AP Assignment

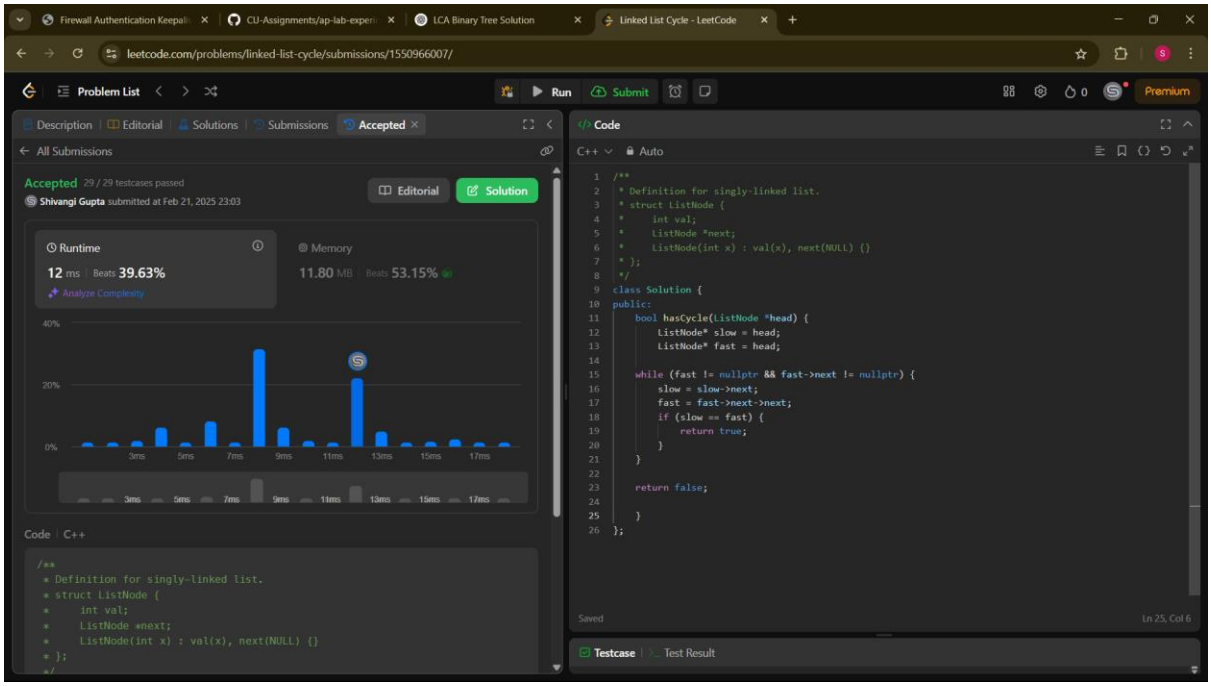
Hard Problems for Fast Learners

Name: Shivangi Gupta UID: 22BCS15008 Section: 601-A

Ques 1. Linked List Cycle https://leetcode.com/problems/linked-list-cycle/description/

Code:

```
class Solution {
public:
    bool hasCycle(ListNode *head) {
        ListNode* slow = head;
        ListNode* fast = head;

    while (fast != nullptr && fast->next != nullptr) {
        slow = slow->next;
        fast = fast->next->next;
        if (slow == fast) {
            return true;
        }
    }

    return false;

    }
};
```

