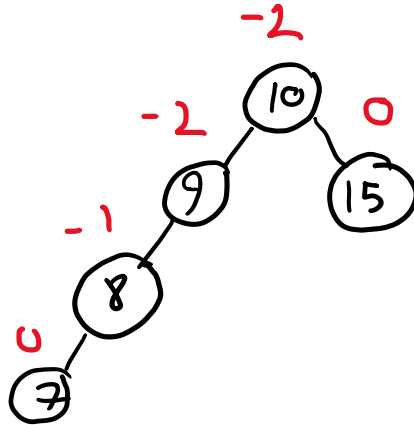*Each leaf node's height is 0*
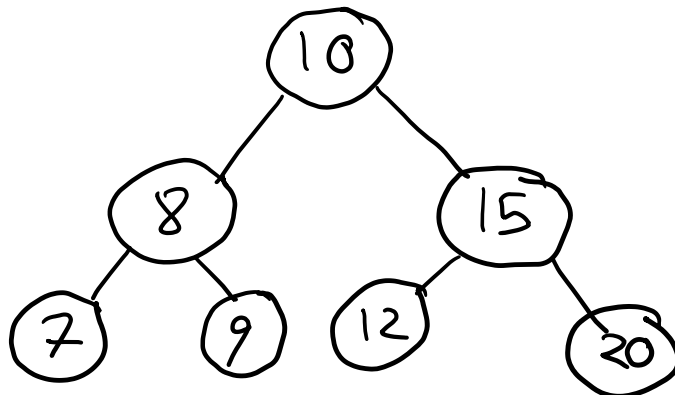*Balance factor calculation formula: rightSubTree's height – leftSubTree's height*

i. Write the balance factors of each node in the tree shown below.

