EXPERIMENT - 5

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Semester: 6th **Subject Code:** 22ITP-351

PROBLEM-1

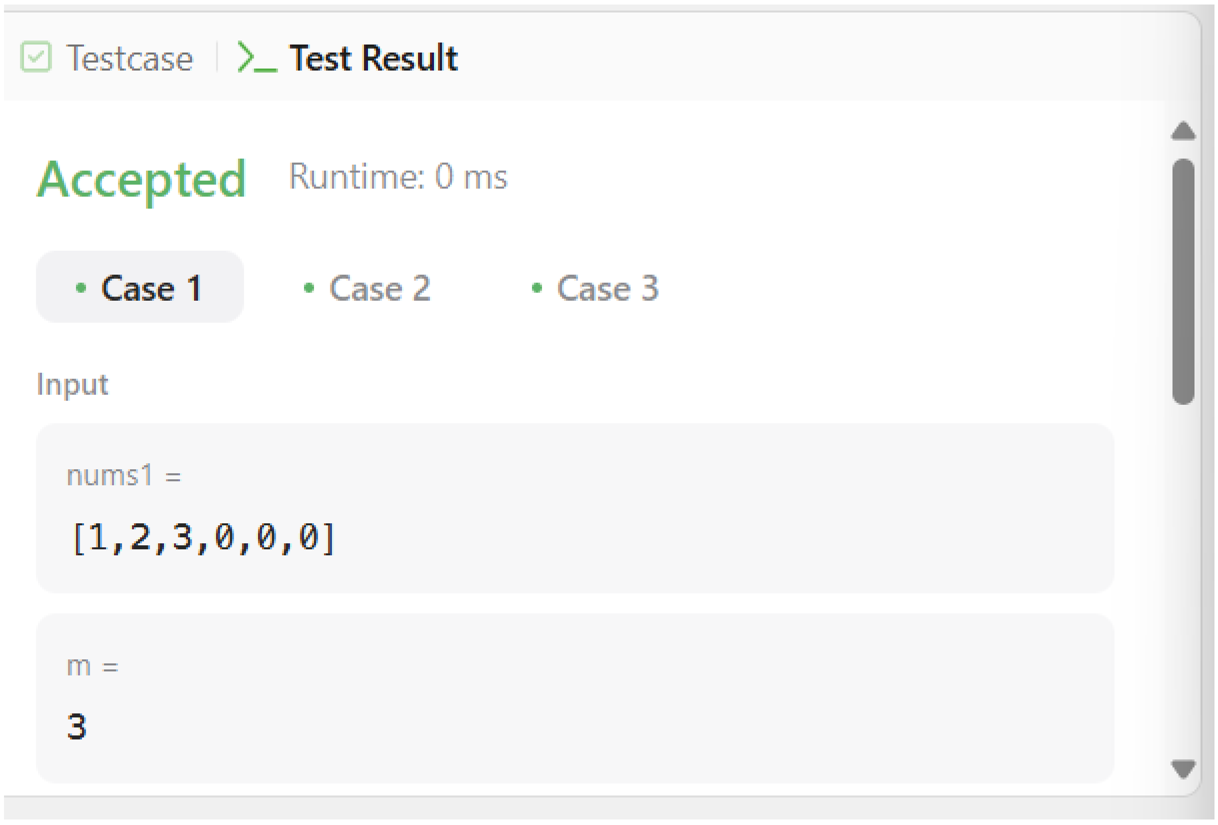
AIM:-

Merge Sorted Array

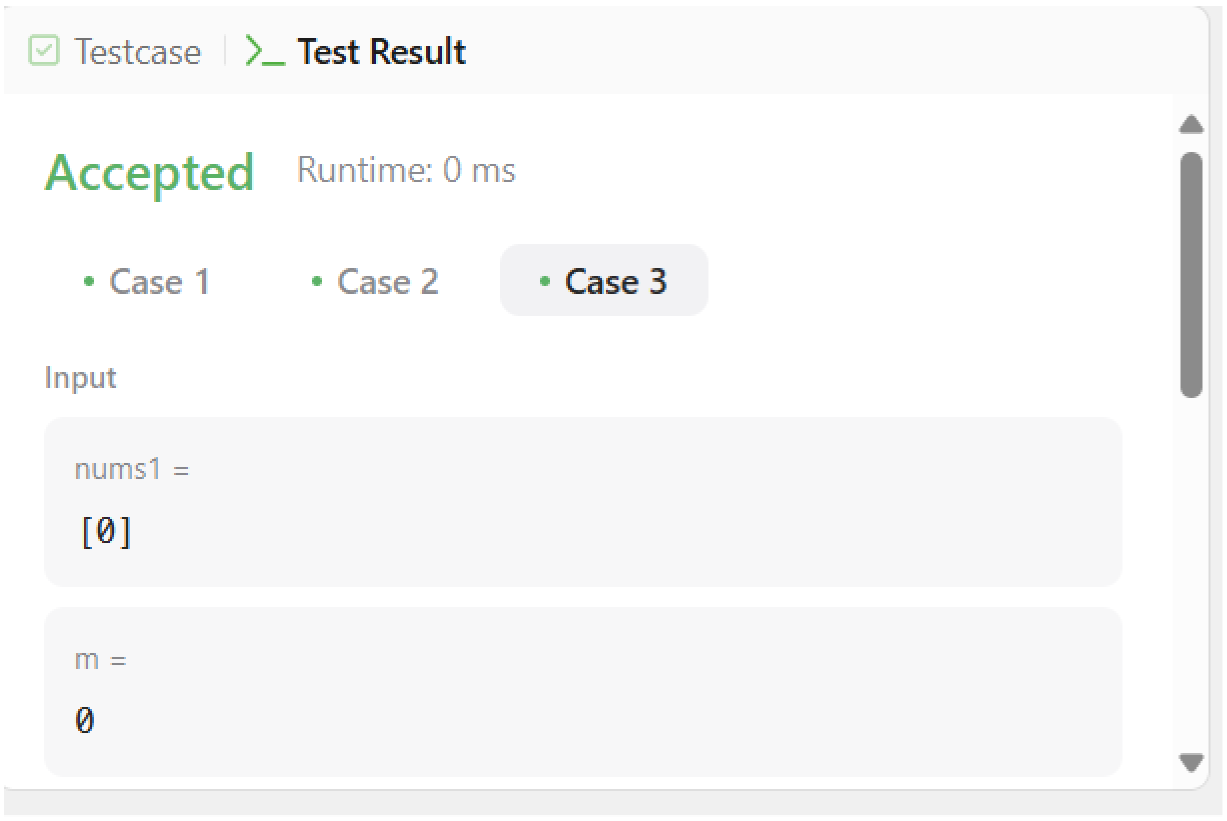
CODE:-

```
class Solution {
public:
   void merge(vector<int>& nums1,
int m, vector<int>& nums2, int n) {
      for (int j = 0, i = m; j<n; j++){
         nums1[i] = nums2[j];
         i++;
      }

sort(nums1.begin(),nums1.end());
   }
};
```

OUTPUT:-



```
Testcase | >_ Test Result

Accepted   Runtime: 0 ms

• Case 1   • Case 2   • Case 3

Input

nums1 =
[1,2,3,0,0,0]

m =
3
```



Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3

Input

```
nums1 =
[0]
```

```
m =
0
```

PROBLEM-2

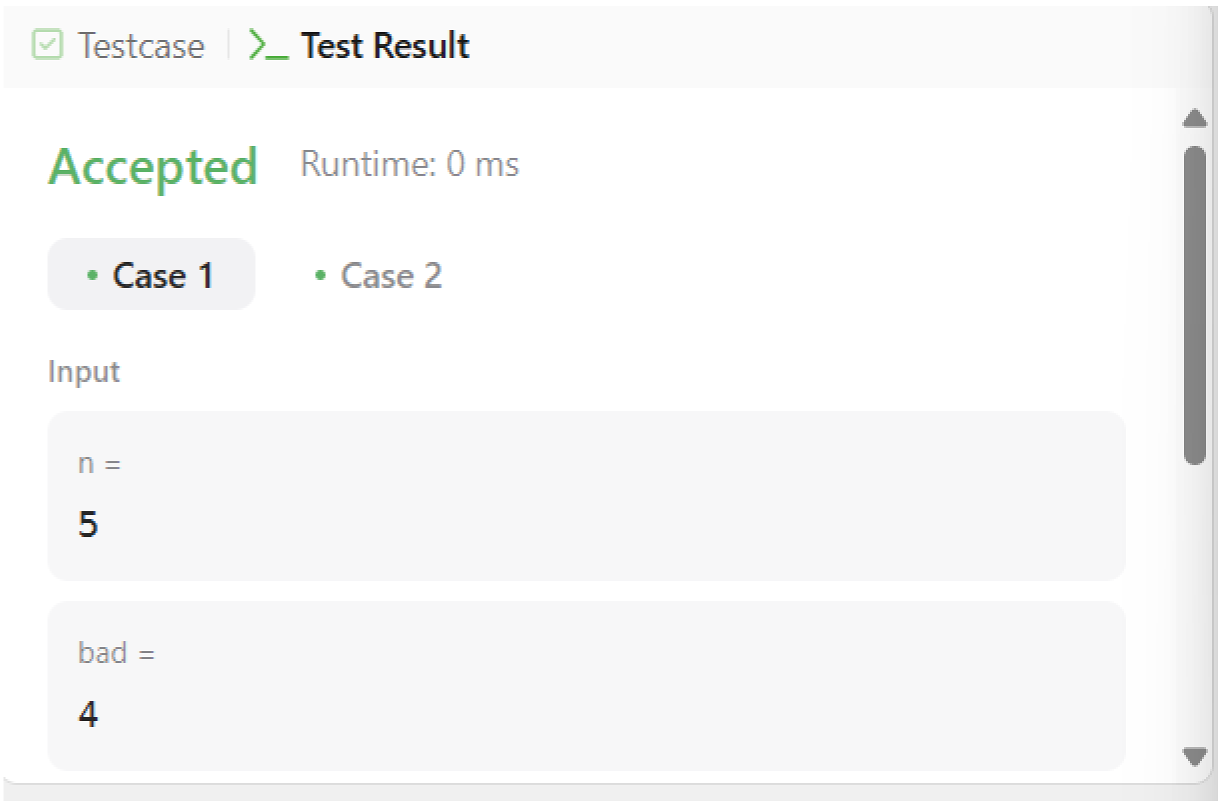
AIM:-

First Bad Version

CODE:-

```
// The API isBadVersion is defined
for you.
// bool isBadVersion(int version);


class Solution {
public:
    int firstBadVersion(int n){
        long long l = 1, r = n;
        long long m, res = n;
        while(l <= r){
            m = l + (r - l) / 2;
            if(isBadVersion(m) == 1){
                r = m - 1;
                res = min(res, m);
            } else {
                l = m + 1;
            }
        }
        return res;
    }
};
```

