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88. Merge Sorted Array

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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`.

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`.

Constraints:

- `nums1.length == m + n`
- `nums2.length == n`
- `0 <= m, n <= 200`
- `1 <= m + n <= 200`
- `-109 <= nums1[i], nums2[j] <= 109`

Follow up: Can you come up with an algorithm that runs in `O(m + n)` time?

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No

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```
1 class Solution {
2     public void merge(int[] nums1, int m, int[] nums2, int n) {
3
4         int p1 = m - 1;
5         int p2 = n - 1;
6         int i = m + n - 1;
7
8         while(p2 >= 0) {
9             if(p1 >= 0 && nums1[p1] > nums2[p2]) {
10                 nums1[i--] = nums1[p1--];
11             }
12             else {
13                 nums1[i--] = nums2[p2--];
14             }
15         }
16     }
17 }
18
```

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1/1