Problem 2237: Count Positions on Street With Required Brightness

Problem Information

Difficulty: Medium
Acceptance Rate: 62.68%
Paid Only: Yes
Tags: Array, Prefix Sum

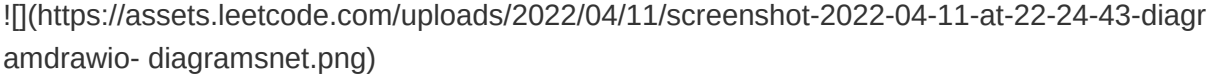
Problem Description

You are given an integer `n`. A perfectly straight street is represented by a number line ranging from `0` to `n - 1`. You are given a 2D integer array `lights` representing the street lamp(s) on the street. Each `lights[i] = [positioni, rangei]` indicates that there is a street lamp at position `positioni` that lights up the area from `[max(0, positioni - rangei), min(n - 1, positioni + rangei)]` (**inclusive**).

The **brightness** of a position `p` is defined as the number of street lamps that light up the position `p`. You are given a **0-indexed** integer array `requirement` of size `n` where `requirement[i]` is the minimum **brightness** of the `ith` position on the street.

Return _the number of positions_`i` _on the street between_`0` _and_`n - 1` _that have a**brightness** __of**at least** _`requirement[i]`_._

Example 1:



Input: n = 5, lights = [[0,1],[2,1],[3,2]], requirement = [0,2,1,4,1] **Output:** 4 **Explanation:** - The first street lamp lights up the area from [max(0, 0 - 1), min(n - 1, 0 + 1)] = [0, 1] (inclusive). - The second street lamp lights up the area from [max(0, 2 - 1), min(n - 1, 2 + 1)] = [1, 3] (inclusive). - The third street lamp lights up the area from [max(0, 3 - 2), min(n - 1, 3 + 2)] = [1, 4] (inclusive). - Position 0 is covered by the first street lamp. It is covered by 1 street lamp which is greater than requirement[0]. - Position 1 is covered by the first, second, and third street lamps. It is covered by 3 street lamps which is greater than requirement[1]. -

Position 2 is covered by the second and third street lamps. It is covered by 2 street lamps which is greater than requirement[2]. - Position 3 is covered by the second and third street lamps. It is covered by 2 street lamps which is less than requirement[3]. - Position 4 is covered by the third street lamp. It is covered by 1 street lamp which is equal to requirement[4]. Positions 0, 1, 2, and 4 meet the requirement so we return 4.

Example 2:

Input: n = 1, lights = [[0,1]], requirement = [2] **Output:** 0 **Explanation:** - The first street lamp lights up the area from [max(0, 0 - 1), min(n - 1, 0 + 1)] = [0, 0] (inclusive). - Position 0 is covered by the first street lamp. It is covered by 1 street lamp which is less than requirement[0]. - We return 0 because no position meets their brightness requirement.

Constraints:

* `1 <= n <= 105` * `1 <= lights.length <= 105` * `0 <= positioni < n` * `0 <= rangei <= 105` * `requirement.length == n` * `0 <= requirement[i] <= 105`

Code Snippets

C++:

```
class Solution {
public:
int meetRequirement(int n, vector<vector<int>>& lights, vector<int>&
requirement) {

}
};
```

Java:

```
class Solution {
public int meetRequirement(int n, int[][] lights, int[] requirement) {

}
}
```

Python3:

```
class Solution:
def meetRequirement(self, n: int, lights: List[List[int]], requirement:
List[int]) -> int:
```