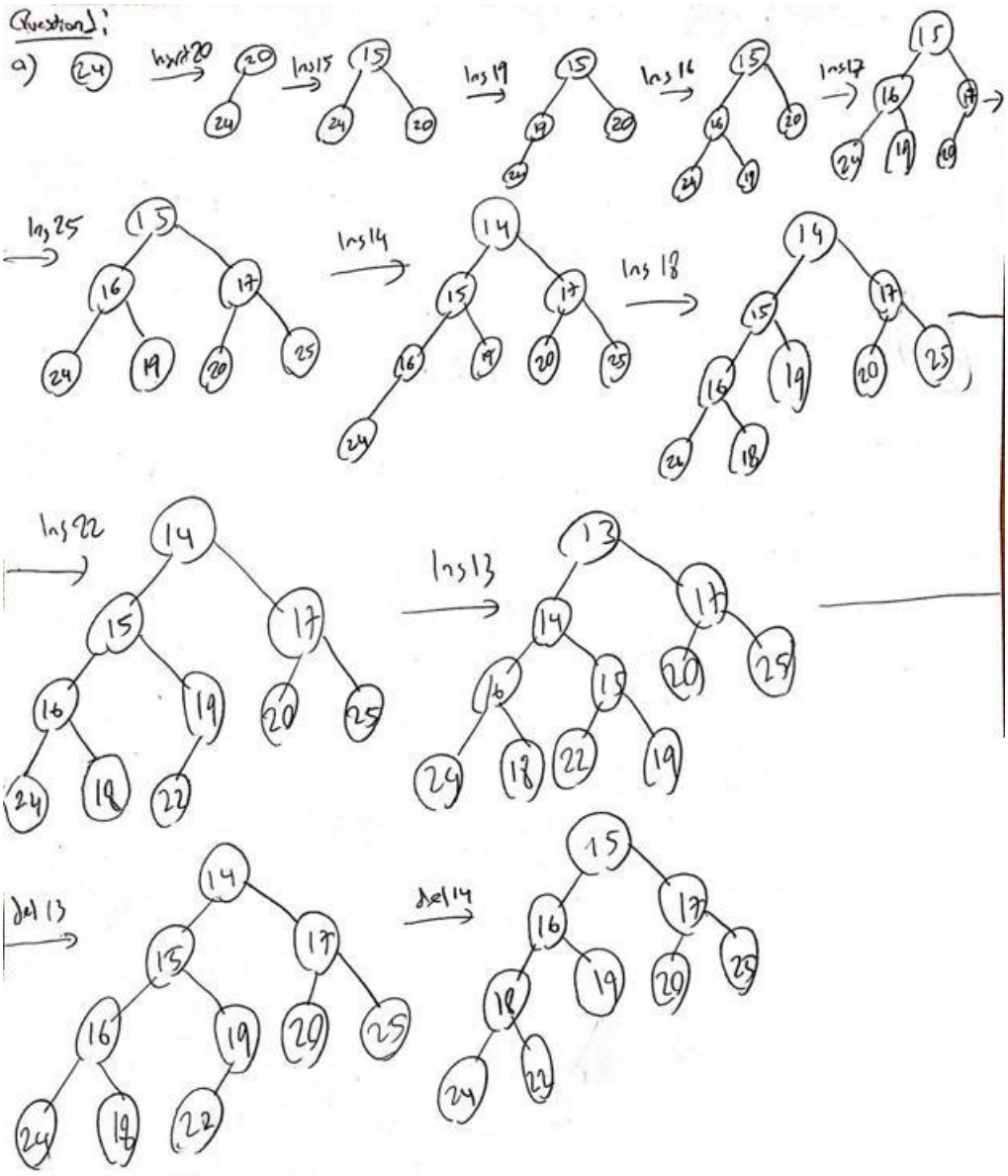
CS 202, Spring 2021

Homework 3 – Heaps, Priority Queues and AVL Trees

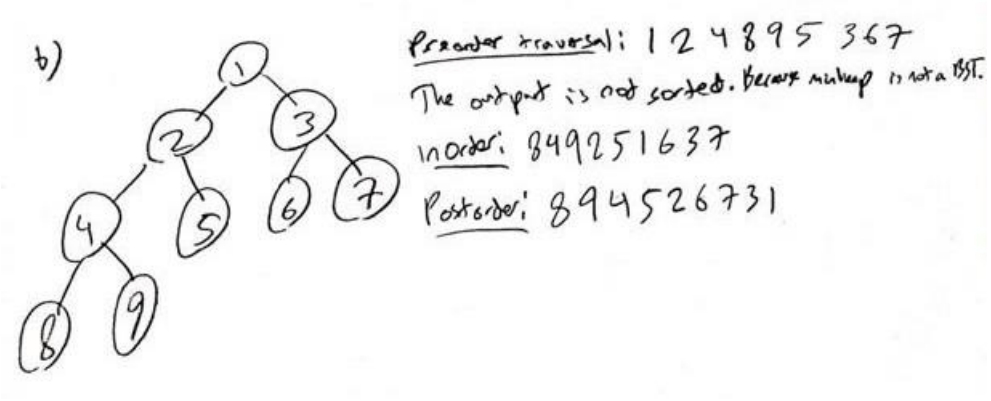
Arda Önal 21903350 Section 3

Question 1:

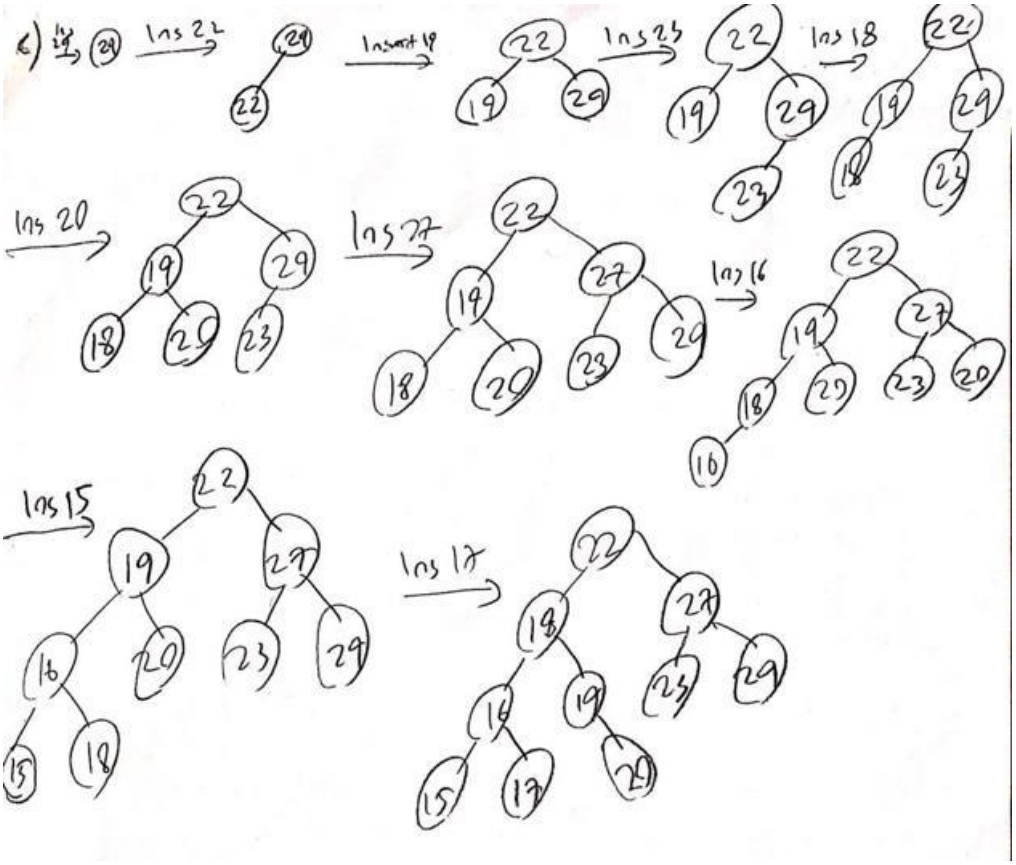
a)



b)



c)



Question 3:

It would not be a good idea to try the simulation starting from 1 printer and increasing until finding the right number $K \leq N$. A better solution could be some sort of divide and conquer approach. We can set the initial value of printers to the value of print requests. Then, in each pass we can divide the number of printers in 2 and keep doing it until we find an average waiting time that is greater than the maximum set average waiting time. After that, the printer number will be multiplied by 2 until it finds an average waiting time that is smaller than the maximum set average waiting time. Then the previous procedure will repeat until we find the correct printer number. By doing this way, the time complexity of the algorithm will not be multiplied

by N, but it will be multiplied by $\log_2(N)$. This will reduce the time complexity significantly when the algorithm runs for values of N that are very large.