Experiment 4

Student Name: Harsh Mishra **UID: 22BCS14844**
Branch: CSE **Section/Group: 604-B**
Semester: 6 **Date of Performance:**
Subject Name: AP LAB-II **Subject Code: 22CSP-351**

1. Aim:

- Binary Search.
- Sort Colors
- Merge Sorted Array

2. Objective:

- Understand the fundamentals Searching and Sorting.
- Writing some good code.
- Understanding some Java concepts.

3. Implementation/Code:

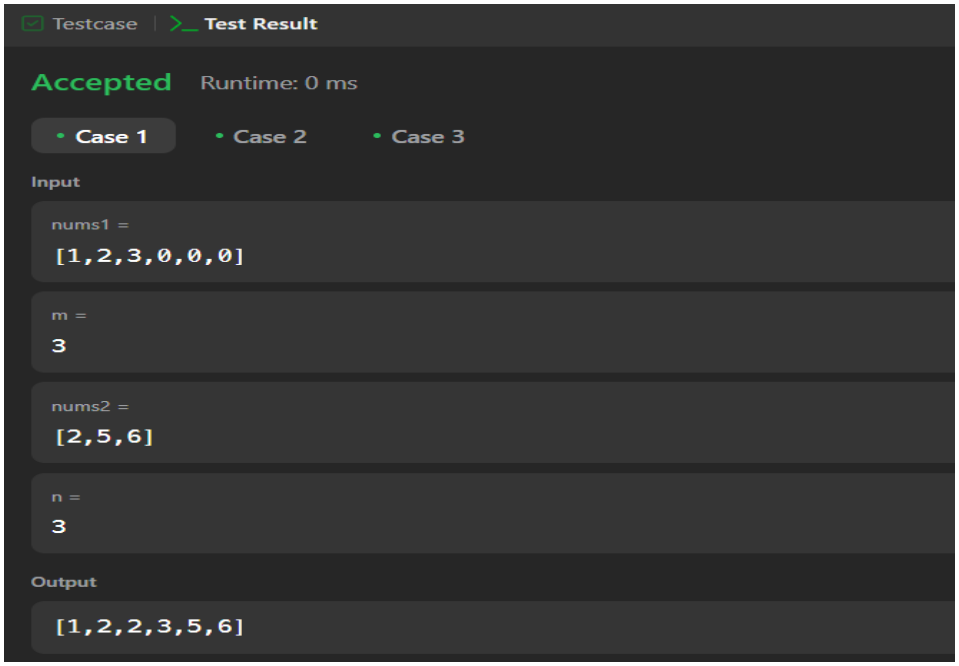
```
class BinarySearch
{
   int binarySearch(int a[], int l, int r, int x)
   {
      while (l <= r) {
         int m = (l + r) / 2;
         if (a[m] == x)
         {
            return m;
         }
         else if (a[m] > x)
```

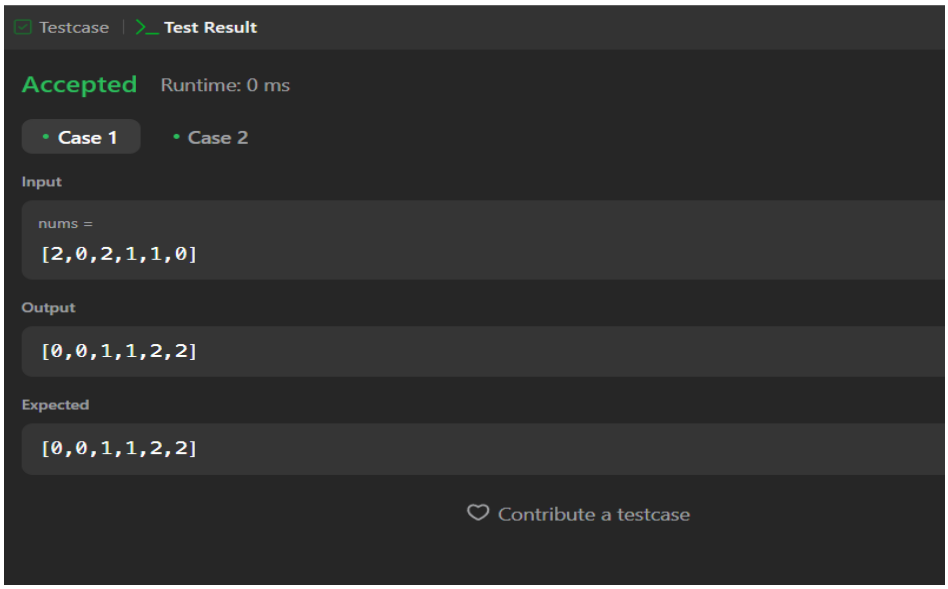
```
            {
                r = m - 1;
            }
            else
            {
             l = m + 1;
            }
        }
        return -1;
    }
    public static void main(String args[])
    {
        BinarySearch ob = new BinarySearch();
        int a[] = { 2, 3, 4, 10, 40 };
        int n = a.length;
        int x = 10;
        int res = ob.binarySearch(a, 0, n - 1, x);
        if (res == -1)
            System.out.println("-1");
        else
            System.out.println(res);
    }
}
```

```
class Solution
{
  public void sortColors(int[] nums)
  {
    int l = 0;
    int r = nums.length - 1;
    for (int i = 0; i <= r;)
      if (nums[i] == 0)
        swap(nums, i++, l++);
      else if (nums[i] == 1)
        ++i;
      else
        swap(nums, i, r--);
  }
  private void swap(int[] nums, int i, int j)
  {
    final int temp = nums[i];
    nums[i] = nums[j];
    nums[j] = temp;
  }
    }
```

```
class Solution
{
  public void merge(int[] nums1, int m, int[] nums2, int n) {
    int i = m - 1;
    int j = n - 1;
    int k = m + n - 1;
    while (j >= 0)
      if (i >= 0 && nums1[i] > nums2[j])
        nums1[k--] = nums1[i--];
      else
        nums1[k--] = nums2[j--];
  }
    }
```

4. Output:


Testcase
Test Result
Accepted
Runtime: 0 ms
Case 1
Case 2
Case 3
Input
nums1 =
[1,2,3,0,0,0]
m =
3
nums2 =
[2,5,6]
n =
3
Output
[1,2,2,3,5,6]


Testcase
Test Result
Accepted
Runtime: 0 ms
Case 1
Case 2
Input
nums =
[2,0,2,1,1,0]
Output
[0,0,1,1,2,2]
Expected
[0,0,1,1,2,2]
Contribute a testcase

5. Learning Outcome:

- Learn how to use divide and conquer approach.
- Set up a leetcode solution page for submitting solution.