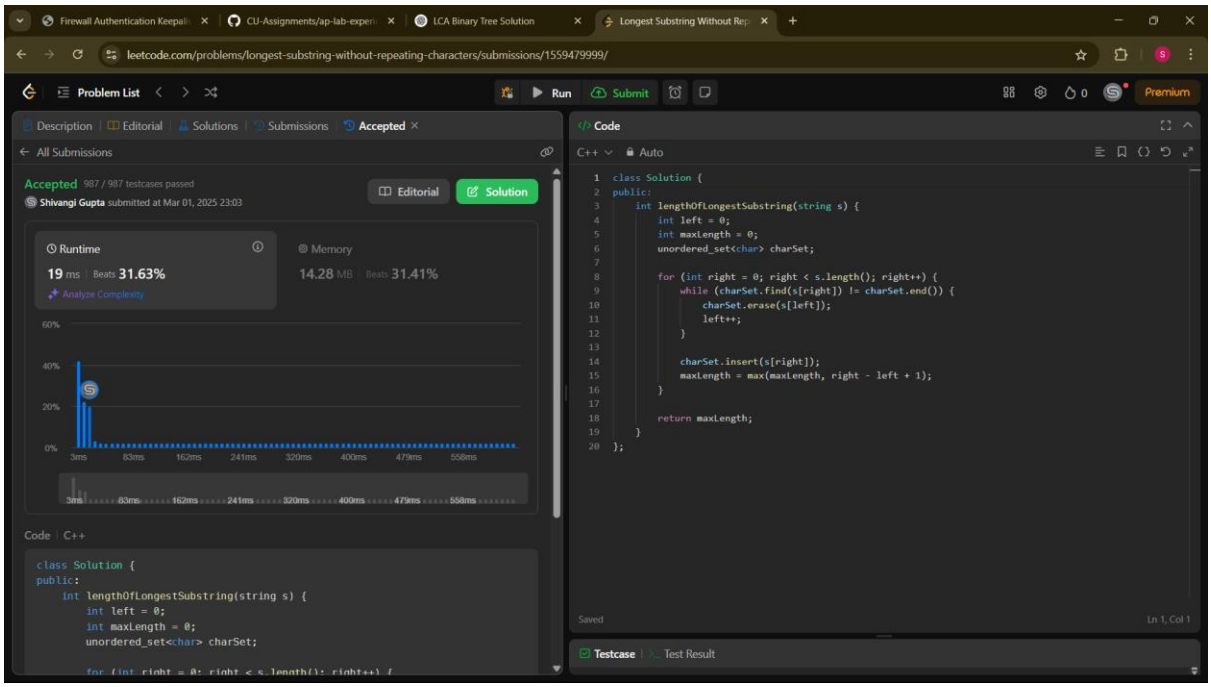


Q2. Longest substring without repeating characters https://leetcode.com/problems/longest-substring-without-repeating-characters/description/

CODE:

```
class Solution {
public:
    int lengthOfLongestSubstring(string s) {
        int left = 0;
        int maxLength = 0;
        unordered_set<char> charSet;

        for (int right = 0; right < s.length(); right++) {
            while (charSet.find(s[right]) != charSet.end()) {
                charSet.erase(s[left]);
                left++;
            }

            charSet.insert(s[right]);
```

```
            maxLength = max(maxLength, right - left + 1);
        }

        return maxLength;
    }
};
```

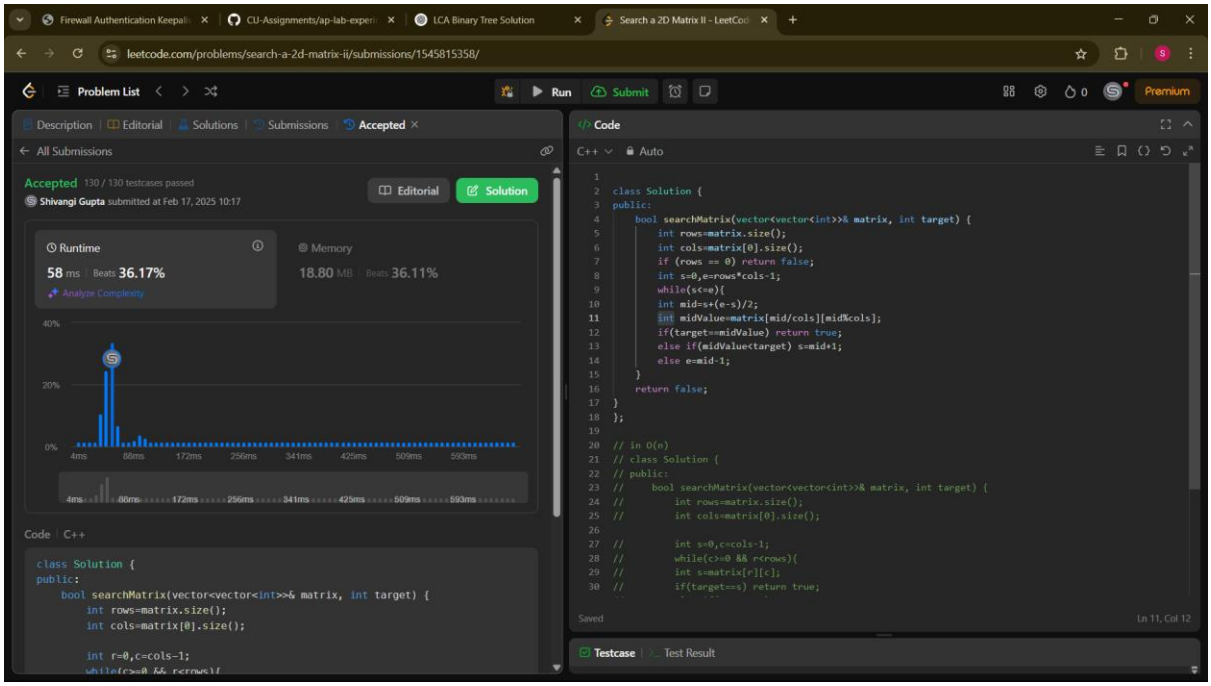


Q3. Search a 2D matrix II https://leetcode.com/problems/search-a-2d-matrix-ii/description/

