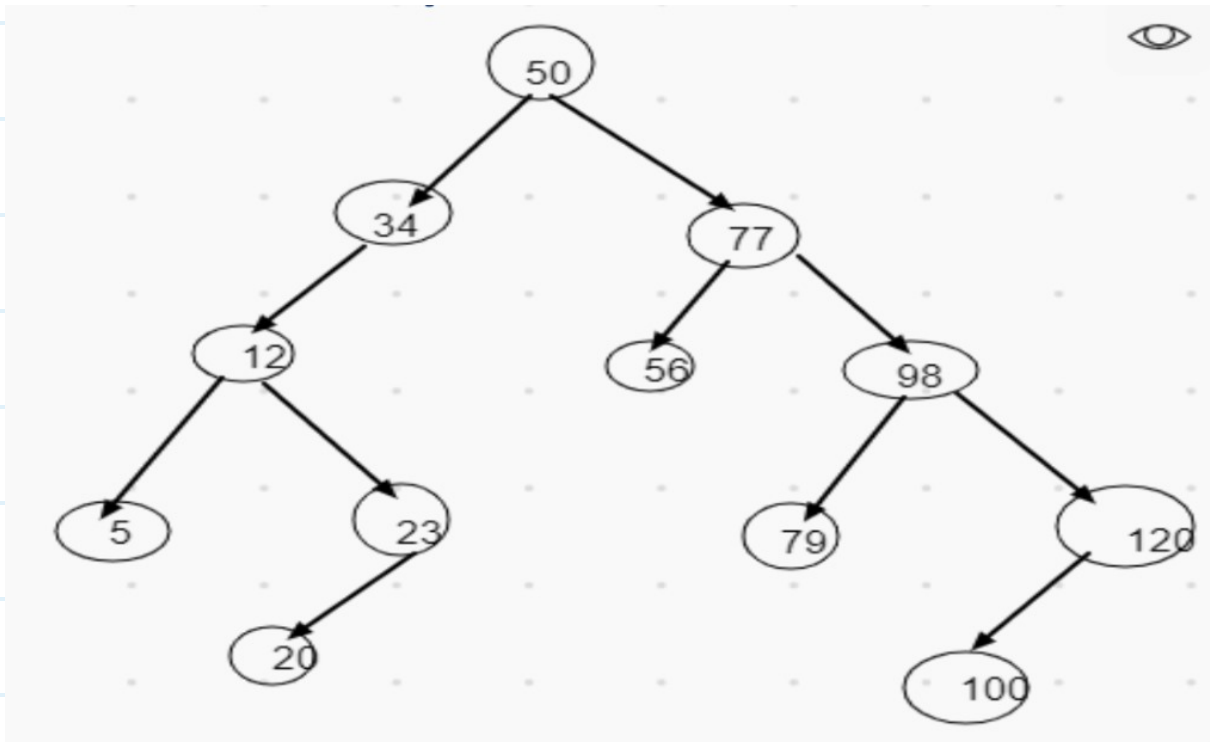


Pre - 67, 27, 19, 66, 35, 40, 100, 98, 83, 69, 75, 99, 200

Post - 8, 19, 40, 35, 66, 27, 75, 69, 83, 99, 98, 200, 100, 67

In - 8, 19, 27, 35, 40, 66, 67, 100, 98, 83, 69, 75



Pre - 50, 34, 12, 5, 23, 20, 77, 56, 98, 79, 120, 100

In - 5, 12, 20, 23, 34, 50, 56, 77, 79, 98, 100, 120

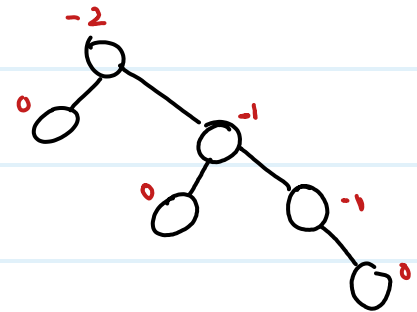
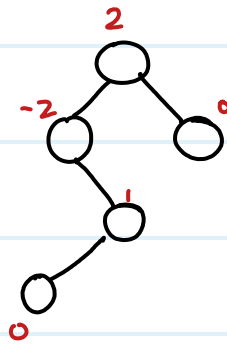
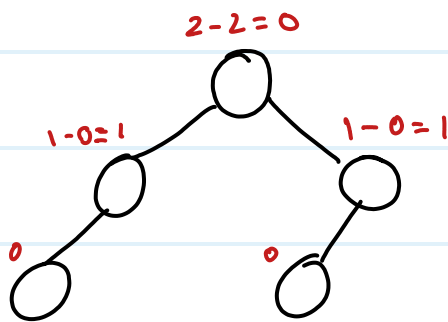
Post = 5, 20, 23, 12, 34, 56, 79, 100, 120, 98, 77, 50