OUTPUT:-



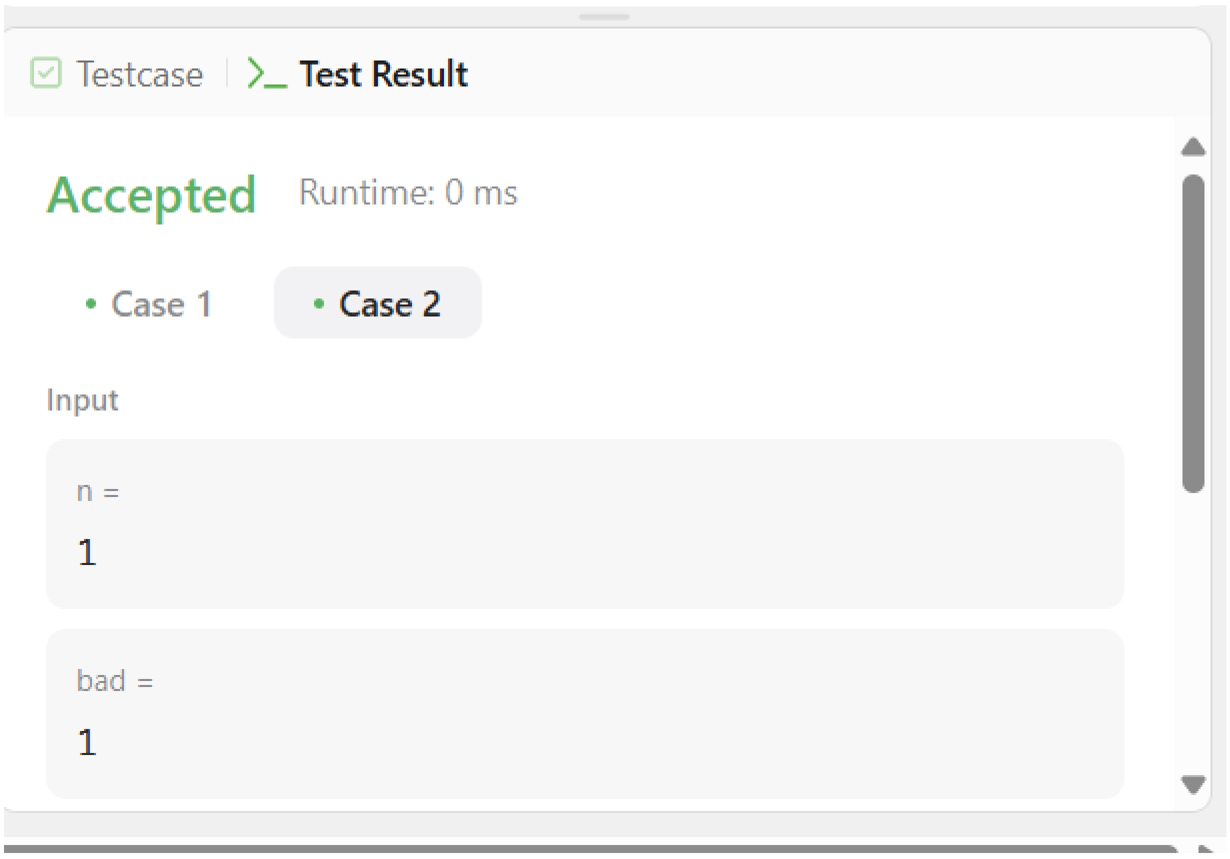
Accepted Runtime: 0 ms

Case 1 Case 2

Input

```
n =
5
```

```
bad =
4
```



Accepted Runtime: 0 ms

Case 1 Case 2

Input

```
n =
1
```

```
bad =
1
```

PROBLEM-3

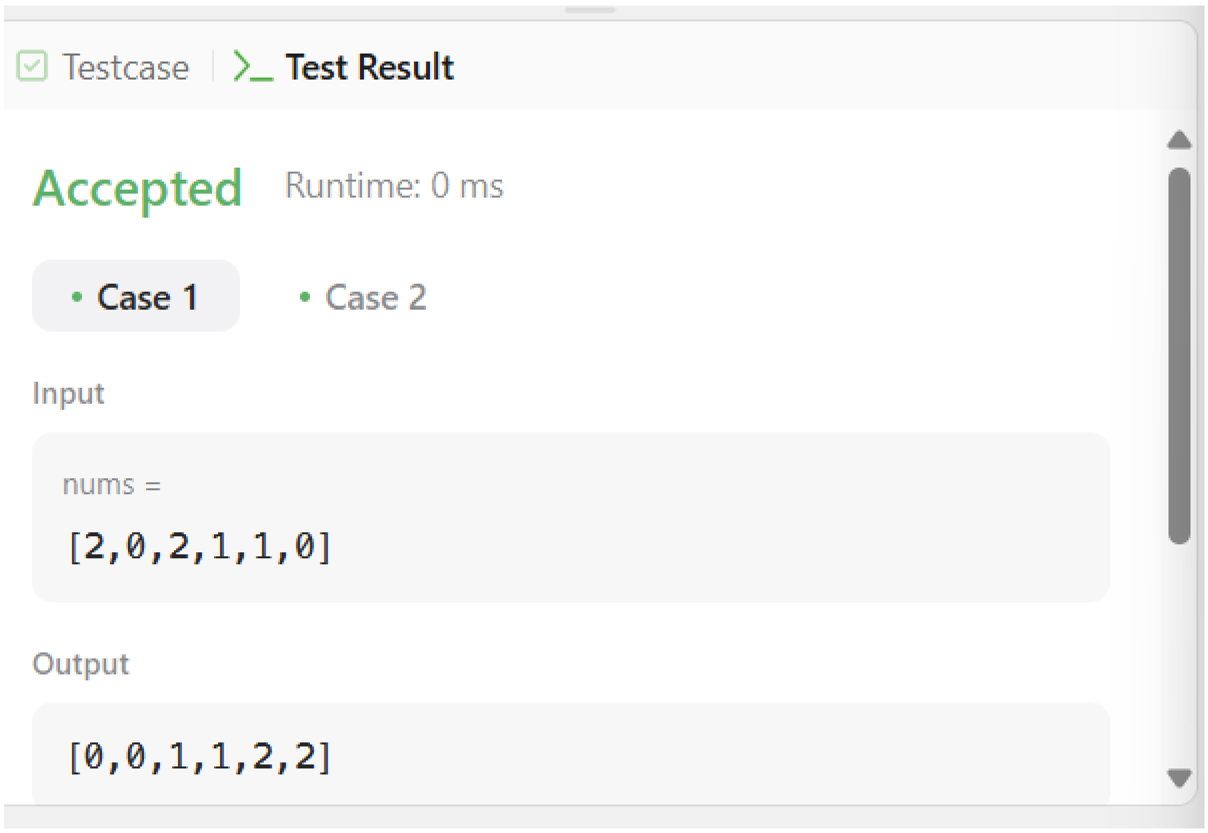
AIM:-

Sort Colors

CODE:-

