ASSIGNMENT - 5

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Section: 608- B **Subject: AP**

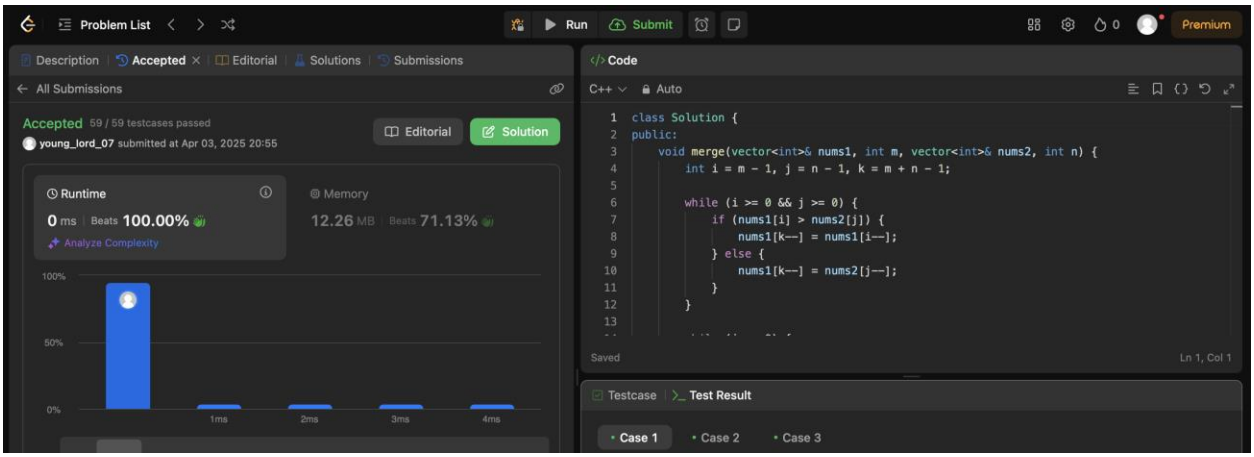
Solution 1: class Solution {

public:

```
  void merge(vector<int>& nums1, int m, vector<int>& nums2, int n) {
    int i = m - 1, j = n - 1, k = m + n - 1;

    while (i >= 0 && j >= 0) {
      if (nums1[i] > nums2[j]) {
        nums1[k--] = nums1[i--];
      } else {
        nums1[k--] = nums2[j--];
      }
    }

    while (j >= 0) {
      nums1[k--] = nums2[j--];
    }
  }
};
```



Solution 2: class Solution {

public:

int firstBadVersion(int n) {

int left = 1, right = n;

while (left < right) {

int mid = left + (right - left) / 2;

if (isBadVersion(mid)) {

right = mid; // Move left to find the first bad version

} else {

left = mid + 1; // Move right

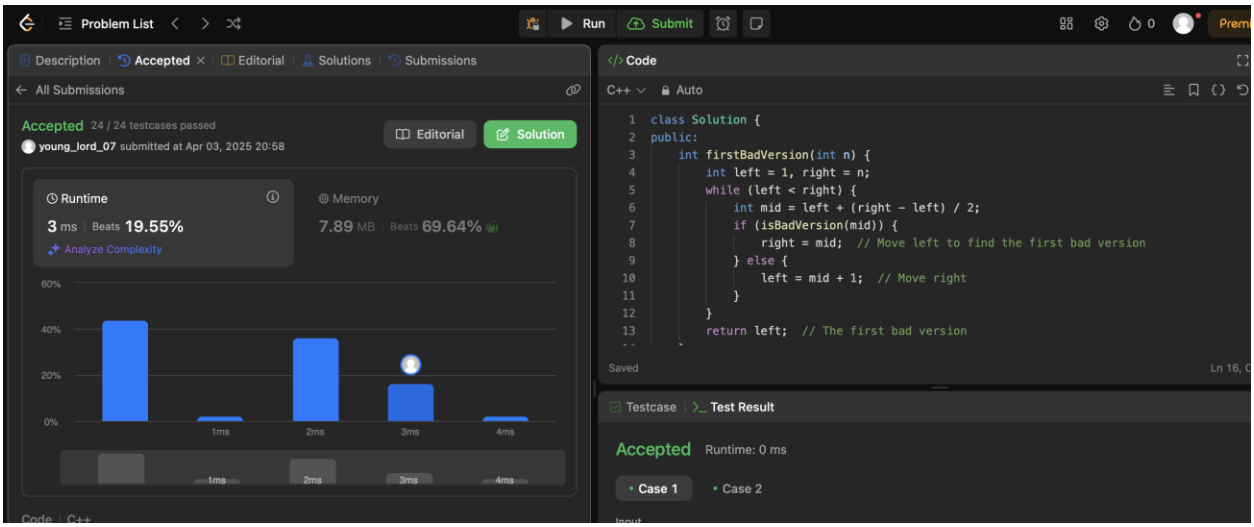
}

}

return left; // The first bad version

}

};