AVL Tree

Balance Factor = height of left subtree - height of right subtree

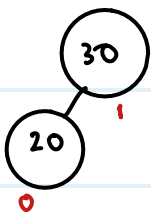
$$|bf| = h_L - h_R = \{-1, 0, 1\}$$

$$|bf| = |h_L - h_R| \leq 1$$

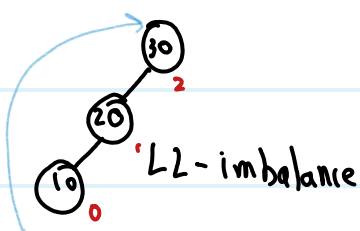


Rotations

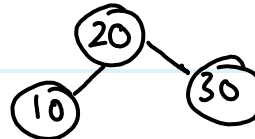
Init



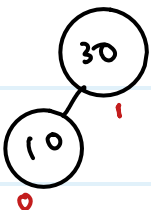
Insert 10



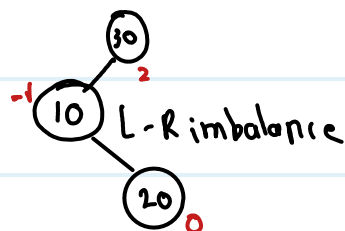
After LL-Rotation



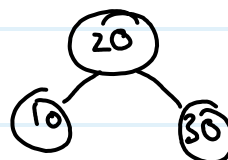
Init

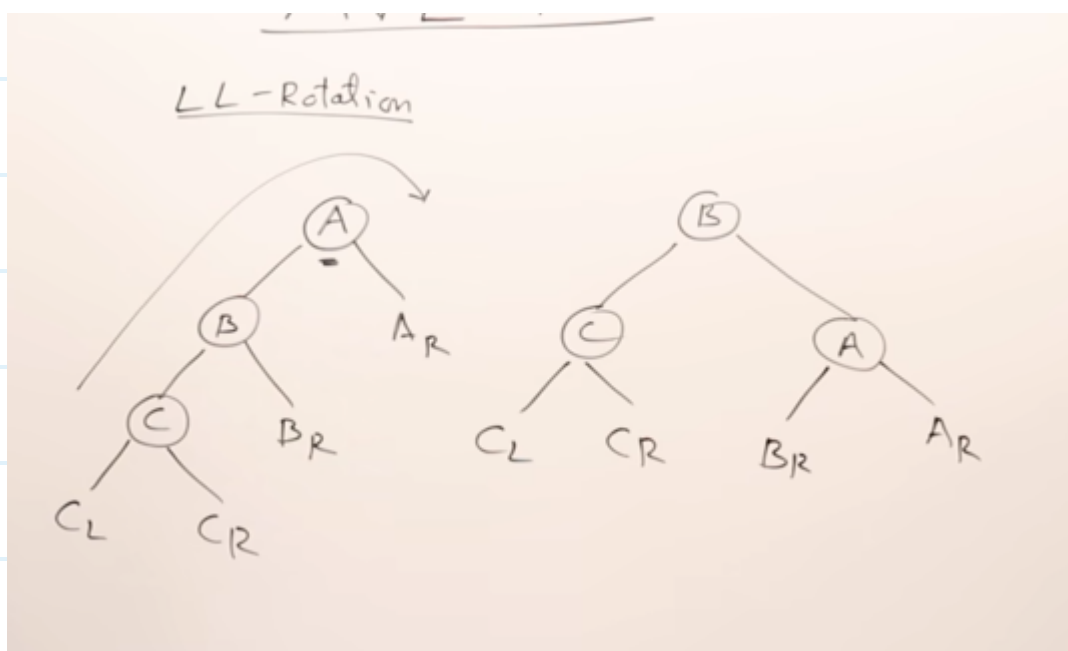
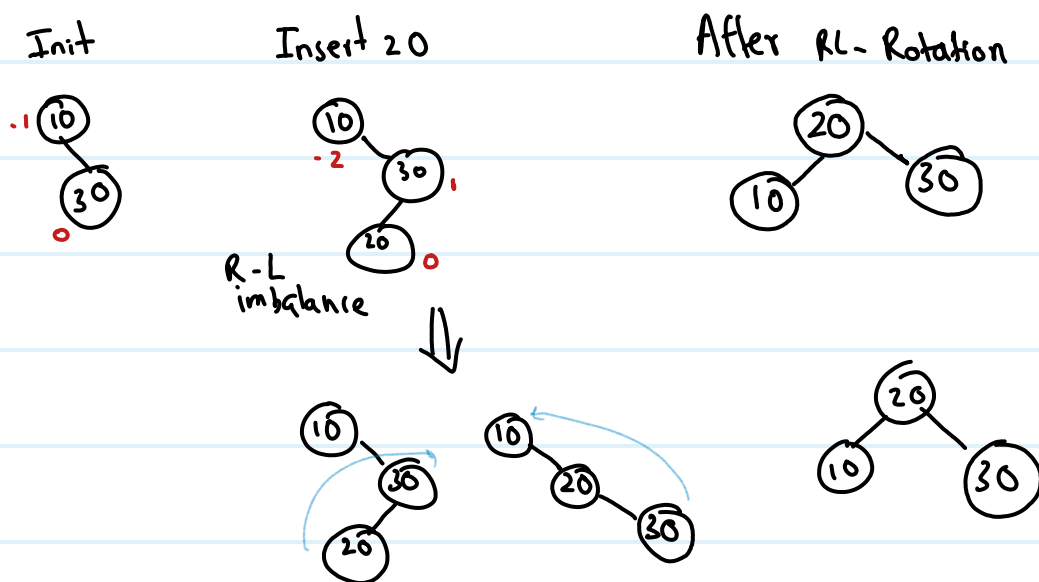
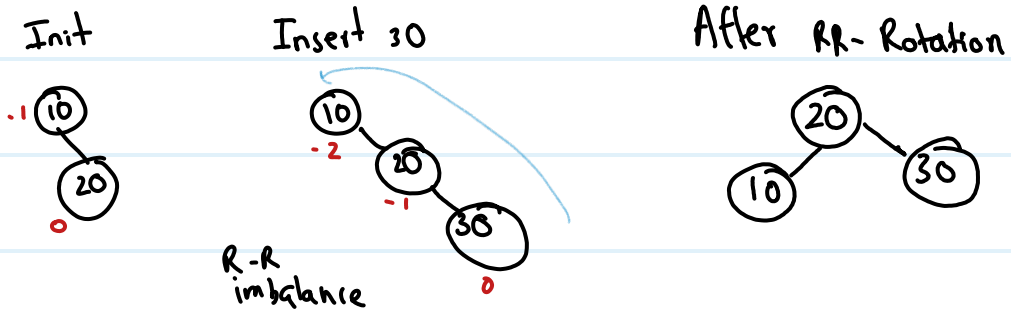


