CSSE 230 Day 15

AVL insert/Delete Review
AVLTree practice
Worktime

After today, you should be able to…
…write code to insert an item into an EditorTree using rank and keep it balanced

Announcements

- Homework 6 posted

Term Project: EditorTrees

Like BST, except:

1. Keep height-balanced
2. Insertion/deletion by **index**, not by comparing elements. So not sorted

Examples:

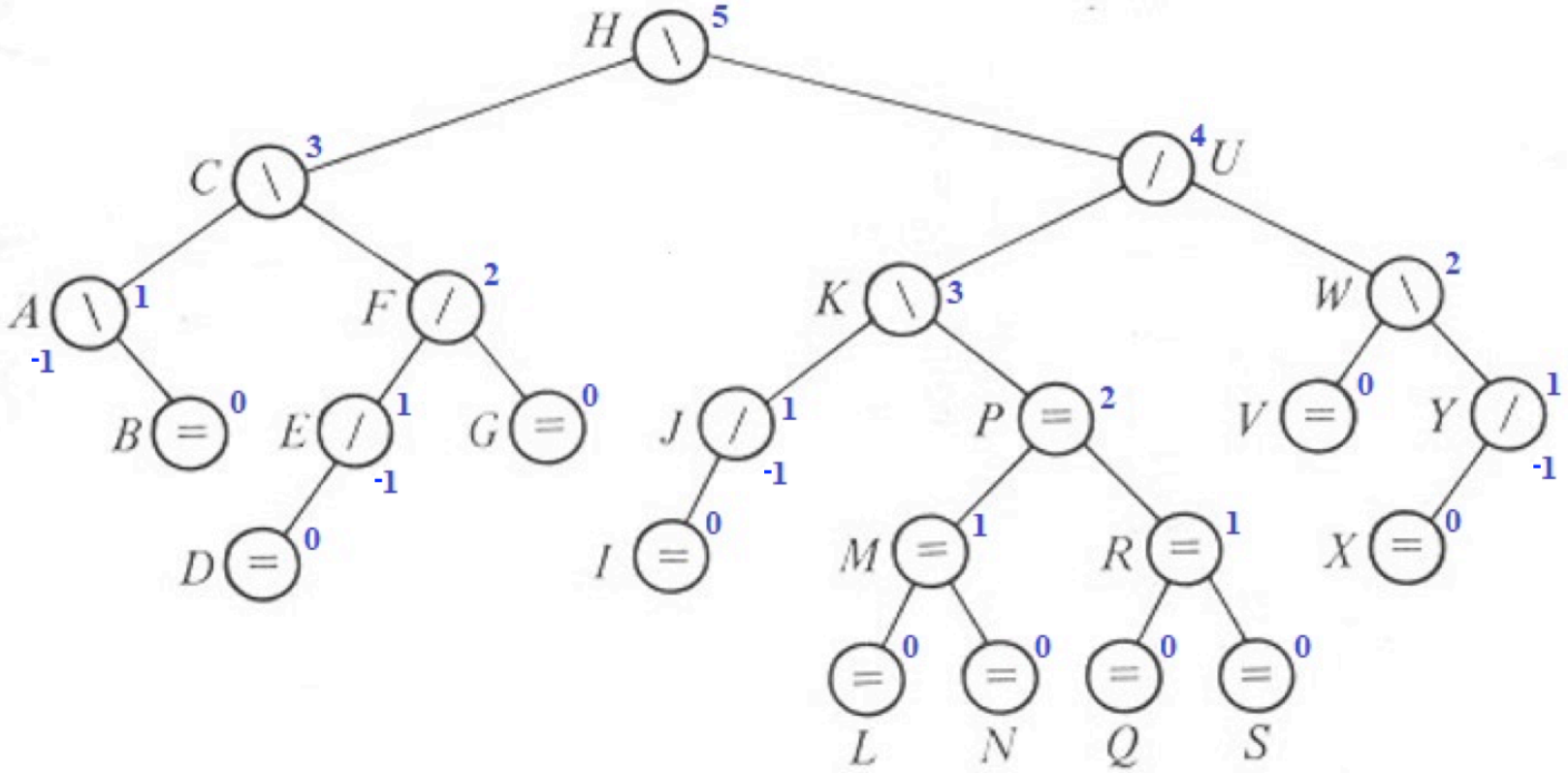
- EditorTree et = new EditorTree()
- et.add(‘a’) // append to end
- et.add(‘b’) // same
- et.add(‘c’) // same. Rebalance!
- et.add(‘d’, 2) // where does it go?
- et.add(‘e’)
- et.add(‘f’, 3)

