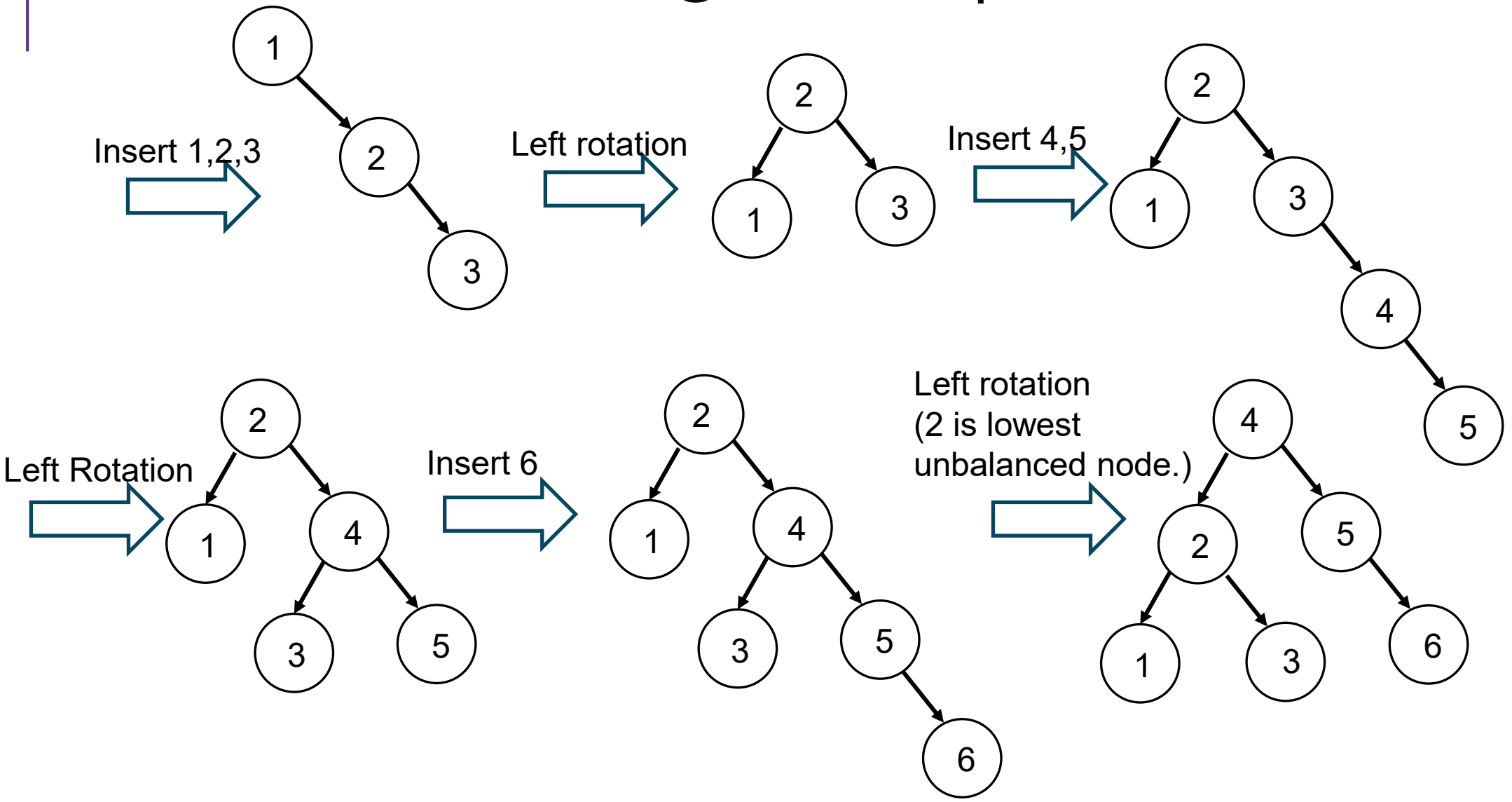
Lecture 9
Self-Balancing Trees

Department of Computer Science
Hofstra University

AVL Tree

- Create an AVL Tree by inserting the sequence: 1, 2, 3, 4, 5, 6. Draw a new figure whenever you do a rotation.