Insert 20

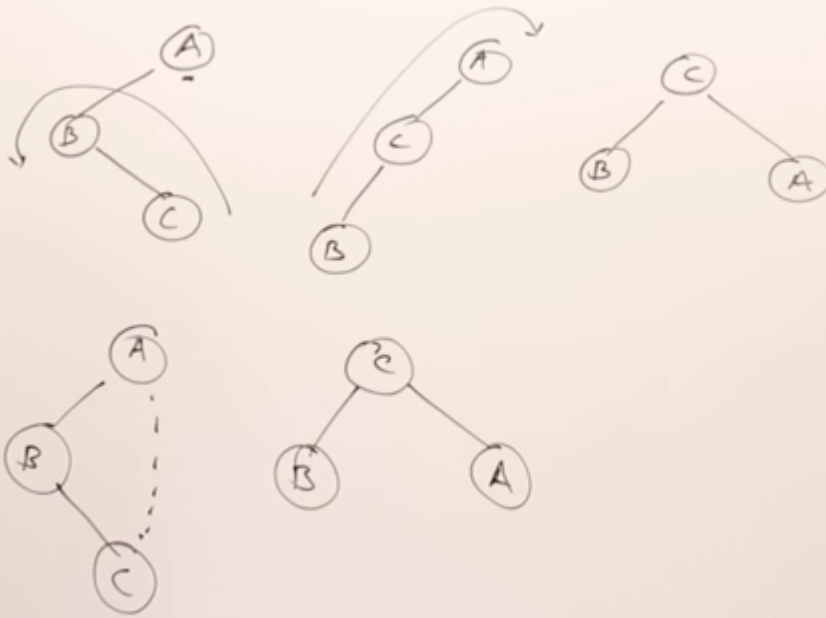


After LR-Rotation

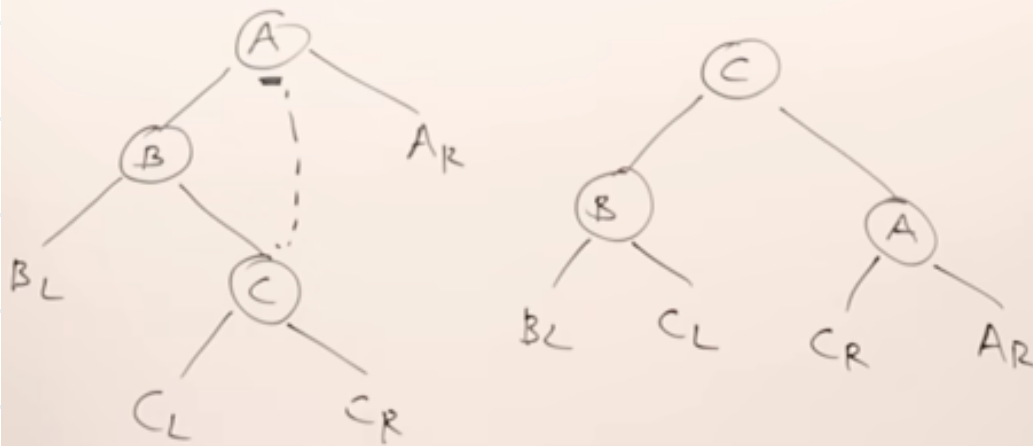




LR-Rotation



LR-Rotation

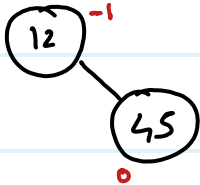


Ex: 12, 45, 65, 23, 89, 50, 4, 35, 100

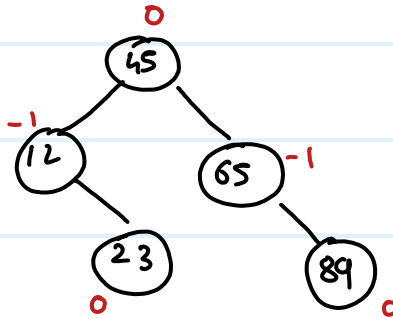
Insert 12



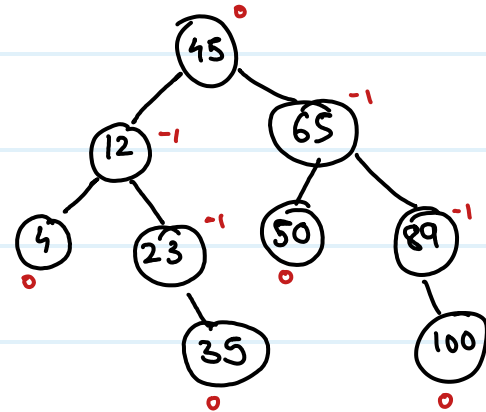
Insert 45



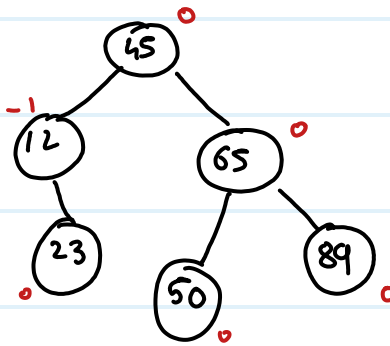
Insert 89



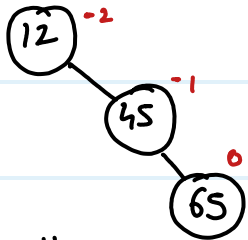
Insert 100



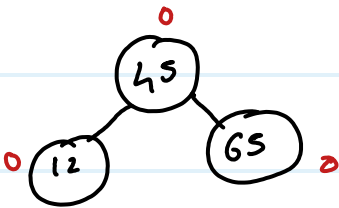
Insert 50



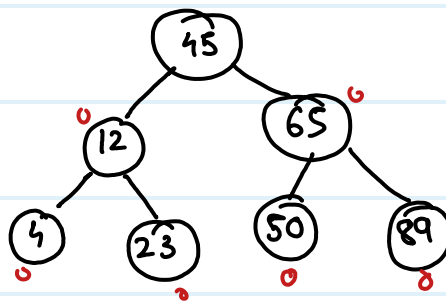
Insert 65



