

CS 202

HW 4

Mannan Abdul

21801066

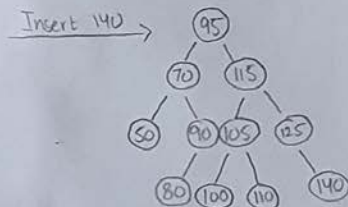
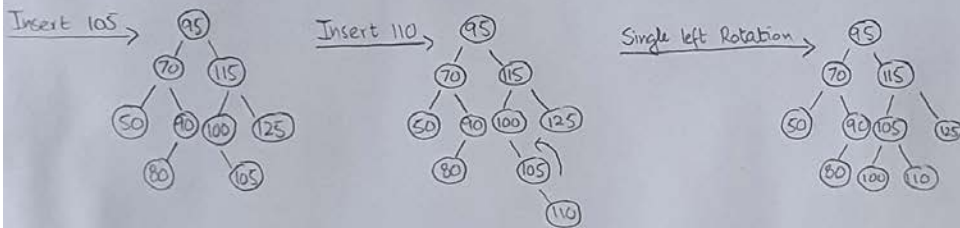
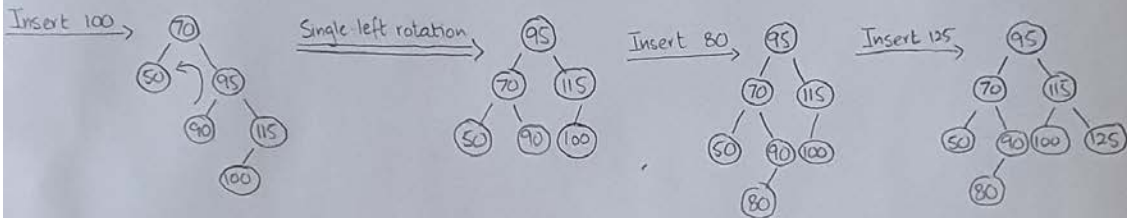
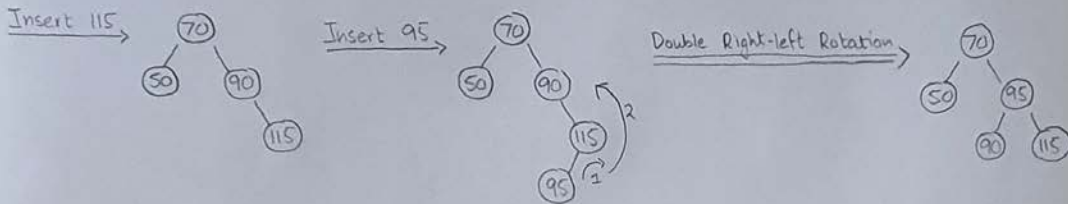
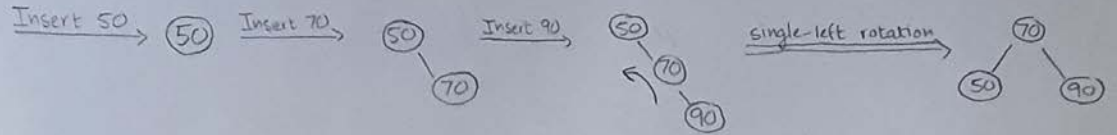
Q1)

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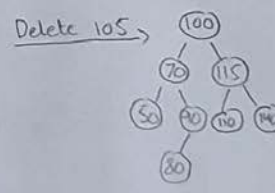
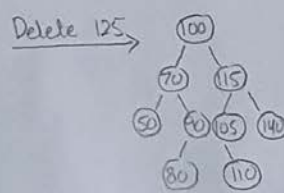
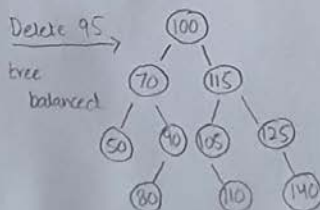
# Q1) AVL Trees Insertion & Deletion

