GREEDY

VIDEO - 46

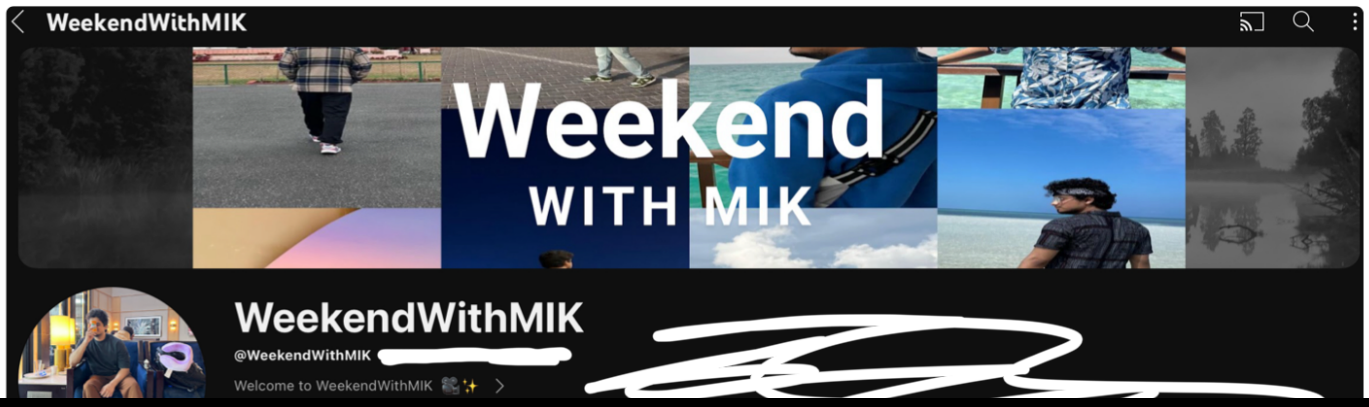
Leetcode - 3480

Hard

codestorywithmik

CswithMIK

codestorywithMIK



Try this channel to see Life Behind The Scenes... + Tech News

Motivation Of the Day :-

Go ghost for the next few months.

Train like your life depends on it (because it does).

MIK...

Come back so focused, so unshakable.

They won't believe it's still you.

Let your silence be your loudest flex.

3480. Maximize Subarrays After Removing One Conflicting Pair

n = 5

{1, 2, 3, 4, 5}

Hard | Topics | Companies | Hint

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.

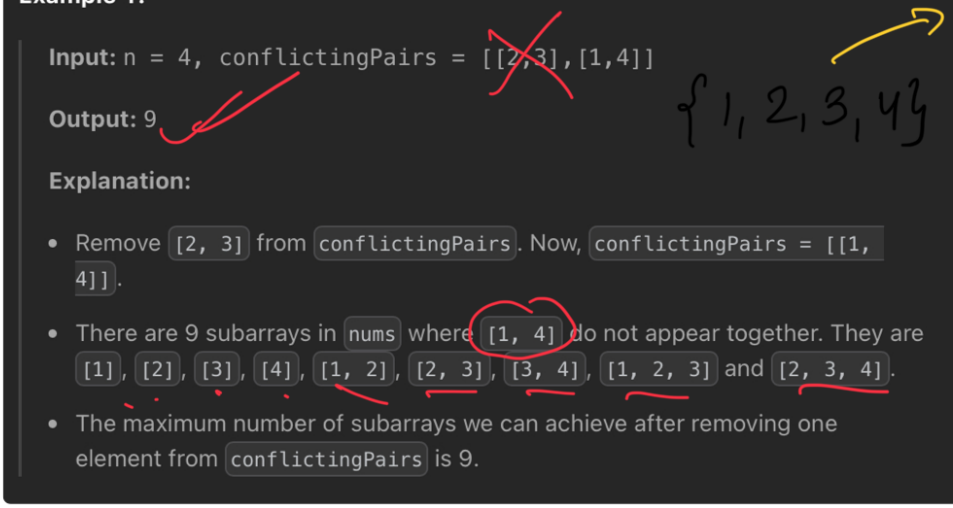
Example 1:

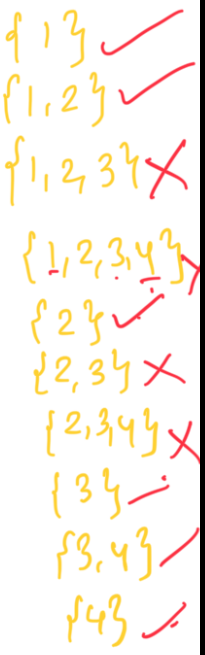
Input: `n = 4, conflictingPairs = [[2,3],[1,4]]`

