Assignment 8 (Advance Programming)

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1827. Minimum Operations to Make the Array Increasing

You are given an integer array nums (0-indexed). In one operation, you can choose an element of the array and increment it by 1.

For example, if nums = [1,2,3], you can choose to increment nums[1] to make nums = [1,3,3].

Return the minimum number of operations needed to make nums strictly increasing.

An array nums is strictly increasing if nums[i] < nums[i+1] for all 0 <= i < nums.length - 1. An array of length 1 is trivially strictly increasing.

Example 1:

Input: nums = [1,1,1]

Output: 3

Explanation: You can do the following operations:

1) Increment nums[2], so nums becomes [1,1,2].

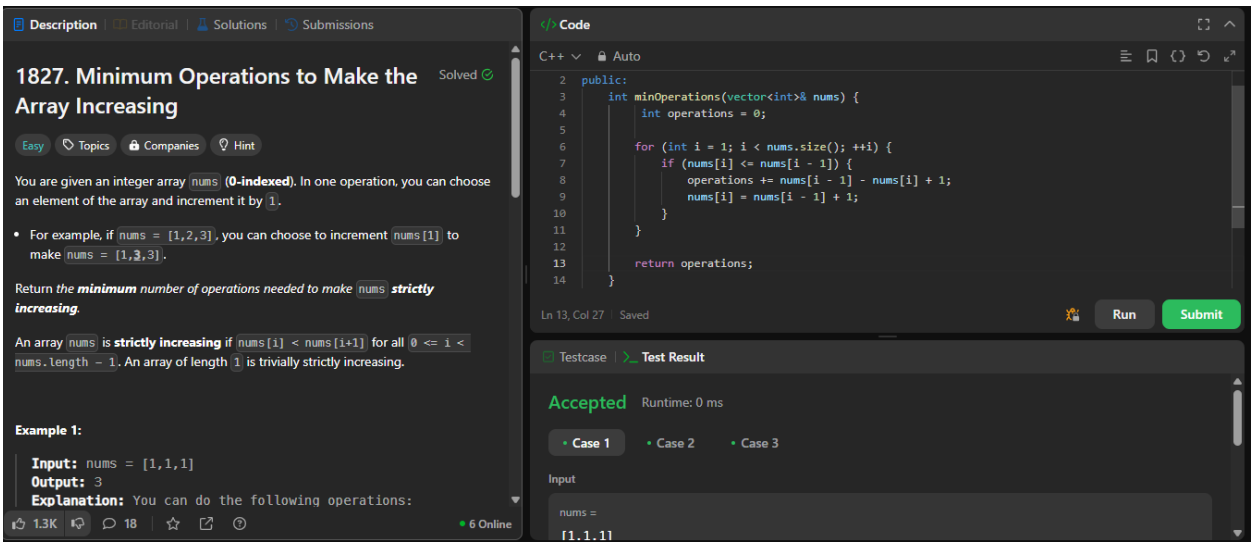
2) Increment nums[1], so nums becomes [1,2,2].

3) Increment nums[2], so nums becomes [1,2,3].

Solution:

```
class Solution {
public:
    int minOperations(vector<int>& nums) {
        int operations = 0;
```

```
        for (int i = 1; i < nums.size(); ++i) {
            if (nums[i] <= nums[i - 1]) {
                operations += nums[i - 1] - nums[i] + 1;
                nums[i] = nums[i - 1] + 1;
            }
        }

        return operations;
    }
};
```



1717. Maximum Score From Removing Substrings

You are given a string s and two integers x and y. You can perform two types of operations any number of times.

Remove substring "ab" and gain x points.

For example, when removing "ab" from "cabxbae" it becomes "cxbae".

Remove substring "ba" and gain y points.

For example, when removing "ba" from "cabxbae" it becomes "cabxe".

Return the maximum points you can gain after applying the above operations on s.

Example 1:

Input: s = "cdbcbbaaabab", x = 4, y = 5

Output: 19

Explanation:

- Remove the "ba" underlined in "cdbcbbaaabab". Now, s = "cdbcbbaaab" and 5 points are added to the score.

- Remove the "ab" underlined in "cdbcbbaaab". Now, s = "cdbcbbaa" and 4 points are added to the score.

