Assignment Two

In this assignment, you will implement a class named ExtendedAVLTree. ExtendedAVLTree extends the AVLTree class to include the following methods:

- Public static <K, V> AVLTree<K, V> clone(AVLTree<K,V> tree)
  This class method creates an identical copy of the AVL tree specified by the parameter and returns a reference to the new AVL tree.

- public static <K, V> AVLTree<K, V> merge(AVLTree<K,V> tree1,
      AVLTree<K,V> tree2)
  This class method merges two AVL trees, tree1 and tree2, into a new tree. After the merge, this method reclaims the unused original AVL trees and returns the new AVL tree. You need to make this method as fast as possible and analyze its running time in big O notation. Put your running time analysis as comments after the code.

  Bonus marks: If the time complexity of your merge method is O(m+n), where m and n are the numbers of nodes of the two input AVL trees, you will get 2 bonus marks.

- public static <K, V> void print(AVLTree<K, V> tree)
  This class method creates a new window and prints the AVL tree specified by the parameter on the new window. Each internal node is displayed by a circle containing its key and each external node is displayed by a rectangle. You need to choose a proper size for all the circles and a proper size for all the rectangles and make sure that this method never prints a tree with crossing edges.

For simplicity, we assume that K is int and V is String.

All the related classes are in the package net-datastructures-4-0. Please download net-datastructures-4-0, install it on your own computer and create the new class ExtendedAVLTree in the same package.

You need to read the code of all the related classes in order to understand how the AVLTree class is implemented.

What to submit?

Submit a single file named ExtendedAVLTree.java containing all the code, excluding the code in datastructures-4-0, by using the following command:

```
give cs9024 assn2 ExtendedAVLTree.java
```

Marking

The full mark of this assignment is 10, excluding the bonus marks. Marking will be based on the correctness, time efficiency and readability of your code.

Deadline

23:59:59 3 May, 2015.
No late submissions will be accepted.

References

1. http://docs.oracle.com/javase/tutorial/2d/index.html.
2. http://www.deitel.com/articles/java_tutorials/20050923/IntroductionToJava2D_Page6.html.
3. http://docs.oracle.com/javase/tutorial/uiswing/components/frame.html.