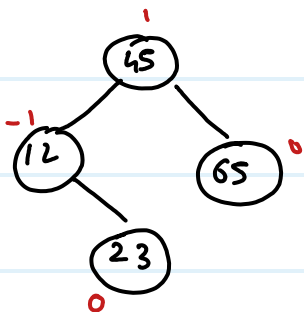
RR Rotation



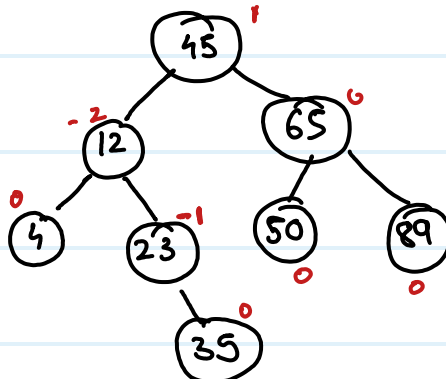
Insert 4



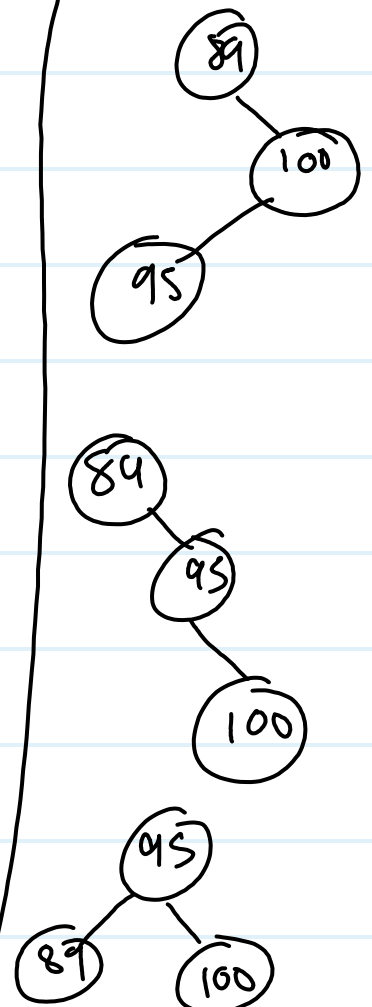
Insert 23



Insert 35



~~EXTRA~~

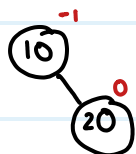


Q] 10, 20, 30, 25, 40, 50, 35, 33, 37, 60, 38

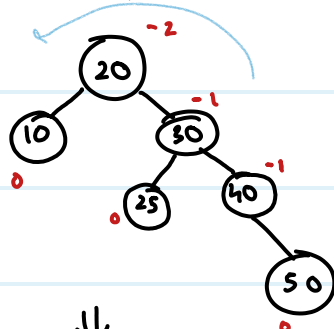
Insert 10



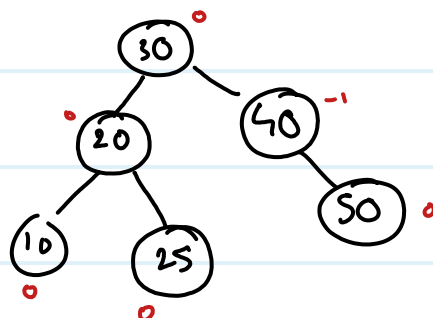
Insert 20



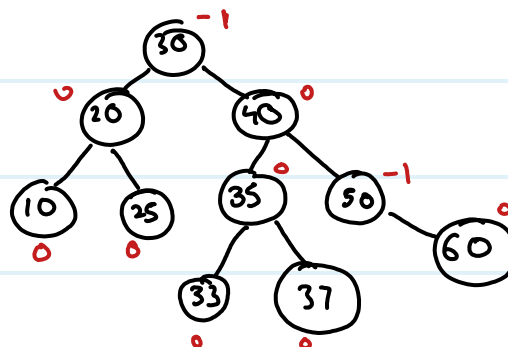
Insert 50



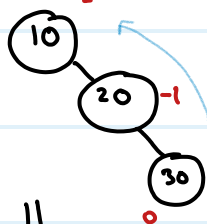
RR Rotation



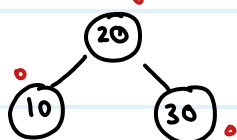
Insert 60