- Remove the "ba" underlined in "cdbcbbaa". Now, s = "cdbcba" and 5 points are added to the score.

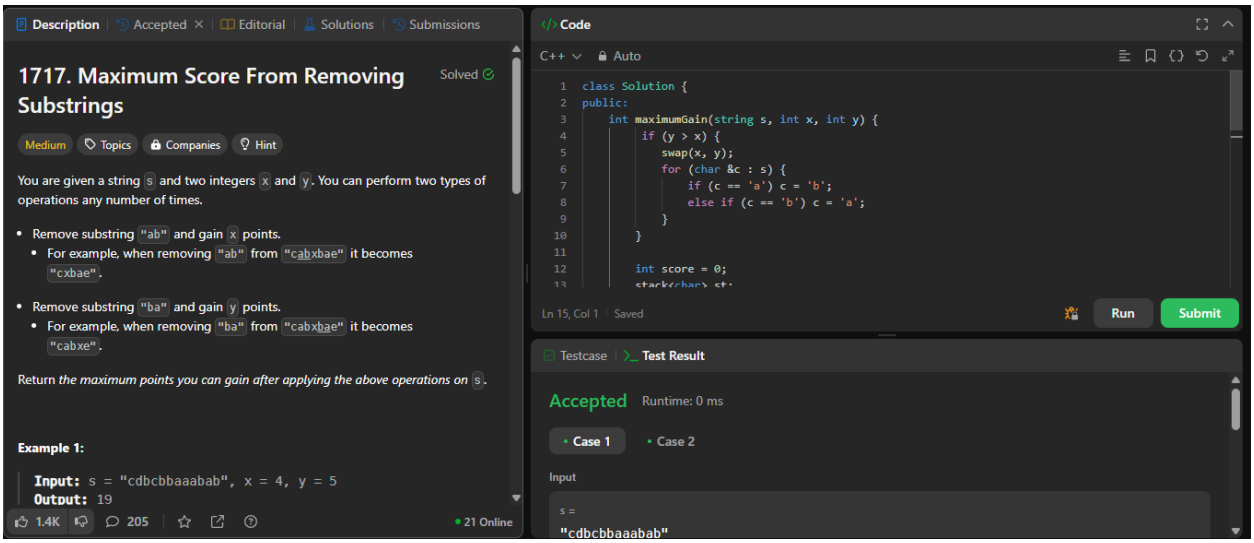
- Remove the "ba" underlined in "cdbcba". Now, s = "cdbc" and 5 points are added to the score.

Total score = 5 + 4 + 5 + 5 = 19.

Solution:

```
class Solution {
public:
    int maximumGain(string s, int x, int y) {
        if (y > x) {
            swap(x, y);
            for (char &c : s) {
                if (c == 'a') c = 'b';
                else if (c == 'b') c = 'a';
            }
        }
        int score = 0;
        stack<char> st;
        string remaining;
```

```
        for (char c : s) {
            if (!st.empty() && st.top() == 'a' && c == 'b') {
                st.pop();
                score += x;
            } else {
                st.push(c);
            }
        }
        while (!st.empty()) {
            remaining += st.top();
            st.pop();
        }
        reverse(remaining.begin(), remaining.end());
        for (char c : remaining) {
            if (!st.empty() && st.top() == 'b' && c == 'a') {
                st.pop();
                score += y;
            } else {
                st.push(c);
            }
        }
        return score;
    }
};
```



1713. Minimum Operations to Make a Subsequence

You are given an array target that consists of distinct integers and another integer array arr that can have duplicates.

In one operation, you can insert any integer at any position in arr. For example, if arr = [1,4,1,2], you can add 3 in the middle and make it [1,4,3,1,2]. Note that you can insert the integer at the very beginning or end of the array.

Return the minimum number of operations needed to make target a subsequence of arr.

A subsequence of an array is a new array generated from the original array by deleting some elements (possibly none) without changing the remaining elements' relative order. For example, [2,7,4] is a subsequence of [4,2,3,7,2,1,4] (the underlined elements), while [2,4,2] is not.

