

Algorithms and Data Structures for Data Science

lab_avl

CS 277

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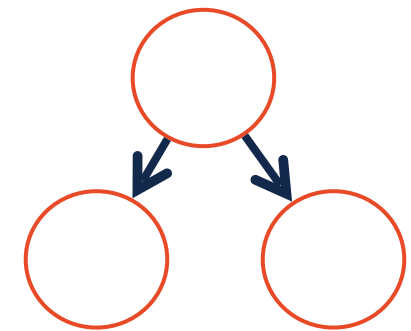
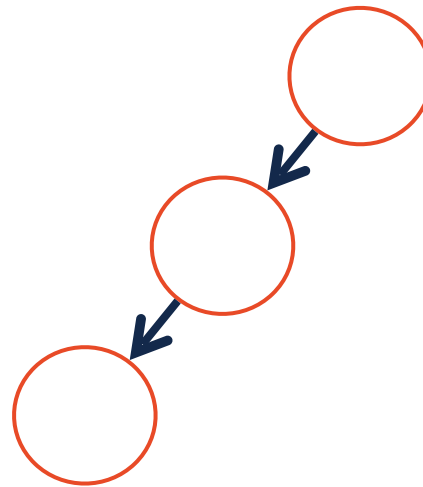
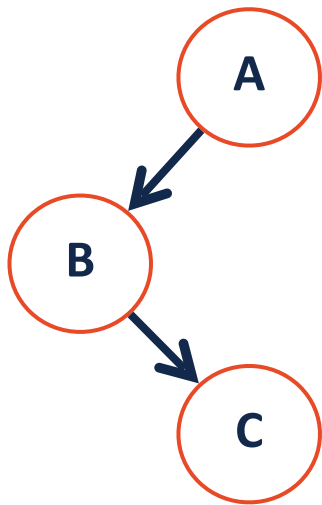
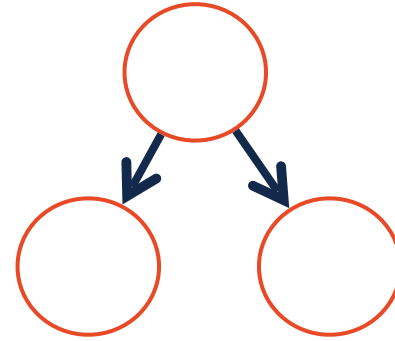
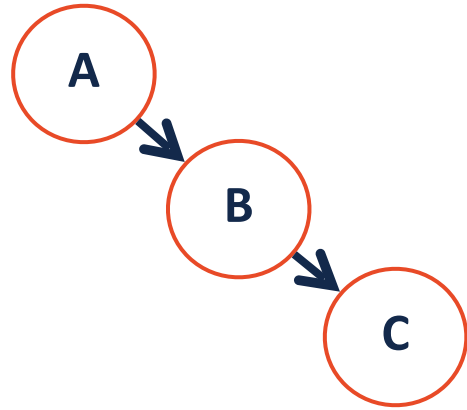
Department of Computer Science

Learning Objectives

Implement tree balancing functions (rotations)

Modify a BST function into an AVL function (rebalance)

AVL Tree Rotations

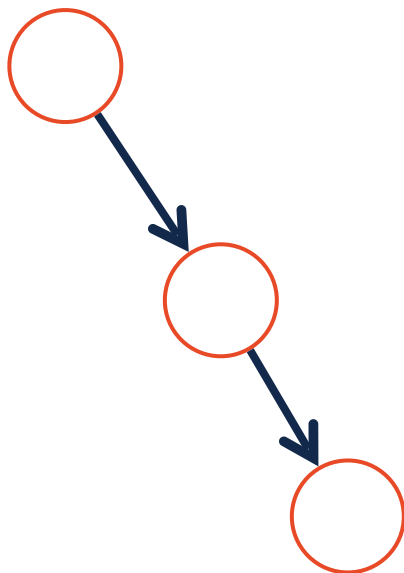


All rotations are $O(1)$

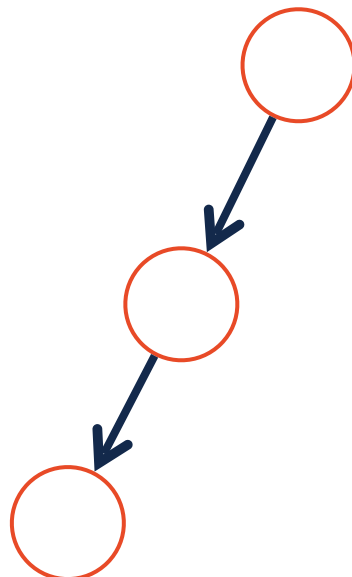
All rotations reduce subtree height by one

AVL Rotations

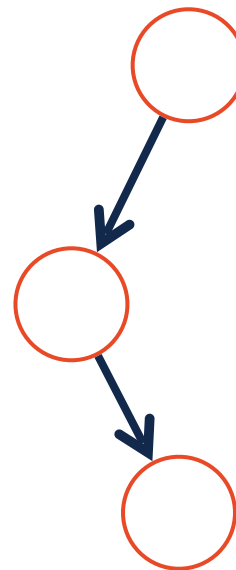
Left



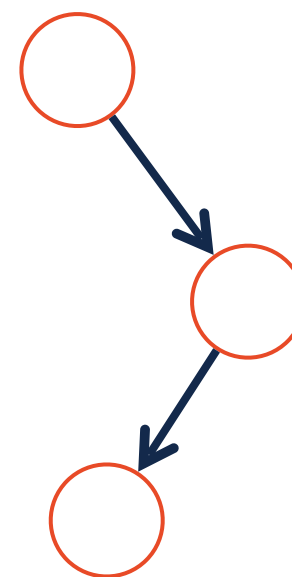
Right



LeftRight



RightLeft



Root Balance:

Child Balance:

Lab Tips

Build and test your rotations first. Use small trees (or the autograder) to test

Make sure your **rebalance** checks if the node is balanced first

Make sure you understand when to call each rotation