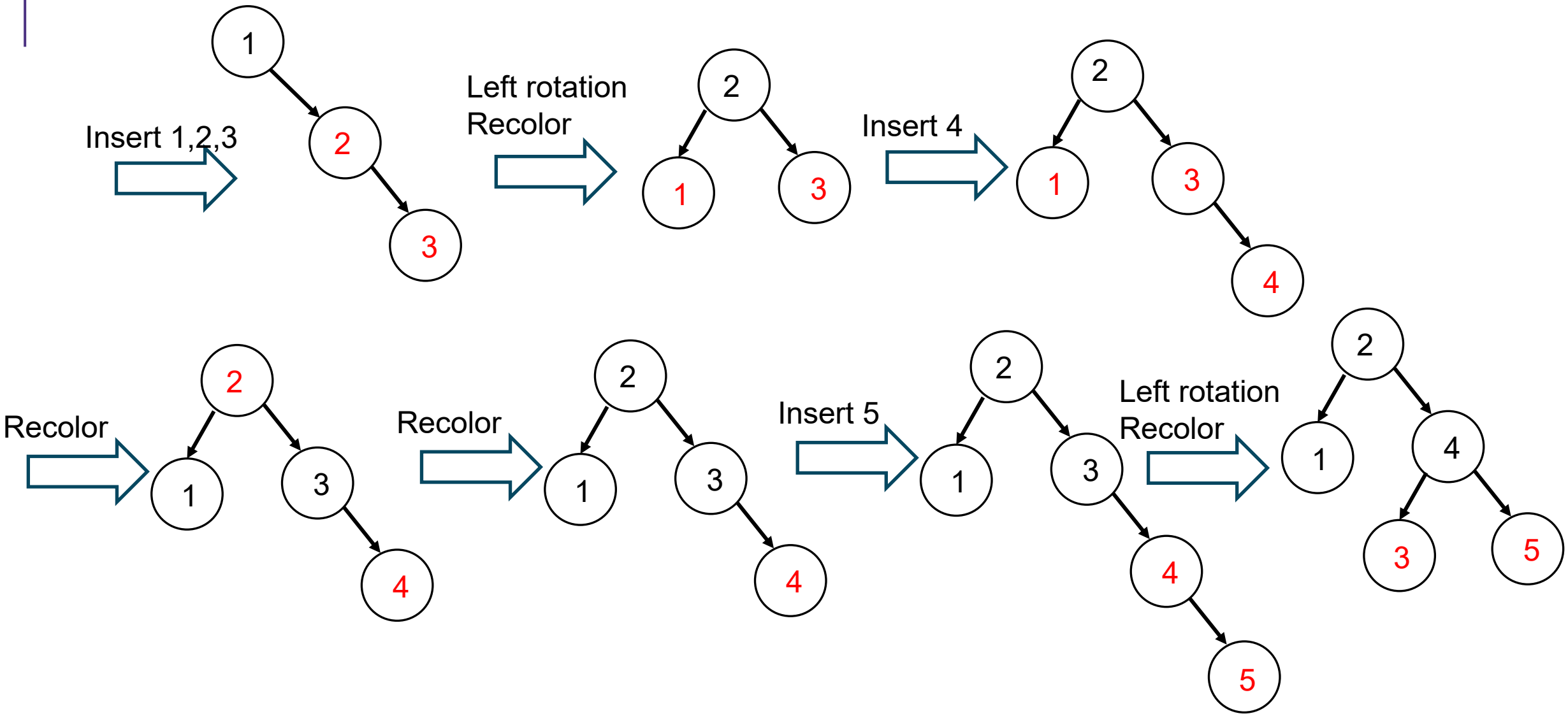
AVL Tree: Inserting the sequence: 1,2,3,4,5,6



