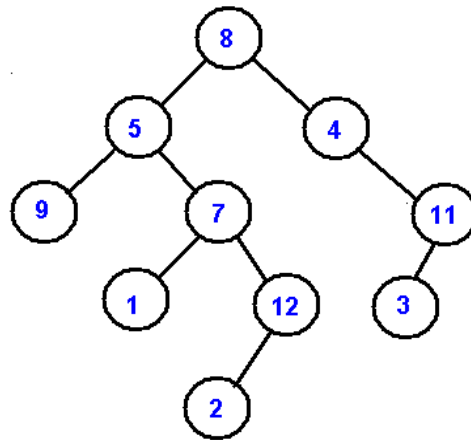# Tutorial 6

Q1. Write the Inorder, Preorder, Postorder and Level Order traversals of the given binary tree:

Q2. Given a sequence of numbers: `11, 6, 8, 19, 4, 10, 5, 17, 43, 49, 31`
Draw a binary search tree by inserting the above numbers from left to right.

Q3. Remove 11 from the above tree and show the two trees that can be the result.

Q4. A binary search tree contains an integer at each node. Write a method to print the contents of the tree in increasing order.

Q5. What is the maximum number of nodes in a binary tree of height **7**?

Q6. Insert 60, 30, 80, 10, 40 on a BST and check if it is an AVL tree by computing balance factor BF at each node. (BF = height of left subtree - height of right subtree).

Q7. Now insert 32 on the tree drawn in question 3 and check again if it is an AVL tree.

Q8. Build an AVL Tree with the following values: **15, 20, 24, 10, 13, 7, 30, 36, 25**
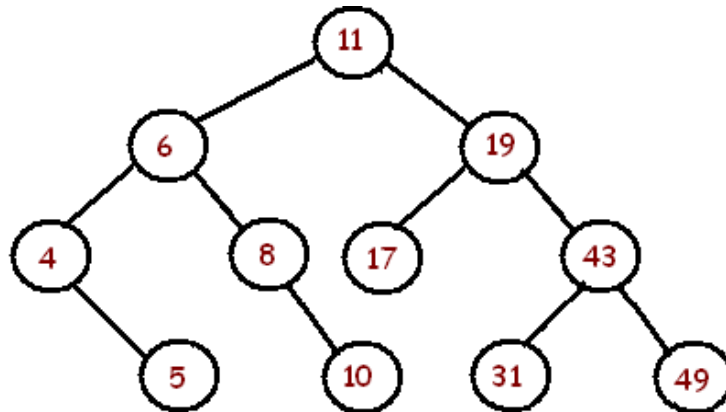
Ans 1.

    PreOrder - 8, 5, 9, 7, 1, 12, 2, 4, 11, 3
    InOrder - 9, 5, 1, 7, 2, 12, 8, 4, 3, 11
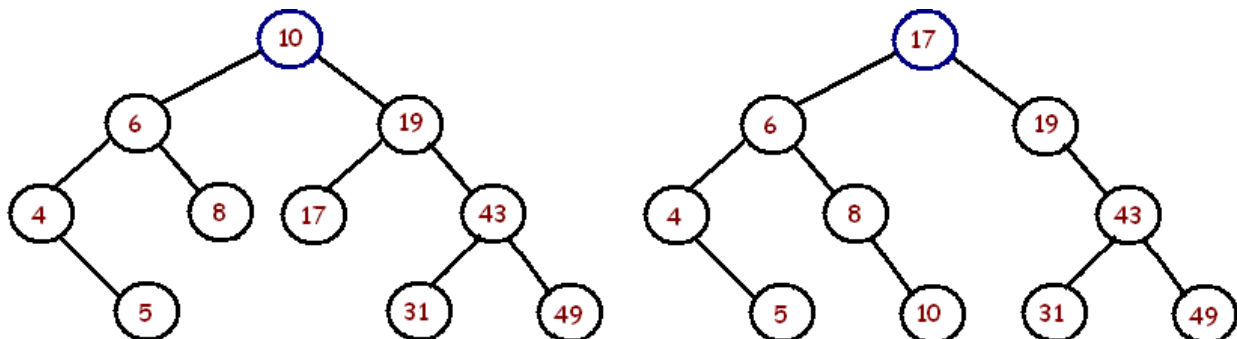   PostOrder - 9, 1, 2, 12, 7, 5, 3, 11, 4, 8
    LevelOrder - 8, 5, 4, 9, 7, 11, 1, 12, 3, 2
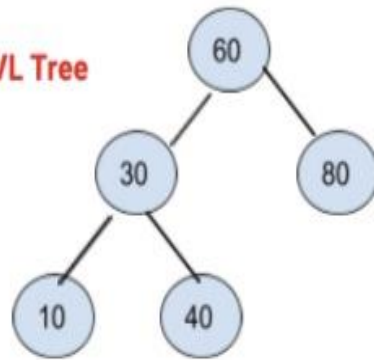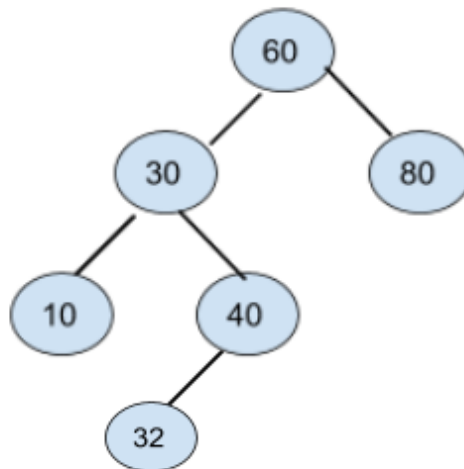
Ans2.

