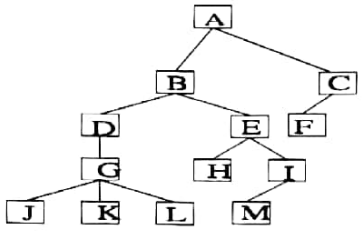
CS 302 Introduction to Data Structures
University of Nevada, Las Vegas
Spring 18

Assignment 7
Due: Saturday, March 17, 2018, by email

1. (a) 4.1 in the text book (b) 4.2 in the text book (c) 4.5 in the text book.
2. (a) Print out the tree below in preorder.
   (b) Print out the tree below in postorder.
   (c) Draw the tree below in left-child right-sibling form.



3. (a) Show the result of inserting the following elements, one by one, into an initially empty Binary Search Tree: 9, 5, 14, 11, 6, 13, 4, 15, 2, 7 , 10, 12, 1, 3, 8 in that order.
   (b) Show the result of deleting 9 and 14 for the tree created in part (a).
4. What is the height of a Binary Search Tree which accommodates 1000 nodes
   (a) in the worst case,
   (b) in the best case?
5. Draw an AVL tree of height 0,1,2,3, 4 with a minimum number of nodes.
6. (a) The minimum number of nodes $S(h)$ of the AVL tree of height h is given by the recurrence $S(h) = S(h-1) + S(h-2) + 1$ with $S(0) = 1$ and $S(1) = 2$. Tabulate the values for $h = 1, \ldots, 20$.
   (b) Try to find a value $a > 1$, such that $s(h) \geq a^h$ for all the values in the table.
7. In what range is the height of an AVL tree, give worst case and best case:
   (a) For 100 items?
   (b) For 500 items?
8. There are 300 elements which need to be stored in an AVL tree.
   (a) What is the height of the AVL tree in the worst case?
   (b) What is the height of the AVL tree in the best case?

How to submit. Create one PDF file with your solutions. Email this file as an attachment to the TA, Mr. Kaushik Deshmukh, deshmk1@unlv.nevada.edu. Subject of your email must be "Assignment 7", <your name>, <your student ID number>.