

EP. 21

**TOP INTERVIEW
QUESTION**

CODING INTERVIEW



Hi Shreya! I am
Ashay. I am going
to take your
technical round.

Hey Ashay! Thanks
for giving me this
oppportunity.



I am going to ask
few Coding
Questions.

okay.





At the end of pdf, I am sharing details of my Microsoft and Oracle interview experiences and Java articles details for interview preparation.

PROBLEM STATEMENT



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 .

EXAMPLES



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`.

Example 2:

Input: `nums1 = [1], m = 1, nums2 = [], n = 0`

Output: `[1]`

Explanation: The arrays we are merging are `[1]` and `[]`.
The result of the merge is `[1]`.

Example 3:

Input: `nums1 = [0], m = 0, nums2 = [1], n = 1`


Output: `[1]`

Explanation: The arrays we are merging are `[]` and `[1]`.
The result of the merge is `[1]`.

Note that because `m = 0`, there are no elements in `nums1`. The `0` is only there to ensure the merge result can fit in `nums1`.

APPROACH 1



Merge these two sorted array into third array and then copy third array to first array : **TC $\rightarrow O(n)$ and SC $\rightarrow O(n)$** – see code for reference. 

CODE

```

1 class Solution {
2     public void merge(int[] nums1, int m, int[] nums2, int n)
3     {
4         int thirdArray[] = new int[n+m];
5         int i = 0; // for nums1
6         int j = 0; // for nums2
7         int k = 0; // for thirdArray
8         while(i<m&& j<n){
9             if(nums1[i]<=nums2[j]){
10                 thirdArray[k] = nums1[i];
11                 i++;
12                 k++;
13             }
14             else{
15                 thirdArray[k] = nums2[j];
16                 j++;
17                 k++;
18             }
19         }
20         while(i<m){
21             thirdArray[k] = nums1[i];
22             i++;
23             k++;
24         }
25         while(j<n){
26             thirdArray[k] = nums2[j];
27             j++;
28             k++;
29         }
30     }
31     for(int idx=0;idx<n+m;idx++){
32         nums1[idx] = thirdArray[idx];
33     }
34 }
35 }
36 }
```


APPROACH 2



Iterate from right to left to merge the arrays into first array: **best solution**

Explanation: Forget this question as of now. Let's say we have to merge two sorted array into third array in increasing order then we can achieve it in two ways. **One** (that is being done in Approach 1) is to keep iterating both the arrays from left to right (i for nums1 and j for nums2) and **Second way** is opposite i.e. keep iterating both the arrays from right to left (i for nums1 and j for nums2).

We follow second way but instead of storing it in third array, we will store it in first array as we have given extra space in that. See solution. 

CODE



```
Title

1 class Solution {
2     public void merge(int[] nums1, int m, int[] nums2, int n)
3     {
4         int i = m-1;
5         int j= n-1;
6         int k= n+m-1;
7         while(i>=0&&j>=0){
8             if(nums1[i]>nums2[j]){
9                 nums1[k]=nums1[i];
10                i--;
11                k--;
12            }
13            else{
14                nums1[k]=nums2[j];
15                j--;k--;
16            }
17        }
18        while(j>=0){
19            nums1[k]=nums2[j];
20            j--;
21            k--;
22        }
23    }
24 }
25 }
```



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