

## Merge Sorted Array - LeetCode

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### 88. Merge Sorted Array

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?