Ans. 3

Ans 4. Inorder traversal of BST prints it in ascending order.

Ans 5. *Maximum number of nodes in a binary tree of height 'h' is $2^h - 1$. So, in the tree of height 7, max no. of nodes is 127.*

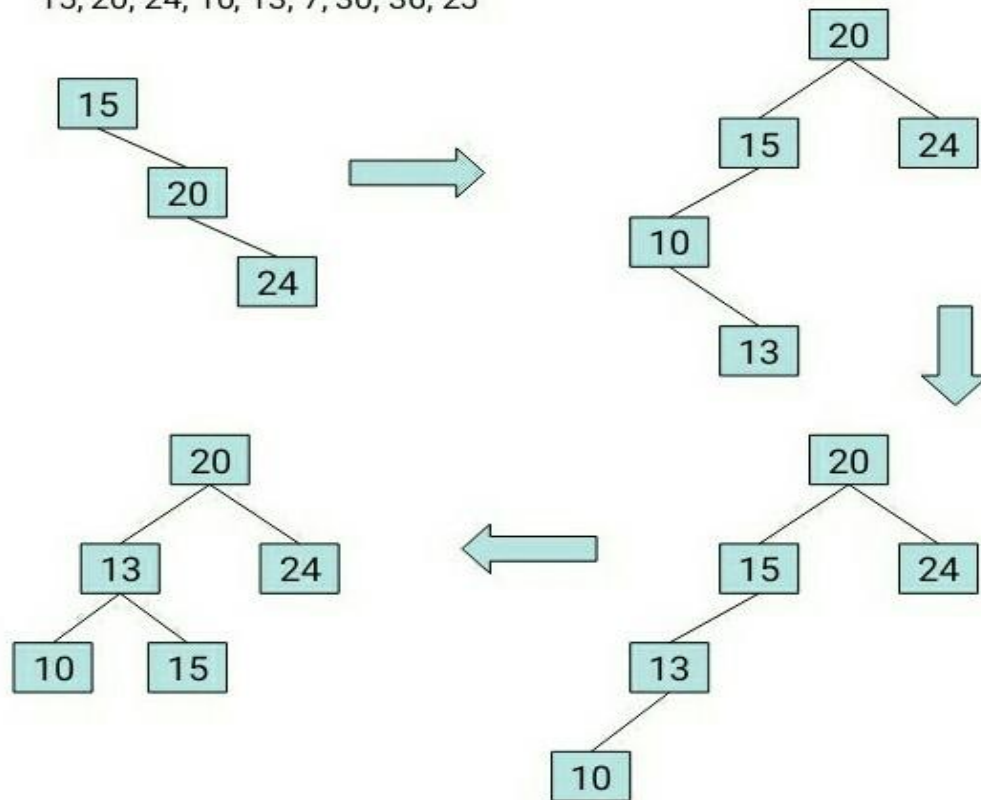**Ans 6. BF=2-1 = 1**
     Yes, it is an AVL Tree