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

OUTPUT:-



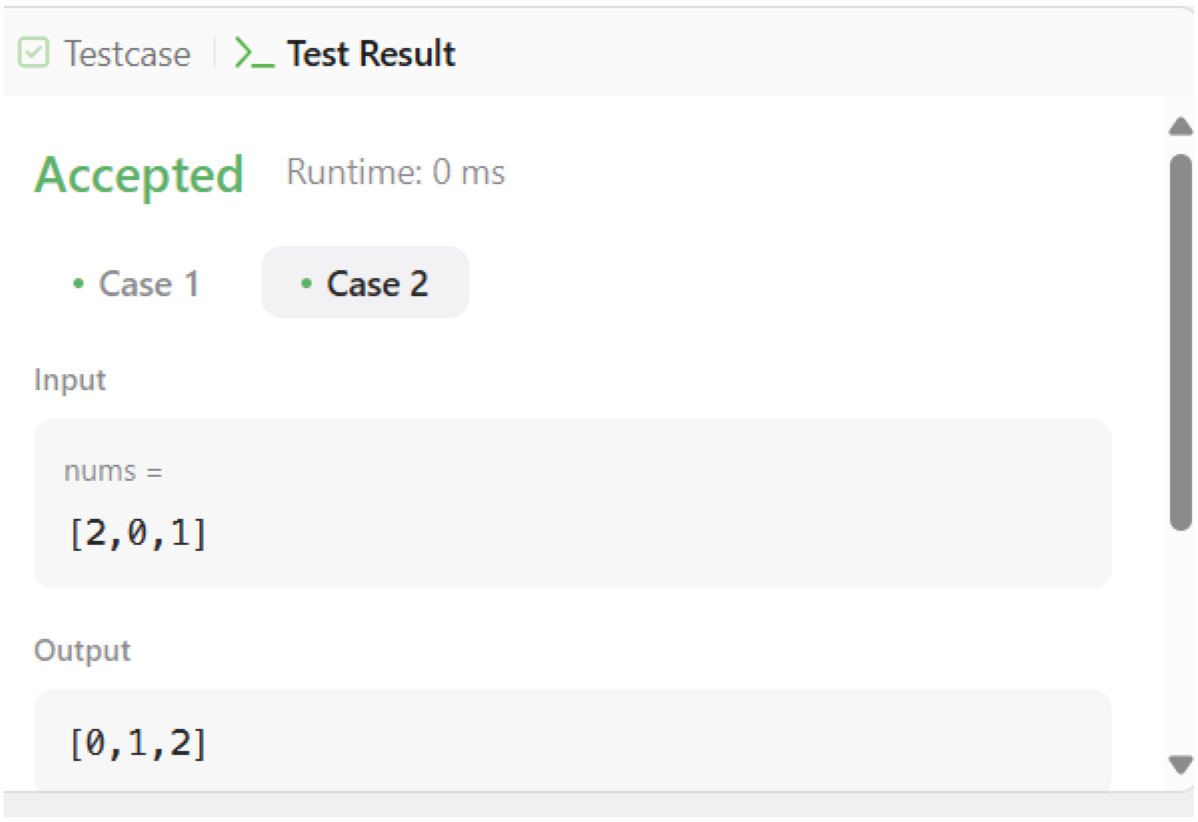
Accepted Runtime: 0 ms

Input

```
nums =
[2,0,2,1,1,0]
```

Output

```
[0,0,1,1,2,2]
```



Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

```
nums =
[2,0,1]
```

Output

```
[0,1,2]
```

PROBLEM-4

