About Lab 5

Lab 5 is the first of 3 labs that deal with trees. In Lab 5 you will work with a straightforward linked implementation of binary trees.

Like the Maze lab, Lab 5 has a graphical application. The application allows you to load trees from files, draws the trees, and allows you to run each of the recursive methods that make up the bulk of the lab. We will grade you lab through this application so you must get your code to work with it.

Our datatype for Lab 5 consists of an abstract BinaryTree<T> and two concrete subclasses: EmptyTree<T> and ConsTree<T>.

Here is what you need to do for the lab:

- Create the 3 tree classes and their constructors
- Write a loadTreeFromFile method in the TreeLoader class that we give you. We talked about the algorithm for this on Friday.
- Write a toString() method ConsTree. We give you code for this; hopefully you will think about how it works as you type it in.
- Your TreeMethodApplication program should now be functional. You can input tree files and see the resulting trees.
- The rest of the lab consists of 13 recursive methods (the last 3 are our standard tree traversals).

- For each of these methods you shoud
  - Add the method to EmptyTree. The code should be trivial.
  - Add the method to ConsTree. . Here you might have to think. One of the goals of this lab is to give you more practice with recursion.
  - Add a call to this method to the TreeMethods class, which is used by the graphical application. For example, the TreeMethods class we give you has a method

```
public int nodeCount(BinaryTree<String> tree) {
    return 0;
}
```

You need to change its body to

```
tree.nodeCount();
```