- Notice the tree is height-balanced (so height = O(log n)), but not a BST

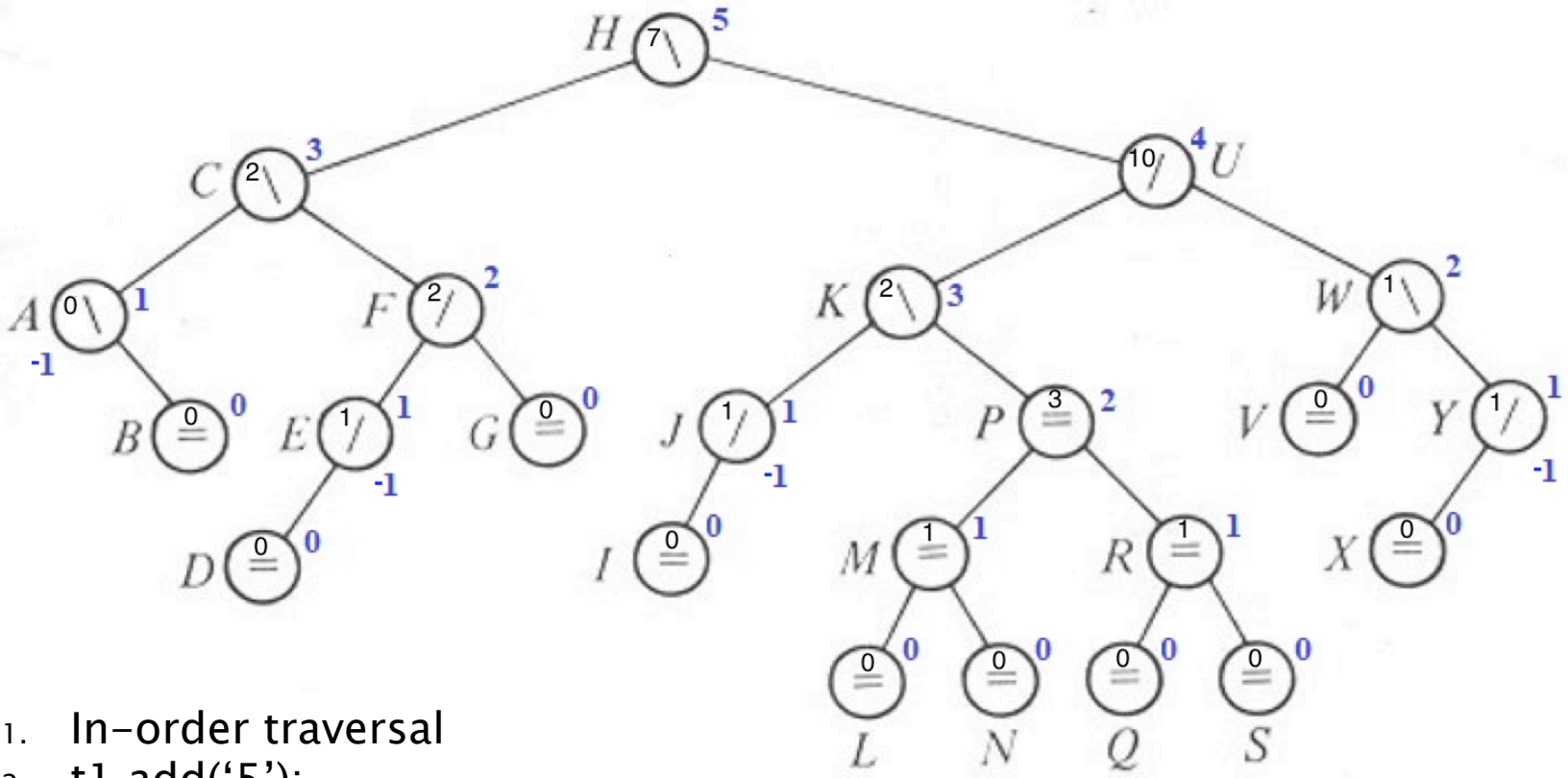
What is the goal of EditorTrees?
Implementing the List ADT using a balanced tree.

- Get/Insert/delete by **index**
  - all in O(log n) time
  - .add(item) adds to end
  - .add(item, index) adds it to the given index, so the position of the item at that index (and all to the right) increases by 1
- Efficient size and height
  - using rank or maintaining fields
- Plus:
  - Concatenate/Split, like String + and .substring()

Add Ranks to This Tree



To do:



1. In-order traversal
2. t1.add('5');
3. t1.add('8');
4. t1.add('3', 6);
5. t1.add('4', 8);
6. t1.add('7', ??); Figure out ?? so that 7 appears as right subtree of 'S'

Today's agenda

- Discuss **rank** and do quiz on it.
- Make sure your whole team has finished and understands yesterday's AVL quiz
  - Get them checked off
- Work with your team on the project
  - I expect to see you working on paper (designing your algorithms and understanding tests) as much as (or more than) on the computer