3299. Sum of Consecutive Subsequences Premium

Hard Topics Hint

We call an array `arr` of length `n` **consecutive** if one of the following holds:

- `arr[i] - arr[i - 1] == 1` for *all* `1 <= i < n`.
- `arr[i] - arr[i - 1] == -1` for *all* `1 <= i < n`.

The **value** of an array is the sum of its elements.

For example, `[3, 4, 5]` is a consecutive array of value 12 and `[9, 8]` is another of value 17. While `[3, 4, 3]` and `[8, 6]` are not consecutive.

Given an array of integers `nums`, return the *sum* of the **values** of all **consecutive** *non-empty* subsequences.

Since the answer may be very large, return it **modulo** $10^9 + 7$.

Note that an array of length 1 is also considered consecutive.

Example 1:

> **Input:** `nums = [1,2]`
>
> **Output:** 6
>
> **Explanation:**
>
> The consecutive subsequences are: `[1]`, `[2]`, `[1, 2]`.

Example 2:

> **Input:** `nums = [1,4,2,3]`
>
> **Output:** 31
>
> **Explanation:**
>
> The consecutive subsequences are: `[1]`, `[4]`, `[2]`, `[3]`, `[1, 2]`, `[2, 3]`, `[4, 3]`, `[1, 2, 3]`.

Constraints:

- `1 <= nums.length <= 10^5`
- `1 <= nums[i] <= 10^5`

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

Yes No

Accepted **245** | Submissions **497** | Acceptance Rate **49.3%**

Topics

Array Hash Table Dynamic Programming

Hint 1

Try to count the number of times each element occurred in a consecutive subsequence, then you can find the answer easily.

Hint 2

Think of dynamic programming as a solution to calculate the number in the previous hint.

Hint 3

Let `left_inc[i]` be the number of increasing consecutive subsequences ending at `nums[i]` (except for `nums[i]` itself).

Hint 4

Let `right_inc[i]` be the number of increasing consecutive subsequences starting at `nums[i]` (except for `nums[i]` itself).

Hint 5

Then `nums[i]` is in `left_inc[i] + right_inc[i] + left_inc[i] * right_inc[i] + 1` increasing subsequences.

Hint 6

Do the same for decreasing consecutive subsequences.

Discussion (0)