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80. L

CSDS 233 Spring Session 8

SI Leader: Jakob Danninger

2/23/2023

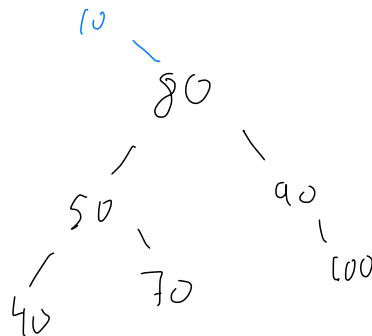
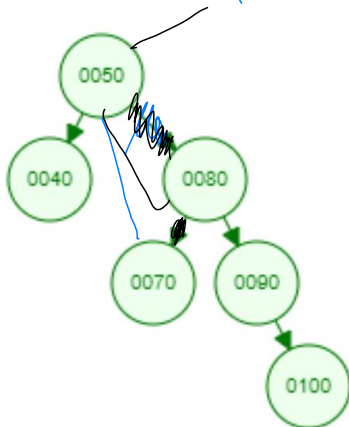
Disclosure: This is a supplement to class, not a replacement. This should not be your only study activity for exams, it should aid you in studying. I do not have the actual exam so questions here will differ from those on the exam.

Session Objectives:

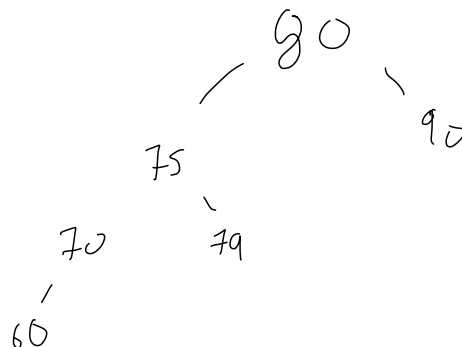
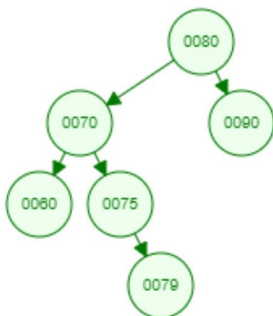
- 1) Understand how to balance a node (figure out which rotations to do to balance)
- 2) Master rotations (if you can do rotations chances are the rest of trees will be easy for you)
- 3) Be able to delete a node in an AVL tree (and figure out what needs to be done to rebalance)

Questions

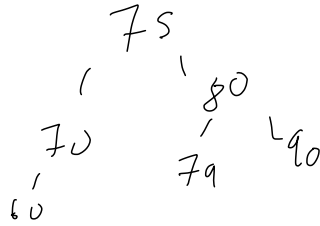
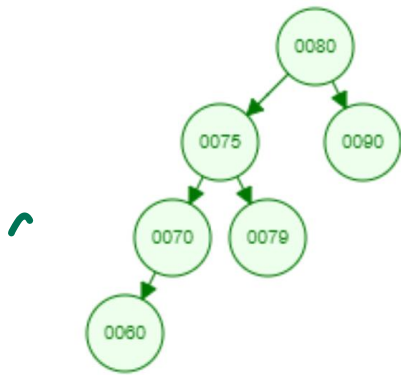
- 1) Rotate the 50 left



- 2) Rotate 70 left



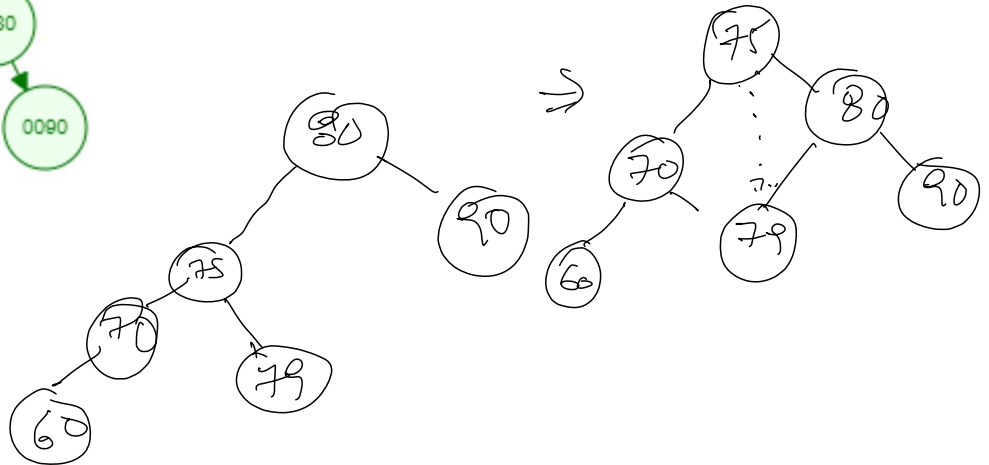
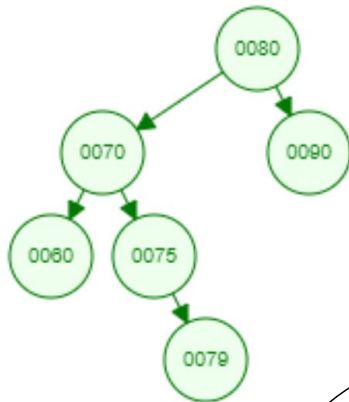
3) Rotate 80 to the right



