

Sorting

1. [3 points] Given an integer array `nums` and an integer `k`, return the `k`th largest element in the array.

Note that it is the `k`th largest element in the sorted order, not the `k`th distinct element.

Example:

Input: `nums = [3,2,1,5,6,4]`, `k = 2`

Output: 5

Test case:

Input: `nums = [3,2,3,1,2,4,5,5,6]`, `k = 4`

Output: 4

2. [4 points] Given an array `nums` with `n` objects colored red, white, or blue, sort them in-place so that objects of the same color are adjacent, with the colors in the order red, white, and blue.

We will use the integers 0, 1, and 2 to represent the color red, white, and blue, respectively.

You must solve this problem without using the library's sort function.

Example:

Input: `nums = [2,0,1]`

Output: `[0,1,2]`

3

Test Case:

Input: `nums = [2,0,2,1,1,0]`

Output: `[0,0,1,1,2,2]`

3. [3 points] Given an integer array of which both first half and second half are sorted. The task is to merge two sorted halves of array into single sorted array.

Example:

Input : `A[] = { 2, 3, 8, -1, 7, 10 }`

Output : `-1, 2, 3, 7, 8, 10`

Test case

Input : `A[] = {-4, 6, 9, -1, 3 }`

Output : `-4, -1, 3, 6, 9`