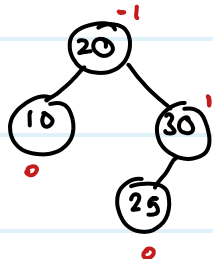
Insert 30



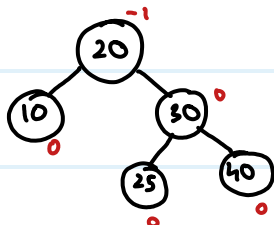
RR Rotation



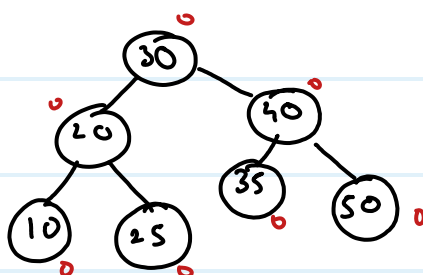
Insert 25



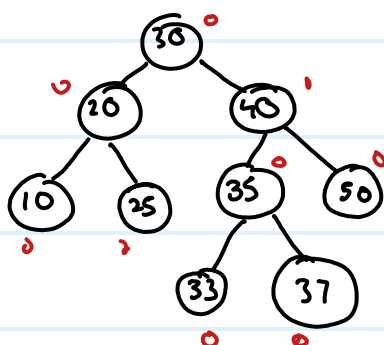
Insert 40



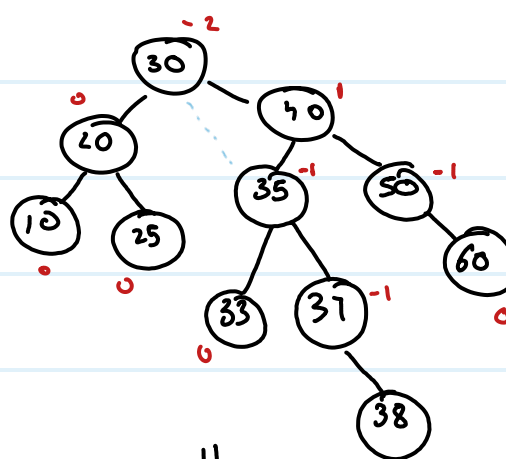
Insert 35



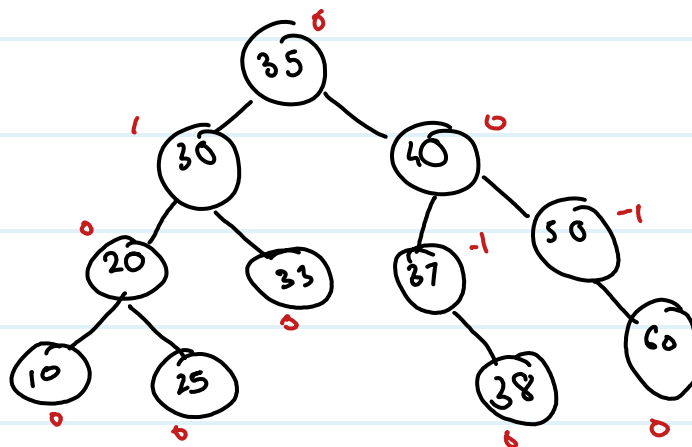
Insert 33, 37



Insert 38



RL Rotation

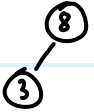


Q] 8, 3, 5, 25, 76, 45, 30, 26, 28, 27

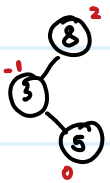
Insert 8



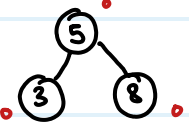
Insert 3