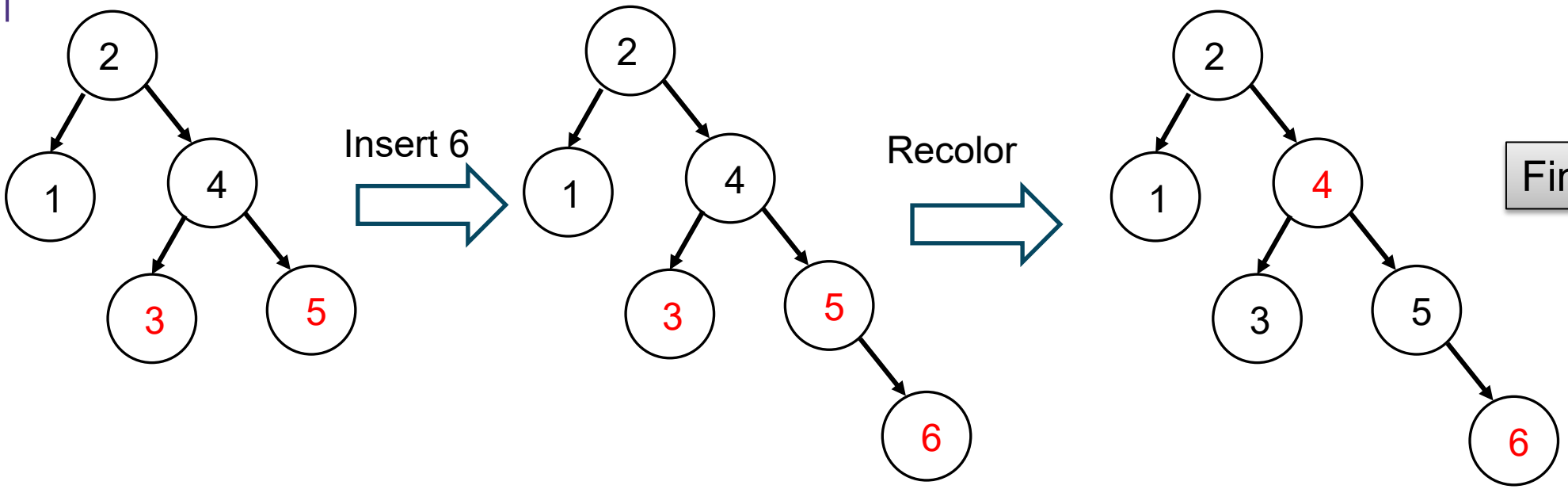
Red-Black Tree

- Create a Red-Black Tree by inserting the sequence: 1, 2, 3, 4, 5, 6. Draw a new figure whenever you do a rotation.

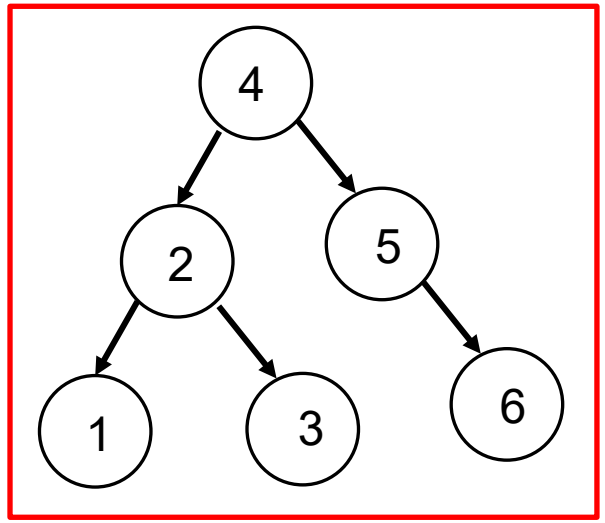
Red-Black Tree: Inserting the sequence: 1,2,3,4,5,6



