COP 3502 Recitation Sheet: AVL Trees, Heaps

Directions: Each of these questions is from either a past Foundation Exam or one of my past exams. They were created to be written on paper. However, the trie questions can be coded on a computer and tested. I strongly recommend first coding on paper, but then transferring to the computer and testing the function until you are convinced it works.

1) Consider inserting the following items into an initially empty AVL tree, in the order shown. Show the state of the tree after each insertion completes.

10,   6,   3,   20,   80,   15,   60,   100,   18,   90

2) Draw an AVL tree **of integers** and designate a single node in the AVL tree such that, if that node were to be deleted, two rebalance operations (not one double rotation, but two separate operations at two different nodes) would occur. Clearly label the node to delete which would precipitate those operations and show the result of deleting that node. (Thus, you should have two drawings, a before drawing of the original tree with the node to be deleted clearly designated, and an after drawing showing what the tree looks like after the node is deleted and goes through 2 rebalance operations.)

3) Show the state of a binary heap (min heap) after the insertion of the following items, in this order, into an initially empty binary heap:

13, 2, 19, 16, 14, 3, 9, 12, 6, 2, 18, 11 and 8

4) Show the array representation of the final state of the heap from the previous question.

Index	1	2	3	4	5	6	7	8	9	10	11	12	13
Value													

5) Delete the minimum value from the heap in question 8 and show a picture of the resulting heap.