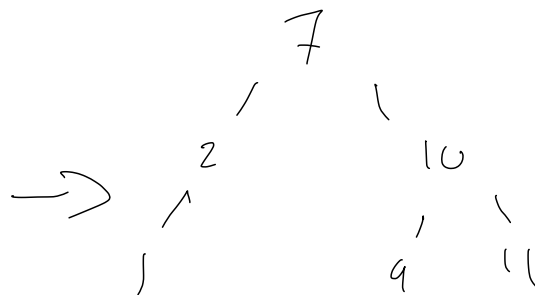
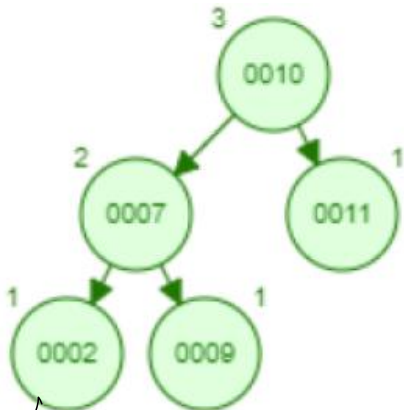
Break to go over answers

4) Balance the following

(2)

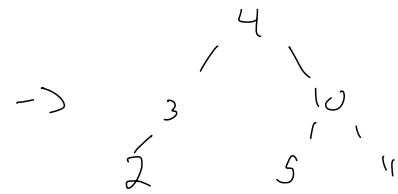
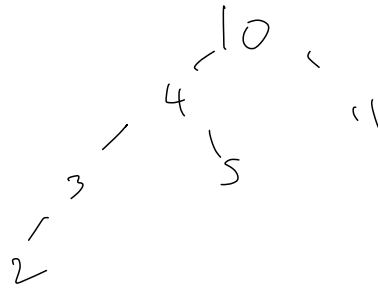
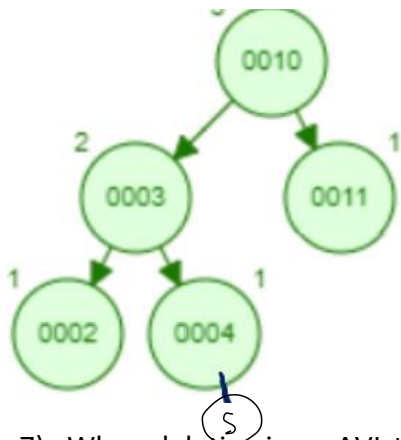


5) Add 1



1

6) Add 5 (this is an AVL tree to after you add check balance)



7) When deleting in an AVL tree where do you need to recheck balance?

All parents

8) Find the big O of the following

a. Search in an AVL tree

$O(\log n)$

b. Search in a Binary Search Tree

$O(n)$

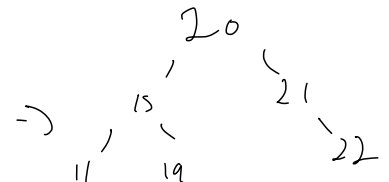
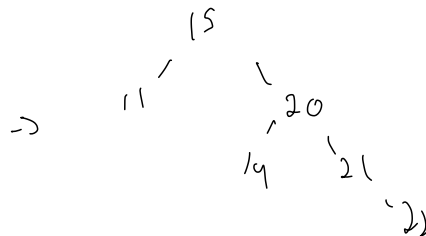
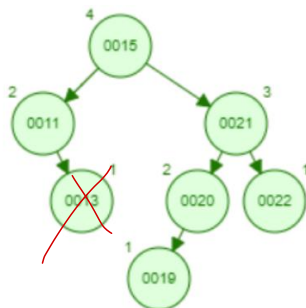
c. Insertion in an AVL tree

