

Data Structures

CSCI 2270

Binary trees, BST, BRT

Sprint 14

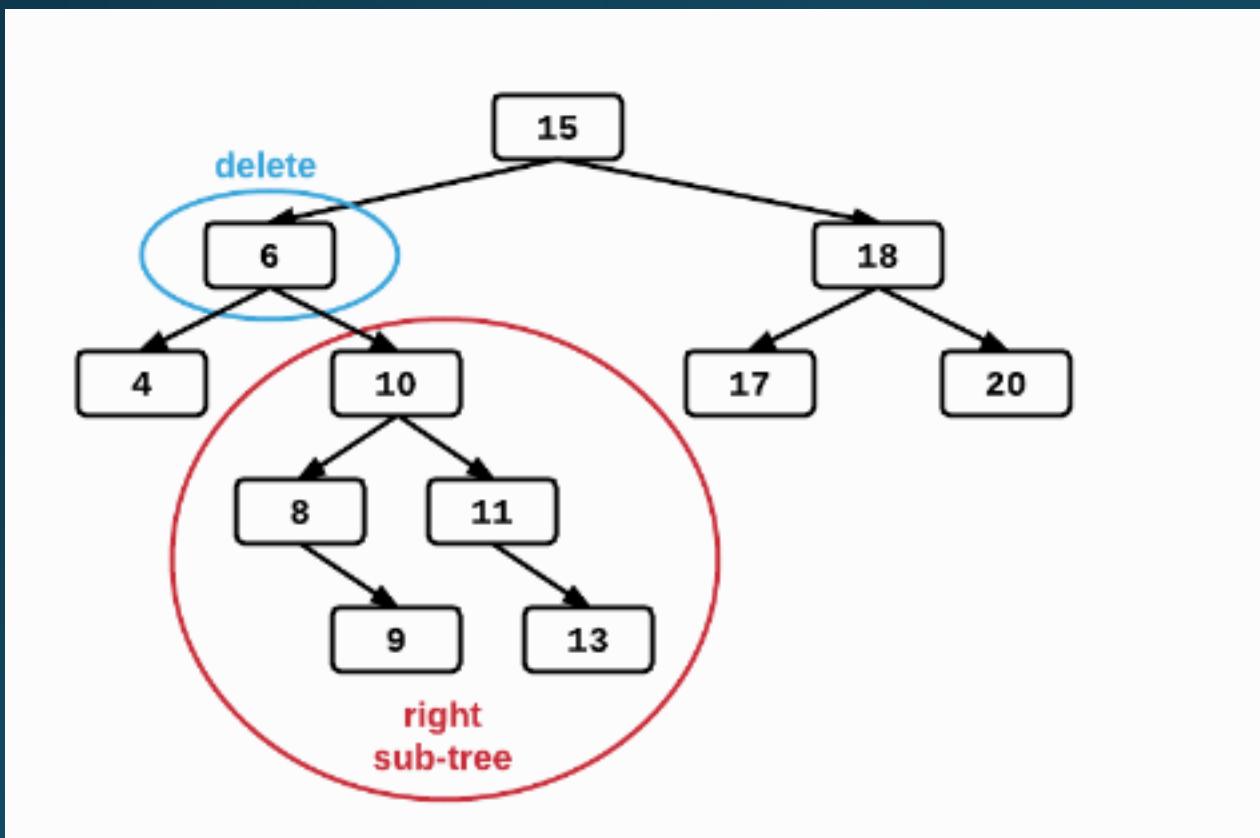
.....

Ready

.....

GO!

Binary Tree: Delete



min.parent.leftChild = min.rightChild
min.rightChild.parent = min.parent
min.parent = node.parent

