Problem 3356: Zero Array Transformation II

Problem Information

Difficulty: Medium
Acceptance Rate: 43.60%
Paid Only: No
Tags: Array, Binary Search, Prefix Sum

Problem Description

You are given an integer array `nums` of length `n` and a 2D array `queries` where `queries[i] = [li, ri, vali]`.

Each `queries[i]` represents the following action on `nums`:

* Decrement the value at each index in the range `[li, ri]` in `nums` by **at most** `vali`. * The amount by which each value is decremented can be chosen **independently** for each index.

A **Zero Array** is an array with all its elements equal to 0.

Return the **minimum** possible **non-negative** value of `k`, such that after processing the first `k` queries in **sequence** , `nums` becomes a **Zero Array**. If no such `k` exists, return -1.

Example 1:

Input: nums = [2,0,2], queries = [[0,2,1],[0,2,1],[1,1,3]]

Output: 2

Explanation:

* **For i = 0 (l = 0, r = 2, val = 1):** * Decrement values at indices `[0, 1, 2]` by `[1, 0, 1]` respectively. * The array will become `[1, 0, 1]`. * **For i = 1 (l = 0, r = 2, val = 1):** * Decrement values at indices `[0, 1, 2]` by `[1, 0, 1]` respectively. * The array will become `[0, 0, 0]`, which is a Zero Array. Therefore, the minimum value of `k` is 2.

Example 2:

Input: nums = [4,3,2,1], queries = [[1,3,2],[0,2,1]]

Output: -1

Explanation:

* **For i = 0 (l = 1, r = 3, val = 2):** * Decrement values at indices `[1, 2, 3]` by `[2, 2, 1]` respectively. * The array will become `[4, 1, 0, 0]`. * **For i = 1 (l = 0, r = 2, val = 1):** * Decrement values at indices `[0, 1, 2]` by `[1, 1, 0]` respectively. * The array will become `[3, 0, 0, 0]`, which is not a Zero Array.

Constraints:

* `1 <= nums.length <= 105` * `0 <= nums[i] <= 5 * 105` * `1 <= queries.length <= 105` * `queries[i].length == 3` * `0 <= li <= ri < nums.length` * `1 <= vali <= 5`

Code Snippets

C++:

```
class Solution {
public:
int minZeroArray(vector<int>& nums, vector<vector<int>>& queries) {


}
};
```

Java:

```
class Solution {
public int minZeroArray(int[] nums, int[][] queries) {


}
}
```

Python3:

```python
class Solution:
    def minZeroArray(self, nums: List[int], queries: List[List[int]]) -> int:
```