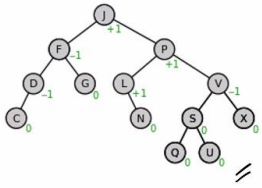
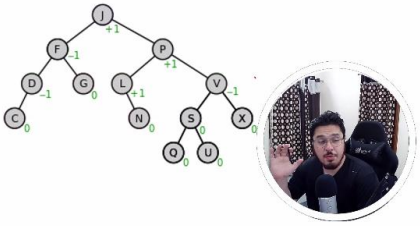
Rotation in AVL Trees With Multiple Nodes

By CodeWithHarry

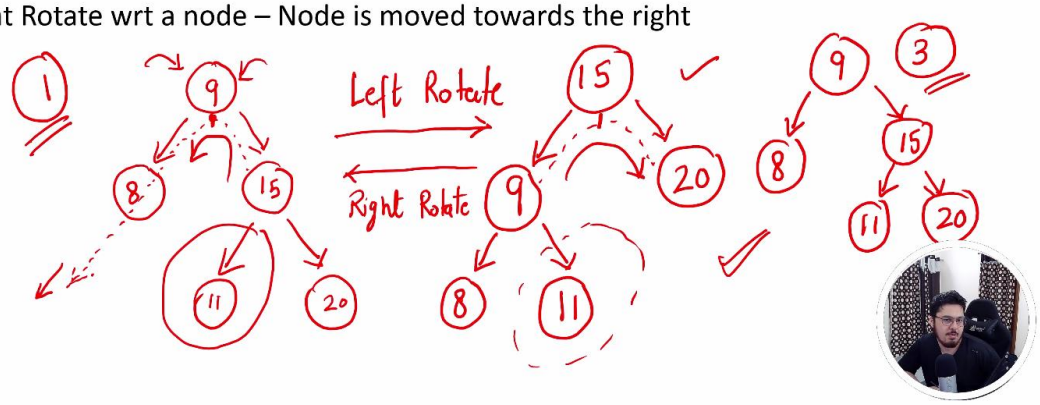




Rotate Operations

We can perform rotate operations to balance a binary search tree such that the newly formed tree satisfies all the properties of a BST. Following are two basic rotate operations:

1. Left Rotate wrt a node – Node is moved towards the left
2. Right Rotate wrt a node – Node is moved towards the right

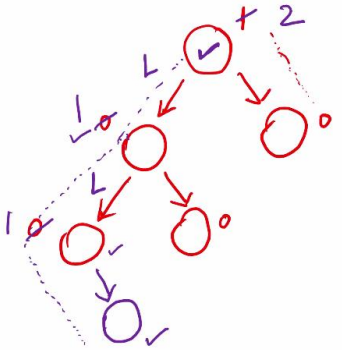


Balancing a AVL tree after insertion

In order to balance an AVL tree after insertion, we can follow the following rules:

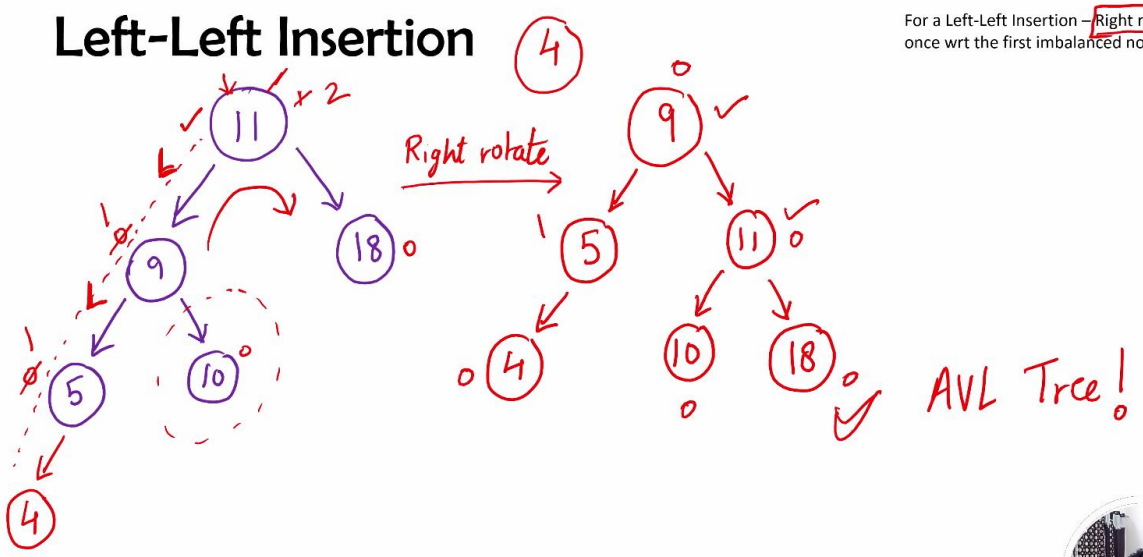
1. For a Left-Left Insertion – Right rotate once wrt the first imbalanced node
2. For a Right-Right Insertion – Left rotate once wrt the first imbalanced node
3. For a Left-Right Insertion – Left rotate once and then Right rotate once
4. For a Right-Left Insertion – Right rotate once and then Left rotate once

Lets Go...



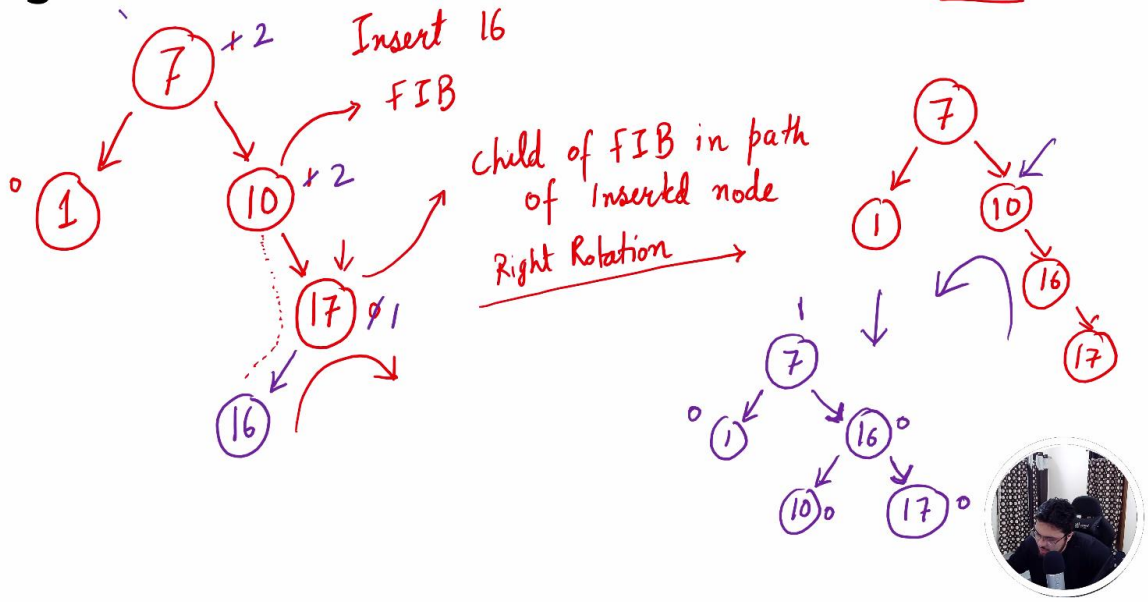
Left-Left Insertion

For a Left-Left Insertion – Right rotate once wrt the first imbalanced node



Right-Left Insertion

For a Right-Left Insertion – Right rotate once and then Left rotate once



FIB node – First Imbalance node