Ans 7. After inserting 32, BF= 3-1= 2
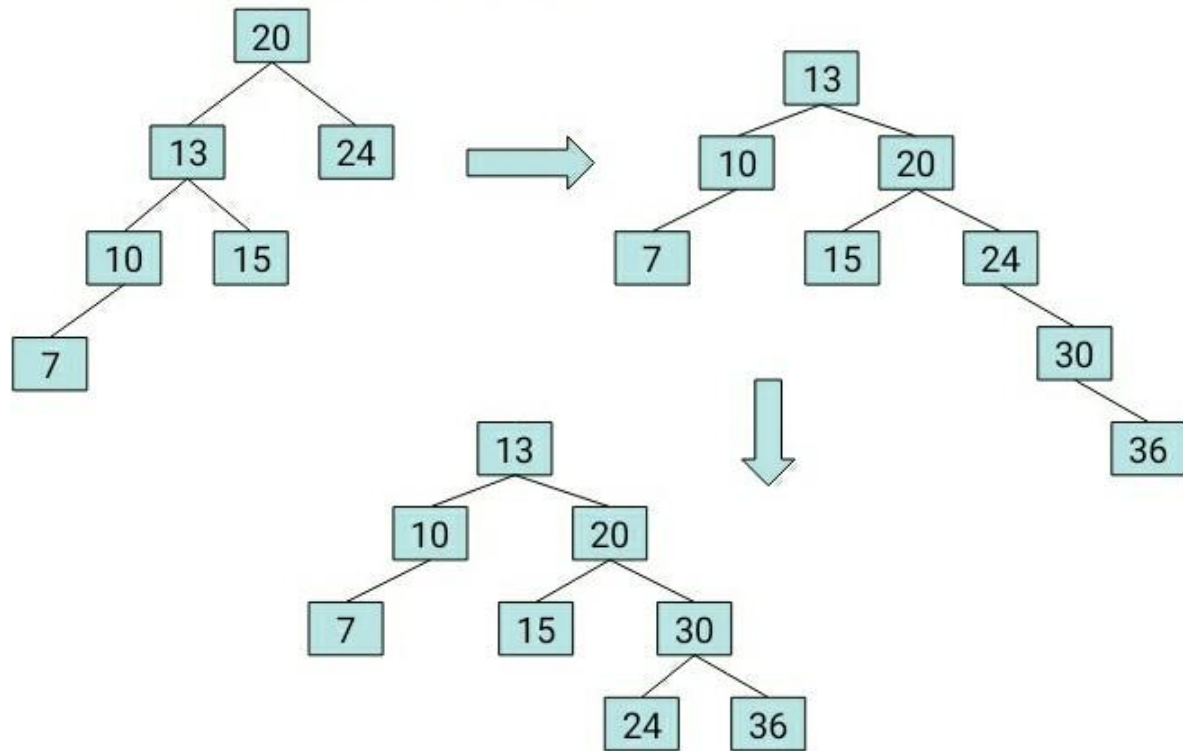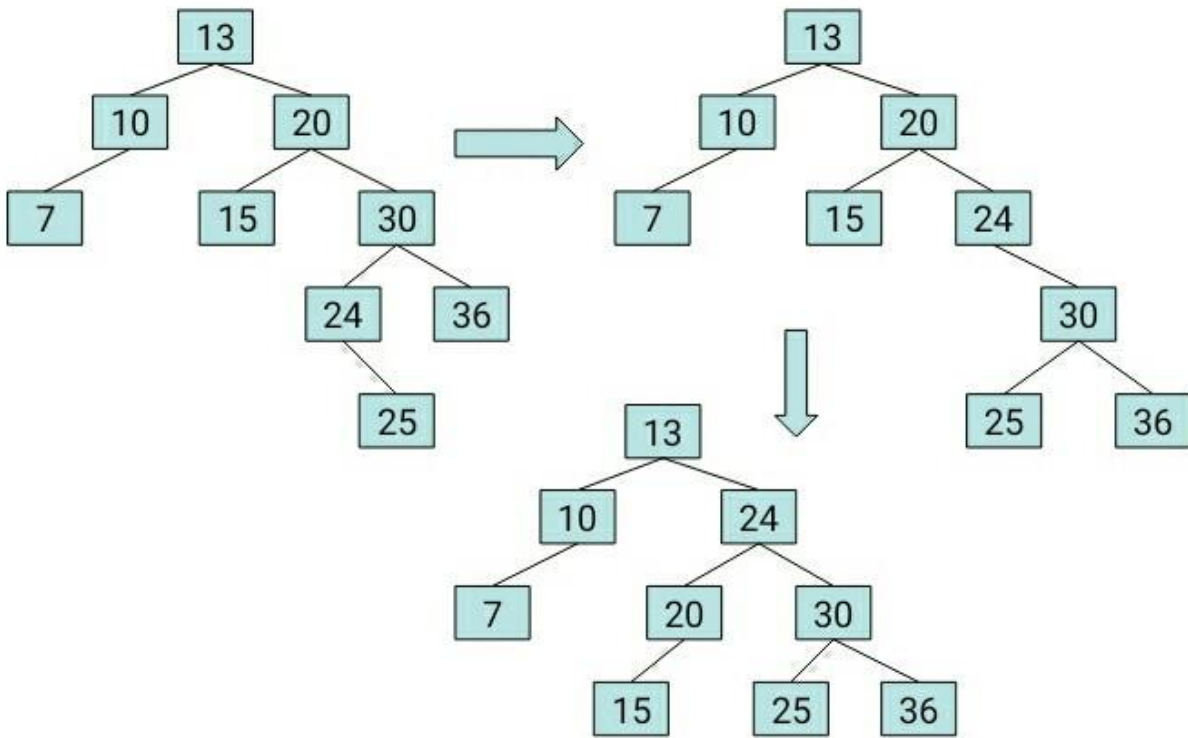   **No, it's not an AVL Tree now**

Ans 8.

15, 20, 24, 10, 13, 7, 30, 36, 25

15, 20, 24, 10, 13, 7, 30, 36, 25

15, 20, 24, 10, 13, 7, 30, 36, 25

Remove 24 and 20 from the AVL tree.