Problem 675: Cut Off Trees for Golf Event

Problem Information

Difficulty: Hard
Acceptance Rate: 35.88%
Paid Only: No
Tags: Array, Breadth-First Search, Heap (Priority Queue), Matrix

Problem Description

You are asked to cut off all the trees in a forest for a golf event. The forest is represented as an `m x n` matrix. In this matrix:

* `0` means the cell cannot be walked through. * `1` represents an empty cell that can be walked through. * A number greater than `1` represents a tree in a cell that can be walked through, and this number is the tree's height.

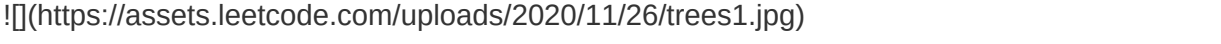
In one step, you can walk in any of the four directions: north, east, south, and west. If you are standing in a cell with a tree, you can choose whether to cut it off.

You must cut off the trees in order from shortest to tallest. When you cut off a tree, the value at its cell becomes `1` (an empty cell).

Starting from the point `(0, 0)`, return _the minimum steps you need to walk to cut off all the trees_. If you cannot cut off all the trees, return `-1`.

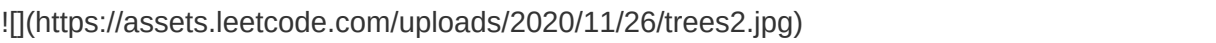
Note: The input is generated such that no two trees have the same height, and there is at least one tree needs to be cut off.

Example 1:



Input: forest = [[1,2,3],[0,0,4],[7,6,5]] **Output:** 6 **Explanation:** Following the path above allows you to cut off the trees from shortest to tallest in 6 steps.

Example 2:



Input: forest = [[1,2,3],[0,0,0],[7,6,5]] **Output:** -1 **Explanation:** The trees in the bottom row cannot be accessed as the middle row is blocked.

Example 3:

Input: forest = [[2,3,4],[0,0,5],[8,7,6]] **Output:** 6 **Explanation:** You can follow the same path as Example 1 to cut off all the trees. Note that you can cut off the first tree at (0, 0) before making any steps.

Constraints:

* `m == forest.length` * `n == forest[i].length` * `1 <= m, n <= 50` * `0 <= forest[i][j] <= 109` * Heights of all trees are **distinct**.

Code Snippets

C++:

```
class Solution {
public:
int cutOffTree(vector<vector<int>>& forest) {

}
};
```

Java:

```
class Solution {
public int cutOffTree(List<List<Integer>> forest) {

}
}
```

Python3:

```
class Solution:
def cutOffTree(self, forest: List[List[int]]) -> int:
```