Output: 9

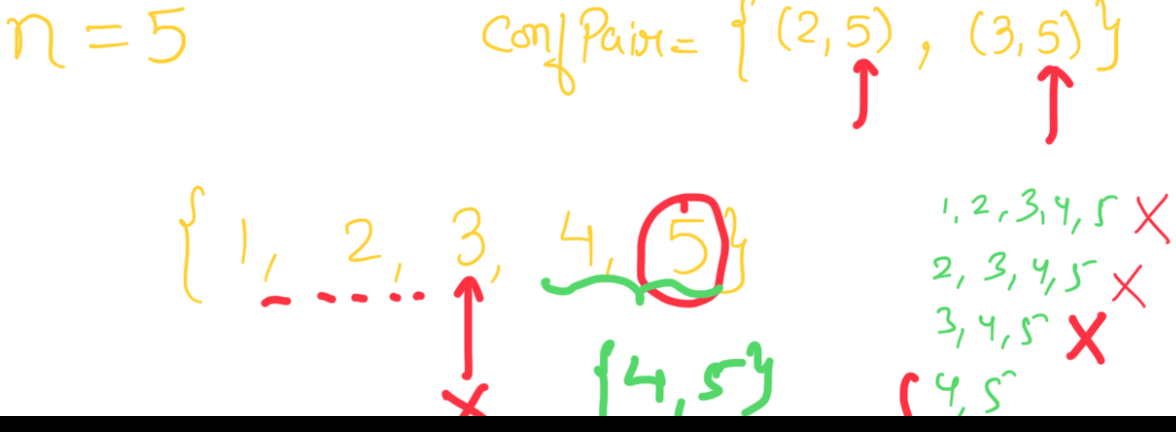
Explanation:

- 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.





Thought Process



{5}

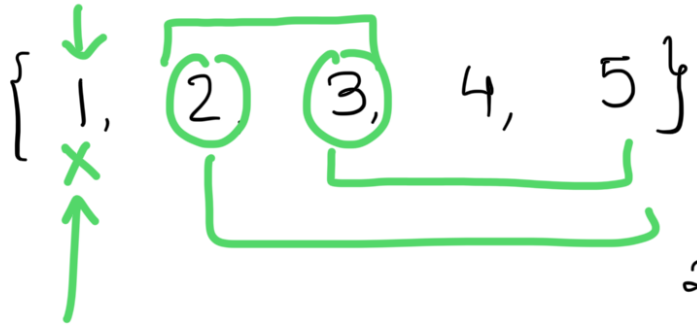
Subarray ending at 5 is restricted to start from > 2

ending at 5 → {2, 3}

5 − 3 = 2

(5) ⟶ 2 subarrays.

n = 5 conf pairs = {(3,5), (1,5)}



2 starting points

$5 \rightarrow \{1\}$ $\quad 5-1=2$

Valid Subarrays ending at 5 $= 5 - 3 = 2 + 2^{\text{extra}}$

$\{\{4,5\}, \{5\}\}$ ✓

$\{\{2,3,4,5\}$
$\{3,4,5\}$

$n = 10$ $\quad$ conflictPairs = ~~$\{(9,6)$~~, $(9,4)$, $(9,3)$, $\{2,5\}\}$

ending at 9

$\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$9 \rightarrow \{3, 6, 4\} \longrightarrow 6$

valid Subarrays ending at 9 $= 9 - 6 = 3 + 2^{\text{extra}} = 5$

$\{7, 8, 9\}$
$\{8, 9\}$
$\{6, 7, 8, 9\}$

{9}

{5,6,7,8,9}

if we remove (6,9) = 6 − 4 = 2

(6,9) ↓ maximum of restrictPoints

4 ↑ 2nd maxi Point

(•) For any point → find all restricting starting points.

(•) Find the maximum restricting starting point

second maximum restricting starting point

(•) validSub = point − maxStP ;
(9)

extra = maxStP − secondMaxStP ; (after removal of one conflicting pair)

valid += extra

Dry Run

$n = 5$

compPairs = [~~(1,2)~~, (2,5), (3,5)]

extra → { 1 extra, 1, 1, 1, 1 }

5 → {3, 2}

2 → {1}

{ 1, 2, 3, 4, 5 }

(1, 2, 3) {1}

(2, 3) {2}

(3)

Subarrays ending at 1 :

1 → { }

validSub = 1 − 0 = 1

Subarrays ending at 2 :

2 → { 1 }

validSum += 2 − 1 = 1

⇒ maxConf = 1
⇒ secaMaxC = 0

⇒ Extra = 1 − 0 = 1
{1, 2}

Subarrays ending at 3 :

3 → { } no conflicting pair.

maxConf = 1
secaMaxC = 0

valid += 3 − 1 = 2
↓
{2, 3}
{3}

extra = maxConf − secaMax
= 1 − 0
= 1
{1, 2, 3}

Subarrays ending at 4 :-

4 → { }

maxCa = 1
seaC = 0

valid += 4 − 1 = 3

{2, 3, 4}
{3, 4}

{4}

extra = maxC - SeqC.

= 1 - 0 = 1

Subarray at 5:-

5 → {3, 2}

maxConfig = 3

SeqC = 2

valid += 5 − 3 = 2

extra = maxCf − SeqC

= 3 − 2

= 1

Result = ValidSubarrays + maxExtra

= 6