

CIS263 Assignment Three

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Design a recursive linear-time algorithm that tests whether a binary tree satisfies the search tree order property at every node. In order to complete this assignment, you must create a node class and a tree class that is capable of holding values in each of the nodes that conform to what a binary tree is. You must also create a print function that will print out the tree to the command line.

Hand-in:

1. Two sample trees (hand written or digitally rendered), one sample should satisfy the search tree order property, the other one should not.
2. The output demonstrating the functionality of your program for each of the above sample trees.
3. The output of the print method clearly displaying the trees.
4. An explanation as to why/how your program/algorithm runs in linear time.
5. A file containing the implementation source code (no zip files).

Approved programming languages: C, C++, C#, Python, Java.

Grading Rubric

	0%	50%	100%
Recursive linear-time algorithm Implementation (20%)	Not completed, or not in linear time	Completed, but doesn't run in linear time	Complete and runs in linear time
Print Tree Method (20%)	Not implemented	Output format is hard to follow	Output format is easy to follow
Two sample trees illustrated (20%)	Neither tree illustrated	One tree illustrated clearly	Both trees illustrated clearly, one which satisfies, one which does not.
Functionality demonstrated (20%)	Not demonstrated clearly	Limited demonstration	Clearly demonstrated
Algorithm Explanation (20%)	Not explained clearly	Limited explanation	Explained clearly and concisely

See blackboard for point breakdown.