CSE 326: Data Structures
Assignment #3
April 10, 1996
due: Wednesday, April 17

1. Page 126, exercise 3. Give a brief justification.

2. Page 208, exercise 5.

3. (a) Show the binary search tree that results from inserting the keys 3, 15, 10, 2, 25, 19, 5, 7, 22, 0, 18, 9, 6, 12 (in this order) into an initially empty binary search tree by repeated application of Algorithm 6.8.

   (b) Show the tree that results from deleting the key 25 from the tree of part (3a), using Algorithm 6.9.

   (c) Show the tree that results from deleting the key 15 from the tree of part (3b), using Algorithm 6.9.

   (d) Show the tree that results from deleting the key 3 from the tree of part (3c), using Algorithm 6.9.

4. 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.

5. If a key K is deleted from a binary search tree according to Algorithm 6.9 (corrected according to problem 4), and then immediately reinserted according to Algorithm 6.8, is the shape of the resulting binary search tree necessarily the same as before? If so, prove it. If not, give a counterexample, and explain under what conditions it would be the same.