ELEC 2543 Object-Oriented Programming and Data Structures

Exercise 11

Topic: Ordered Binary Trees

Due Date: YOU DO NOT HAVE TO SUBMIT THIS LAB FOR GRADING

Classes BinTreeNode and BinTree represent binary tree nodes and binary trees, respectively. The two classes will be used to maintain an ordered binary tree. Some methods have been provided: add, inOrderTraversal, and size.

Implement the following methods in class BinTree. Note that you may need to implement relevant methods in BinTreeNode.

public int height(): this method returns the height of the tree. An empty tree is of height -1.

public boolean hasItem(int item): this method returns true if the item exists in the tree; false otherwise.

public void preOrderTraversal(): this method prints out the tree elements according to the pre-order traversal.

public void ppstOrderTraversal(): this method prints out the tree elements according to the post-order traversal.

Implement the following methods in class BinTreeNode.

public BinTreeNode mySibling(): this method returns the sibling node of the node that invokes the method. Return null if the node does not have a sibling.

public ArrayList<BinTreeNode> findLeaves(): this method returns all the leaves on the subtree rooted at the node that invokes this method as an ArrayList of BinTreeNode.

TreeDemo.java has been provided to test your codes. The sample output is available in Moodle.