CS2302 - Data Structures

Spring 2020

Exercise - Binary Search Trees

1. Write the function *printSmaller(t,k)* that receives a reference to the root of a binary search tree and an integer k and prints all the items in the tree that are less than k.

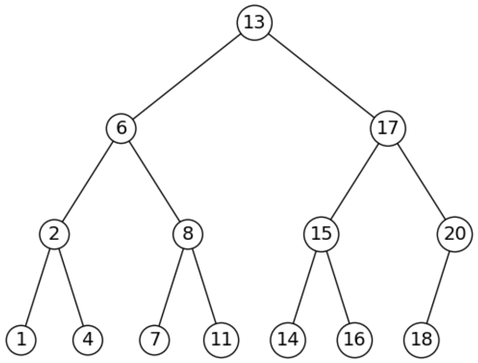
2. Write the function *printLeaves(t)* that receives a reference to the root of a binary search tree t and prints all the items in the tree that are stored in leaf nodes.

3. Write the function *atDepthD(t,d)* that receives a reference to the root of a binary search tree t and an integer d and returns a list of the items in the tree that are stored at depth d in the tree (recall that the root has depth 0, its children have depth 1, and so on).

4. Write the function *depthOfK(t,k)* that receives a reference to the root of a binary search tree t and an integer k and returns the depth of the node that contains k, or -1 if k is not in the tree.

5. Write the function *tree2List(t)* that receives a reference to the root of a binary search tree t and returns a sorted list containing the elements in the tree.

6. Write the function *list2Tree(L)* that receives a sorted list L and builds and returns a balanced (as much as possible) binary search tree containing the elements of L. The figures below were generated by the main program in the starting code.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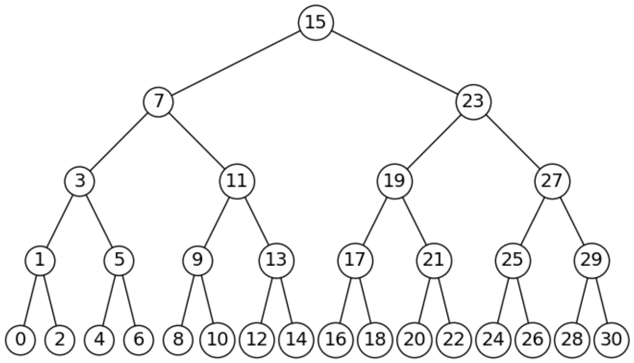
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