Inserting 50, 70, 90, 115, 95, 100, 80, 125, 105, 110, 140

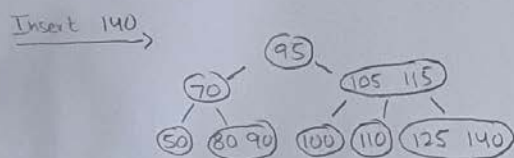
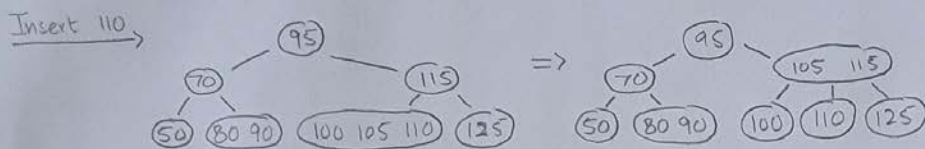
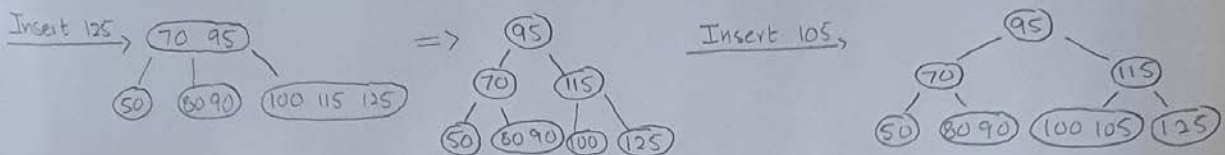
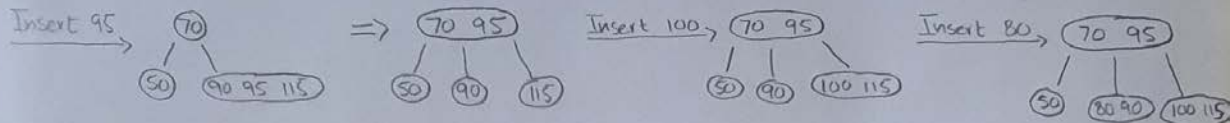
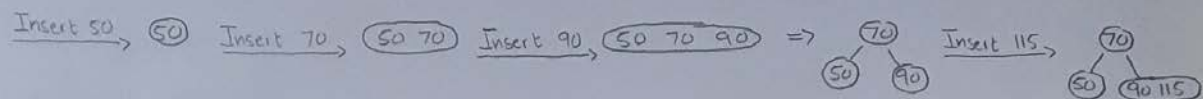
Key:  $\rightarrow$  = next stage  
 $\Rightarrow$  = transition



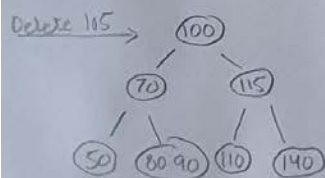
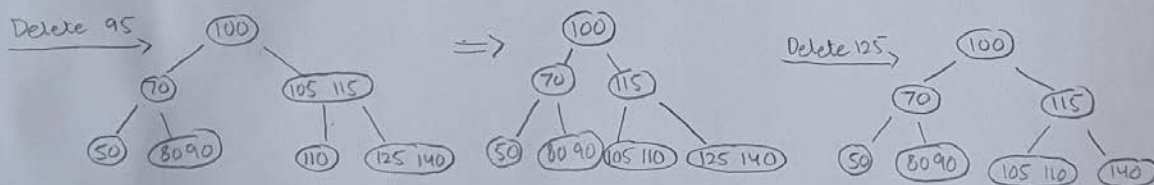
Deleting 95, 125, 105 (First Step is always replacing with in-order successor)



## 2-3 Trees

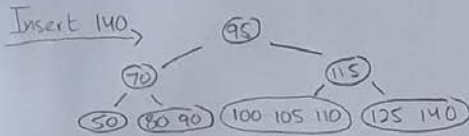
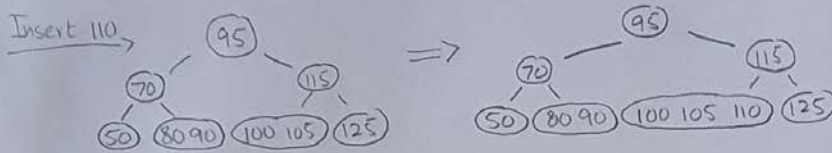
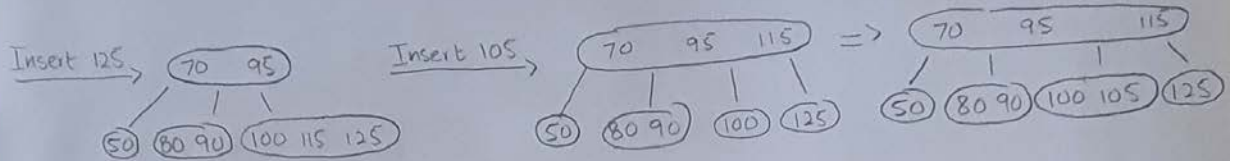
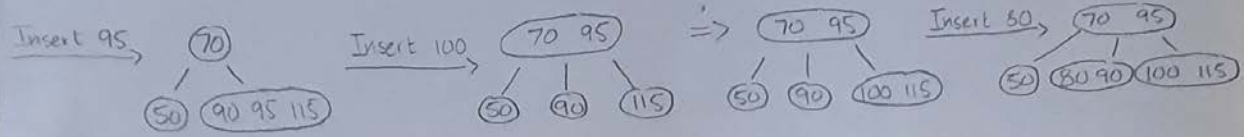
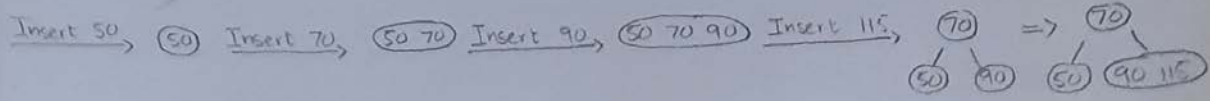


\* Again, for deletion, we always replace with inorder successor first



## 2-3-4 Trees

\* Splits are done before insertion when necessary



\* For deletion, node to delete is replaced by inorder successor. Any 2-node is dealt with first that is in the path to deletion

