

Assignment Questions 1

Q1. Given an array of integers `nums` and an integer `target`, return indices of the two numbers such that they add up to `target`.

You may assume that each input would have exactly one solution, and you may not use the same element twice.

You can return the answer in any order.

Example: Input: `nums = [2,7,11,15]`, `target = 9` Output: `[0,1]`

Explanation: Because `nums[0] + nums[1] == 9`, we return `[0, 1]`

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Ans =

```
class Solution {
public:
    vector<int> twoSum(vector<int>& nums, int target) {
        int n = nums.size();
        for (int i = 0; i < n - 1; i++) {
            for (int j = i + 1; j < n; j++) {
                if (nums[i] + nums[j] == target) {
                    return {i, j};
                }
            }
        }
        return {}; // No solution found
    }
};
```

Q2. Given an integer array `nums` and an integer `val`, remove all occurrences of `val` in `nums` in-place. The order of the elements may be changed. Then return the number of elements in `nums` which are not equal to `val`.

Consider the number of elements in `nums` which are not equal to `val` be `k`, to get accepted, you need to do the following things:

- Change the array `nums` such that the first `k` elements of `nums` contain the elements which are not equal to `val`. The remaining elements of `nums` are not important as well as the size of `nums`.
- Return `k`.

Example : Input: `nums = [3,2,2,3]`, `val = 3` Output: `2`, `nums = [2,2,*,*]`

Explanation: Your function should return `k = 2`, with the first two elements of `nums` being `2`. It does not matter what you leave beyond the returned `k` (hence they are underscores)

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Ans =

```
class Solution {
```

```

int removeElement(List<int> nums, int val) {

    for(int i = 0 ; i < nums.length;i++){
        nums.remove(val);
    }
    return nums.length;
}
}

```

Q3. Given a sorted array of distinct integers and a target value, return the index if the target is found. If not, return the index where it would be if it were inserted in order.

You must write an algorithm with $O(\log n)$ runtime complexity.

Example 1: Input: nums = [1,3,5,6], target = 5

Output: 2

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Ans =

```

class Solution {
public:
    int searchInsert(vector<int>& nums, int target) {
        int low=0;
        int high=nums.size();
        int mid;
        if(target>nums[high-1]){
            return high;
        }
        while(low<=high){
            mid=(low+high)/2;
            if(nums[mid]==target){
                return mid;
            }

            if(target<nums[mid]){
                high=mid-1;
            }else{
                low=mid+1;
            }
        }
        return low;
    }
};

```

Q4. You are given a large integer represented as an integer array `digits`, where each `digits[i]` is the *i*th digit of the integer. The digits are ordered from most significant to least significant in left-to-right order. The large integer does not contain any leading 0's.

Increment the large integer by one and return the resulting array of digits.

Example 1: Input: `digits = [1,2,3]` Output: `[1,2,4]`

Explanation: The array represents the integer 123.

Incrementing by one gives $123 + 1 = 124$. Thus, the result should be `[1,2,4]`.

</aside>

Ans=

```
class Solution {
public:
    vector<int> plusOne(vector<int>& v) {
        int n = v.size();
        for(int i = n-1; i >= 0; i--){
            if(i == n-1)
                v[i]++;
            if(v[i] == 10){
                v[i] = 0;
                if(i != 0){
                    v[i-1]++;
                }
            }
            else{
                v.push_back(0);
                v[i] = 1;
            }
        }
    }
    return v;
};
```

Q5. You are given two integer arrays `nums1` and `nums2`, sorted in non-decreasing order, and two integers `m` and `n`, representing the number of elements in `nums1` and `nums2` respectively.

Merge `nums1` and `nums2` into a single array sorted in non-decreasing order.

The final sorted array should not be returned by the function, but instead be stored inside the array `nums1`. To accommodate this, `nums1` has a length of `m + n`, where the first `m` elements denote the elements that should be merged, and the last `n` elements are set to 0 and should be ignored. `nums2` has a length of `n`.

Example 1: Input: `nums1 = [1,2,3,0,0,0]`, `m = 3`, `nums2 = [2,5,6]`, `n = 3` Output: `[1,2,2,3,5,6]`

Explanation: The arrays we are merging are `[1,2,3]` and `[2,5,6]`. The result of the merge is `[1,2,2,3,5,6]` with the underlined elements coming from `nums1`.

Ans =

```
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 (j >= 0) {
```

```
        if (i >= 0 && nums1[i] > nums2[j]) {
```

```
            nums1[k--] = nums1[i--];
```

```
        } else {
```

```
            nums1[k--] = nums2[j--];
```

```
        }
```

```
    }
```

```
}
```

```
};
```

Q6. Given an integer array nums, return true if any value appears at least twice in the array, and return false if every element is distinct.

Example 1: Input: nums = [1,2,3,1]

Output: true

Ans =

```
/** Approach : Sort & Find Duplicates */
```

```
// Time Complexity: O(nlogn)
```

```
// Space Complexity: O(1)
```

```
class Solution {
```

```
public:
```

```
bool containsDuplicate(vector<int>& nums) {
```

```
    // Sort the nums...
```

```

    sort(nums.begin(), nums.end());

    // Traverse all the elements through the loop...
    for(int idx = 0; idx < nums.size() - 1; idx++) {

        // Check the duplicate element...

        if(nums[idx] == nums[idx + 1])

            return true;

    }

    // Otherwise return false...

    return false;

}

};

```

Q7. Given an integer array nums, move all 0's to the end of it while maintaining the relative order of the nonzero elements.

Note that you must do this in-place without making a copy of the array.

Example 1: Input: nums = [0,1,0,3,12] Output: [1,3,12,0,0]

Ans =

```

    class Solution {

public:

    void moveZeroes(vector<int>& nums) {

        int n= nums.size();

        int start=0, end=n-1,mid=0;

        while(mid<=end){

            if(nums[mid]!=0){

                swap(nums[start],nums[mid]);

                start++;

            }

}

```

```
        mid++;  
    }  
}  
};
```