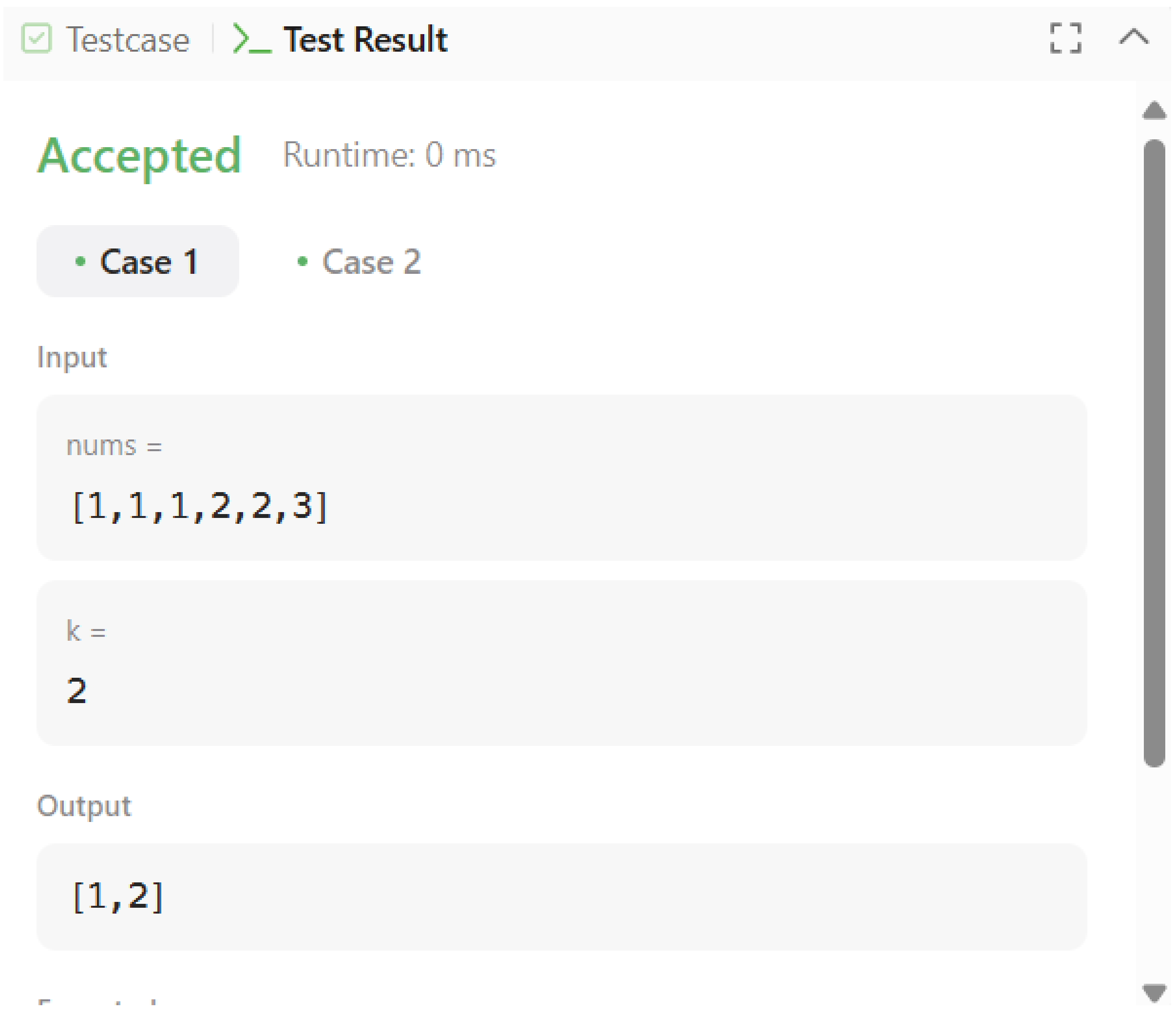
AIM:-

Top K Frequency Element

CODE:-

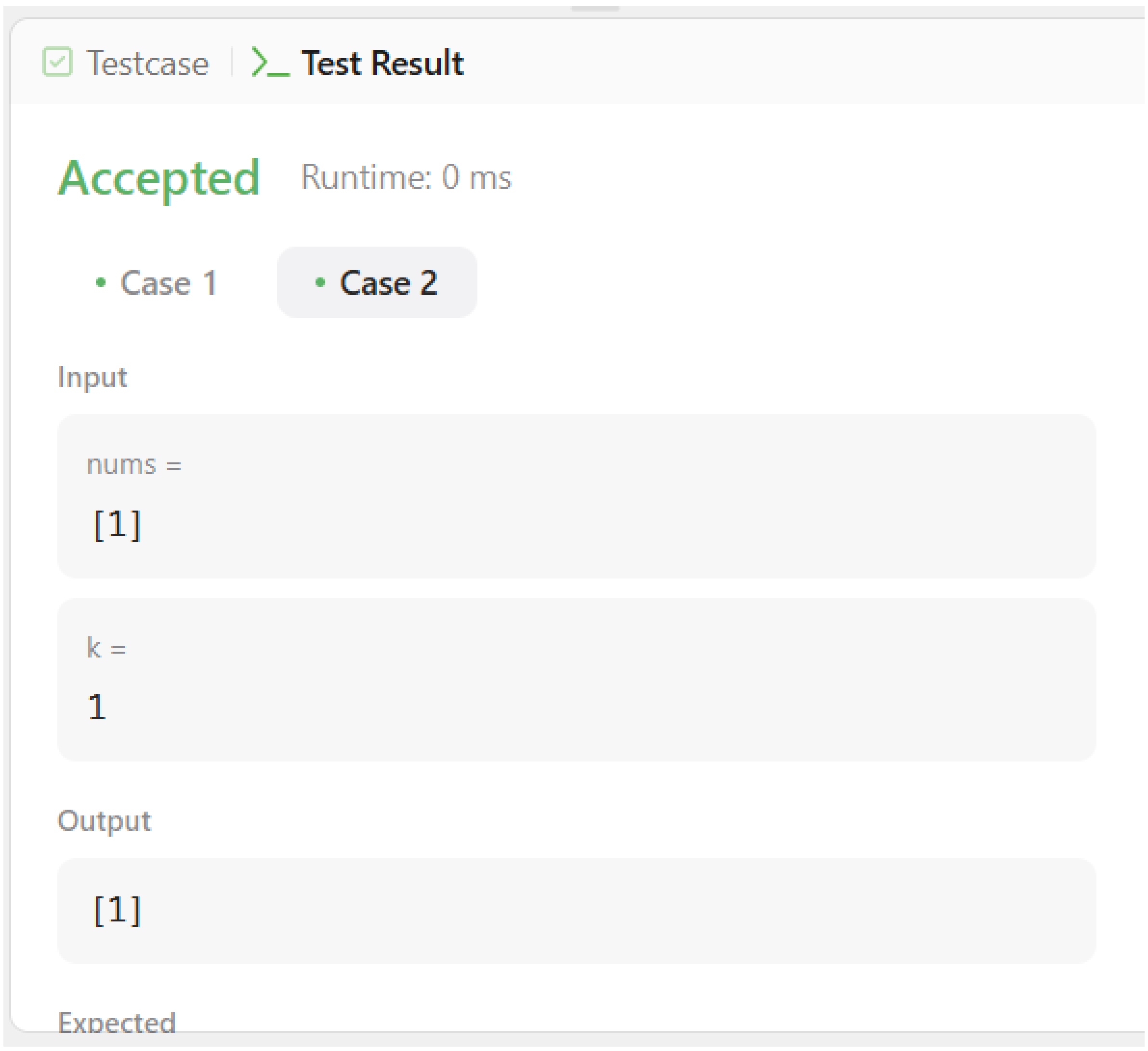
```
  class Solution {
  public:
     vector<int>
topKFrequent(vector<int>&
nums, int k) {
        unordered_map<int, int>
ump;

        for(int i: nums){
          ump[i]++;
        }

        priority_queue<pair<int,
int>>pq;

        for(auto i: ump){

pq.push({i.second,i.first});
        }
        vector<int> res;

        while(k--){
            auto [elem, count] =
pq.top();
            res.push_back(count);
            pq.pop();
        }

        return res;
    }
};
```