Code:

```
class Solution {
public:
    bool searchMatrix(vector<vector<int>>& matrix, int target) {
        int rows=matrix.size();
        int cols=matrix[0].size();
        if (rows == 0) return false;
        int s=0,e=rows*cols-1;
        while(s<=e){
```

```
        int mid=s+(e-s)/2;
        int midValue=matrix[mid/cols][mid%cols];
        if(target==midValue) return true;
        else if(midValue<target) s=mid+1;
        else e=mid-1;
    }
    return false;
}
};
```



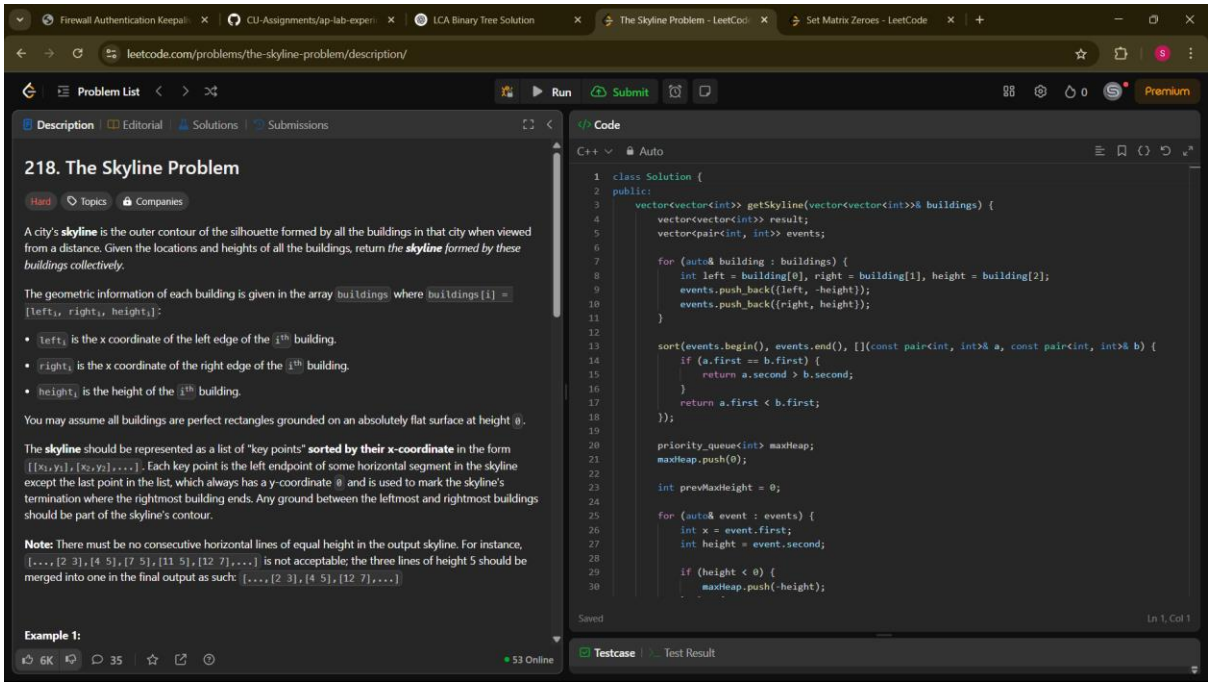
Q4. The Skyline Problem https://leetcode.com/problems/the-skyline-problem/

Code:

```
vector<vector<int>> getSkyline(vector<vector<int>>& buildings) {
        vector<vector<int>> result;
        vector<pair<int, int>> events;

        for (auto& building : buildings) {
```

```
    int left = building[0], right = building[1], height = building[2];
    events.push_back({left, -height});
    events.push_back({right, height});
}

sort(events.begin(), events.end(), [](const pair<int, int>& a, const pair<int, int>& b) {
    if (a.first == b.first) {
        return a.second > b.second;
    }
    return a.first < b.first;
});

priority_queue<int> maxHeap;
maxHeap.push(0);

int prevMaxHeight = 0;

for (auto& event : events) {
    int x = event.first;
    int height = event.second;

    if (height < 0) {
        maxHeap.push(-height);
    } else {
        maxHeap.push(height);
    }

    int currentMaxHeight = maxHeap.top();
```

```
        if (currentMaxHeight != prevMaxHeight) {
            result.push_back({x, currentMaxHeight});
            prevMaxHeight = currentMaxHeight;
        }
    }

    return result;
}
```

