

Problem 1878: Get Biggest Three Rhombus Sums in a Grid

Problem Information

Difficulty: Medium

Acceptance Rate: 49.75%

Paid Only: No

Tags: Array, Math, Sorting, Heap (Priority Queue), Matrix, Prefix Sum

Problem Description

You are given an $m \times n$ integer matrix `grid`.

A **rhombus sum** is the sum of the elements that form the **border** of a regular rhombus shape in `grid`. The rhombus must have the shape of a square rotated 45 degrees with each of the corners centered in a grid cell. Below is an image of four valid rhombus shapes with the corresponding colored cells that should be included in each **rhombus sum**:



Note that the rhombus can have an area of 0, which is depicted by the purple rhombus in the bottom right corner.

Return the biggest three **distinct rhombus sums** in the `grid` in **descending order**. If there are less than three distinct values, return all of them.

Example 1:



Input: `grid = [[3,4,5,1,3],[3,3,4,2,3],[20,30,200,40,10],[1,5,5,4,1],[4,3,2,2,5]]` **Output:** `[228,216,211]` **Explanation:** The rhombus shapes for the three biggest distinct rhombus sums are depicted above. - Blue: $20 + 3 + 200 + 5 = 228$ - Red: $200 + 2 + 10 + 4 = 216$ - Green: $5 + 200 + 4 + 2 = 211$

****Example 2:****

 (https://assets.leetcode.com/uploads/2021/04/23/pc73-q4-ex2.png)

****Input:**** grid = [[1,2,3],[4,5,6],[7,8,9]] ****Output:**** [20,9,8] ****Explanation:**** The rhombus shapes for the three biggest distinct rhombus sums are depicted above. - Blue: $4 + 2 + 6 + 8 = 20$ - Red: 9 (area 0 rhombus in the bottom right corner) - Green: 8 (area 0 rhombus in the bottom middle)

****Example 3:****

****Input:**** grid = [[7,7,7]] ****Output:**** [7] ****Explanation:**** All three possible rhombus sums are the same, so return [7].

****Constraints:****

* `m == grid.length` * `n == grid[i].length` * `1 <= m, n <= 50` * `1 <= grid[i][j] <= 105`

Code Snippets

C++:

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

    }
};
```

Java:

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

    }
}
```

Python3:

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