

# 1628. Count Submatrices With All Ones

## Difficulty : Medium

<https://leetcode.com/problems/count-submatrices-with-all-ones>

Given an  $m \times n$  binary matrix `mat`, return the number of **submatrices** that have all ones.

### Example 1:

1	0	1
1	1	0
1	1	0

**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:

0	1	1	0
0	1	1	1
1	1	1	0

**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:

- $1 \leq m, n \leq 150$
- `mat[i][j]` is either 0 or 1.