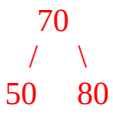
3) (5 pts) ALG (AVL Trees)

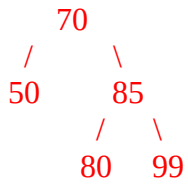
Insert the following integers into an AVL tree in the given order. Whenever an insertion causes the tree to become unbalanced, rebalance it immediately before proceeding with the next insertion. Continue this process, rebalancing as needed, until all elements have been added. Put a box around the state of the tree after each of the bolded-underlined elements are inserted. (Each of these pictures will be worth 1 point.)

50, 80, **70,** 99, **85**, **100,** **95** and **84**

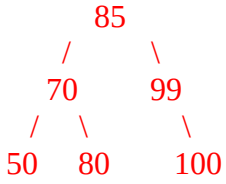
After 70 is inserted and rebalanced, tree is



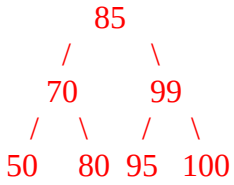
After 85 is inserted and rebalanced, tree is



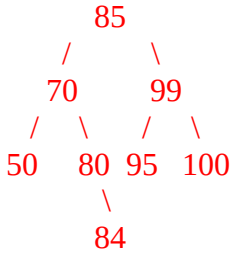
After 100 is inserted and rebalanced, tree is



Here is the tree after 95 is inserted:



Here is the tree after 84 is inserted:



Grading: 1 pt for each of the trees shown above. Tree has to be perfectly correct to get the point.

Computer Science Foundation Exam

January 11, 2025

Section C

ALGORITHM ANALYSIS

NO books, notes, or calculators may be used,
and you must work entirely on your own.

SOLUTION

Question #	Max Pts	Category	Score
1	5	ANL	
2	10	ANL	
3	10	ANL	
TOTAL	25		

You must do all 3 problems in this section of the exam.

Problems will be graded based on the completeness of the solution steps and not graded based on the answer alone. Credit cannot be given unless all work is shown and is readable. Be complete, yet concise, and above all be neat. For each coding question, assume that all of the necessary includes (stdlib.h, stdio.h, math.h, string.h) for that particular question have been made.