Problem 1840: Maximum Building Height

Problem Information

Difficulty: Hard
Acceptance Rate: 38.14%
Paid Only: No
Tags: Array, Math, Sorting

Problem Description

You want to build `n` new buildings in a city. The new buildings will be built in a line and are labeled from `1` to `n`.

However, there are city restrictions on the heights of the new buildings:

* The height of each building must be a non-negative integer. * The height of the first building **must** be `0`. * The height difference between any two adjacent buildings **cannot exceed** `1`.

Additionally, there are city restrictions on the maximum height of specific buildings. These restrictions are given as a 2D integer array `restrictions` where `restrictions[i] = [idi, maxHeighti]` indicates that building `idi` must have a height **less than or equal to** `maxHeighti`.

It is guaranteed that each building will appear **at most once** in `restrictions`, and building `1` will **not** be in `restrictions`.

Return _the**maximum possible height** of the **tallest** building_.

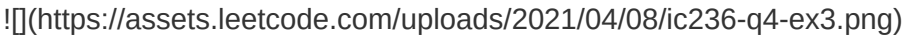
Example 1:

Input: n = 5, restrictions = [[2,1],[4,1]] **Output:** 2 **Explanation:** The green area in the image indicates the maximum allowed height for each building. We can build the buildings with heights [0,1,2,1,2], and the tallest building has a height of 2.

Example 2:

Input: n = 6, restrictions = [] **Output:** 5 **Explanation:** The green area in the image indicates the maximum allowed height for each building. We can build the buildings with heights [0,1,2,3,4,5], and the tallest building has a height of 5.

Example 3:



Input: n = 10, restrictions = [[5,3],[2,5],[7,4],[10,3]] **Output:** 5 **Explanation:** The green area in the image indicates the maximum allowed height for each building. We can build the buildings with heights [0,1,2,3,3,4,4,5,4,3], and the tallest building has a height of 5.

Constraints:

* `2 <= n <= 109` * `0 <= restrictions.length <= min(n - 1, 105)` * `2 <= idi <= n` * `idi` is **unique**. * `0 <= maxHeighti <= 109`

Code Snippets

C++:

```
class Solution {
public:
int maxBuilding(int n, vector<vector<int>>& restrictions) {

}
};
```

Java:

```
class Solution {
public int maxBuilding(int n, int[][] restrictions) {

}
}
```

Python3:

```
class Solution:
def maxBuilding(self, n: int, restrictions: List[List[int]]) -> int:
```