Balance factor

In a binary tree the *balance factor* of a node X is defined to be the height difference

$$\mathrm{BF}(X) := \mathrm{Height}(\mathrm{RightSubtree}(X)) - \mathrm{Height}(\mathrm{LeftSubtree}(X))$$ or

most used **BF(x)=Height(LeftSubtree(x) - Height(RightSubtree(x))**

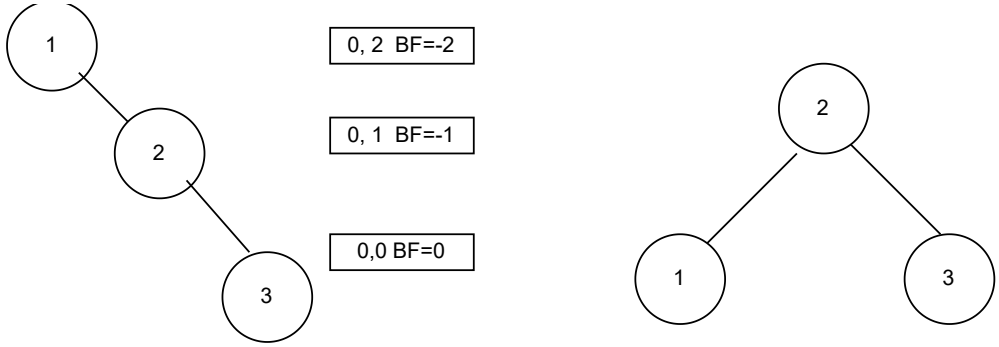
of its two child sub-trees rooted by node X. A binary tree is defined to be an *AVL tree* if the invariant

$\mathrm{BF}(X) \in \{-1, 0, 1\}$ The value of balance factor should always be -1,0, or +1

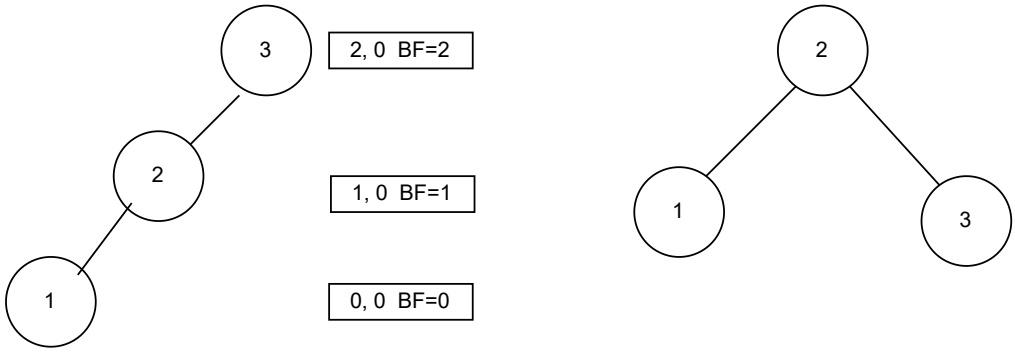
holds for every node X in the tree.

A node X with $\mathrm{BF}(X) < 0$ is called "right-heavy", one with $\mathrm{BF}(X) > 0$ is called "left-heavy", and one with $\mathrm{BF}(X) = 0$ is sometimes simply called "balanced".

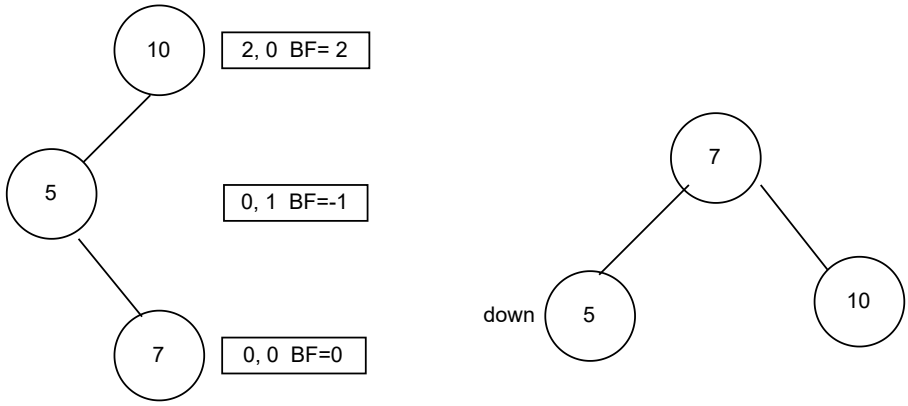
left rotation



right rotation



left and right rotation



right and left rotation