CSL 106: Data Structures and Algorithms

Assignment 5

Date of Submission: 5 October 2018

Q1.a. Construct minimal AVL trees of height 0, 1, 2, 3, 4, and 5. What is the number of nodes in a minimal AVL tree of height 6?

b. how many different shapes can there be of a minimal AVL tree of height *h?*

Q2. Given a binary search tree, write an algorithm to check whether it is an AVL tree or not?

Q3. Given a height *h*, give an algorithm to generate an AVL tree with minimum number of nodes.

Discuss the worst case possible height of AVL tree?

Q4. Write an algorithm for inorder traversal without recursion and without stack.  
 (Hint: Morris Traversal)

Q5.  Insert the following numbers, in the order given, into (a) an ordinary, unbalanced binary search tree and (b) an AVL tree. For the AVL tree, indicate at which points rotations occur to restore the balance of the tree.  
94, 33, 50, 76, 96, 67, 56, 65, 83, 34

Q6. Given a binary search tree, describe how you could convert it into an AVL tree with worst-case time O (n log n) and best case O (n).

Q7. How to insert, delete and traverse in fully threaded binary tree.