CSE 326 DATA STRUCTURES
HOMEWORK 4

Due: **Friday, May 9, 2008** at the beginning of class.

**Problem 1. AVL tree as a leftist heap**

Prove or disprove the following statement:

There exists an AVL tree of size \( n > 2 \), and containing unique keys, that is also a leftist heap.

**Problem 2. AVL Deletion Cases**

In class, we noted that there were two fundamental AVL deletion cases (left-left and left-right) and their mirror images. The following situation was resolved using a single rotation, thus treating it as a left-left case:

Would it have worked to treat instead it as a left-right case? Justify your answer.
Problem 3. Practice with AVL Deletions

In this problem, you will practice deletion on the following AVL tree:

For the questions below, you only need to show the final result, but note that if you do this it will be hard to award partial credit if the final result has problems.

(a) Perform the operation delete(17). When replacing the deleted node, find a replacement from the left subtree.

(b) Perform the operation delete(17). When replacing the deleted node, find a replacement from the right subtree.

Problem 4. Some Practice with Splay Trees

Weiss problem 4.27, 4.28. Again, you only need to show the final results, but showing intermediate steps will help in assigning partial credit.