AP Experiment-9

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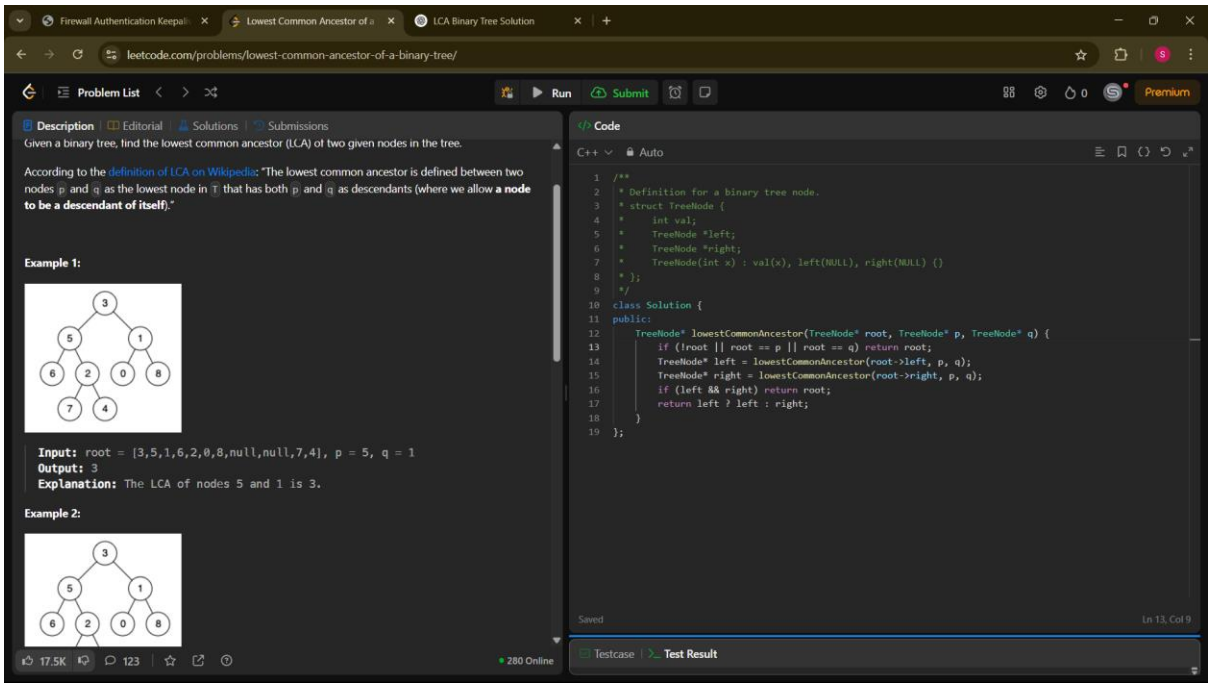
Q1. Lowest Common Ancestor of a Binary Tree https://leetcode.com/problems/lowest-common-ancestor-of-a-binary-tree/

CODE:

```
class Solution {
public:
    TreeNode* lowestCommonAncestor(TreeNode* root, TreeNode* p, TreeNode* q) {
        if (!root || root == p || root == q) return root;
        TreeNode* left = lowestCommonAncestor(root->left, p, q);
        TreeNode* right = lowestCommonAncestor(root->right, p, q);
        if (left && right) return root;
        return left ? left : right;
    }
};
```

