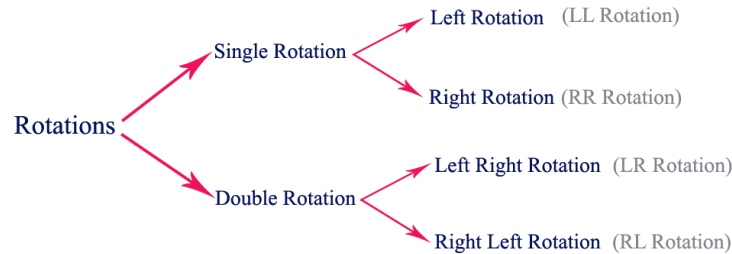Rotation operations are used to make a tree balanced.
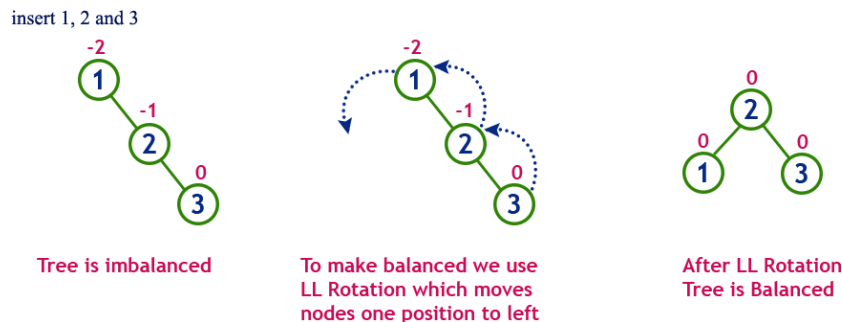
Rotation is the process of moving the nodes to either left or right to make tree balanced.

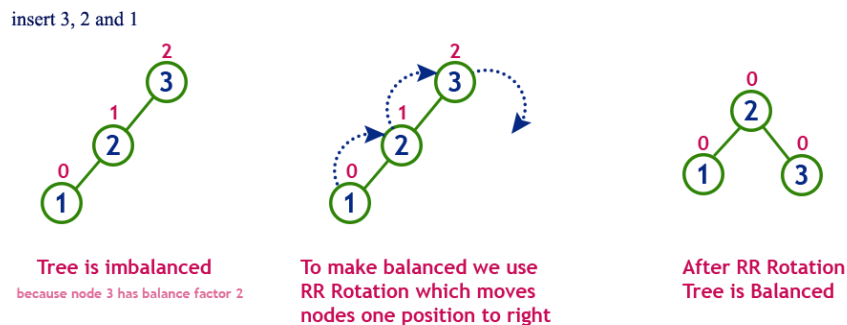There are **four** rotations and they are classified into **two** types.

Single Left Rotation (LL Rotation)

In LL Rotation every node moves one position to left from the current position. To understand LL Rotation, let us consider following insertion operations into an AVL Tree...

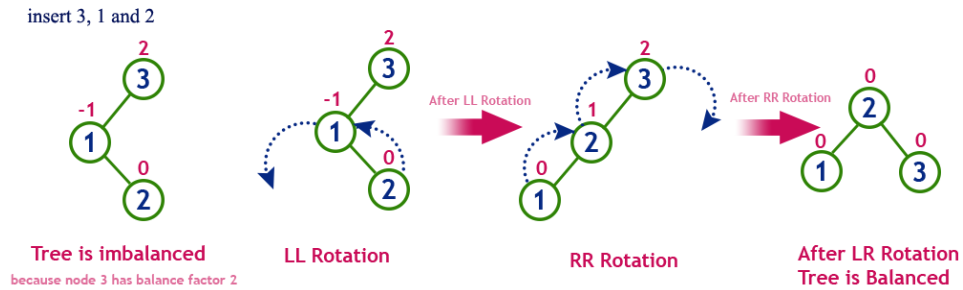## Single Right Rotation (RR Rotation)

In RR Rotation every node moves one position to right from the current position. To understand RR Rotation, let us consider following insertion operations into an AVL Tree...

Left Right Rotation (LR Rotation)

The LR Rotation is combination of single left rotation followed by single right rotation. In LR Roration, first every node moves one position to left then one position to right from the current

position. To understand LR Rotation, let us consider following insertion operations into an AVL Tree...

insert 3, 1 and 2

Tree is imbalanced
because node 3 has balance factor 2

LL Rotation

After LL Rotation

RR Rotation

After RR Rotation

**After LR Rotation
Tree is Balanced**

Right Left Rotation (RL Rotation)

The RL Rotation is combination of single right rotation followed by single left rotation. In RL Roration, first every node moves one position to right then one position to left from the current position. To understand RL Rotation, let us consider following insertion operations into an AVL Tree...

insert 1, 3 and 2

Tree is imbalanced
because node 1 has balance factor -2

RR Rotation

After RR Rotation

LL Rotation

After LL Rotation

**After RL Rotation
Tree is Balanced**