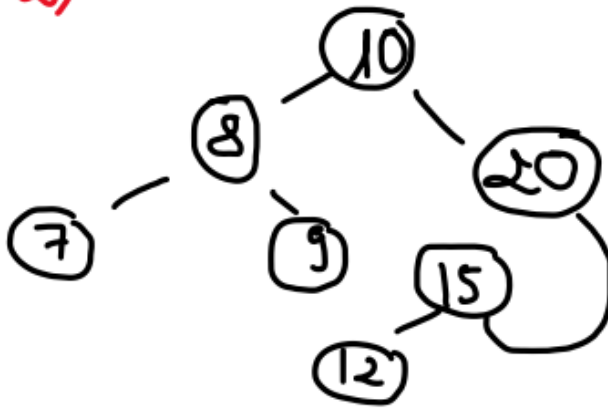

ii. Rotate the sub-tree rooted at node containing 15 to the left by 1 in the tree shown below. Draw trees to show intermediate steps.
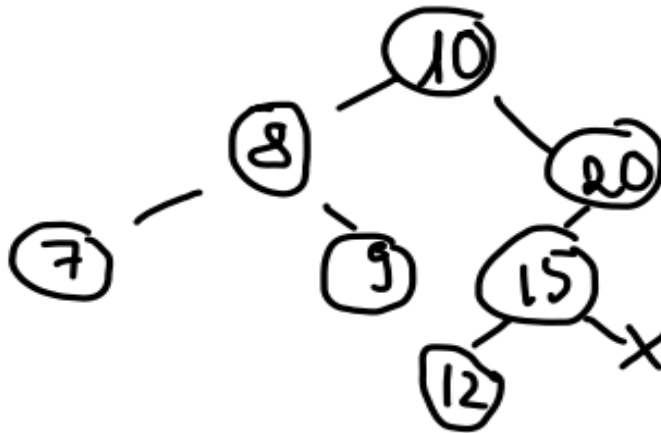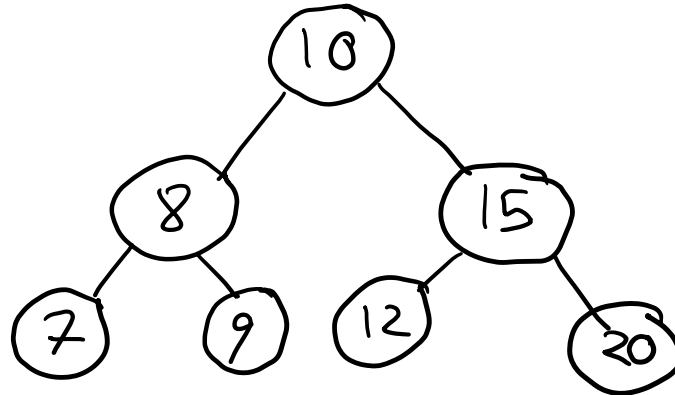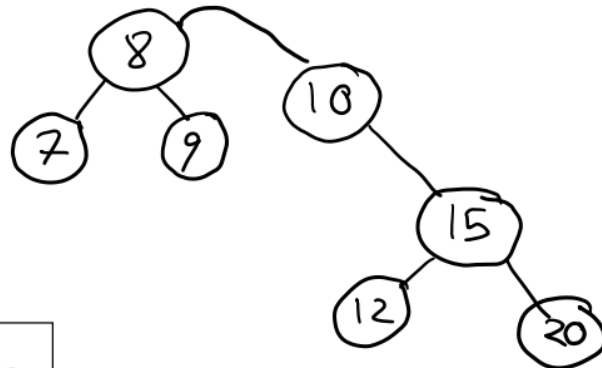
2)

15->right is still 20.

3)

iii.   Rotate the sub-tree rooted at node containing 10 to the right by 1 in the tree shown below. Draw trees to show intermediate steps.
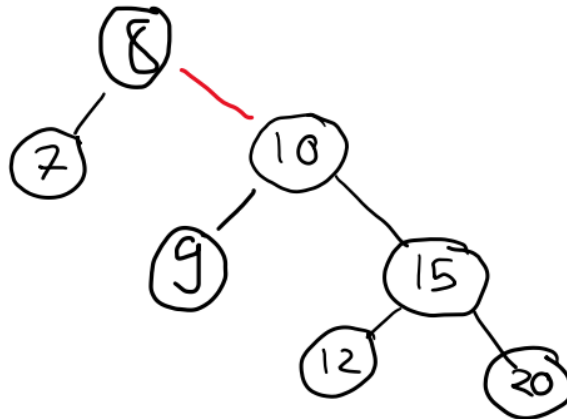
1)

2)

