

Homework 3

1. Write a function `CountLeaves(T)` that counts the number of leaves in the binary tree rooted with node `T`.
2. Draw the binary tree representation of the arithmetic expression

$$(((5 + 2) * (2 - 1)) / ((2 + 9) + ((7 - 2) - 1)) * 8).$$

3. Find the post-order traversal of the tree you drew for Problem 2.
4. Insert into an empty binary search tree the keys 30, 40, 24, 58, 48, 26, 11, and 23 (in that order). Draw the resulting tree.
5. How many different binary search trees can store the keys {1, 2, 3}?
6. Draw the AVL tree resulting from the insertion of 52 into the AVL tree in Figure 11.14b on page 486 of your textbook.
7. Draw the AVL tree resulting from the deletion of 62 from the AVL tree in Figure 11.14b on page 486 of your textbook.
8. Determine whether each of the following statements about red-black trees is true or false. Justify your answer.
 - (a) A subtree of a red-black tree is itself a red-black tree.
 - (b) A node that does not have a sibling is colored red.
9. Explain why you would get the same output in the inorder listing of entries in a binary search tree T , independent of whether T is maintained by an AVL tree, red-black tree, or splay tree.
10. What does a splay tree look like if its entries are access in increasing order?