CSE 373 – Data Structures
Homework 3

Assigned: Wednesday, April 17, 2002
Due: Wednesday, April 24, 2002
                 At the start of class

Remember:
    Attach a copy of your wintree.dot or tree.dot
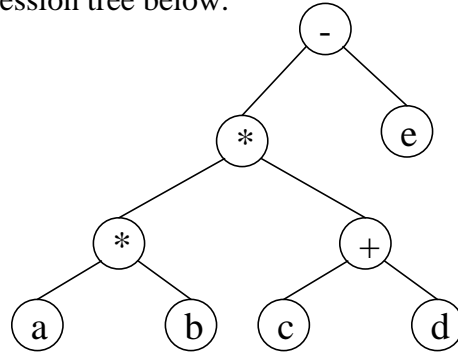   Attach a copy of your two plots
    Attach a copy of your turnin receipt
    Do an web turnin of tree.c.

Your name: _____

Student number: _____

1. Consider the two trees that were attached to the homework 3 project description.

    a. What is the height of the node plotTreeFooter in the sorted by value tree?

    b. What is the height of the node plotTreeFooter in the sorted by name tree?

    c. What is the height of the sorted by value tree?

    d. What is the depth of the node plotTreeHeader in the sorted by value tree?

2. Consider an ordinary binary search tree containing 7 elements with values 1 to 7 with no balance conditions whatsoever.

    a. Draw a tree showing the worst case configuration (ie, the maximum depth that might occur) with these 7 elements.

    b. Draw the same 7 elements in a binary search tree illustrating the best case configuration (ie, the minimum depth that might occur) with these 7 elements.

3. Consider the expression tree below.

a. What is the corresponding infix expression?

b. What is the corresponding postfix expression?

4. Binary search trees can provide significant speed improvements over straight linear searches through a list of elements.

a. What is the worst case big-O order associated with finding a node in an AVL tree stated relative to the number of nodes N in the tree?

b. Under what circumstances does this worst-case access occur?

c. What is the worst case big-O order associated with finding a node in a Splay tree stated relative to the number of nodes N in the tree?

d. Under what circumstances does this worst-case access occur?