Department of Computer Science and Engg.- NITK Surathkal

CO-360 Advanced Data Structures

Assignment sheet- 1 Due Date: 31st January 2019

1) Let T and U be AVL Trees storing n and m items respectively, such that all the items in T have keys less than the keys of all the items in U. Implement an O (log n +log m) time method for joining T an U into a single tree that stores all the items in T and U. (Destroying the old version of T and U)

Justify the correctness and efficiency of your algorithm.

2) Let T be a AVL tree storing n items, and k be the key of an item in T. Show how to construct from T, in O(log n) time two AVL trees T' and T" Such that T' contains all the keys of T less than k , and T" contains all the keys of T greater than k. This operation destroys T.

Justify the correctness and efficiency of your algorithm.

3) Let T and U be Red-Black Trees storing n and m items respectively, such that all the items in T have keys less than the keys of all the items in U. Implement an O (log n +log m) time method for joining T an U into a single tree that stores all the items in T and U. (Destroying the old version of T and U). Justify the correctness and efficiency of your algorithm.