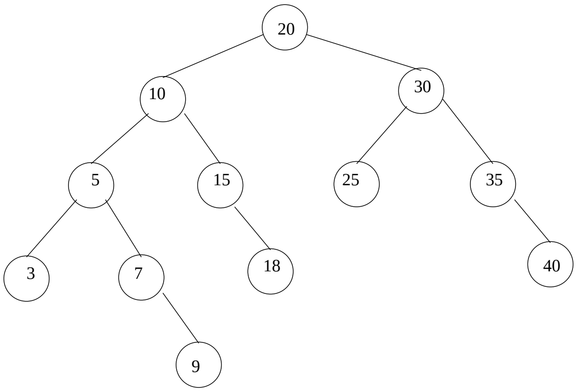
CSE 326
Autumn 2005
Assignment 5
Due 11/2/05

For all algorithm and data structure design problems please provide elegant pseudocode and an adequate explanation of your methods. If is often helpful to include small examples demonstrating the method. Put your name at the top of each sheet of paper that you turn in.

1. In this problem you will design a recursive AVL deletion procedure and execute it on a simple example.

   (a) Design a recursive AVL tree deletion procedure. You may assume that rotation and height calculation procedures are available to you. Your procedure should be modeled on the recursive deletion procedure on page 107 of the text. After each recursive call and before returning, rotations must be done to rebalance the tree. See the way this is done for AVL tree insertion on page 121 of the text.

   (b) Demonstrate your algorithm by doing all the rotations needed to delete 10 from the following AVL tree. If there is more than one rotation show the result after each single or double rotation.



2. In this problem you will demonstrate how splay tree insertion and deletion work on the example tree above.

   (a) Insert 8 into the tree above. Show the tree after zig-zig, zig-zag, and zig operation.

   (b) Delete 10 from the tree above. Show the tree after each zig-zig, zig-zag, and zig operation.

3. Show the result of inserting 1,2,.,12 in this order into an empty B-tree of order 3 (a 2-3 tree). Show the result after each insertion.

4. Consider the following points. (10,20), (20,10), (15,15), (5,10), (10,4). Enter these into a balanced k-d tree. Show the work along the way.