APAssignment 5

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Section: 608-B

1) Merge Sorted Array

```
#include <iostream>
#include <vector>
using namespace std;
class Solution {
public:
  void merge(vector<int>& nums1, int m, vector<int>& nums2, int n) {
     int i = m - 1;
     int j = n - 1;
     int k = m + n - 1;
     while (i \ge 0 \&\& j \ge 0) {
       if (nums1[i] > nums2[j]) {
          nums1[k--] = nums1[i--];
       } else {
          nums1[k--] = nums2[j--];
     }
     while (j >= 0) {
       nums1[k--] = nums2[j--];
     }
  }
};
int main() {
  Solution sol;
  vector<int> nums1 = {1, 2, 3, 0, 0, 0};
  vector<int> nums2 = \{2, 5, 6\};
  int m = 3, n = 3;
```

```
sol.merge(nums1, m, nums2, n);
cout << "Merged Array: ";</pre>
for (int num: nums1) {
   cout << num << " ";
}
return 0;
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   Sep 25, 2024
```

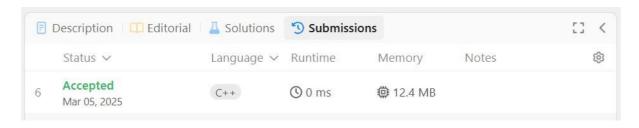
2) Sort Colors

```
nums[index++] = 0;
     }
     while (k--) {
       nums[index++] = 1;
     }
     while (l--) {
       nums[index++] = 2;
     }
  }
};
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3) Find Peak Element
class Solution {
```

```
public:
  int findPeakElement(vector<int>& nums) {
    int n = nums.size();
    int low = 0, high = n - 1;
    while (low < high) {
       int mid = low + (high - low) / 2;
       if (nums[mid] > nums[mid + 1]) {
         high = mid;
```

```
} else {
    low = mid + 1;
}

return low;
}
```



4) Median of two sorted Array

```
class Solution {
public:
    double findMedianSortedArrays(vector<int>& nums1, vector<int>& nums2) {
        if (nums1.size() > nums2.size()) {
            return findMedianSortedArrays(nums2, nums1);
        }
        int m = nums1.size();
        int n = nums2.size();
        int low = 0, high = m;

        while (low <= high) {
            int partition1 = low + (high - low) / 2;
            int partition2 = (m + n + 1) / 2 - partition1;

        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
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        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
        int maxLeft1 = (partition1 == 0) ? INT_MIN : nums1[partition1 - 1];
```

```
int minRight1 = (partition1 == m) ? INT_MAX : nums1[partition1];
       int maxLeft2 = (partition2 == 0) ? INT_MIN : nums2[partition2 - 1];
       int minRight2 = (partition2 == n) ? INT_MAX : nums2[partition2];
       if (maxLeft1 <= minRight2 && maxLeft2 <= minRight1) {</pre>
         if ((m + n) \% 2 == 0) {
            return (max(maxLeft1, maxLeft2) + min(minRight1, minRight2)) / 2.0;
          } else {
            return max(maxLeft1, maxLeft2);
          }
       } else if (maxLeft1 > minRight2) {
         high = partition1 - 1;
       } else {
         low = partition 1 + 1;
       }
     }
    throw invalid_argument("Input arrays are not sorted.");
  }
};
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```

5) First Bad Version

bool isBadVersion(int version);

```
class Solution {
public:
  int firstBadVersion(int n) {
     int low = 1, high = n;
     while (low < high) {
       int mid = low + (high - low) / 2;
       if (isBadVersion(mid)) {
          high = mid;
        } else {
          low = mid + 1;
        }
     }
     return low
  }
};

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