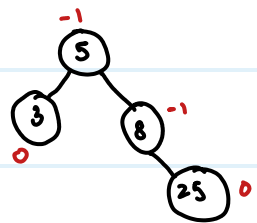
Insert 5



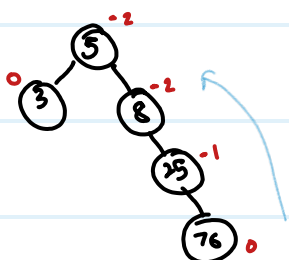
LR Rotation



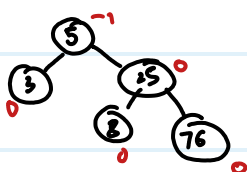
Insert 25



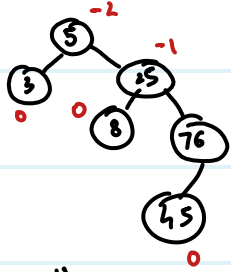
Insert 76



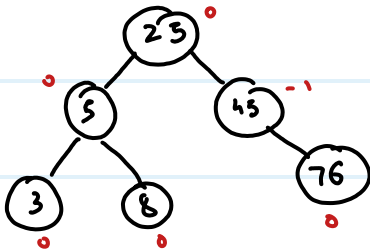
RR Rotation



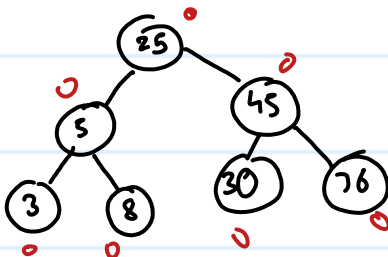
Insert 45



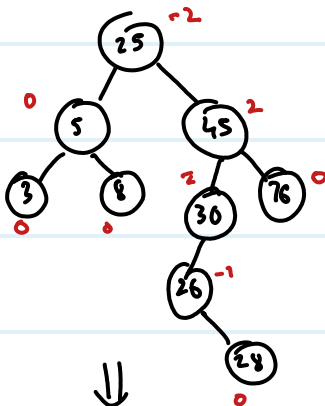
RL Rotation



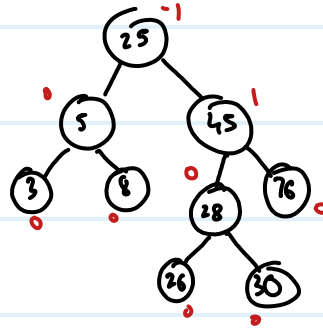
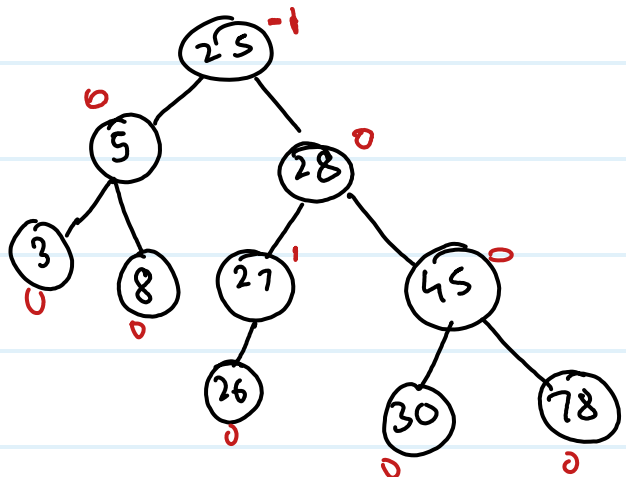
Insert 30



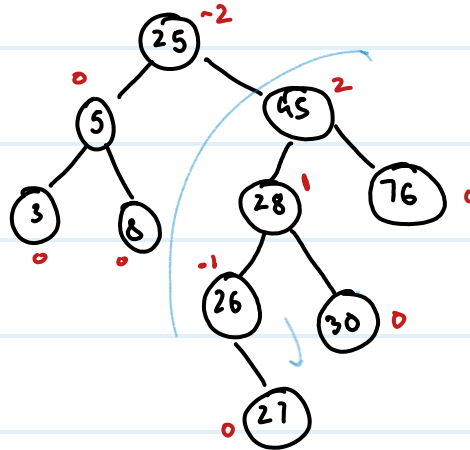
Insert 26, 28



LR Rotation



Insert 27



LR Rotation