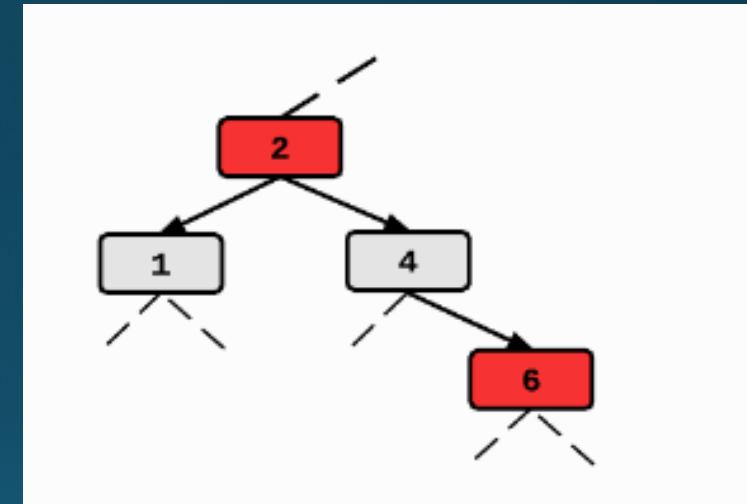
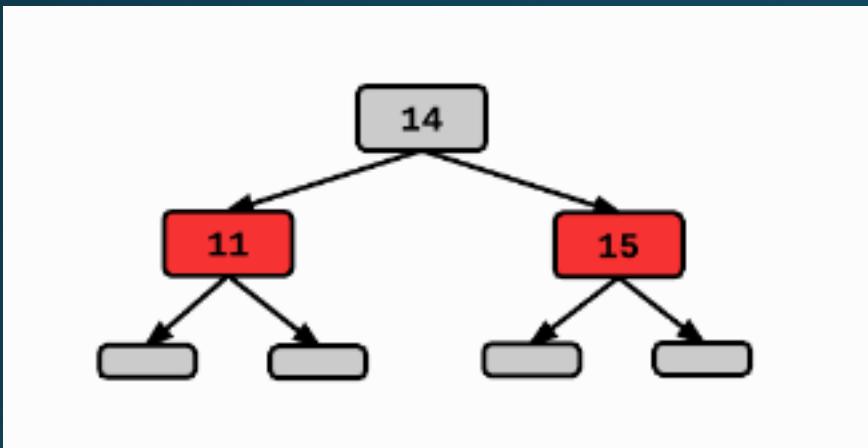
node.parent.leftChild = min
min.leftChild = node.leftChild
min.rightChild = node.rightChild

node.rightChild.parent = min
node.leftChild.parent = min

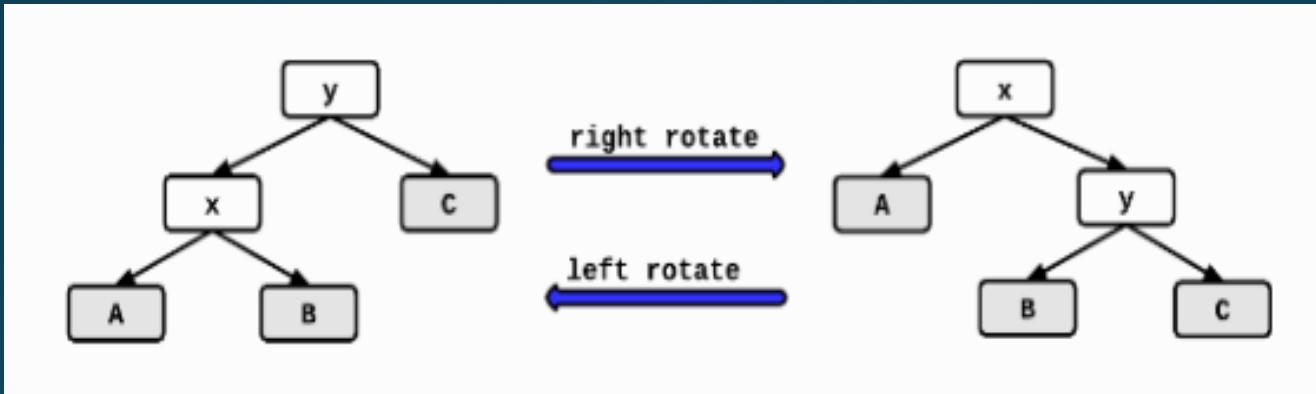
Binary Tree: Balancing

- Node struct + color
- Properties:
 - Root and leaves are black
 - If red then children are black
 - All the paths from n node to leaf == black nodes