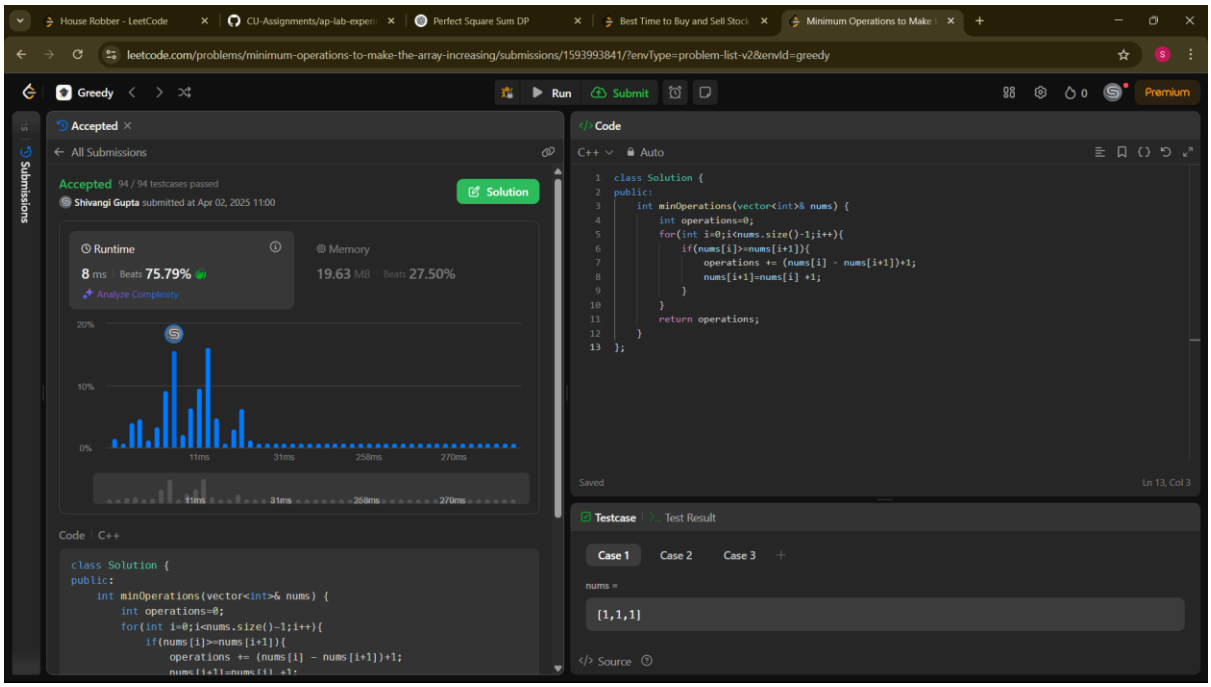


Q2. https://leetcode.com/problems/minimum-operations-to-make-the-array-increasing/description/?envType=problem-list-v2&envId=greedy

CODE:

```
class Solution {
```

```
public:
    int minOperations(vector<int>& nums) {
        int operations=0;
        for(int i=0;i<nums.size()-1;i++){
            if(nums[i]>=nums[i+1]){
                operations += (nums[i] - nums[i+1])+1;
                nums[i+1]=nums[i] +1;
            }
        }
        return operations;
    }
};
```



Q3. https://leetcode.com/problems/remove-stones-to-minimize-the-total/?envType=problem-list-v2&envId=greedy

CODE:

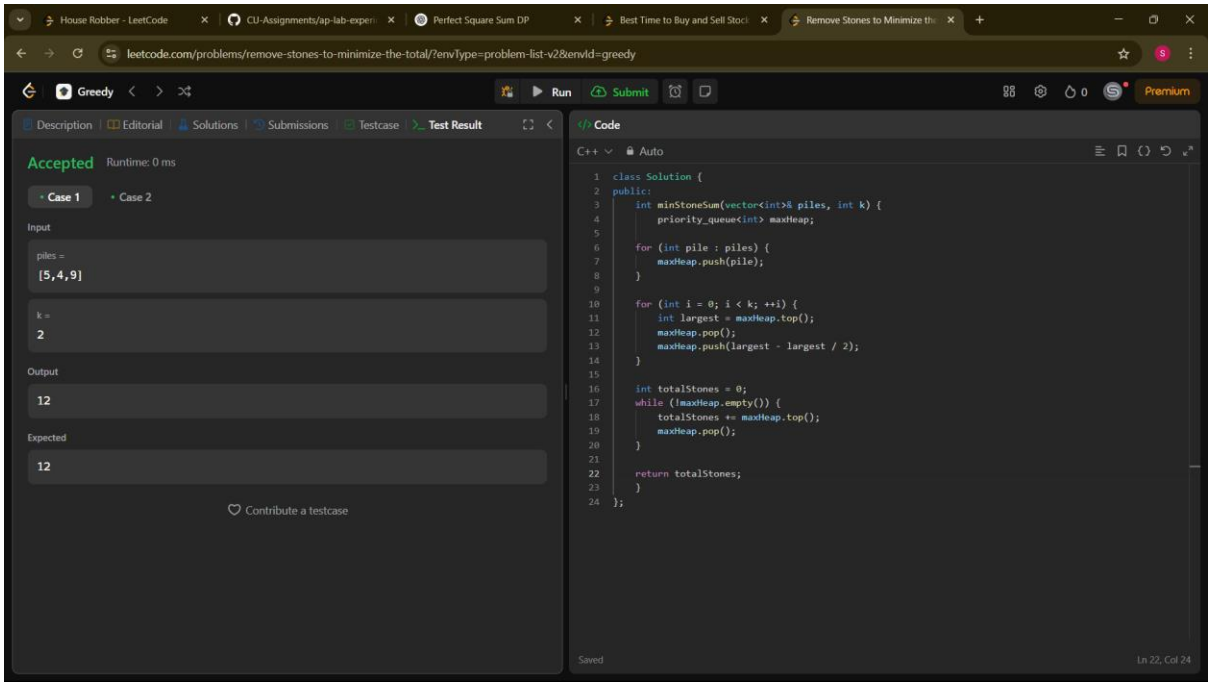
```
class Solution {
public:
    int minStoneSum(vector<int>& piles, int k) {
        priority_queue<int> maxHeap;
```

```
    for (int pile : piles) {
        maxHeap.push(pile);
    }

    for (int i = 0; i < k; ++i) {
        int largest = maxHeap.top();
        maxHeap.pop();
        maxHeap.push(largest - largest / 2);
    }

    int totalStones = 0;
    while (!maxHeap.empty()) {
        totalStones += maxHeap.top();
        maxHeap.pop();
    }

    return totalStones;
    }
};
```



Q4. https://leetcode.com/problems/maximum-score-from-removing-substrings/?envType=problem-list-v2&envId=greedy

CODE:

```
class Solution {
public:
    int maximumGain(string s, int x, int y) {
        int points = 0;

    while (true) {
        size_t pos_ab = s.find("ab");
        size_t pos_ba = s.find("ba");

        if (pos_ab != string::npos && (pos_ba == string::npos || x >= y)) {
            s.erase(pos_ab, 2);
            points += x;
        } else if (pos_ba != string::npos) {
            s.erase(pos_ba, 2);
            points += y;
        } else {
```

```
            break;
        }
    }

    return points;
    }
};
```