$O(\log n)$

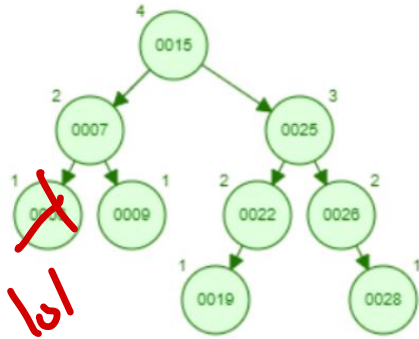
d. Insertion in a Binary Search Tree

$O(n)$

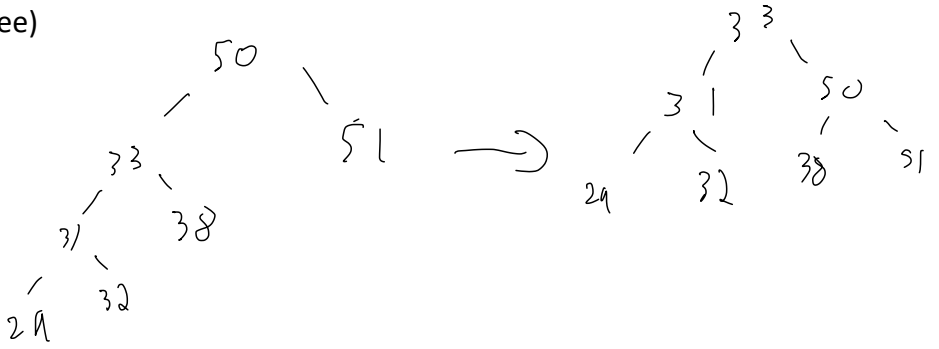
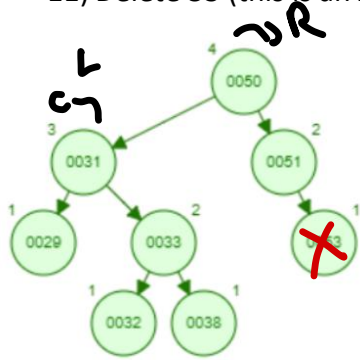
9) Delete 13 (this is an AVL tree)



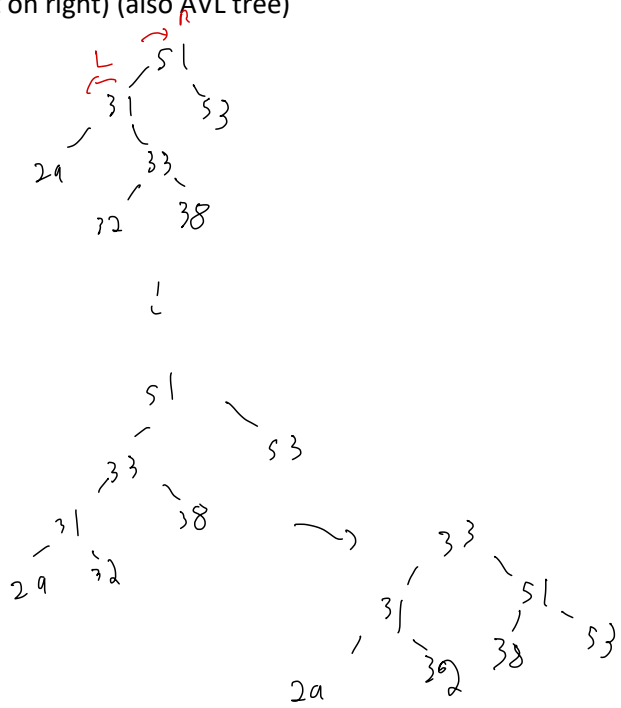
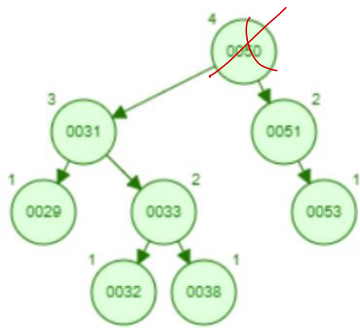
10) Delete 6 (this is an AVL tree)



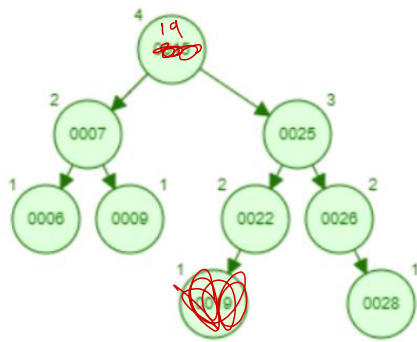
11) Delete 53 (this is an AVL tree)



12) Delete 50 :) (replace with smallest on right) (also AVL tree)



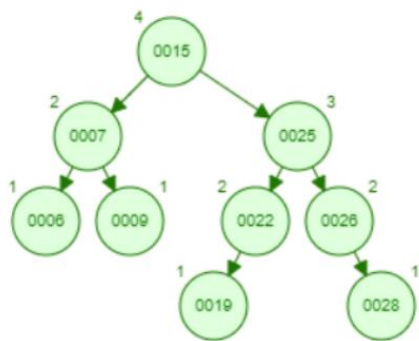
13) Delete 15 (AVL tree)



lol

Next session is 2/28 covering B-trees and on 2/2 there will be a midterm review session!!

13) Delete 15 (AVL tree)



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