

Due Dates: Saturday, October 21 at 11:59pm

Submit: eLearning

Late Policy: -10 points per hour late

Instructions: This is an individual assignment. Answers should be your own work.

Introduction:

In this project you will modify the author's BinarySearchTree code to implement some new methods.

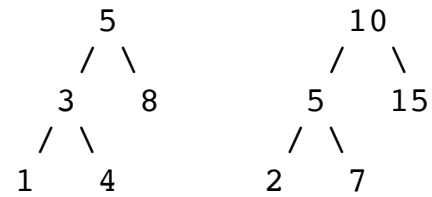
Description:

Modify the author's BinarySearchTree code to implement the methods shown below.

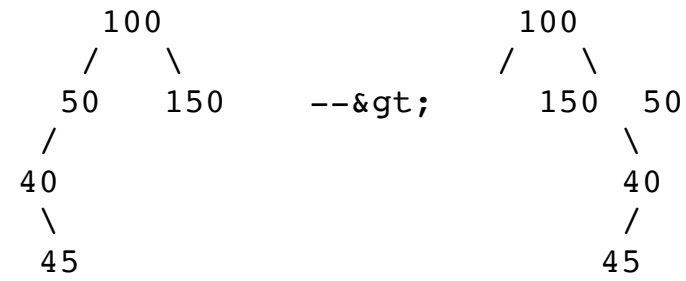
Each method is 10 points.

- a) nodeCount
Recursively traverses the tree and returns the count of nodes.
- b) isFull
Returns true if the tree is full. A full tree has every node as either a leaf or a parent with two children.
- c) compareStructure
Compares the structure of current tree to another tree and returns true if they match.

For example, these two trees have the same structure:



- d) equals
Compares the current tree to another tree and returns true if they are identical.
- e) copy
Creates and returns a new tree that is a copy of the original tree.
- f) mirror
Creates and returns a new tree that is a mirror image of the original tree. For example, for the tree on the left, the tree on the right is returned:



- g) isMirror
Returns true if the tree is a mirror of the passed tree.
- h) rotateRight
Performs a single rotation on the node having the passed value. If a RotateRight on 100 is performed:



```
      50      150      --&gt;      40      100
      /          \          \          \
    40          45      150
      \
    45
```

g) rotateLeft

As above but left rotation.

i) printLevels - performs a level-by-level printing of the tree.

j) main - demonstrate in your main method that all of your new methods work.

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BinarySearchTree.java

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