2146. K Highest Ranked Items Within a Price Range

Description

You are given a **0-indexed** 2D integer array `grid` of size `m x n` that represents a map of the items in a shop. The integers in the grid represent the following:

- `0` represents a wall that you cannot pass through.
- `1` represents an empty cell that you can freely move to and from.
- All other positive integers represent the price of an item in that cell. You may also freely move to and from these item cells.

It takes `1` step to travel between adjacent grid cells.

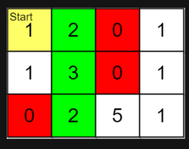
You are also given integer arrays `pricing` and `start` where `pricing = [low, high]` and `start = [row, col]` indicates that you start at the position `(row, col)` and are interested only in items with a price in the range of `[low, high]` (**inclusive**). You are further given an integer `k`.

You are interested in the **positions** of the `k` **highest-ranked** items whose prices are **within** the given price range. The rank is determined by the **first** of these criteria that is different:

1. Distance, defined as the length of the shortest path from the `start` (**shorter** distance has a higher rank).
2. Price (**lower** price has a higher rank, but it must be **in the price range**).
3. The row number (**smaller** row number has a higher rank).
4. The column number (**smaller** column number has a higher rank).

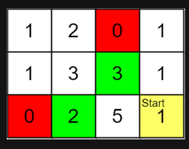
Return *the* `k` *highest-ranked items within the price range* ***sorted*** *by their rank (highest to lowest)*. If there are fewer than `k` reachable items within the price range, return ***all*** *of them*.

Example 1:




```
Input: grid = [[1,2,0,1],[1,3,0,1],[0,2,5,1]], pricing = [2,5], start = [0,0], k = 3
Output: [[0,1],[1,1],[2,1]]
Explanation: You start at (0,0).
With a price range of [2,5], we can take items from (0,1), (1,1), (2,1) and (2,2).
The ranks of these items are:
- (0,1) with distance 1
- (1,1) with distance 2
- (2,1) with distance 3
- (2,2) with distance 4
Thus, the 3 highest ranked items in the price range are (0,1), (1,1), and (2,1).
```

Example 2:




```
Input: grid = [[1,2,0,1],[1,3,3,1],[0,2,5,1]], pricing = [2,3], start = [2,3], k = 2
Output: [[2,1],[1,2]]
Explanation: You start at (2,3).
With a price range of [2,3], we can take items from (0,1), (1,1), (1,2) and (2,1).
The ranks of these items are:
- (2,1) with distance 2, price 2
- (1,2) with distance 2, price 3
- (1,1) with distance 3
- (0,1) with distance 4
Thus, the 2 highest ranked items in the price range are (2,1) and (1,2).
```

Example 3:


```
Input: grid = [[1,1,1],[0,0,1],[2,3,4]], pricing = [2,3], start = [0,0], k = 3
Output: [[2,1],[2,0]]
Explanation: You start at (0,0).
With a price range of [2,3], we can take items from (2,0) and (2,1).
The ranks of these items are:
- (2,1) with distance 5
- (2,0) with distance 6
Thus, the 2 highest ranked items in the price range are (2,1) and (2,0).
Note that k = 3 but there are only 2 reachable items within the price range.
```

Constraints:

- `m == grid.length`
- `n == grid[i].length`
- `1 <= m, n <= 10^5`
- `1 <= m * n <= 10^5`
- `0 <= grid[i][j] <= 10^5`
- `pricing.length == 2`
- `2 <= low <= high <= 10^5`
- `start.length == 2`
- `0 <= row <= m - 1`
- `0 <= col <= n - 1`
- `grid[row][col] > 0`
- `1 <= k <= m * n`