Red-Black Tree: Inserting the sequence: 1,2,3,4,5,6



Final Red-Black tree

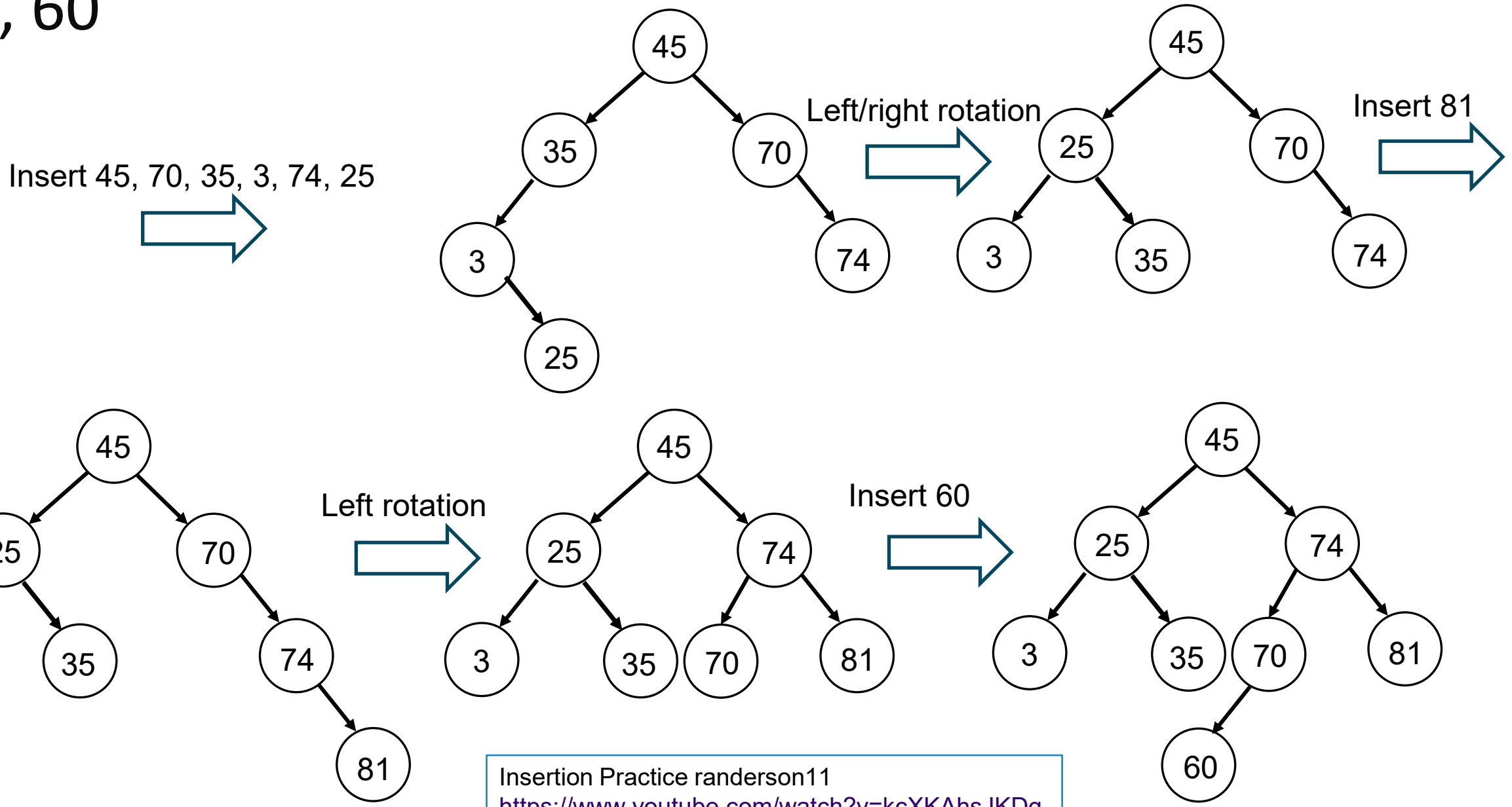


Final AVL tree

AVL Tree

- Create an AVL Tree by inserting the sequence: 45, 70, 35, 3, 74, 25, 81, 60. Draw a new figure whenever you do a rotation.