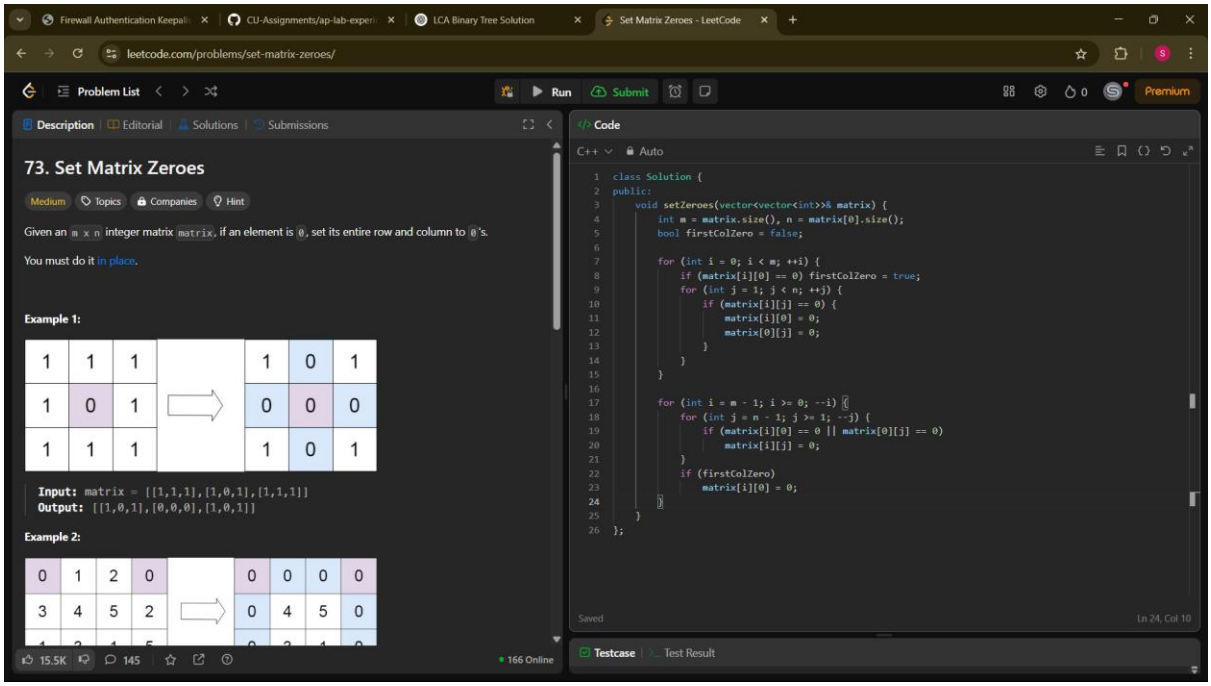


Q5. Set matrix zeroes https://leetcode.com/problems/set-matrix-zeroes/

CODE:

```
class Solution {
public:
    void setZeroes(vector<vector<int>>& matrix) {
        int m = matrix.size(), n = matrix[0].size();
        bool firstColZero = false;
```

```
        for (int i = 0; i < m; ++i) {
            if (matrix[i][0] == 0) firstColZero = true;
            for (int j = 1; j < n; ++j) {
                if (matrix[i][j] == 0) {
                    matrix[i][0] = 0;
                    matrix[0][j] = 0;
                }
            }
        }

        for (int i = m - 1; i >= 0; --i) {
            for (int j = n - 1; j >= 1; --j) {
                if (matrix[i][0] == 0 || matrix[0][j] == 0)
                    matrix[i][j] = 0;
            }
            if (firstColZero)
                matrix[i][0] = 0;
        }
    }
};
```


Firewall Authentication Keepali
CU-Assignments/ap-lab-experi
LCA Binary Tree Solution
Set Matrix Zeroes - LeetCode
leetcode.com/problems/set-matrix-zeroes/
Problem List
Run
Submit
Premium
Description
Editorial
Solutions
Submissions
73. Set Matrix Zeroes
Medium
Topics
Companies
Hint
Given an m x n integer matrix matrix, if an element is 0, set its entire row and column to 0's.
You must do it in place.
Example 1:
Input: matrix = [[1,1,1],[1,0,1],[1,1,1]]
Output: [[1,0,1],[0,0,0],[1,0,1]]
Example 2:
15.5K
145
166 Online
Code
C++
Auto
class Solution {
public:
void setZeroes(vector<vector<int>>& matrix) {
int m = matrix.size(), n = matrix[0].size();
bool firstColZero = false;
for (int i = 0; i < m; ++i) {
if (matrix[i][0] == 0) firstColZero = true;
for (int j = 1; j < n; ++j) {
if (matrix[i][j] == 0) {
matrix[i][0] = 0;
matrix[0][j] = 0;
}
}
}
for (int i = m - 1; i >= 0; --i) {
for (int j = n - 1; j >= 1; --j) {
if (matrix[i][0] == 0 || matrix[0][j] == 0)
matrix[i][j] = 0;
}
if (firstColZero)
matrix[i][0] = 0;
}
}
};
Saved
Ln 24, Col 10
Testcase
Test Result