Students: Find your X-Team Group number before class (available by end of day on Monday)

Week 3

CS learning Center
Ind Tutoring (the shelf) in CS

ASSIGNMENTS
x1 complete in class this week (Thursday)
p1 available and due before 10pm on Thursday 2/7
h2 available and due before 10pm on Monday 2/11

Module: Week 3 (start on week 4 before next week)

THIS WEEK

- Finish Binary Search Trees (BST) (Bring rest of Week 2 outline to finish)
  - structure
  - insert practice
  - delete practice
  - implementing: lookup, insert, delete
  - complexities
- Classifying Binary Trees
- Balanced Search Trees
- George Adelson-Velsky and Evgenii Landis
- AVL Summary
- X-team Exercise x1
  - in-class exercise with your assigned teams
  - watch for instructions
    - to find your team number
    - how to meet

Find X-Team
- Go to Canvas, Groups

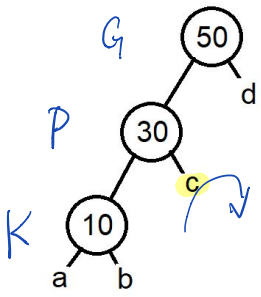
Grade Scope

NEXT WEEK

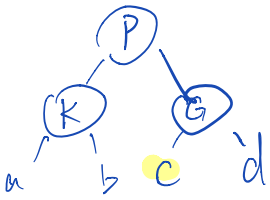
- **Red-Black Tree**

AVL Rebalancing Summary

Re-balance when out of balance is detected from left subtree of left subtree

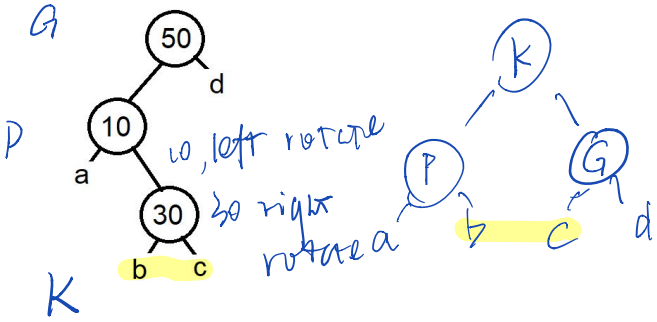


right rotate



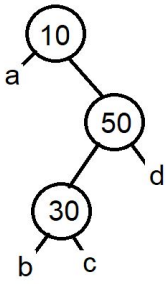

```
G.left = P.right
P.right = G
return P
```

Re-balancing when out of balance is detected from right subtree of left subtree



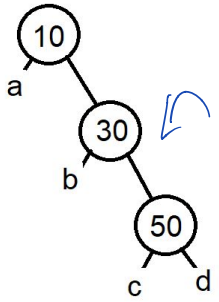

```
G.left = K.right;
P.right = K.left;
K.left = P;
K.right = G
return K.
```

Re-balancing when out of balance is detected from left subtree of right subtree



Re-balancing when out of balance is detected from right subtree of right subtree

node 13



left rotate

Do on your own

Implementation Notes

```
// method to rotate nodes to the left
// (counter-clockwise about right-child of node)
private Treenode<T> leftRotate( Treenode<T> node ) {
```

G = node

```
}

// method to rotate nodes to the right
// (clockwise about the left-child of current node)
private Treenode<T> rightRotate( Treenode<T> node ) {
```

```
}
```

Other methods? Other Balanced Search Trees?