

5925. Count Fertile Pyramids in a Land

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A farmer has a **rectangular grid** of land with m rows and n columns that can be divided into unit cells. Each cell is either **fertile** (represented by a 1) or **barren** (represented by a 0). All cells outside the grid are considered barren.

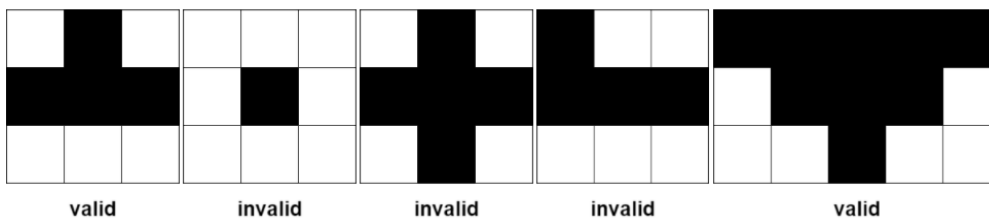
A **pyramidal plot** of land can be defined as a set of cells with the following criteria:

1. The number of cells in the set has to be **greater than 1** and all cells must be **fertile**.
2. The **apex** of a pyramid is the **topmost** cell of the pyramid. The **height** of a pyramid is the number of rows it covers. Let (r, c) be the apex of the pyramid, and its height be h . Then, the plot comprises of cells (i, j) where $r \leq i \leq r + h - 1$ and $c - (i - r) \leq j \leq c + (i - r)$.

An **inverse pyramidal plot** of land can be defined as a set of cells with similar criteria:

1. The number of cells in the set has to be **greater than 1** and all cells must be **fertile**.
2. The **apex** of an inverse pyramid is the **bottommost** cell of the inverse pyramid. The **height** of an inverse pyramid is the number of rows it covers. Let (r, c) be the apex of the pyramid, and its height be h . Then, the plot comprises of cells (i, j) where $r - h + 1 \leq i \leq r$ and $c - (r - i) \leq j \leq c + (r - i)$.

Some examples of valid and invalid pyramidal (and inverse pyramidal) plots are shown below. Black cells indicate fertile cells.



Given a **0-indexed** $m \times n$ binary matrix `grid` representing the farmland, return *the total number of pyramidal and inverse pyramidal plots that can be found in `grid`.*

Example 1:

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

Input: grid = [[0,1,1,0],[1,1,1,1]]

Output: 2

Explanation:

The 2 possible pyramidal plots are shown in blue and red respectively.

There are no inverse pyramidal plots in this grid.

Hence total number of pyramidal and inverse pyramidal plots is $2 + 0 = 2$.

Example 2:

1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1

Input: grid = [[1,1,1],[1,1,1]]

Output: 2

Explanation:

The pyramidal plot is shown in blue, and the inverse pyramidal plot is shown in red.

Hence the total number of plots is $1 + 1 = 2$.

User Accepted:	202
User Tried:	267
Total Accepted:	211
Total Submissions:	344
Difficulty:	Hard

Example 3:

1	0	1
0	0	0
1	0	1

Input: grid = [[1,0,1],[0,0,0],[1,0,1]]**Output:** 0**Explanation:**

There are no pyramidal or inverse pyramidal plots in the grid.

Example 4:

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

Input: grid = [[1,1,1,1,0],[1,1,1,1,1],[1,1,1,1,1],[0,1,0,0,1]]**Output:** 13**Explanation:**

There are 7 pyramidal plots, 3 of which are shown in the 2nd and 3rd figures.

There are 6 inverse pyramidal plots, 2 of which are shown in the last figure.

The total number of plots is $7 + 6 = 13$.**Constraints:**

- $m == \text{grid.length}$
- $n == \text{grid}[i].\text{length}$
- $1 \leq m, n \leq 1000$
- $1 \leq m * n \leq 10^5$
- $\text{grid}[i][j]$ is either 0 or 1.

JavaScript



```

1 /**
2  * @param {number[][]} grid
3  * @return {number}
4  */
5 var countPyramids = function(grid) {
6
7 };

```