**a) Left Left Case**

T1, T2, T3 and T4 are subtrees.

z y

/ \ / \

y T4 Right Rotate (z) x z

/ \ - - - - - - - - -> / \ / \

x T3 T1 T2 T3 T4

/ \

T1 T2

**b) Left Right Case**

z z x

/ \ / \ / \

y T4 Left Rotate (y) x T4 Right Rotate(z) y z

/ \ - - - - - - - - -> / \ - - - - - - - -> / \ / \

T1 x y T3 T1 T2 T3 T4

/ \ / \

T2 T3 T1 T2

**c) Right Right Case**

z y

/ \ / \

T1 y Left Rotate(z) z x

/ \ - - - - - - - -> / \ / \

T2 x T1 T2 T3 T4

/ \

T3 T4

**d) Right Left Case**

z z x

/ \ / \ / \

T1 y Right Rotate (y) T1 x Left Rotate(z) z y

/ \ - - - - - - - - -> / \ - - - - - - - -> / \ / \

x T4 T2 y T1 T2 T3 T4

/ \ / \

T2 T3 T3 T4

T1, T2 and T3 are subtrees of the tree rooted with y (on left side)

or x (on right side)

y x

/ \ Right Rotation / \

x T3 – – – – – – – > T1 y

/ \ < - - - - - - - / \

T1 T2 Left Rotation T2 T3

Keys in both of the above trees follow the following order

keys(T1) < key(x) < keys(T2) < key(y) < keys(T3)

So BST property is not violated anywhere.

Source: http://www.geeksforgeeks.org/avl-tree-set-1-insertion/