Title : Binary Search Trees

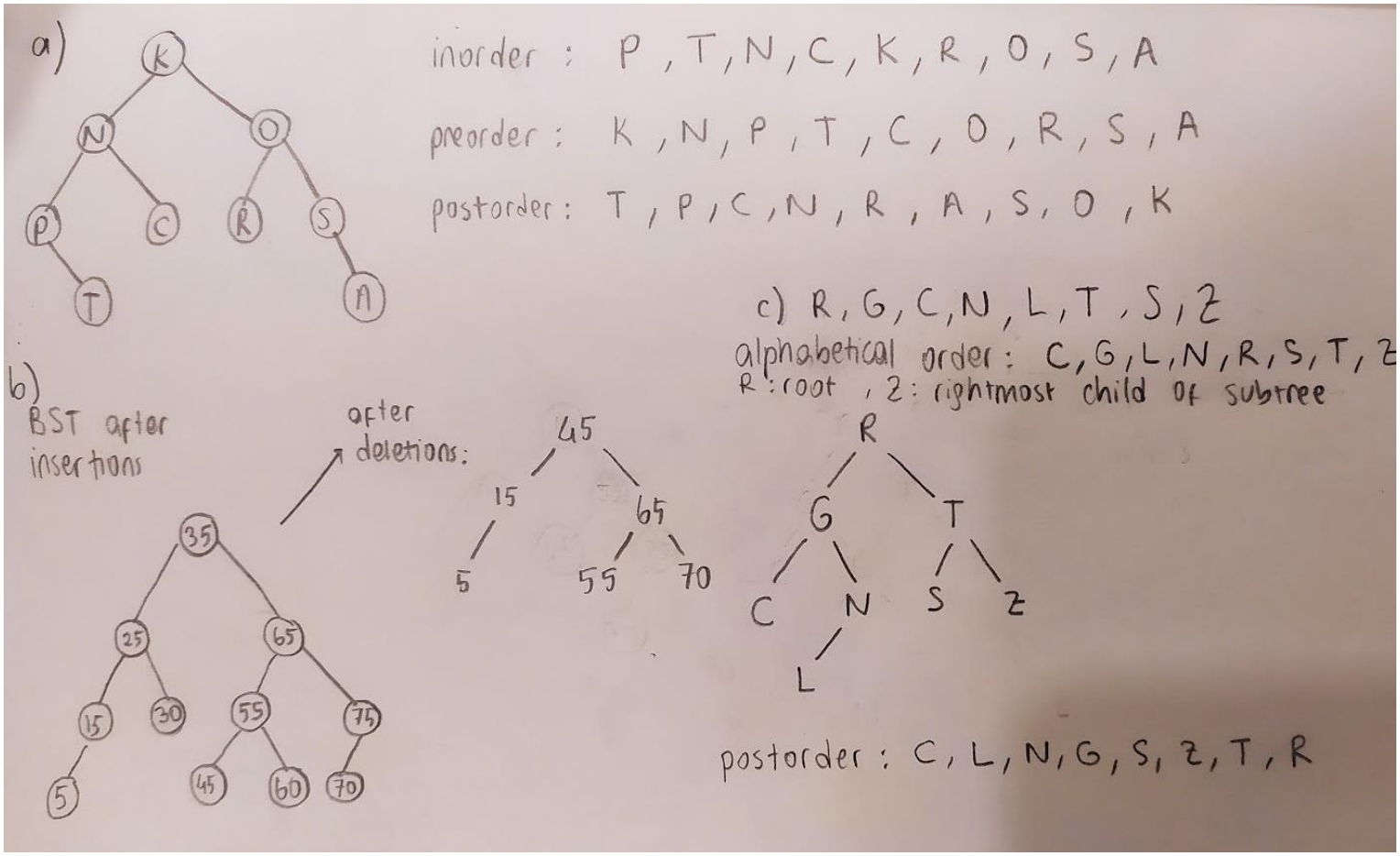
Author : Deniz Sun

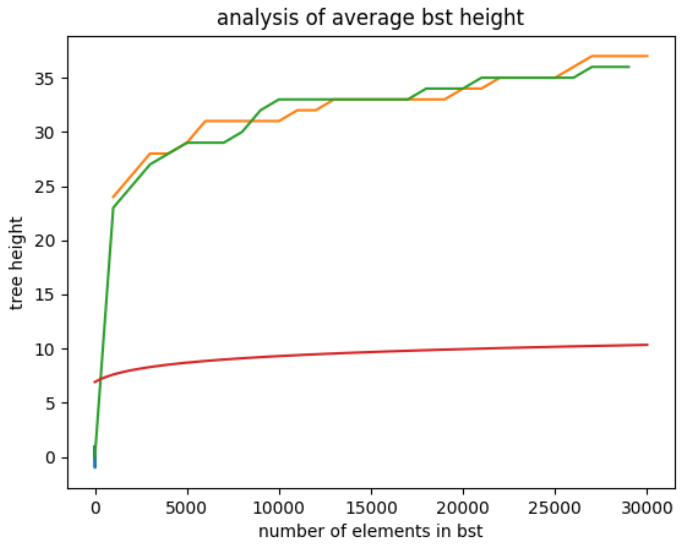
ID: 22003981

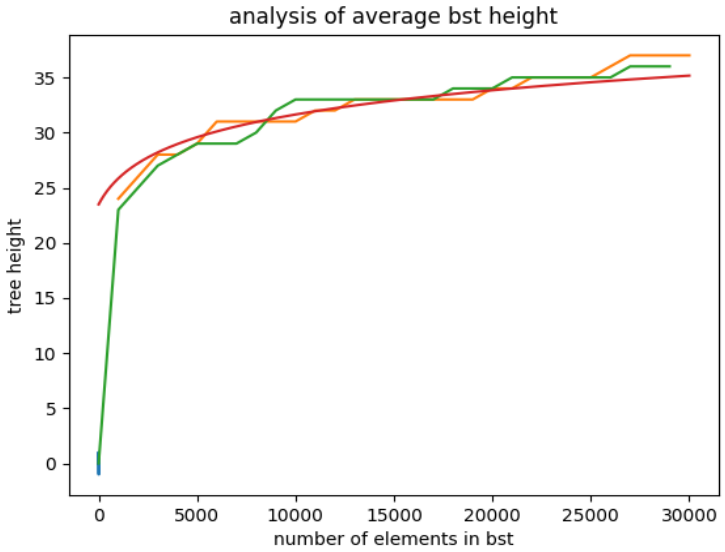
Section : 1

Assignment : 2

Description : Solutions for the homework questions 1, 3







The number of elements vs tree height graph has the theoretical result of log n. Since it does not change when this value is multiplied by a constant, we can get the theoretical graph for average values, which are closer to the random elements in my nodes. The second graph is after the theoretical result is multiplied by a constant to reach the random values entered. The red line is the theoretical result, a log n graph multiplied by a constant; the orange line is the results after insertion and the green line is the results after deletion. The minimum height of a BST is log(n) which is the theoretical result in graph 1. All results obtained are in range of minimum and maximum height, so they are accurate.

If sorted numbers were inserted into the tree, it would be the same as theoretical result. The nodes would be inserted in the same subtree direction and have the maximum possible height, which is (n – 1). If numbers are sorted ascending, the nodes would be inserted as right children, and if they are sorted descending, the nodes would be inserted as left children.