

Problem 883: Projection Area of 3D Shapes

Problem Information

Difficulty: Easy

Acceptance Rate: 74.95%

Paid Only: No

Tags: Array, Math, Geometry, Matrix

Problem Description

You are given an $n \times n$ grid where we place some $1 \times 1 \times 1$ cubes that are axis-aligned with the x , y , and z axes.

Each value $v = \text{grid}[i][j]$ represents a tower of v cubes placed on top of the cell (i, j) .

We view the projection of these cubes onto the xy , yz , and zx planes.

A **projection** is like a shadow, that maps our **3-dimensional** figure to a **2-dimensional** plane. We are viewing the "shadow" when looking at the cubes from the top, the front, and the side.

Return the total area of all three projections.

Example 1:



Input: grid = [[1,2],[3,4]] **Output:** 17 **Explanation:** Here are the three projections ("shadows") of the shape made with each axis-aligned plane.

Example 2:

Input: grid = [[2]] **Output:** 5

Example 3:

****Input:**** grid = [[1,0],[0,2]] ****Output:**** 8

****Constraints:****

* `n == grid.length == grid[i].length` * `1 <= n <= 50` * `0 <= grid[i][j] <= 50`

Code Snippets

C++:

```
class Solution {
public:
    int projectionArea(vector<vector<int>>& grid) {

    }
};
```

Java:

```
class Solution {
    public int projectionArea(int[][] grid) {

    }
}
```

Python3:

```
class Solution:
    def projectionArea(self, grid: List[List[int]]) -> int:
```