QUESTION #10

AVL TREE
How to insert a value in an AVL Tree.

TREES

Solution

Function to insert key => insert(self, root, key):

1. Perform normal BST.
2. Update the height of the ancestor node,
   height = 1 + max(Height(root.left), Height(root.right))
3. Get the balance_factor(root),
   bf = Height(root.left) - Height(root.right)
4. If the node is unbalanced(bf !=1), then try out the 4 cases,
   4.1. Left Left (if bf>1 && key < root.left.val) => RotateRight(root)
   4.1. Right Right (if bf<-1 && key > root.right.val) => RotateLeft(root)
   4.1. Left Right (if bf>1 && key > root.left.val),
      LeftRotate(root.left) => RotateRight(root)
   4.1. Right Left (if bf<-1 && key < root.right.val),
      RightRotate(root.right) => RotateLeft(root)

Nerving Into Data Structures