Applied Programming

Fall 2017

Quiz # 3

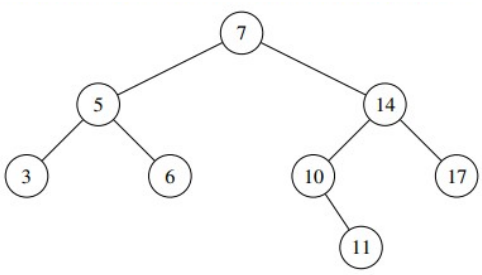
Registration # _____

Q. 1: In what order should keys be inserted into an AVL tree so that we don't have to perform any rotations?

Answer:

Suppose numbers 1, 2, 3, 4, 5, 6, 7 are to be inserted into an empty AVL tree. If the numbers are inserted in the order 4, 2, 6, 1, 3, 5, 7 no rotations will need to be performed.

Q. 2: Draw the binary search tree after the root node from the following is deleted




```
          10
     5              14
3         6    11        17
```

Q. 3: True/False questions

a) Inserting into an AVL tree with n nodes requires $\Theta(\log_2 n)$ rotations

False. Number of rotations is $O(\log_2 n)$ but not $(\log_2 n)$

b) The height of any Binary Search Tree is $O(\log_2 n)$

False. It can be up to n.

c) The key for every node in a Binary Search Tree is greater than its parent's key

False. The key of nodes in the left subtree of a node are less than their parent's key.