2025-01-25 - Handout – Kth Maximum / Minimum

Prerequisites – Heaps, Binary Search, Quick Select Algorithm, Time and, Space Complexity

Q1. 215. Kth Largest Element in an Array

Link https://leetcode.com/problems/kth-largest-element-in-an-array/description/

Given an integer array nums and an integer k, return *the* kth *largest element in the array*.

Note that it is the kth largest element in the sorted order, not the kth distinct element.

Can you solve it without sorting?

Example 1:

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

Output: 5

Example 2:

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

Output: 4

Q2 692. Top K Frequent Words

Link: https://leetcode.com/problems/top-k-frequent-words/description/

Given an array of strings words and an integer k, return *the* k *most frequent strings*.

Return the answer **sorted** by **the frequency** from highest to lowest. Sort the words with the same frequency by their **lexicographical order**.

Example 1:

Input: words = ["i","love","leetcode","i","love","coding"], k = 2

Output: ["i","love"]

Explanation: "i" and "love" are the two most frequent words.

Note that "i" comes before "love" due to a lower alphabetical order.

Example 2:

Input: words = ["the","day","is","sunny","the","the","the","sunny","is","is"], k = 4

Output: ["the","is","sunny","day"]

Explanation: "the", "is", "sunny" and "day" are the four most frequent words, with the number of occurrence being 4, 3, 2 and 1 respectively.

Q3. 373. Find K Pairs with Smallest Sums

Link: https://leetcode.com/problems/find-k-pairs-with-smallest-sums/description/

You are given two integer arrays nums1 and nums2 sorted in **non-decreasing order** and an integer k.

Define a pair (u, v) which consists of one element from the first array and one element from the second array.

Return *the* k *pairs* $(u_1, v_1), (u_2, v_2), ..., (u_k, v_k)$ *with the smallest sums*.

Example 1:

Input: nums1 = [1,7,11], nums2 = [2,4,6], k = 3

Output: [[1,2],[1,4],[1,6]]

Explanation: The first 3 pairs are returned from the sequence: [1,2],[1,4],[1,6],[7,2],[7,4],[11,2],[7,6],[11,4],[11,6]

Example 2:

Input: nums1 = [1,1,2], nums2 = [1,2,3], k = 2

Output: [[1,1],[1,1]]

Explanation: The first 2 pairs are returned from the sequence: [1,1],[1,1],[1,2],[2,1],[1,2],[2,2],[1,3],[1,3],[2,3]