MA 251 Data Structures

Laboratory Assignment 10

06-11-2019

Note: Upload your programs to the server (deadline: 4:30 pm)

Binary Search Tree (BST)

1. **Is it a BST**: In this lab assignment, you are given a binary tree with integers as keys. You need to check whether the given tree is a BST or not.

The vertices are numbered from 0 to n-1. Vertex 0 is the root. The input to the program is n+1 lines. The first line specify the number of keys n. The next n lines supply information about the nodes 0 to n-1. Each input line will have three values of the node <left child, key value, right child>. If a node does not have a child, the value is -1.

Constraints: The input is guaranteed to be valid binary tree and all keys are distinct.

Sample I:
Input:
3
5 7 9
-1 5 -1
-1 9 -1
Output:
Correct

Sample II
Input
3
7 5 9
-1 7 -1
-1 9 -1
Output:
Incorrect

2. **Sorting:** Write a program that stores a set S of names in sorted order using BST. The program should support the following operations
   i. + <name>: insert name into S. If name already present, ignore.
   ii. - <name>: delete name from S. If not present ignore.
   iii. ? <name>: Check if name is in S (exact match) and report.

Constraints: The names are guaranteed to be a combination of capital letter [A – Z] and/or small letters [a – z]. The names can have blank spaces. You can also assume an upper bound on the length of the names.

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