Binary Tree: Balancing

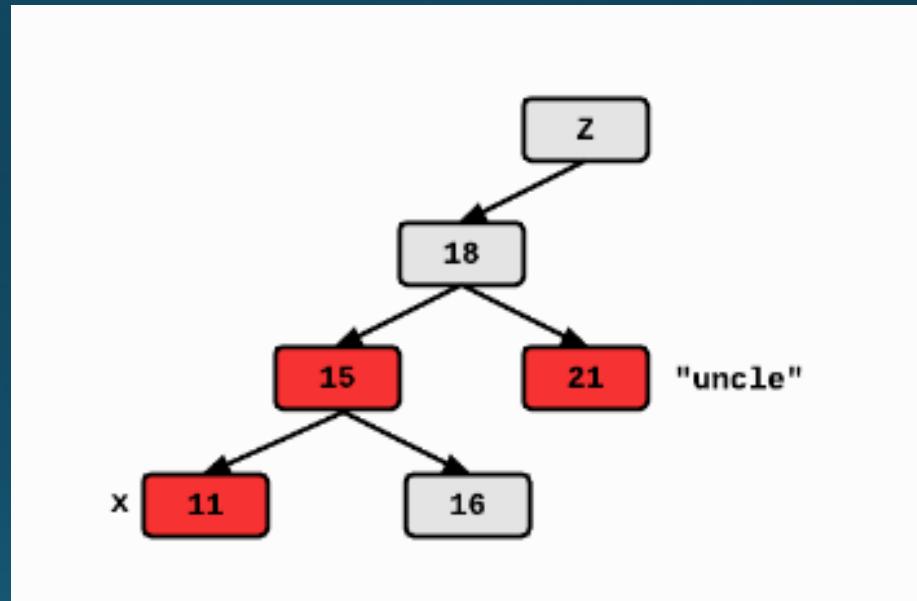


Binary Tree: Rotation



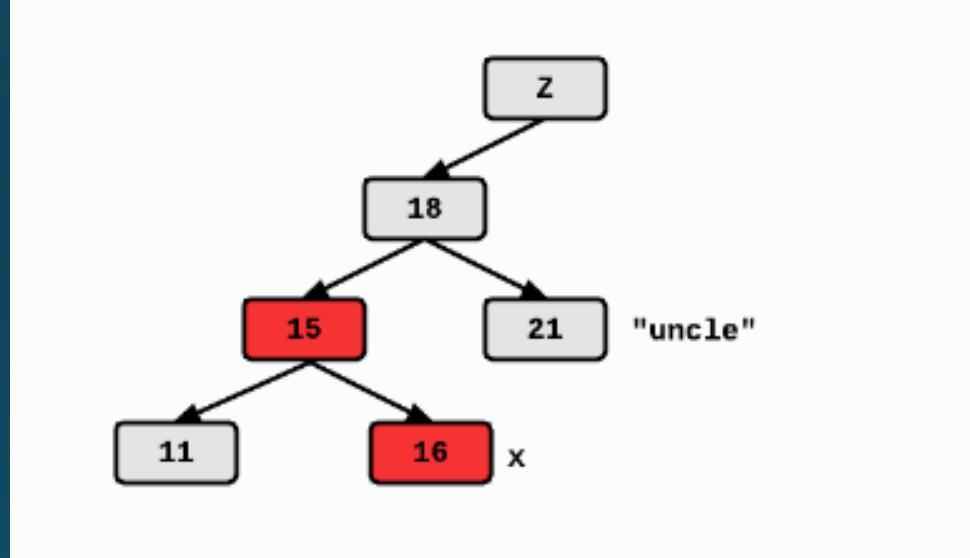
BRT Violation: Case 1 -> red uncle

- Recolor
- Move up 2



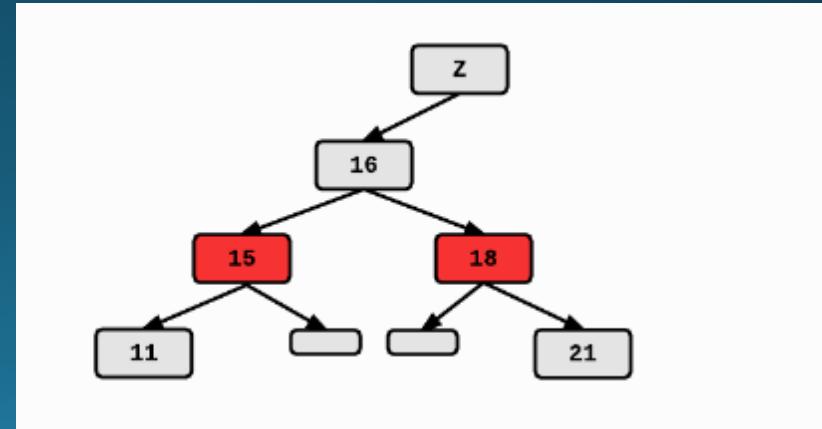
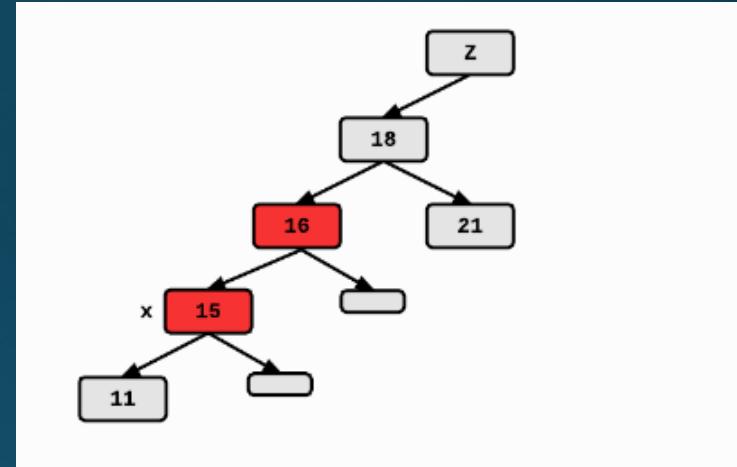
BRT Violation: Case 2 -> black uncle

- x is x.parent
- leftRotate(x)



BRT Violation: Case 3 -> black uncle

- parent and granpa-> recolor
- rightRotate(x.parent.parent)



Lecture Quiz

Key: hola