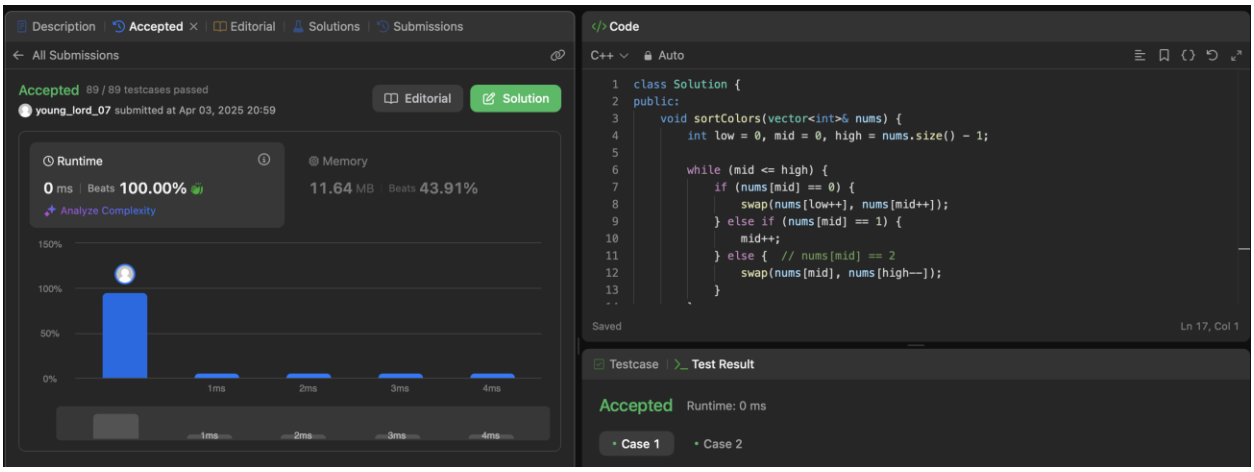


Solution 3: class Solution {

public:

```
    void sortColors(vector<int>& nums) {
        int low = 0, mid = 0, high = nums.size() - 1;

        while (mid <= high) {
            if (nums[mid] == 0) {
                swap(nums[low++], nums[mid++]);
            } else if (nums[mid] == 1) {
                mid++;
            } else {  // nums[mid] == 2
                swap(nums[mid], nums[high--]);
            }
        }
    }
};
```



Solution 4: class Solution {

public:

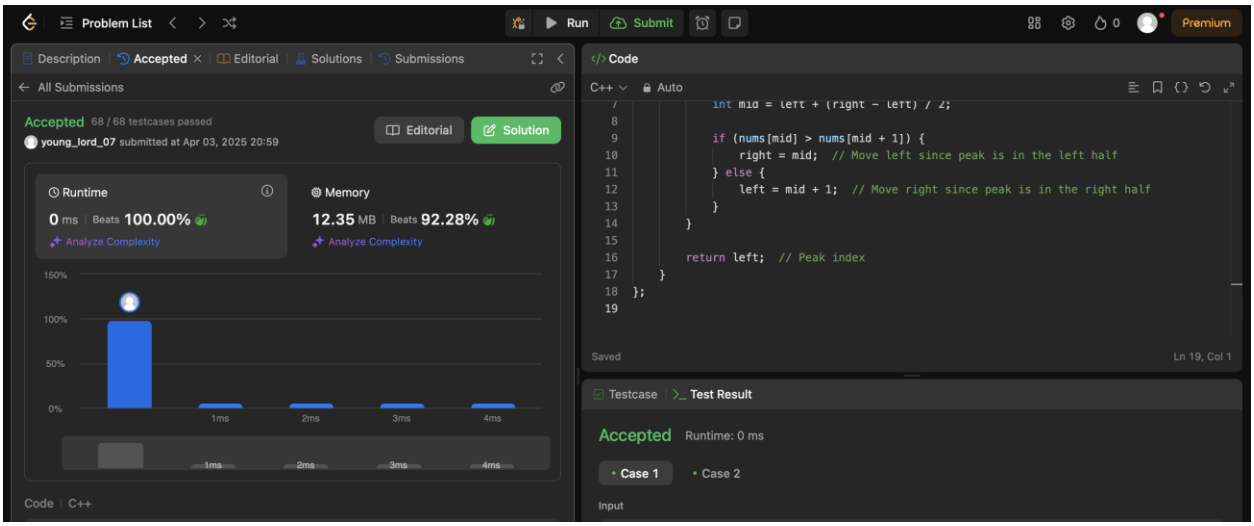
```
    int findPeakElement(vector<int>& nums) {
        int left = 0, right = nums.size() - 1;

        while (left < right) {
            int mid = left + (right - left) / 2;

            if (nums[mid] > nums[mid + 1]) {
                right = mid;  // Move left since peak is in the left half
            } else {
                left = mid + 1;  // Move right since peak is in the right half
            }
        }

        return left;  // Peak index
    }
```

};



Solution 5:

class Solution {

public:

double findMedianSortedArrays(vector<int>& nums1, vector<int>& nums2) {

if (nums1.size() > nums2.size())

return findMedianSortedArrays(nums2, nums1); // Ensuring nums1 is the smaller array

int m = nums1.size(), n = nums2.size();

int left = 0, right = m, halfLen = (m + n + 1) / 2;

while (left <= right) {

int mid1 = left + (right - left) / 2;

int mid2 = halfLen - mid1;

int left1 = (mid1 > 0) ? nums1[mid1 - 1] : INT_MIN;

int right1 = (mid1 < m) ? nums1[mid1] : INT_MAX;

```
        int left2 = (mid2 > 0) ? nums2[mid2 - 1] : INT_MIN;
        int right2 = (mid2 < n) ? nums2[mid2] : INT_MAX;

        if (left1 <= right2 && left2 <= right1) {
            if ((m + n) % 2 == 0)
                return (max(left1, left2) + min(right1, right2)) / 2.0;
            else
                return max(left1, left2);
        } else if (left1 > right2) {
            right = mid1 - 1;
        } else {
            left = mid1 + 1;
        }
    }

    return 0.0; // This should never be reached
  }
};
```