3018. Maximum Number of Removal Queries That Can Be Processed I Premium

Hard Topics Hint

You are given a **0-indexed** array `nums` and a **0-indexed** array `queries`.

You can do the following operation at the beginning **at most once**:

- Replace `nums` with a subsequence of `nums`.

We start processing queries in the given order; for each query, we do the following:

- If the first **and** the last element of `nums` is **less than** `queries[i]`, the processing of queries **ends**.
- Otherwise, we choose either the first **or** the last element of `nums` if it is **greater than or equal to** `queries[i]`, and we **remove** the chosen element from `nums`.

Return *the **maximum** number of queries that can be processed by doing the operation optimally.*

Example 1:

```
Input: nums = [1,2,3,4,5], queries = [1,2,3,4,6]
Output: 4
Explanation: We don't do any operation and process the queries as follows:
1- We choose and remove nums[0] since 1 <= 1, then nums becomes [2,3,4,5].
2- We choose and remove nums[0] since 2 <= 2, then nums becomes [3,4,5].
3- We choose and remove nums[0] since 3 <= 3, then nums becomes [4,5].
4- We choose and remove nums[0] since 4 <= 4, then nums becomes [5].
5- We can not choose any elements from nums since they are not greater than or equal to 5.
Hence, the answer is 4.
It can be shown that we can't process more than 4 queries.
```

Example 2:

```
Input: nums = [2,3,2], queries = [2,2,3]
Output: 3
Explanation: We don't do any operation and process the queries as follows:
1- We choose and remove nums[0] since 2 <= 2, then nums becomes [3,2].
2- We choose and remove nums[1] since 2 <= 2, then nums becomes [3].
3- We choose and remove nums[0] since 3 <= 3, then nums becomes [].
Hence, the answer is 3.
It can be shown that we can't process more than 3 queries.
```

Example 3:

```
Input: nums = [3,4,3], queries = [4,3,2]
Output: 2
Explanation: First we replace nums with the subsequence of nums [4,3].
Then we can process the queries as follows:
1- We choose and remove nums[0] since 4 <= 4, then nums becomes [3].
2- We choose and remove nums[0] since 3 <= 3, then nums becomes [].
3- We can not process any more queries since nums is empty.
Hence, the answer is 2.
It can be shown that we can't process more than 2 queries.
```

Constraints:

- `1 <= nums.length <= 1000`
- `1 <= queries.length <= 1000`
- `1 <= nums[i], queries[i] <= 10^9`

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

Yes No

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Topics

Array Dynamic Programming

Hint 1

Think of dynamic programming.

Hint 2

The definition of `dp` is a little unusual. Try to think more.

Hint 3

Let `dp[l][r]` be the maximum number of queries we can process if we want `a[l], a[l + 1], ..., a[r - 1]` not to be removed after processing `dp[l][r]` queries.

Hint 4

So `dp[0][n] = 0` since we can not remove anything.

Hint 5

The answer would be `max(dp[i][i])`.

Discussion (1)