Problem 3454: Separate Squares II

Problem Information

Difficulty: Hard
Acceptance Rate: 21.75%
Paid Only: No
Tags: Array, Binary Search, Segment Tree, Line Sweep

Problem Description

You are given a 2D integer array `squares`. Each `squares[i] = [xi, yi, li]` represents the coordinates of the bottom-left point and the side length of a square parallel to the x-axis.

Find the **minimum** y-coordinate value of a horizontal line such that the total area covered by squares above the line _equals_ the total area covered by squares below the line.

Answers within `10-5` of the actual answer will be accepted.

Note : Squares **may** overlap. Overlapping areas should be counted **only once** in this version.

Example 1:

Input: squares = [[0,0,1],[2,2,1]]

Output: 1.00000

Explanation:

Any horizontal line between `y = 1` and `y = 2` results in an equal split, with 1 square unit above and 1 square unit below. The minimum y-value is 1.

Example 2:

Input: squares = [[0,0,2],[1,1,1]]

Output: 1.00000

Explanation:

Since the blue square overlaps with the red square, it will not be counted again. Thus, the line `y = 1` splits the squares into two equal parts.

Constraints:

* `1 <= squares.length <= 5 * 104` * `squares[i] = [xi, yi, li]` * `squares[i].length == 3` * `0 <= xi, yi <= 109` * `1 <= li <= 109` * The total area of all the squares will not exceed `1015`.

Code Snippets

C++:

```
class Solution {
public:
double separateSquares(vector<vector<int>>& squares) {

}
};
```

Java:

```
class Solution {
public double separateSquares(int[][] squares) {

}
}
```

Python3:

```
class Solution:
def separateSquares(self, squares: List[List[int]]) -> float:
```