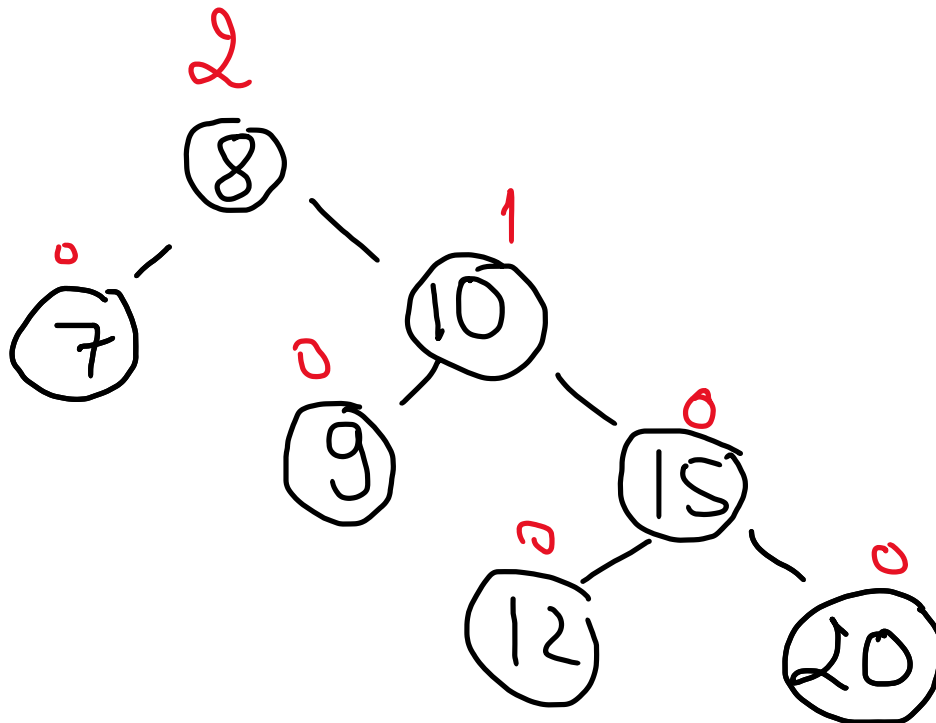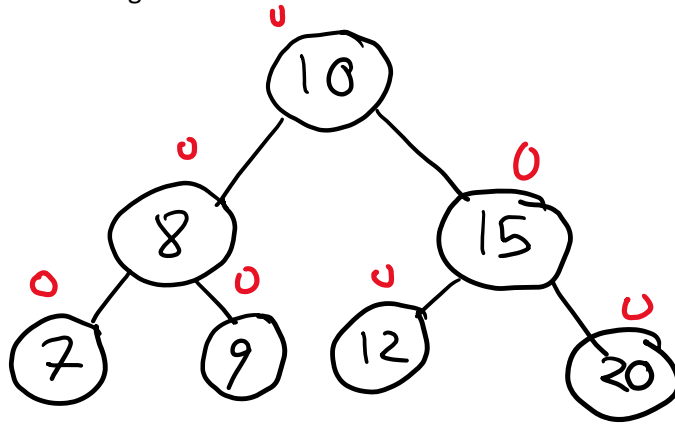Node 8 is the root now.
Node 10-left at the moment is still 8

3)

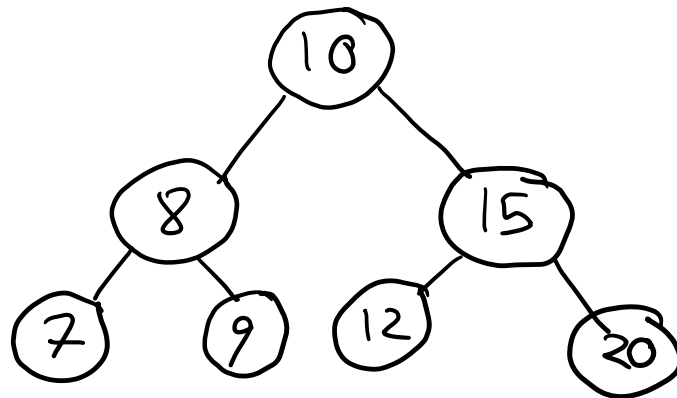Node 10-left links to node8-right.
node8-right now links to 10.

2. AVL Tree analysis
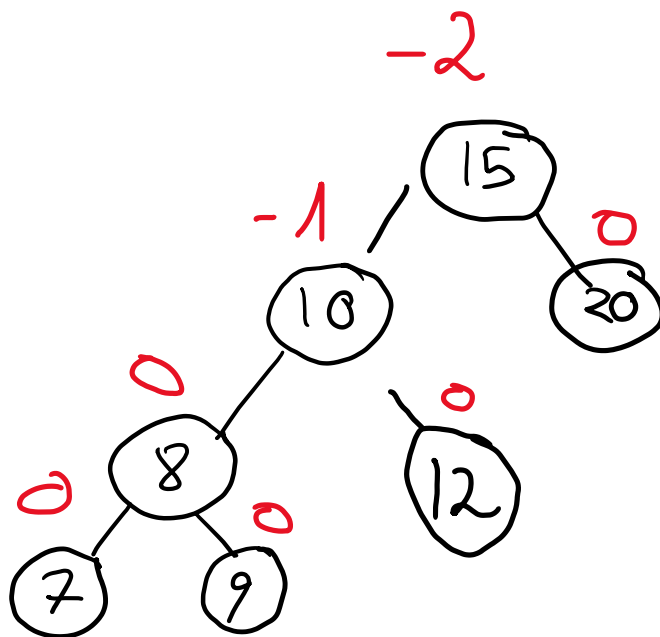   a. Convert the following bst into one that has an RR imbalance.

