Assignment #4

Due Dates: Saturday, September 26 at 11:59pm

Submit: eLearning

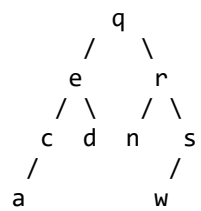
Late Policy: -10 points per hour late

Instructions: This is an individual assignment. Answers should be your own work.

Chapter 4

6 points
1. Tree traversals.

Give the sequence of letters for each traversal of this binary tree:

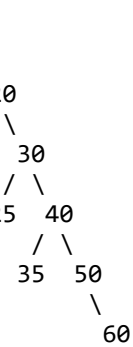


a. (2 pts) an inorder traversal
b. (2 pts) a preorder traversal
c. (2 pts) a postorder traversal

10 points
2. Draw an AVL tree for the following values inserted in this order. Illustrate each rotation that occurs:
65 13 16 52 28 11 20 14 87 50 26

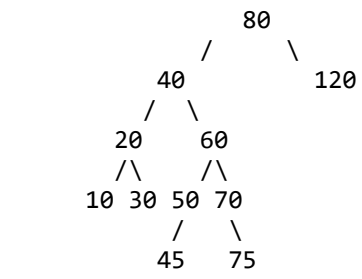
10 points
3. Draw an AVL tree for the following values inserted in this order. Illustrate each rotation that occurs:
83 12 68 55 32 6 46 57 62

10 points
4. For the splay tree shown below, show how an access of node 60 is performed. Illustrate each operation that occurs:

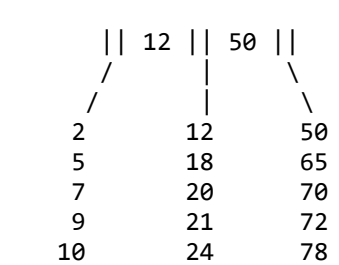


10 points

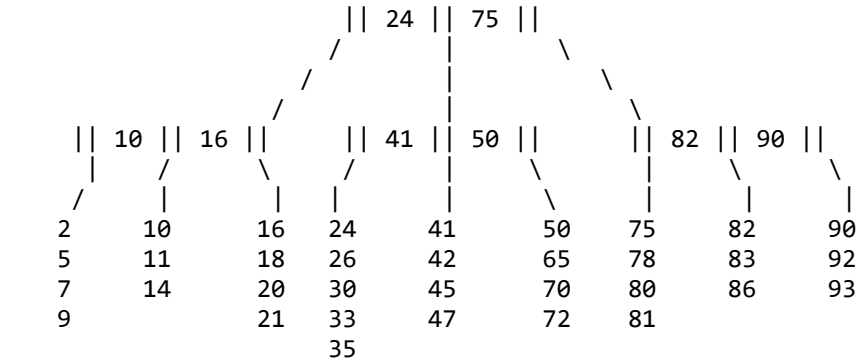
5. For the splay tree shown below, show how an access of node 75 is performed. Illustrate each operation that occurs:



10 points
6. For the B+-tree where M=3 and L=5 shown below, show how an insert of value 80 is handled.



10 points
7. For the B+-tree where M=3 and L=5 shown below, show how an insert of value 28 is handled.



10 points
8. A B+-tree is to be stored on disk whose block size is 3096 bytes. The data records to be stored are 36 bytes, and their key is 4 bytes. Determine the values for M and L for the B+-tree. Assume pointers are 4 bytes each.

8 points
9. For the problem above, how many levels are needed to store 8,600,000 records?

8 points
10. If a binary tree has N nodes, how many null child pointers will it have? Explain your reasoning.

8 points
11. In a perfect binary tree (one filled at every level), what does adding another level do to the number of nodes in the tree?

Submit to eLearning:
hw4.doc (.doc can be .txt, .jpg, etc.)