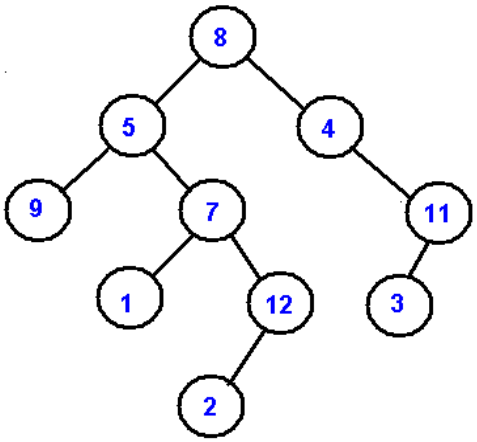
Tutorial 6

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).

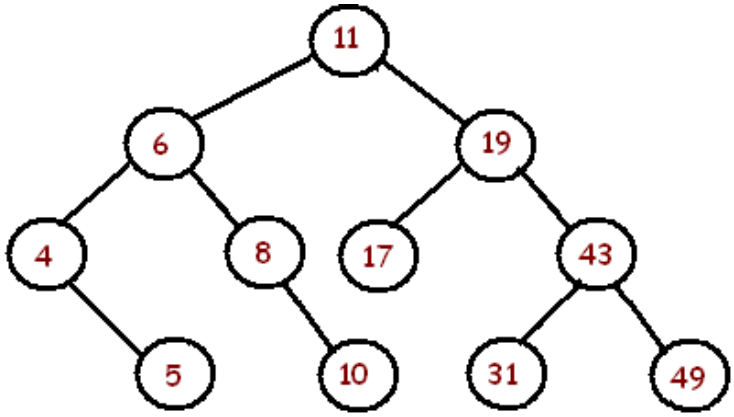
Q7. Now insert 32 on the tree drawn in question 3 and check again if it is an AVL tree.

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

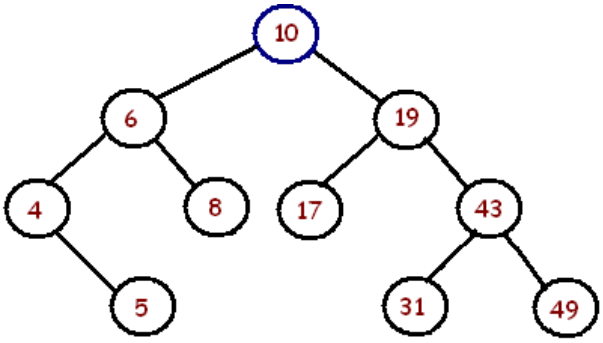
Ans 1.

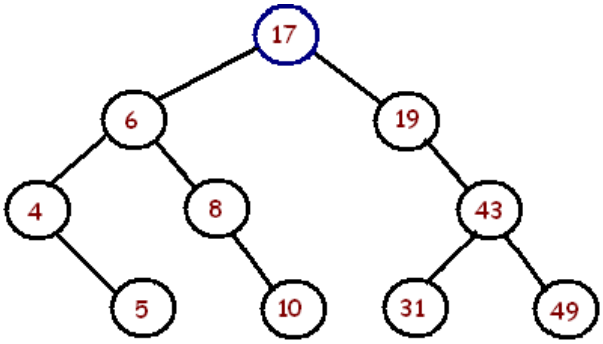
PreOrder - 8, 5, 9, 7, 1, 12, 2, 4, 11, 3
InOrder - 9, 5, 1, 7, 2, 12, 8, 4, 3, 11
PostOrder - 9, 1, 2, 12, 7, 5, 3, 11, 4, 8
LevelOrder - 8, 5, 4, 9, 7, 11, 1, 12, 3, 2

Ans2.



Ans. 3



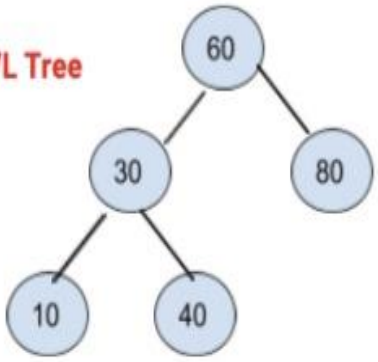


Ans 4. Inorder traversal of BST prints it in ascending order.

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.

