



WORKSHEET 4

Student Name: Parth Arora

UID: 22BCS16661

Branch: BE-CSE

Section/Group: 22BCS_NTPP-602-A

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Subject Name: AP LAB - II

Subject Code: 22CSP-351

- 1. Aim:** Reverse 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**.

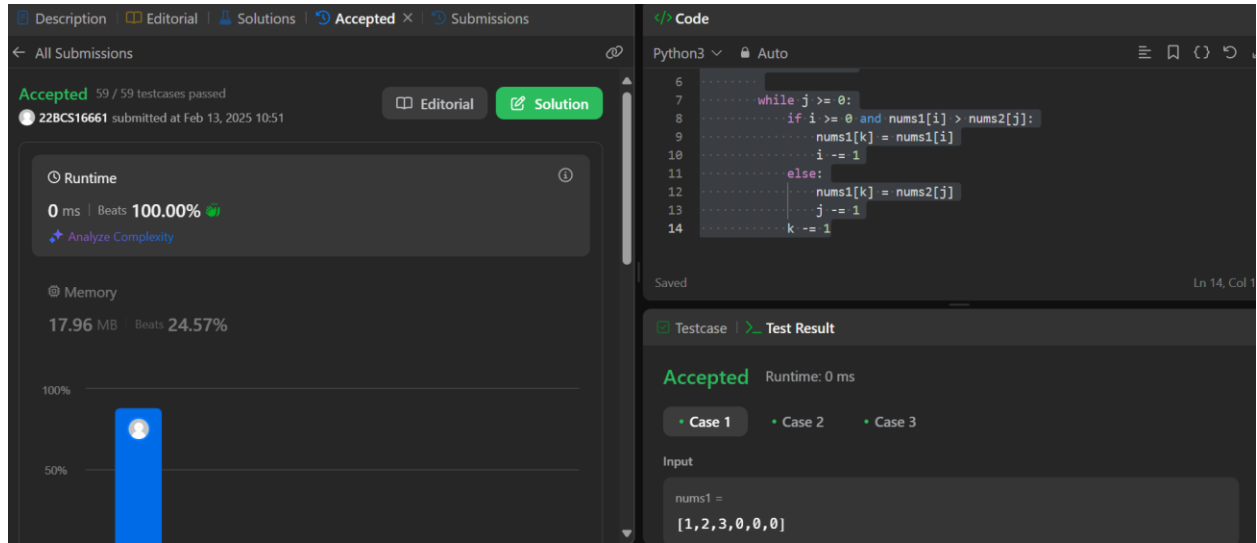
The final sorted array should not be returned by the function, but instead be *stored inside the array* `nums1`. To accommodate this, `nums1` has a length of `m + n`, where the first `m` elements denote the elements that should be merged, and the last `n` elements are set to 0 and should be ignored.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

2. Source Code:

```
class Solution(object):
    def merge(self, nums1, m, nums2, n):
        i = m - 1
        j = n - 1
        k = m + n - 1

        while j >= 0:
            if i >= 0 and nums1[i] > nums2[j]:
                nums1[k] = nums1[i]
                i -= 1
            else:
                nums1[k] = nums2[j]
                j -= 1
            k -= 1
```

3. Screenshots of outputs:



The screenshot displays a code editor interface for a Python solution. The left pane shows the submission status: 'Accepted' with 59/59 testcases passed. The runtime is 0 ms, beating 100.00% of other solutions. The memory usage is 17.96 MB, beating 24.57%. The right pane shows the Python code, which uses a dictionary to count the frequency of each element in the input array and then sorts the items to return the top k elements.

```

6 .....while j >= 0:
7 .....    if i >= 0 and nums1[i] > nums2[j]:
8 .....        nums1[k] = nums1[i]
9 .....        i -= 1
10 .....    else:
11 .....        nums1[k] = nums2[j]
12 .....        j -= 1
13 .....        k -= 1
14 .....

