CSE 326: Data Structures
Assignment #3
January 26, 1998
due: Monday, February 2

1. Page 126, exercise 7. You will need to know the formula for a geometric series, which is on page 18 of the text. Understand and memorize the top half of this formula (the case $c \neq 1$), because it comes up all the time. For part (e), do the proof by course-of-values induction on the total number of nodes. Hint: remove the root.

2. (a) Show the tree that results from inserting the following keys, in the order given, into an initially empty binary search tree (*not* an AVL tree) by repeated application of Algorithm 6.8:

   $$42, 68, 120, 51, 95, 71, 187, 40, 79, 146, 186, 86, 72, 121$$

   (b) Show the tree that results from deleting the key 187 from the tree of part (2a), using Algorithm 6.9.

   (c) Show the tree that results from deleting the key 68 from the tree of part (2b), using Algorithm 6.9.

3. Explain what is wrong with Algorithm 6.9 when the node N that contains the key K satisfies $\mathrm{LC}(\mathrm{RC}(N)) = \Lambda$. Fix the problem by replacing the final simultaneous assignment statement by statements that follow the suggestion of exercise 39 on page 214.

4. Page 251, exercise 2a. Show the AVL tree after each of the 10 insertions (including possible rotations) has completed.