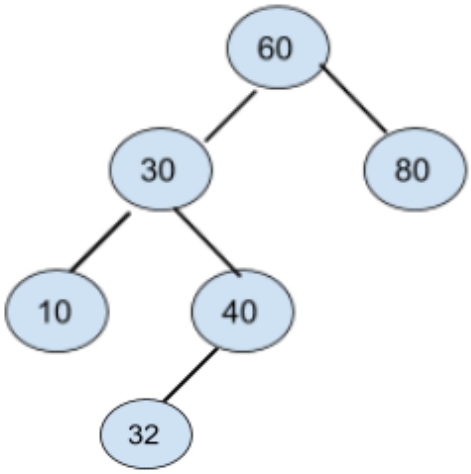
Ans 6. BF=2-1 = 1

Yes, it is an AVL Tree

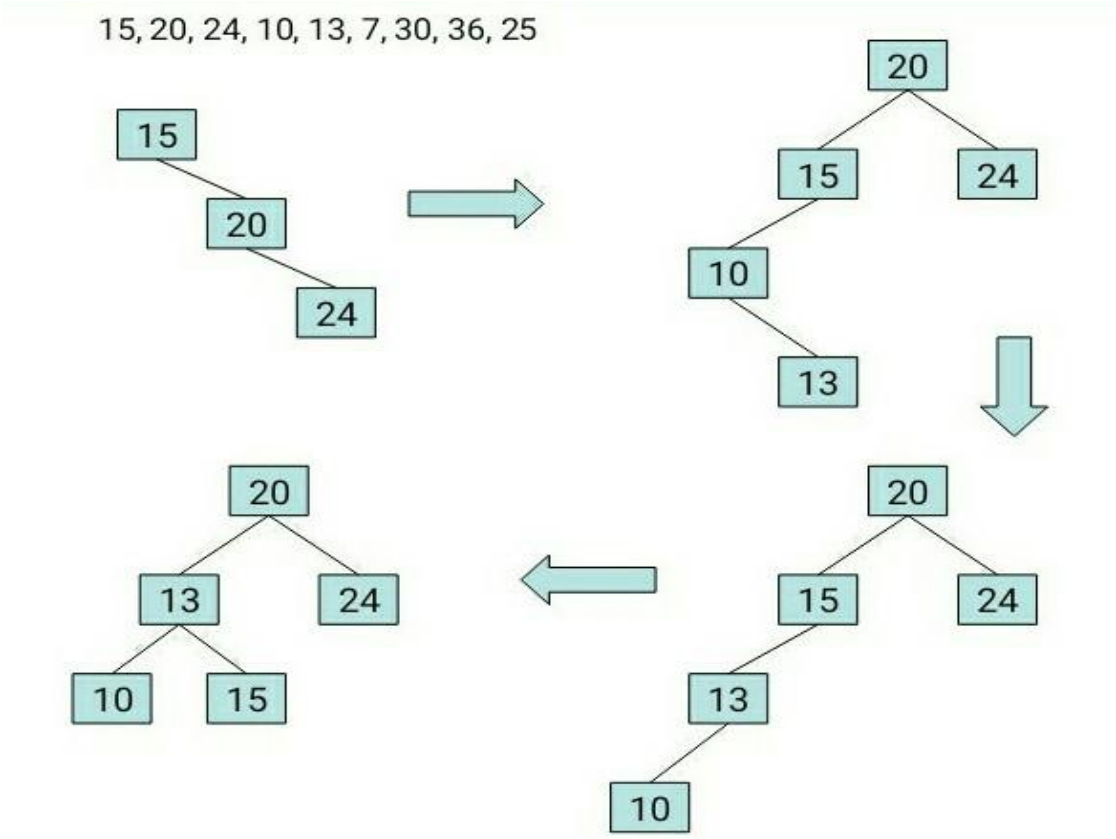


Ans 7. After inserting 32, BF= 3-1= 2

No, it's not an AVL Tree now



