Problem 3569: Maximize Count of Distinct Primes After Split

Problem Information

Difficulty: Hard
Acceptance Rate: 16.76%
Paid Only: No
Tags: Array, Math, Segment Tree, Number Theory

Problem Description

You are given an integer array `nums` having length `n` and a 2D integer array `queries` where `queries[i] = [idx, val]`.

For each query:

1. Update `nums[idx] = val`. 2. Choose an integer `k` with `1 <= k < n` to split the array into the non-empty prefix `nums[0..k-1]` and suffix `nums[k..n-1]` such that the sum of the counts of **distinct** prime values in each part is **maximum**.

Note: The changes made to the array in one query persist into the next query.

Return an array containing the result for each query, in the order they are given.

Example 1:

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

Output: [3,4]

Explanation:

* Initially `nums = [2, 1, 3, 1, 2]`. * After 1st query, `nums = [2, 2, 3, 1, 2]`. Split `nums` into `[2]` and `[2, 3, 1, 2]`. `[2]` consists of 1 distinct prime and `[2, 3, 1, 2]` consists of 2 distinct primes. Hence, the answer for this query is `1 + 2 = 3`. * After 2nd query, `nums = [2, 2, 3, 3, 2]`. Split

`nums` into `[2, 2, 3]` and `[3, 2]` with an answer of `2 + 2 = 4`. * The output is `[3, 4]`.

Example 2:

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

Output: [0]

Explanation:

* Initially `nums = [2, 1, 4]`. * After 1st query, `nums = [1, 1, 4]`. There are no prime numbers in `nums`, hence the answer for this query is 0. * The output is `[0]`.

Constraints:

* `2 <= n == nums.length <= 5 * 104` * `1 <= queries.length <= 5 * 104` * `1 <= nums[i] <= 105` * `0 <= queries[i][0] < nums.length` * `1 <= queries[i][1] <= 105`

Code Snippets

C++:

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

}
};
```

Java:

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

}
}
```

Python3:

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