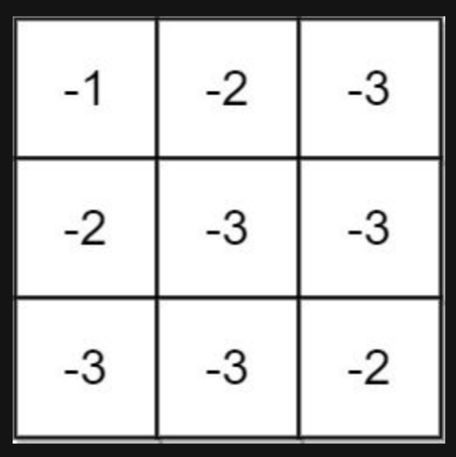
You are given a `m x n` matrix `grid`. Initially, you are located at the top-left corner `(0, 0)`, and in each step, you can only **move right or down** in the matrix.

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`.

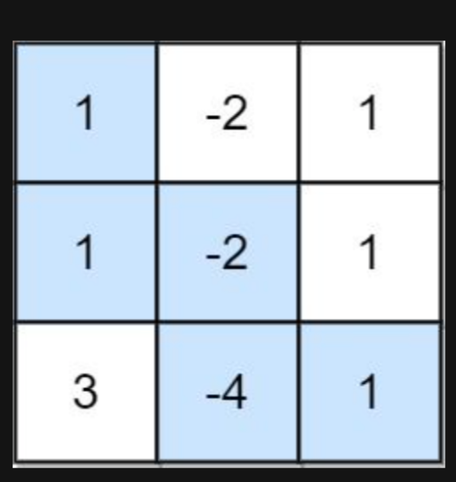
Notice that the modulo is performed after getting the maximum product.

Example 1:



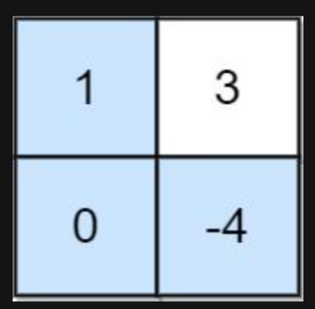

```
Input: grid = [[-1,-2,-3],[-2,-3,-3],[-3,-3,-2]]
Output: -1
Explanation: It is not possible to get non-negative product in the path from (0, 0) to (2, 2), so return -1.
```

Example 2:




```
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:




```
Input: grid = [[1,3],[0,-4]]
Output: 0
Explanation: Maximum non-negative product is shown (1 * 0 * -4 = 0).
```

Constraints:

- `m == grid.length`
- `n == grid[i].length`
- `1 <= m, n <= 15`
- `-4 <= grid[i][j] <= 4`