AVL Tree: Inserting the sequence: 45, 70, 35, 3, 74, 25, 81, 60

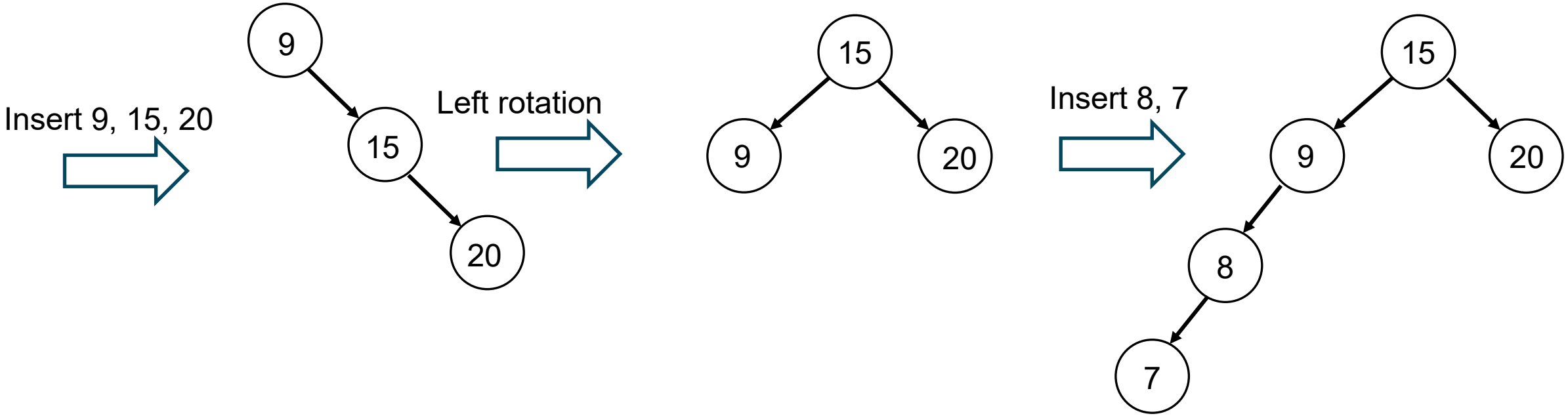


Insertion Practice randerson11
https://www.youtube.com/watch?v=kcXKAhsJKDg

AVL Tree

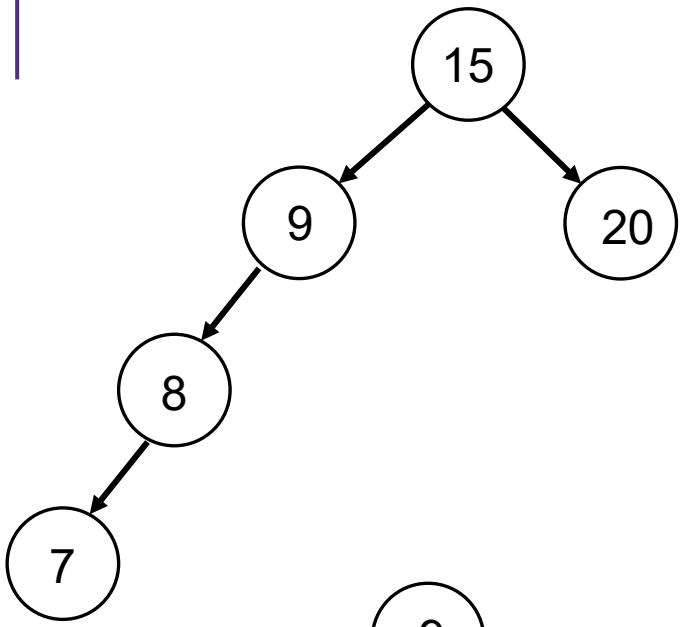
- Create an AVL Tree by inserting the values: 45, 70, 35, 3, 74, 25, 81, 60. Draw a new figure whenever you do a rotation.

