3809. Best Reachable Tower

Solved

Medium Hint

You are given a 2D integer array `towers`, where `towers[i] = [$x_i$, $y_i$, $q_i$]` represents the coordinates `($x_i$, $y_i$)` and quality factor `$q_i$` of the `$i^{th}$` tower.

You are also given an integer array `center = [cx, cy]` representing your location, and an integer `radius`.

A tower is **reachable** if its **Manhattan distance** from `center` is **less than or equal** to `radius`.

Among all reachable towers:

- Return the coordinates of the tower with the **maximum** quality factor.
- If there is a tie, return the tower with the **lexicographically smallest** coordinate. If no tower is reachable, return `[-1, -1]`.

The **Manhattan Distance** between two cells `($x_i$, $y_i$)` and `($x_j$, $y_j$)` is `|$x_i$ - $x_j$| + |$y_i$ - $y_j$|`.
A coordinate `[$x_i$, $y_i$]` is **lexicographically smaller** than `[$x_j$, $y_j$]` if `$x_i$ < $x_j$`, or `$x_i$ == $x_j$` and `$y_i$ < $y_j$`.

`|x|` denotes the **absolute value** of `x`.

Example 1:

> **Input:** towers = [[1,2,5], [2,1,7], [3,1,9]], center = [1,1], radius = 2
>
> **Output:** [3,1]
>
> **Explanation:**
>
> - Tower `[1, 2, 5]`: Manhattan distance = `|1 - 1| + |2 - 1| = 1`, reachable.
> - Tower `[2, 1, 7]`: Manhattan distance = `|2 - 1| + |1 - 1| = 1`, reachable.
> - Tower `[3, 1, 9]`: Manhattan distance = `|3 - 1| + |1 - 1| = 2`, reachable.
>
> All towers are reachable. The maximum quality factor is 9, which corresponds to tower `[3, 1]`.

Example 2:

> **Input:** towers = [[1,3,4], [2,2,4], [4,4,7]], center = [0,0], radius = 5
>
> **Output:** [1,3]
>
> **Explanation:**
>
> - Tower `[1, 3, 4]`: Manhattan distance = `|1 - 0| + |3 - 0| = 4`, reachable.
> - Tower `[2, 2, 4]`: Manhattan distance = `|2 - 0| + |2 - 0| = 4`, reachable.
> - Tower `[4, 4, 7]`: Manhattan distance = `|4 - 0| + |4 - 0| = 8`, not reachable.
>
> Among the reachable towers, the maximum quality factor is 4. Both `[1, 3]` and `[2, 2]` have the same quality, so the lexicographically smaller coordinate is `[1, 3]`.

Example 3:

> **Input:** towers = [[5,6,8], [0,3,5]], center = [1,2], radius = 1
>
> **Output:** [-1,-1]
>
> **Explanation:**
>
> - Tower `[5, 6, 8]`: Manhattan distance = `|5 - 1| + |6 - 2| = 8`, not reachable.
> - Tower `[0, 3, 5]`: Manhattan distance = `|0 - 1| + |3 - 2| = 2`, not reachable.
>
> No tower is reachable within the given radius, so `[-1, -1]` is returned.

Constraints:

- `1 <= towers.length <= $10^5$`
- `towers[i] = [$x_i$, $y_i$, $q_i$]`
- `center = [cx, cy]`
- `0 <= $x_i$, $y_i$, $q_i$, cx, cy <= $10^5$`
- `0 <= radius <= $10^5$`

Seen this question in a real interview before? 1/5

Yes No

Accepted 26,381/48.3K | **Acceptance Rate** 54.6%

Topics

Hint 1

Hint 2

Hint 3

Hint 4

Discussion (13)