Problem 1504: Count Submatrices With All Ones

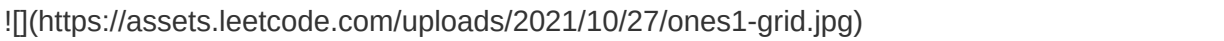
Problem Information

Difficulty: Medium
Acceptance Rate: 71.05%
Paid Only: No
Tags: Array, Dynamic Programming, Stack, Matrix, Monotonic Stack

Problem Description

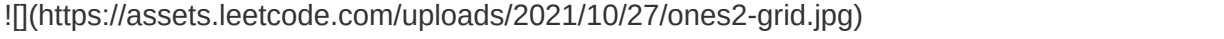
Given an `m x n` binary matrix `mat`, _return the number of**submatrices** that have all ones_.

Example 1:



Input: mat = [[1,0,1],[1,1,0],[1,1,0]] **Output:** 13 **Explanation:** There are 6 rectangles of side 1x1. There are 2 rectangles of side 1x2. There are 3 rectangles of side 2x1. There is 1 rectangle of side 2x2. There is 1 rectangle of side 3x1. Total number of rectangles = 6 + 2 + 3 + 1 + 1 = 13.

Example 2:



Input: mat = [[0,1,1,0],[0,1,1,1],[1,1,1,0]] **Output:** 24 **Explanation:** There are 8 rectangles of side 1x1. There are 5 rectangles of side 1x2. There are 2 rectangles of side 1x3. There are 4 rectangles of side 2x1. There are 2 rectangles of side 2x2. There are 2 rectangles of side 3x1. There is 1 rectangle of side 3x2. Total number of rectangles = 8 + 5 + 2 + 4 + 2 + 2 + 1 = 24.

Constraints:

* `1 <= m, n <= 150` * `mat[i][j]` is either `0` or `1`.

Code Snippets

C++:

```
class Solution {
public:
int numSubmat(vector<vector<int>>& mat) {

}
};
```

Java:

```
class Solution {
public int numSubmat(int[][] mat) {

}
}
```

Python3:

```
class Solution:
def numSubmat(self, mat: List[List[int]]) -> int:
```