AVL Trees

DSA Tutorial (3 April 2020)

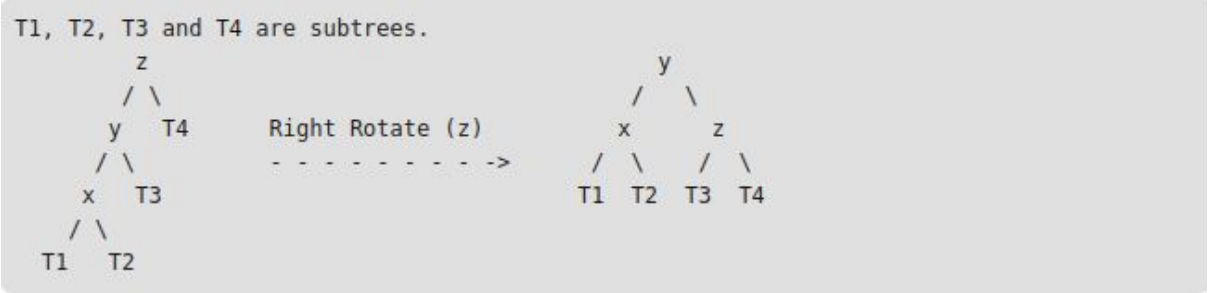
Overview

Height of a vertex v = 1 + max { height (left_child of v), height (right_child of v) }

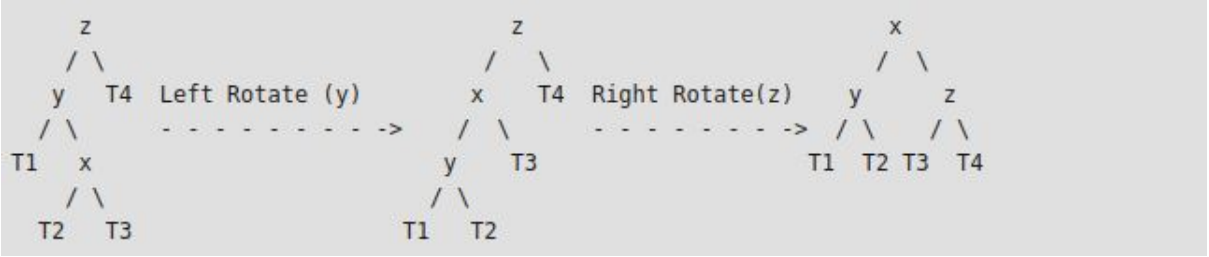
Balance Factor = (height of left child) - (height of right child)

The 4 types of imbalances and the rotations required for balancing :

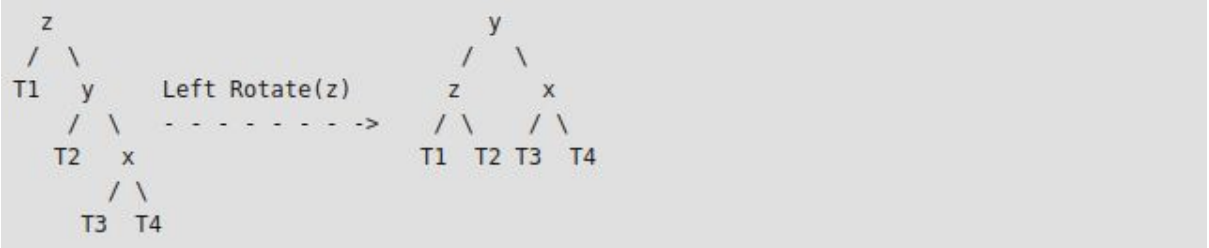
1. Left Left Case



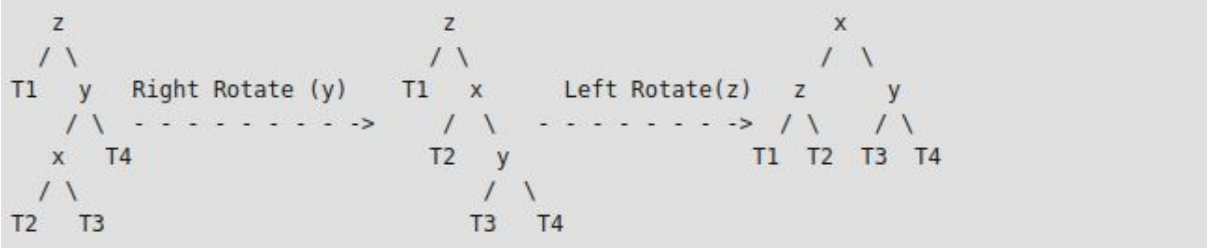
2. Left Right Case



3. Right Right Case



4. Right Left Case



Practice Problems

1. Adding elements to an AVL Tree.
2. Deleting elements from an AVL Tree

3. Given an integer k, find the kth smallest element in the AVL Tree.
4. Given an integer x, find the number of nodes in the tree with a value greater than x.