Segment Tree

Concepts & Qns...

codestorywithmiK

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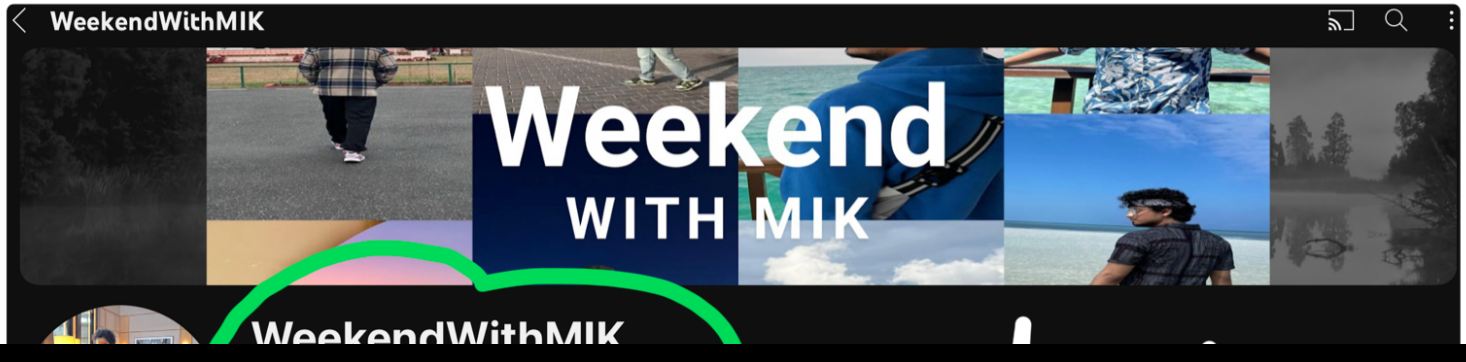
"No more fear of Segment Tree"

video - 15

Leetcode - 3721

Hard



Try this channel to see my "Life behind the Scenes + Tech News"

Motivation :-

It's now or never.
work hard today,
enjoy the results later...

MIK...

3721. Longest Balanced Subarray II

Hard | Topics | Companies | Hint

You are given an integer array `nums`.

A **subarray** is called **balanced** if the number of **distinct even** numbers in the subarray is equal to the number of **distinct odd** numbers.

Return the length of the **longest** balanced subarray.

Example 1:

Input: nums = [2,5,4,3]

Output: 4

Explanation:

- The longest balanced subarray is `[2, 5, 4, 3]`.
- It has 2 distinct even numbers `[2, 4]` and 2 distinct odd numbers `[5, 3]`. Thus,

the answer is 4.

Constraints :

$1 <= nums.length <= 10^5$

$1 <= nums[i] <= 10^5$

n^2 ✗

$O(n)$

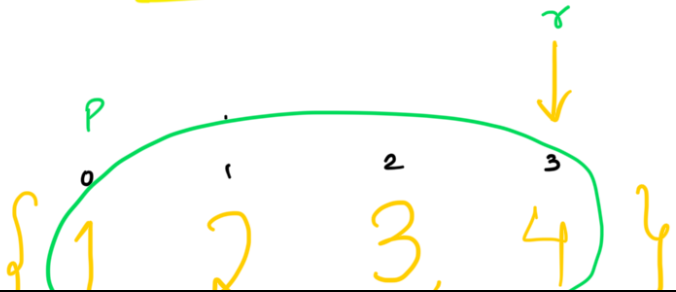
$n \log n$

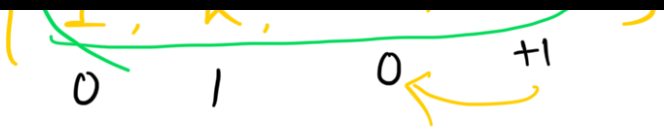
Thought Process

→ Pre-requisite...