Example 1:

Input: target = [5,1,3], arr = [9,4,2,3,4]

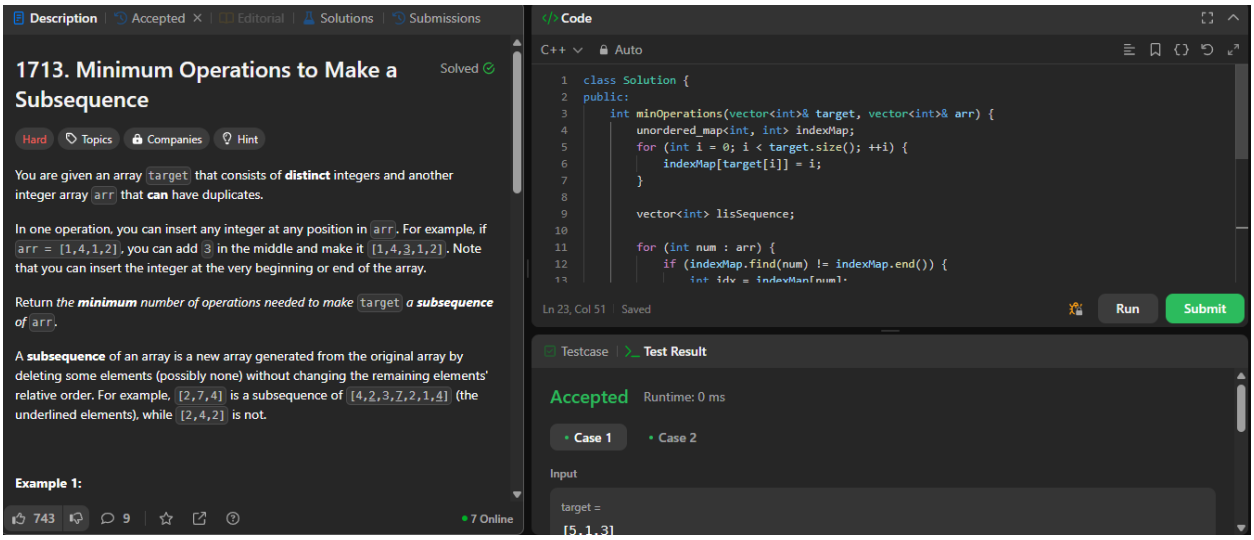
Output: 2

Explanation: You can add 5 and 1 in such a way that makes arr = [5,9,4,1,2,3,4], then target will be a subsequence of arr.

Solution:

```
class Solution {

public:

    int minOperations(vector<int>& target, vector<int>& arr) {
```

```
        unordered_map<int, int> indexMap;
        for (int i = 0; i < target.size(); ++i) {
            indexMap[target[i]] = i;
        }

        vector<int> lisSequence;

        for (int num : arr) {
            if (indexMap.find(num) != indexMap.end()) {
                int idx = indexMap[num];
                auto it = lower_bound(lisSequence.begin(), lisSequence.end(), idx);
                if (it == lisSequence.end()) {
                    lisSequence.push_back(idx);
                } else {
                    *it = idx;
                }
            }
        }

        return target.size() - lisSequence.size();
    }
};
```


Description | Accepted | Editorial | Solutions | Submissions
1713. Minimum Operations to Make a Subsequence
Solved
Hard
Topics
Companies
Hint
You are given an array target that consists of distinct integers and another integer array arr that can have duplicates.
In one operation, you can insert any integer at any position in arr. For example, if arr = [1,4,1,2], you can add 3 in the middle and make it [1,4,3,1,2]. Note that you can insert the integer at the very beginning or end of the array.
Return the minimum number of operations needed to make target a subsequence of arr.
A subsequence of an array is a new array generated from the original array by deleting some elements (possibly none) without changing the remaining elements' relative order. For example, [2,7,4] is a subsequence of [4,2,3,7,2,1,4] (the underlined elements), while [2,4,2] is not.
Example 1:
743
9
7 Online
Code
C++
Auto
class Solution {
public:
int minOperations(vector<int>& target, vector<int>& arr) {
unordered_map<int, int> indexMap;
for (int i = 0; i < target.size(); ++i) {
indexMap[target[i]] = i;
}
vector<int> lisSequence;
for (int num : arr) {
if (indexMap.find(num) != indexMap.end()) {
Ln 23, Col 51
Saved
Run
Submit
Testcase
Test Result
Accepted
Runtime: 0 ms
Case 1
Case 2
Input
target =
[5,1,3]