Important: This tutorial has an online part, which you should complete on LMS (tutorial section). The deadline for online task is Sunday at 8:00 A.M

Problem 1

a. Construct a new binary min-heap from the following elements: $12, 5, 17,$ $22, 20, 9, 1, 32, 50, 16, 25, 8, 44$ and 33

b. Perform three RemoveRoot from the heap you built in a.

c. Apply Heap sort on heap you build on a

Problem 2

What is the complexity of building a binary heap from a sequence of elements when all elements are

a. Sorted according to the heap property
b. Sorted in the inverse of the heap property

Problem 3

Give the implementation of the method isBinaryHeap(int[] a, int size) that returns true if array a satisfies max-binary heap condition.

Problem 4

a. Can a BST satisfy heap conditions? Give an example if yes.
b. Can we implement a priority queue as a BST? Why or why not?