RR imbalance at 8

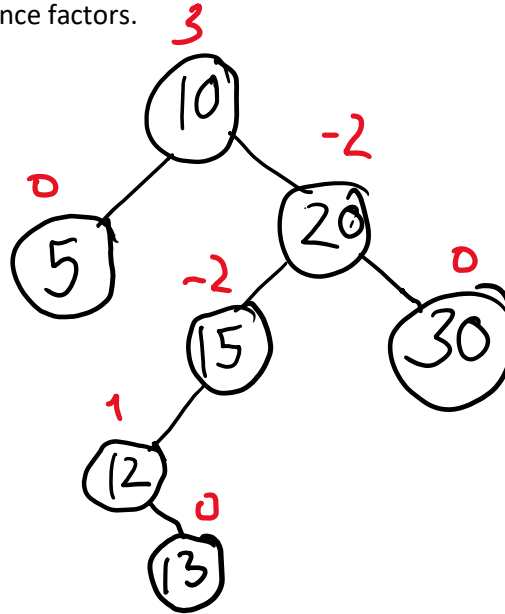b. Convert the following bst into one that has an LR imbalance.

LR imbalance at 15

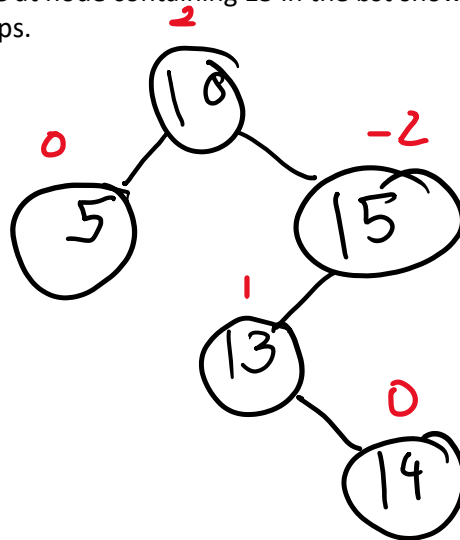c. What type of imbalance does the bst shown below have at node containing 15? Give reasoning using balance factors.

At 15, it's LR imbalance since:
BF(15) == -2
BF(15->left) = BF(12) = 1

d. Fix the imbalance at node containing 15 in the bst shown below. Draw trees to show intermediate steps.

At 15 → LR imbalance.
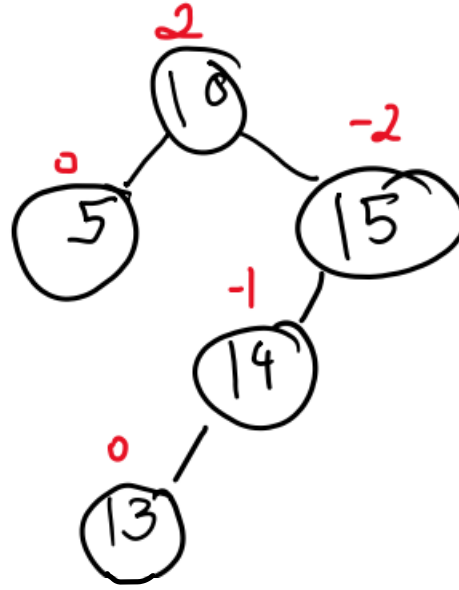
→ 1 left rotation at 13
→ 1 right rotation at 15

1)

Left rotation at 13:
15->left to 13->right which is 14
13->right to 14->left which is nullptr
14->left to 13

Right rotation at 15:
10->right now links to 14
15->left links to 14->right (nullptr)
14->right links to 15

2)