Array #15

Leetcode #414

Third Maximum Number

https://leetcode.com/problems/third-maximum-number/description/

Given an integer array nums, return the third distinct maximum number in this array. If the third maximum doesn't exist, return the maximum number

Example 1:
Input: nums = [3, 2, 1]
Output: 1

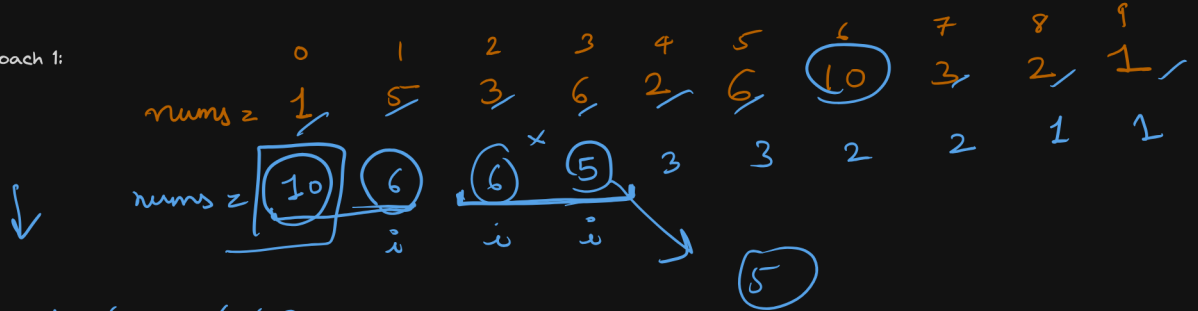
Example 2:
Input: nums = [1, 2]
Output: 2

Example 3:
Input: nums = [2, 2, 3, 1]
Output: 1

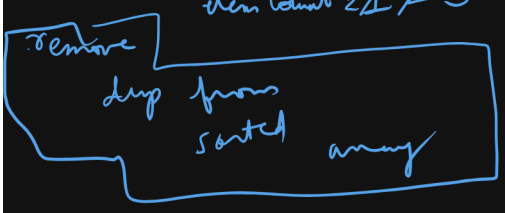
Constraints:
1 <= nums.length <= 10^4
-2^31 <= nums[i] <= 2^31 - 1

Companies:
Google, Tiktok, Adobe, Bloomberg, Uber, etc

Approach 1:

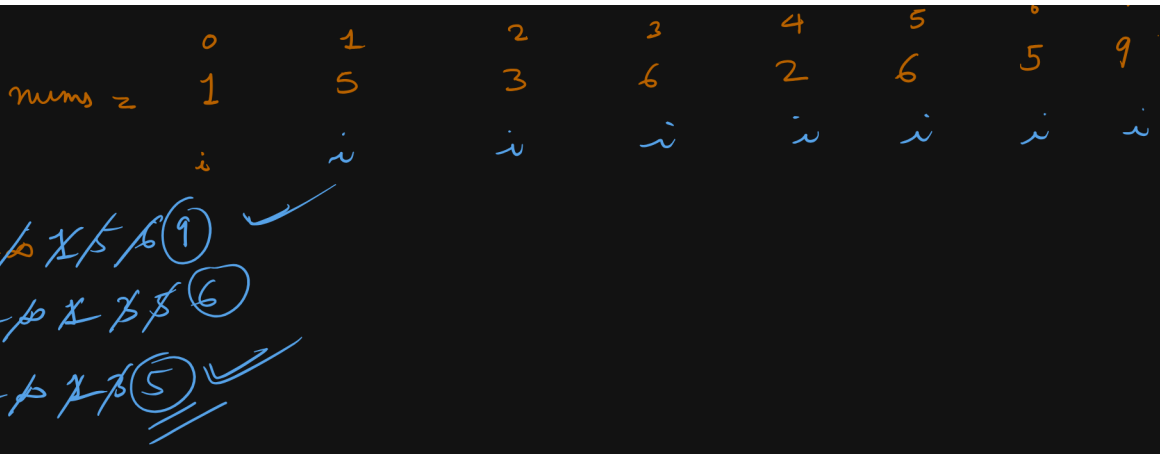


then count = 1 != 3



Time complexity:
O(N.logN)
Space Complexity:
O(Space complexity used when sorting the nums)

Approach 2:



Time complexity:
O(N)
Space Complexity:
O(1)

```
class Solution {
    public int thirdMax(int[] nums) {
        // approach 1
        Arrays.sort(nums);

        int i = 0,
            j = nums.length - 1;

        while (i < j) {
            int temp = nums[i];
            nums[i] = nums[j];
            nums[j] = temp;

            i++;
            j--;
        }

        int elemCount = 1;

        for (int k = 1; k < nums.length; k++) {
            if (nums[k] != nums[k - 1]) {
                elemCount++;
            }

            if (elemCount == 3) {
                return nums[k];
            }
        }

        return nums[0];
    }

}
```

```
class Solution {
    public int thirdMax(int[] nums) {
```

```
                Integer max1 = null,
                    max2 = null,
                    max3 = null;

                for (int i = 0; i < nums.length; i++) {
                    if (max1 != null && max1 == nums[i]) {
                        continue;
                    }

                    if (max2 != null && max2 == nums[i]) {
                        continue;
                    }

                    if (max3 != null && max3 == nums[i]) {
                        continue;
                    }

                    if (max1 == null || nums[i] > max1) {
                        max3 = max2;
                        max2 = max1;
                        max1 = nums[i];
                    } else if (max2 == null || nums[i] > max2) {
                        max3 = max2;
                        max2 = nums[i];
                    } else if (max3 == null || nums[i] > max3) {
                        max3 = nums[i];
                    }
                }

                if (max3 != null) {
                    return max3;
                }

                return max1;
            }
        }
```