COMP2011

Lab and Tutorial Eight (Total Marks: 100)
Deadline 23:59, 13 Nov., 2014

1. For the binary search tree we studied, suppose the tree is empty in the beginning, given the following nodes (only provide iData for key value) that will be inserted into the tree in order, draw the corresponding tree (use a circle to represent a node and put its key value inside).

(1) 50, 40, 60, 70, 30, 20, 55, 45, 35, 41, 47, 54, 56, 65, 80
(2) 20, 30, 35, 40, 41, 45, 47, 50, 54, 55, 56, 60, 65, 70, 80
(3) 80, 70, 65, 60, 56, 55, 54, 50, 47, 45, 41, 40, 35, 30, 20

2. Download the tree.java program. In the lecture, we study the inorder traversal in which all the nodes will be visited in ascending order based on their key values. Add a new method in Class Tree as follows:

<div align="center">public double sum()</div>

In the method sum(), if the tree is empty, print the message "the tree is empty" and return -1; otherwise, call a new method you design that can **recursively calculate the summation of dData of each node** in which **all the nodes will be visited in <u>descending order</u> based on their key** values. In your implementation, in each step, when a node is processed, print a message like:

<div align="center">"Process node: Key = xx; dData = yy"</div>

Here, xx and yy are iData and dData of the corresponding node.

What to submit:
(1) The report that contains (a) the results of Question 1; (b) the output of your program from Question 2.
(2) The java source code of your program from Question 2.