```

The test result shows the solution is 'Accepted' with a runtime of 0 ms. The input for the test case is:

```

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

```

2.

Aim: Given an integer array *nums* and an integer *k*, return *the k most frequent elements*. You may return the answer in **any order**.

Source Code:

```

class Solution:
    def topKFrequent(self, nums: List[int], k: int) -> List[int]:
        gods_love = dict()
        ans = list()

        for num in nums:
            # adding freq of elem like a true one liner god
            gods_love[num] = gods_love.get(num, 0) + 1

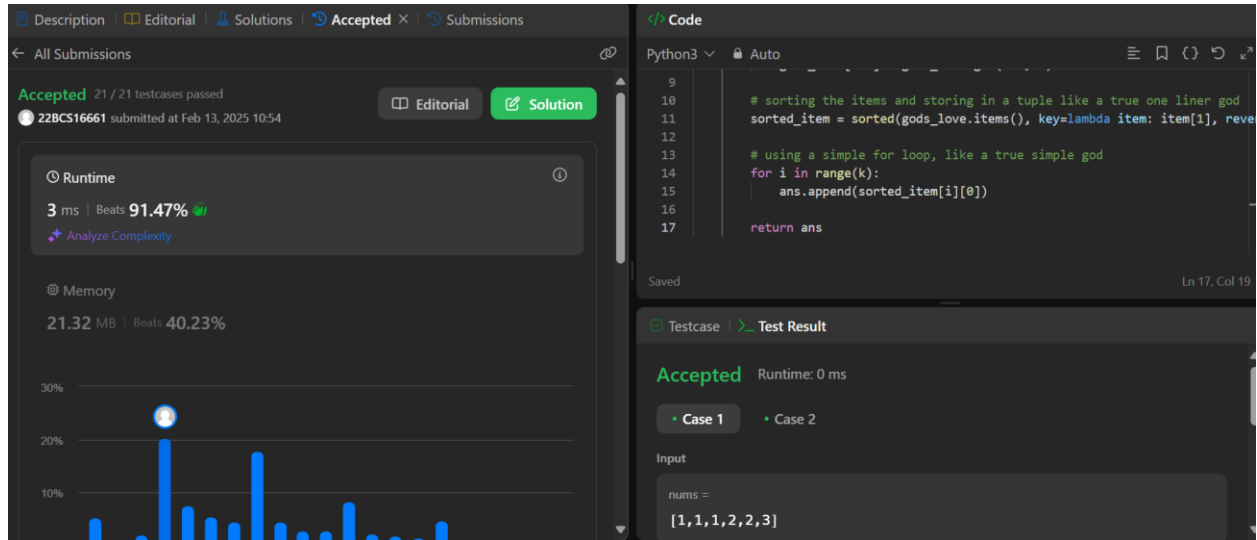
        # sorting the items and storing in a tuple like a true one liner god
        sorted_item = sorted(gods_love.items(), key=lambda item: item[1], reverse=True)

        # using a simple for loop, like a true simple god
        for i in range(k):
            ans.append(sorted_item[i][0])

        return ans

```

Screenshots of outputs:



3.

Aim: Given an array of intervals where $\text{intervals}[i] = [\text{start}_i, \text{end}_i]$, merge all overlapping intervals, and return *an array of the non-overlapping intervals that cover all the intervals in the input.*

Source Code:

```

class Solution:
    def merge(self, intervals: List[List[int]]) -> List[List[int]]:
        intervals.sort(key=lambda x: x[0]) # Sort intervals by start time
        k = 0 # Index for merged intervals

        for i in range(1, len(intervals)):
            if intervals[k][1] >= intervals[i][0]: # Overlap detected
                intervals[k][1] = max(intervals[k][1], intervals[i][1]) # Merge
            else:
                k += 1 # Move to the next position
                intervals[k] = intervals[i] # Replace in-place

        return intervals[:k + 1] # Return only merged intervals
        result.append([x, curr_max_height])

```



4. Screenshots of outputs:

