King Saud University
College of Computer and Information Sciences
Computer Science Department

CSC 212 **First Semester 1437-1438**

Tutorial #9

Important: This tutorial has an online part, which you should complete on LMS (tutorial section).

Problem 1

a) Insert the following keys into an empty binary search tree: 21, 13, 7, 20, 34, 19, 90, 8, 13.

b) Remove the following keys from the final tree in part a: 20, 34, 21.

c) If we wish to print the keys in increasing order, then which traversal method should we use?

Problem 2

Write the method range member of the class BST that returns the range of the binary search tree. The range is defined as the difference between the maximum key and the minimum key. Assume that the tree is not empty.

Method: public int range()

Problem 3

Write an efficient method inRange, member of the class BST, that takes as input a key k and returns true if the binary search tree contains at least two keys k1 and k2 such that $k1 \leq k \leq k2$, false otherwise. Try to minimize the number of visited nodes.

Method: public boolean inRange(int k)

Problem 4

Write the recursive method sumKeys member of the class BST that returns the sum of all the keys

Method: public int sumKeys()

Problem 5

Write the member method public int countKeys (int k) of the class BST (binary search tree) that returns the number of nodes in the sub-tree rooted at the node with key k. Assume that k exists. Do not call any other method.

Method: public int countKeys (int k)