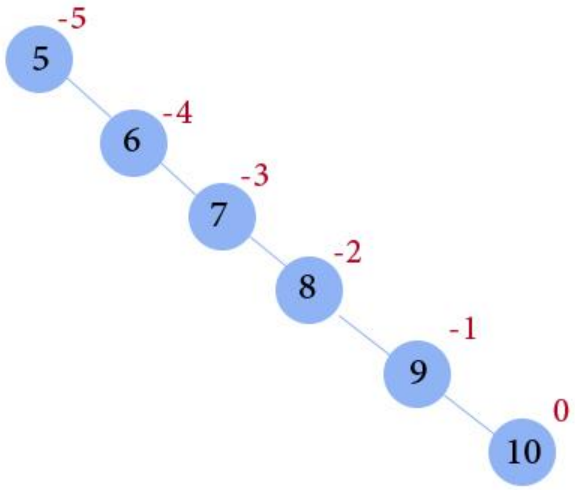
# Lab 6

# AVL Trees

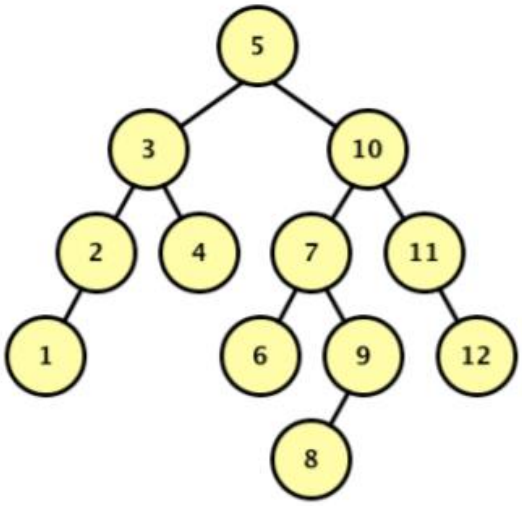
**1- [15 marks] Given the following AVL Tree:**




a- Draw the resulting tree after rebalance, Label each node in the resulting tree with its balance factor.

2- **[20 marks]** Construct AVL Tree for the following sequence of numbers :
50 , 20 , 60 , 10 , 8 , 15 , 32 , 46 , 11 , 48

**3- [50 marks] Given the following AVL Tree:**



a- **[25 marks]** Draw the resulting BST after 1 , 2 are removed, but before any rebalancing takes place. Label each node in the resulting tree with its balance factor. Replace a node with both children using an appropriate value from the node's left child

b- **[25 marks]** Now rebalance the tree that results from (a). Draw a new tree for each rotation that occurs when rebalancing the AVL Tree (you only need to draw one tree that results from an RL or LR rotation). You do not need to label these trees with balance factors.

**4- [15 marks]** Provide an ADT java class for AVL Tree using type of tree named "AVLTree " that supports the following functionalities :

1. **[5 marks]** AVL Tree construction
2. **[5 marks]** Right Rotation
3. **[5 marks]** Left Rotation