Ans 8.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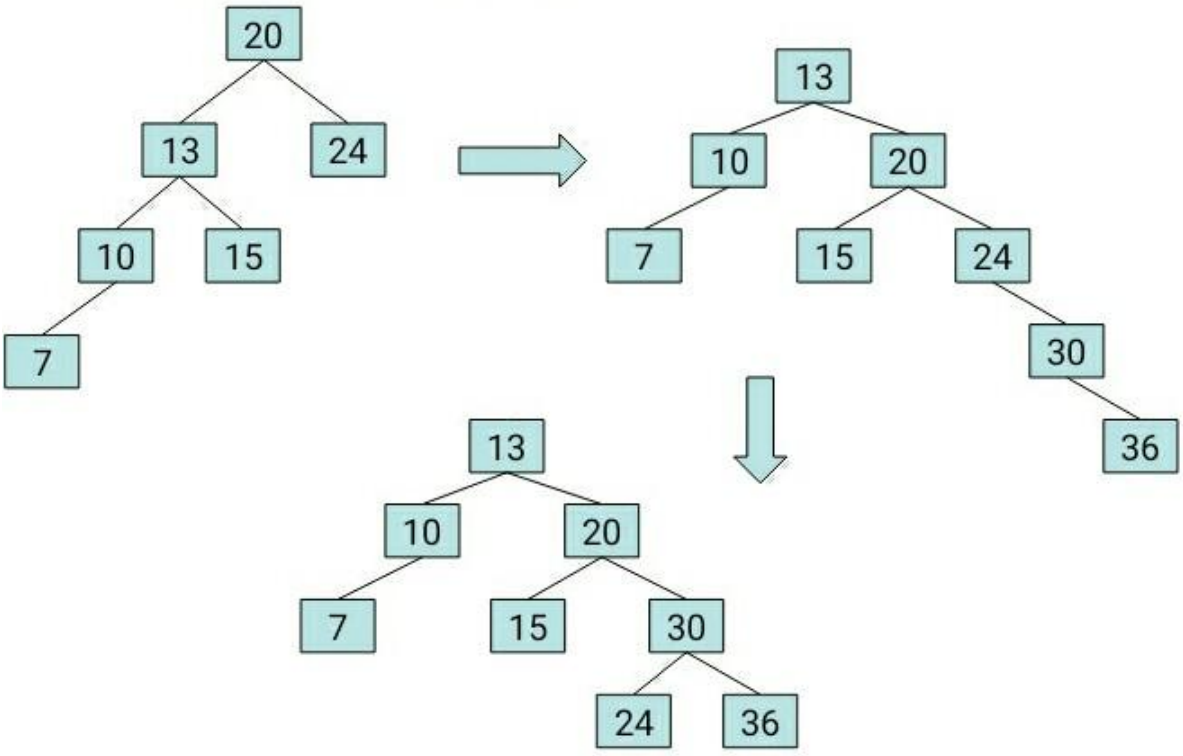
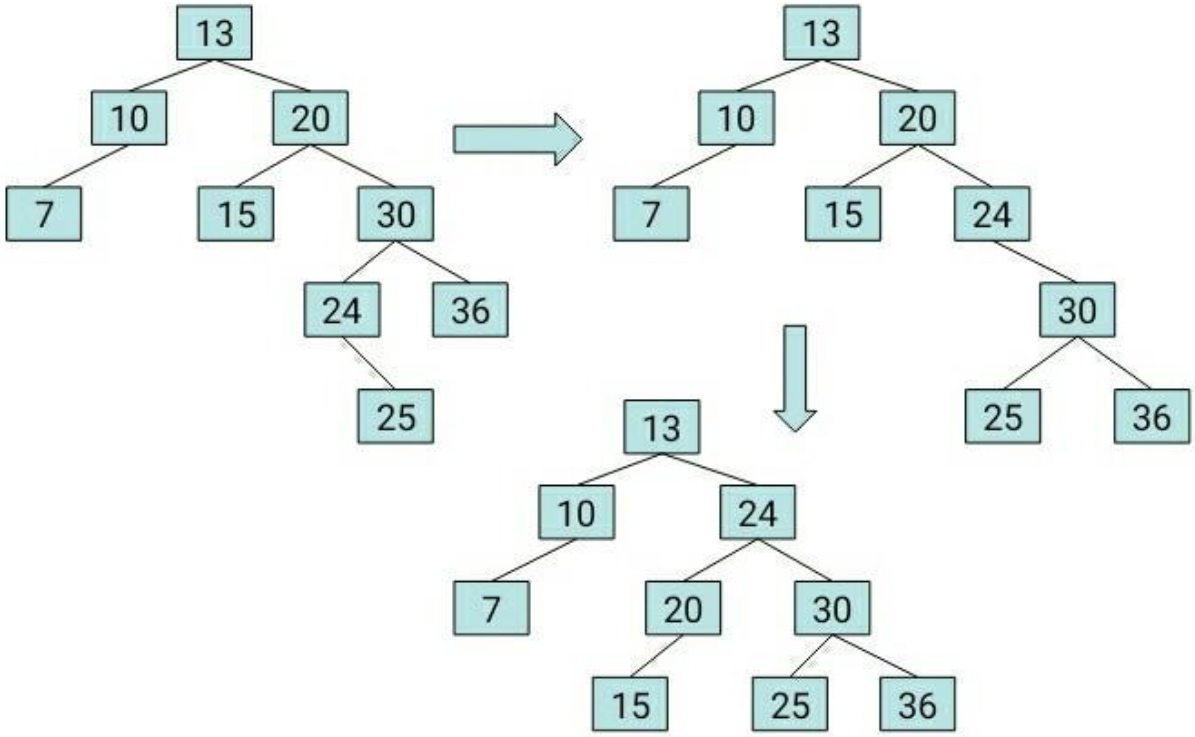


15, 20, 24, 10, 13, 7, 30, 36, 25



Remove 24 and 20 from the AVL tree.