Problem 3480: Maximize Subarrays After Removing One Conflicting Pair

Problem Information

Difficulty: Hard
Acceptance Rate: 64.83%
Paid Only: No
Tags: Array, Segment Tree, Enumeration, Prefix Sum

Problem Description

You are given an integer `n` which represents an array `nums` containing the numbers from 1 to `n` in order. Additionally, you are given a 2D array `conflictingPairs`, where `conflictingPairs[i] = [a, b]` indicates that `a` and `b` form a conflicting pair.

Remove **exactly** one element from `conflictingPairs`. Afterward, count the number of non-empty subarrays of `nums` which do not contain both `a` and `b` for any remaining conflicting pair `[a, b]`.

Return the **maximum** number of subarrays possible after removing **exactly** one conflicting pair.

Example 1:

Input: n = 4, conflictingPairs = [[2,3],[1,4]]

Output: 9

Explanation:

* Remove `[2, 3]` from `conflictingPairs`. Now, `conflictingPairs = [[1, 4]]`. * There are 9 subarrays in `nums` where `[1, 4]` do not appear together. They are `[1]`, `[2]`, `[3]`, `[4]`, `[1, 2]`, `[2, 3]`, `[3, 4]`, `[1, 2, 3]` and `[2, 3, 4]`. * The maximum number of subarrays we can achieve after removing one element from `conflictingPairs` is 9.

Example 2:

Input: n = 5, conflictingPairs = [[1,2],[2,5],[3,5]]

Output: 12

Explanation:

* Remove `[1, 2]` from `conflictingPairs`. Now, `conflictingPairs = [[2, 5], [3, 5]]`. * There are 12 subarrays in `nums` where `[2, 5]` and `[3, 5]` do not appear together. * The maximum number of subarrays we can achieve after removing one element from `conflictingPairs` is 12.

Constraints:

* `2 <= n <= 105` * `1 <= conflictingPairs.length <= 2 * n` * `conflictingPairs[i].length == 2` * `1 <= conflictingPairs[i][j] <= n` * `conflictingPairs[i][0] != conflictingPairs[i][1]`

Code Snippets

C++:

```
class Solution {
public:
long long maxSubarrays(int n, vector<vector<int>>& conflictingPairs) {

}
};
```

Java:

```
class Solution {
public long maxSubarrays(int n, int[][] conflictingPairs) {

}
}
```

Python3:

```
class Solution:
def maxSubarrays(self, n: int, conflictingPairs: List[List[int]]) -> int:
```