OUTPUT:-



Testcase   Test Result

```
Accepted    Runtime: 0 ms

• Case 1    • Case 2

Input

nums =
[1,1,1,2,2,3]

k =
2

Output

[1,2]
```


Testcase | >_ Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

nums =
```
[1]
```

k =
```
1
```

Output
```
[1]
```

Expected

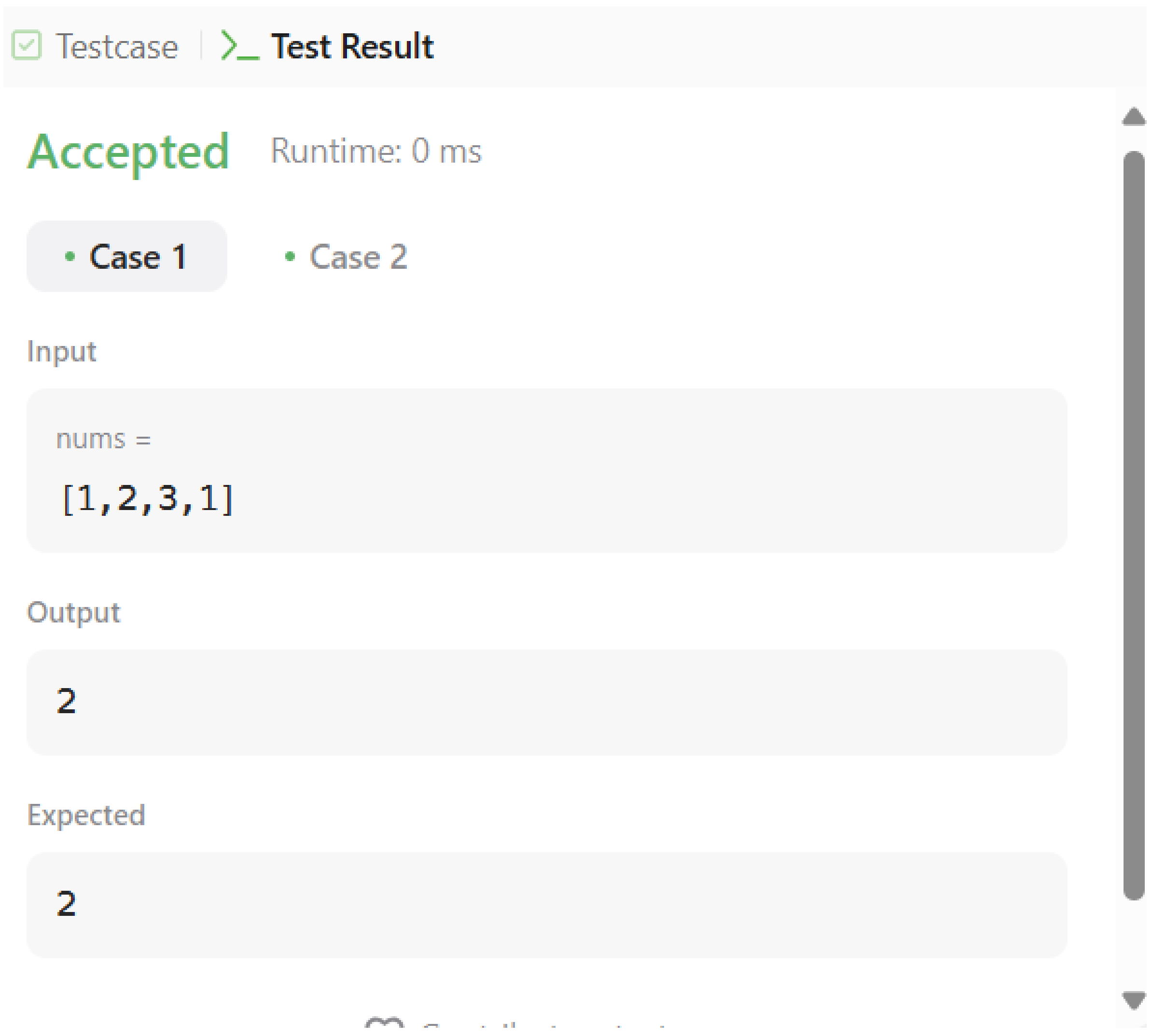
PROBLEM-5

AIM:- Find Peak Element

CODE:-

```
class Solution {

public:

    void solve(vector<int>&nums,int l,int r, int&ans){

        if(l>r || ans>-1) return ;

        int m=(r-l)/2+l;

        if(!(m-1>=0 && nums[m]<nums[m-1]) &&
!(m+1<nums.size() && nums[m]<nums[m+1])) ans=m;

        solve(nums, l, m-1, ans);

        solve(nums, m+1, r, ans);

        return ;
    }
    int findPeakElement(vector<int>& nums) {
        int ans=-1, l=0, r=nums.size()-1;
        solve(nums, l, r, ans);
        return ans;
    }
};
```

