

Heaps

Assignment Questions



Q1. Given an integer array, find the kth largest element using priority queue.

Input 1: `arr[] = {1,2,3,5,2,6,9}` `k = 3`

Output 1: 5

Input 2: `arr[] = {1,7,8,5,2,6,9}` `k = 6`

Output 2: 2

Q2. Given n ropes of different lengths, connect them into a single rope with minimum cost. Assume that the cost to connect two ropes is the same as the sum of their lengths.

For example,

Input: `[5, 4, 2, 8]`

Output: The minimum cost is 36

`[5, 4, 2, 8]` → First, connect ropes of lengths 4 and 2 that will cost 6.

`[5, 6, 8]` → Next, connect ropes of lengths 5 and 6 that will cost 11.

`[11, 8]` → Finally, connect the remaining two ropes that will cost 19.

Therefore, the total cost for connecting all ropes is $6 + 11 + 19 = 36$.

Q3. Given an array of string '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 occurrences being 4, 3, 2 and 1 respectively.

Q4. You are given an array of integer stones where `stones[i]` is the weight of the ith stone. We are playing a game with the stones. On each turn, we choose the heaviest two stones and smash them together. Suppose the heaviest two stones have weights `x` and `y` with $x \leq y$. The result of this smash is:

If $x == y$, both stones are destroyed, and

If $x \neq y$, the stone of weight `x` is destroyed, and the stone of weight `y` has new weight `y - x`.

At the end of the game, there is at most one stone left.

Return the weight of the last remaining stone. If there are no stones left, return 0.

Example 1:

Input: stones = [2,7,4,1,8,1]

Output: 1

Explanation:

We combine 7 and 8 to get 1 so the array converts to [2,4,1,1,1] then,

we combine 2 and 4 to get 2 so the array converts to [2,1,1,1] then,

we combine 2 and 1 to get 1 so the array converts to [1,1,1] then,

we combine 1 and 1 to get 0 so the array converts to [1] then that's the value of the last stone.

Example 2:

Input: stones = [1]

Output: 1