AVL Tree: Inserting the sequence: 9, 15, 20, 8, 7, 13, 10

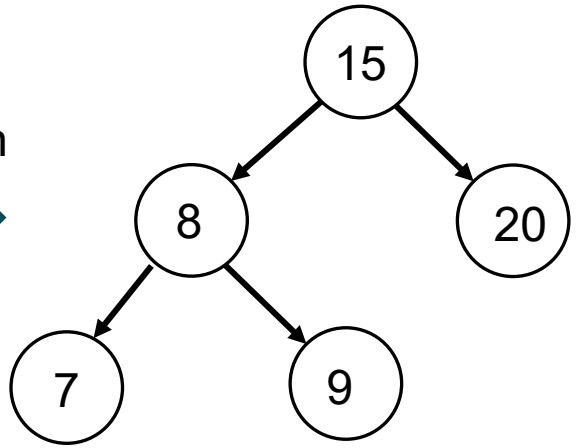


AVL Tree – Insertion Lalitha Natraj
https://www.youtube.com/watch?v=CdGVkgMuq_4

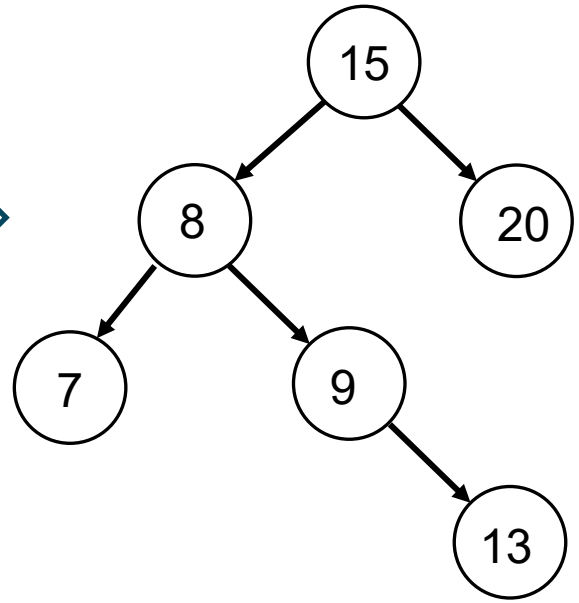
AVL Tree: Inserting the sequence: 9, 15, 20, 8, 7, 13, 10

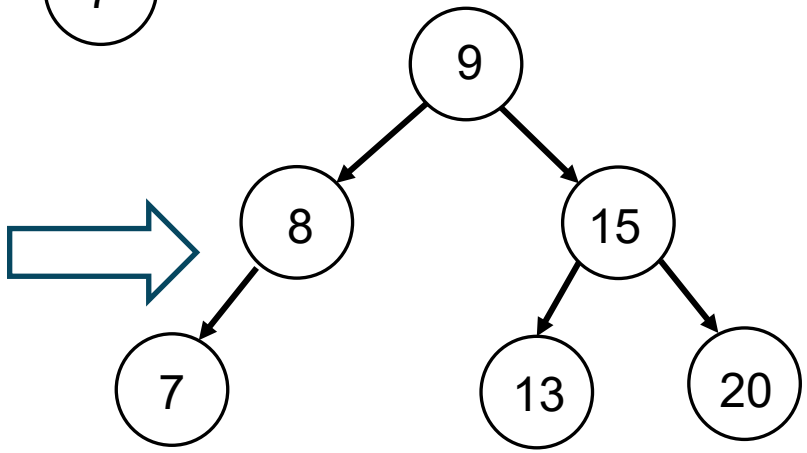


Right rotation

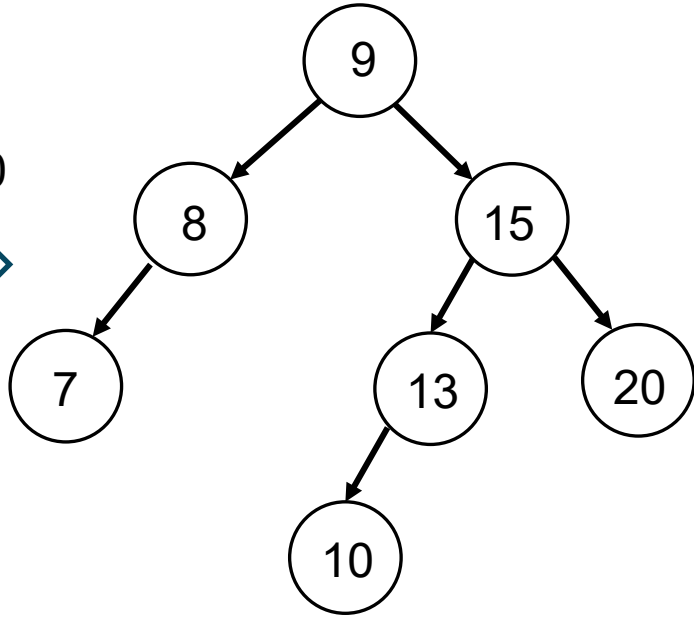


Insert 13



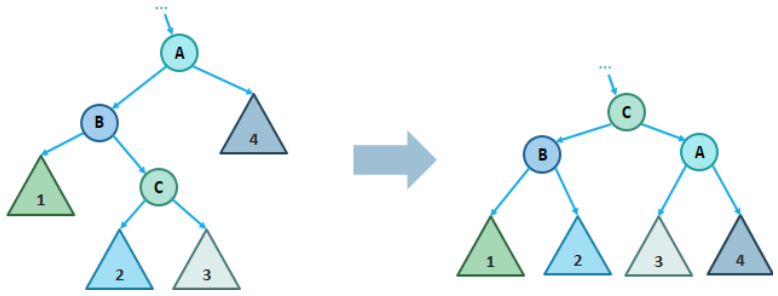


Insert 10



Left/Right Rotation

- Mirror image of Right/Left Rotation!



Left/right rotation
(15 is lowest unbalanced node.)