

CSI 33 LECTURE NOTES (Ojakian)

Topic 9: AVL Trees

OUTLINE

(References: 13.3)

1. AVL Trees - Definition and key fact
 2. Compare to BST and Heap
-

1. AVL Trees

- (a) Definition: Height of a tree (note: Just a root means height 0)
- (b) Definition (AVL tree): A BST with an extra requirement - At all nodes, the left subtree and right subtree have heights that differ by at most one.
PROBLEM 1. *In Section 13.3 (page 455) see figure 13.5. Why is one of them an AVL tree and the other not?*
- (c) Key Fact: The height of an AVL tree is $O(\log n)$.
PROBLEM 2. *As an example of what is avoided with AVL Tree, consider:*
 - i. The result in inserting 5, 4, 3, 2, 1 in order into a BST*
 - ii. In Section 13.3 (page 454) see figure 13.4. Why is this NOT an AVL tree?*
- (d) Insertion and Deletion for AVL - Skipping! (Insertion is in the book, deletion is not)
- (e) Sorting the various kinds of trees.
PROBLEM 3. *Draw some examples of binary trees. For each example, which is it - BST? AVL Tree? Heap? None of these?*