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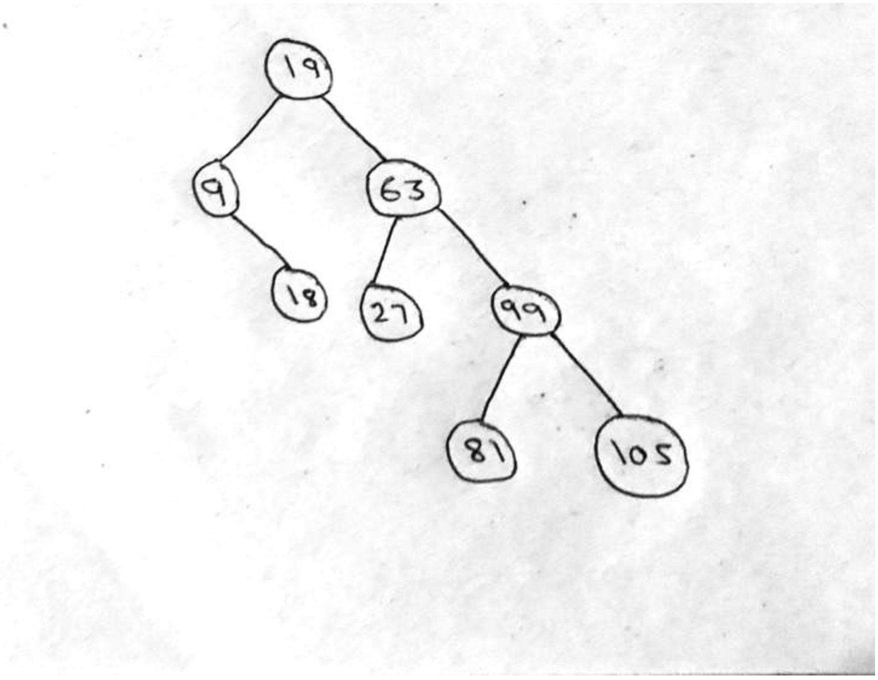
Q.1

A) The tree is not AVL since there are no lesser or less than 1 between the upper left and right subtrees.

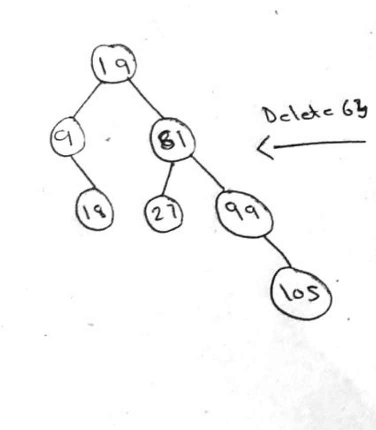
B) 19,9,18,63,27,99,81,105 is the b-preorder traversal list.

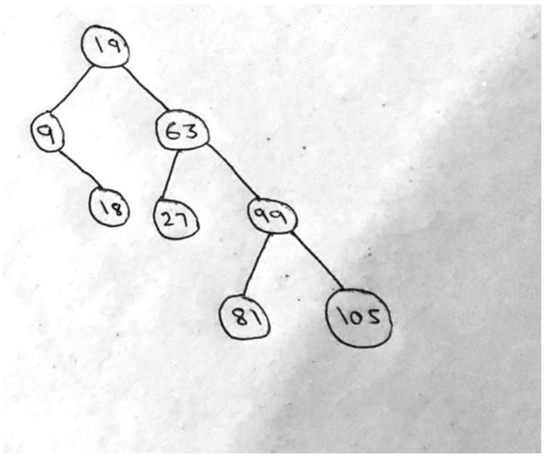
C) The following is the c-postorder traversal list: 18,9,81,105,99,27,63,19

D) The following is the d-inorder traversal list: 9,18,19,81,99,105,27,63



E)