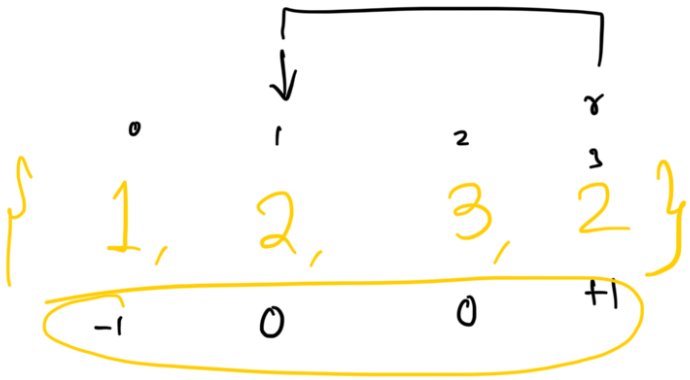
video - 7
video - 14

Brute Force ...





r - l + 1
= 3 - 0 + 1
= 4



Optimising using Segment Tree...

Lazy Prop

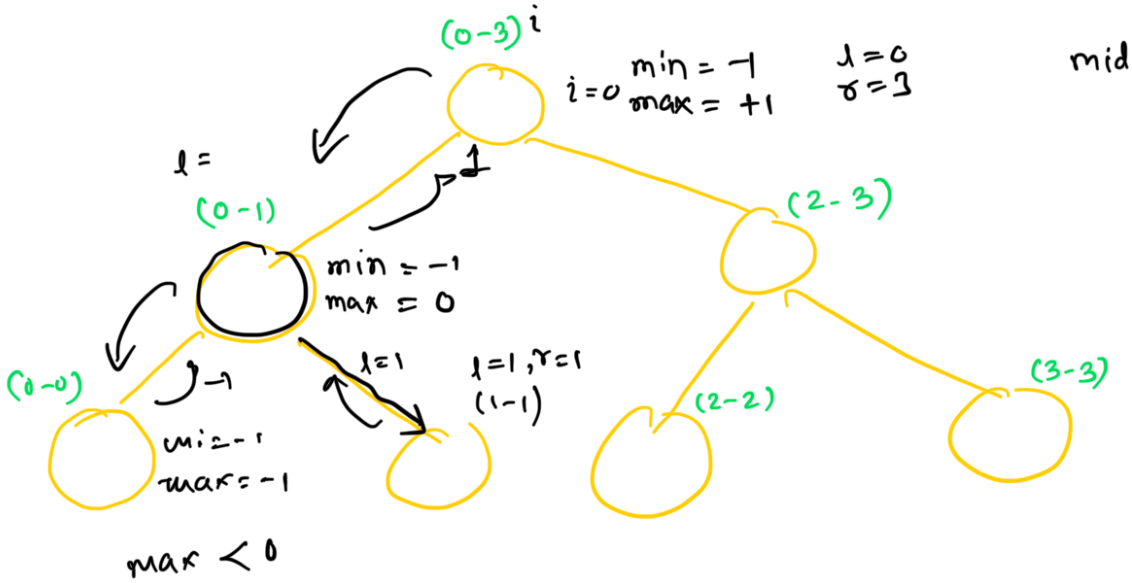
```
if(prev != -1) { //we have seen this element in past
    //[0...prev] we are adding (-val) in the range
    for(int l = 0; l <= prev; l++) { //O(n) Range Quewry Update - Segment tree log(n)
        cumSum[l] += -val;
    }
}

//[0...r] we are adding val in the range
for(int l = 0; l <= r; l++) {
    cumSum[l] += val; //O(n) Range Quewry Update - Segment tree log(n)
}

//We are finding left most 0 in the range [0...r]
for(int l = 0; l <= r; l++) {
    if(cumSum[l] == 0) {
        maxL = max(maxL, r-l+1); //Range Search - segment in log
        break;
    }
}
```

cumSum = [-1, 0, 0, +1]

Query (i=0, l=0, r=3)



Query (2i+1, l=0, r=0)

l=0 , r=1

mid = 0+1/2 = 0