OUTPUT:-



Accepted Runtime: 0 ms

Case 1 Case 2

Input

nums =

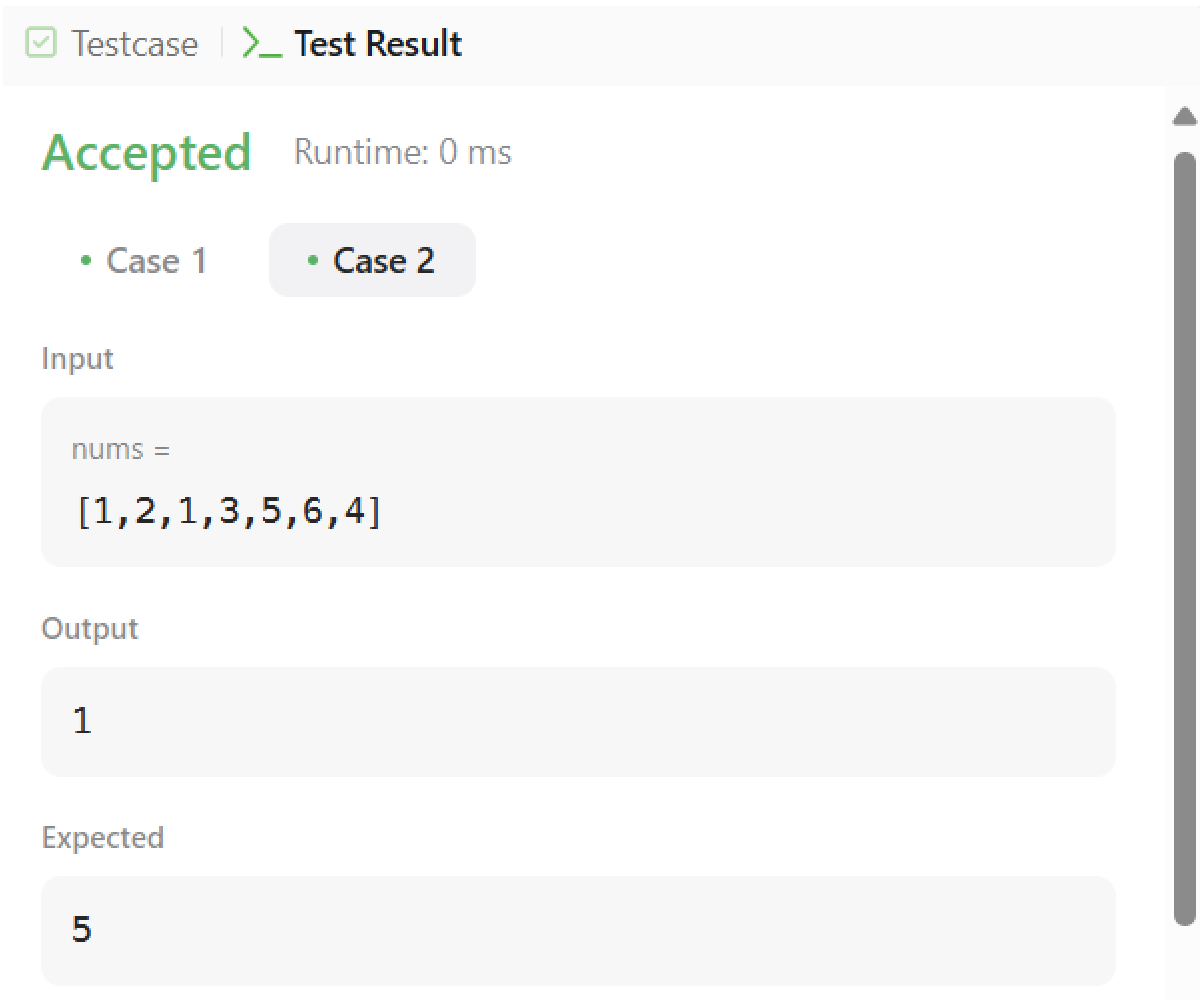
```
[1,2,3,1]
```

Output

```
2
```

Expected

```
2
```


Testcase | Test Result

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

nums =

```
[1,2,1,3,5,6,4]
```

Output

```
1
```

Expected

```
5
```