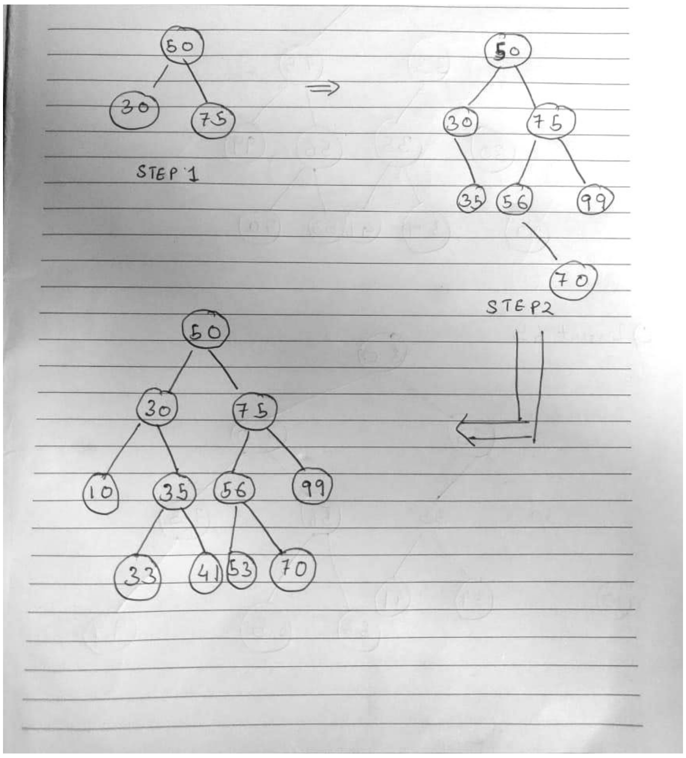


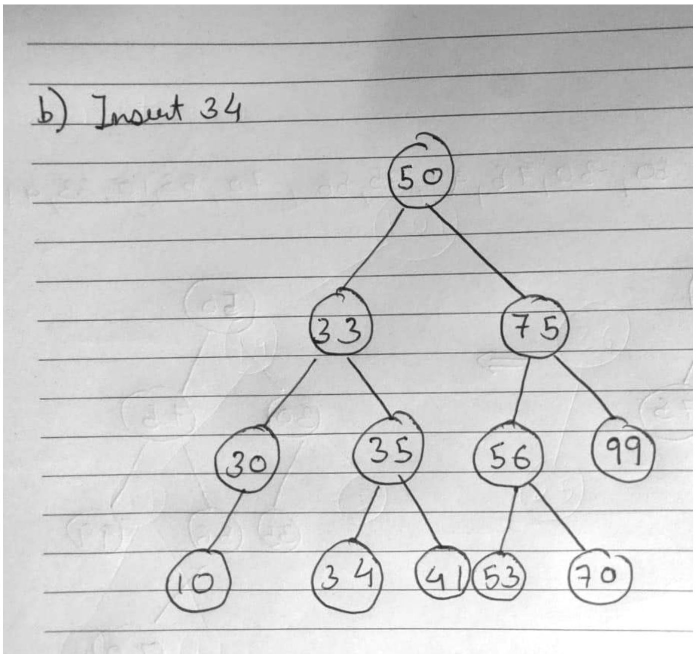


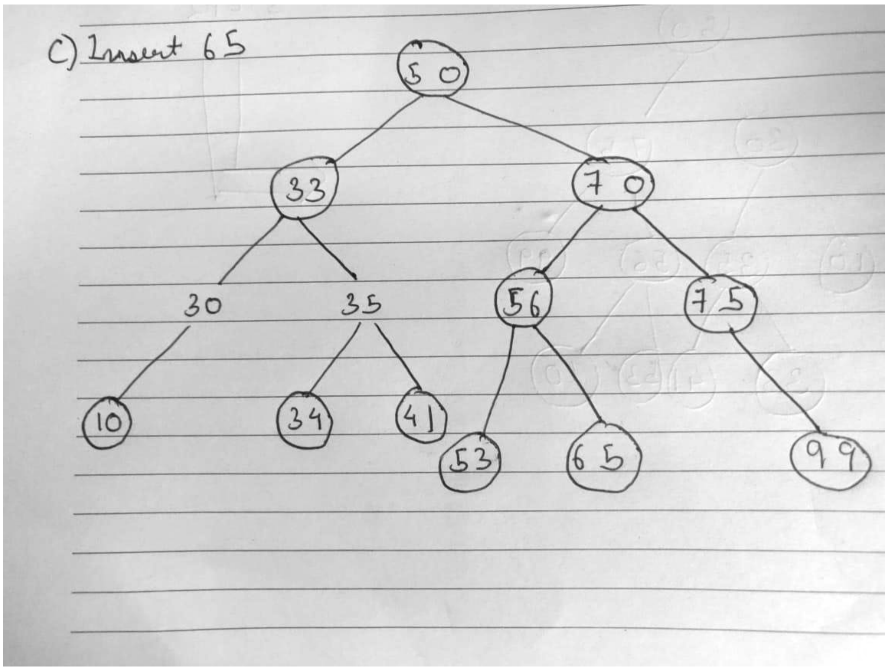
Q.2

The self-balancing attribute of the AVL tree makes it a self-balancing tree. Self-balancing simply implies that the difference in height between the right and left subtrees should not exceed 1.

When the difference is more than 1, the AVL tree performs two sorts of operations: Left Rotation and Right Rotation.







Q.3

The AVL tree is 6 feet tall.

Consider H to be the tree's height, therefore H=6.

Number of nodes required:

N(H)=N(H-1)+N(H-2)+1 (where N(0) is 1 and N(1) is 2)

Thus, the formula N(6)=33 may be determined by first subtracting values from N(2),N(3),N(4),N(5), and then subtracting the value of N(6) (6)

N(2)=N(1)+N(0)+1=4

N(3)=N(2)+N(1)+1=7

N(4)=N(3)+N(2)+1=12

N(5)=N(4)+N(3)+1=20

N(6)=N(5)+N(4)+1=33

Number of nodes required:

2(H+1)-1 is the formula.

As a result, the maximum number of nodes is: 2(7)-1=127

Q.4

3 in. high heap

Assume H is the height of the heap, therefore H=3.

2(H+1) -1 is the maximum number of nodes.

As a result, 2(4)-1=15.

2(H) + 1 = minimum number of nodes

As a result, 2(3)+1=9

Q.5

A binary tree in which the value of the parent node is larger than or equal to the value of the children's node. As a result, in a max heap, the value of Node is the highest value, implying that root should have the highest value among all the other nodes in the heap. In most cases, a maximum heap is shown or provided as an array.