CSSE 230 Day 14

AVL insert/Delete
AVLTree practice
Doublets Work time

Agenda

▸ AVL insertion/deletion practice
▸ More work time for the project

▸ A word on in-class work time" in general!
  ◦ You should not leave or work on other courses unless you have finished the next programming assignment and next written assignment.
  ◦ The idea is to work on things while you can get help if questions come up.

▸ Answers to your questions.
▸ Upcoming schedule

Do Midterm feedback survey on Moodle

Questions about
- Textbook

- The course: $+$ Δ

- Your study habits: $+$ Δ

▸ 5 minutes, do around break time

After insertion into AVL or EditorTree, go up tree, updating balance codes and checking for imbalance

- p = parent of inserted node
- while p != null
  - // 3 cases (=, tipped towards, tipped away)
  - if p.balanceCode is '='
    - set code to '/' or '\' as appropriate
    - p = p.getParent()
  - else if p.balanceCode indicates "insertion was in shorter subtree"
    - change code to '='
    - break
  - else //insertion was into taller side.
   - do the appropriate rotation
    - Break

You will design a similar procedure for deletion (milestone 2)

Which kind of rotation to do after an insertion?

Depends on the first two links in the path from the lowest node that has the imbalance (A) down to the newly-inserted node.
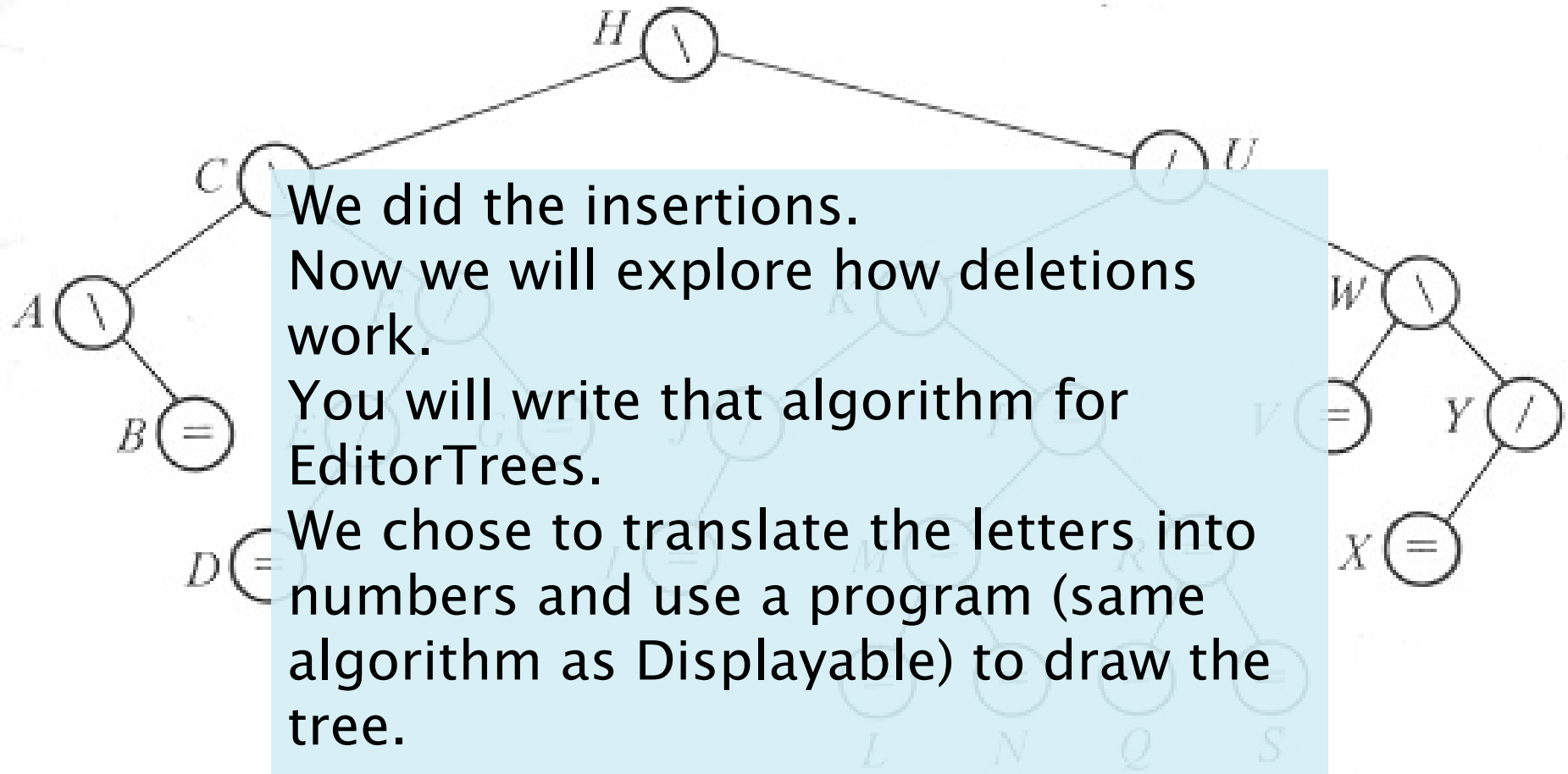
| First link (down from A)	Second link (down from A's child)	Rotation type (rotate "around A's position")
Left	Left	Single right
Left	Right	Double right
Right	Right	Single left
Right	Left	Double left

A sample AVL tree
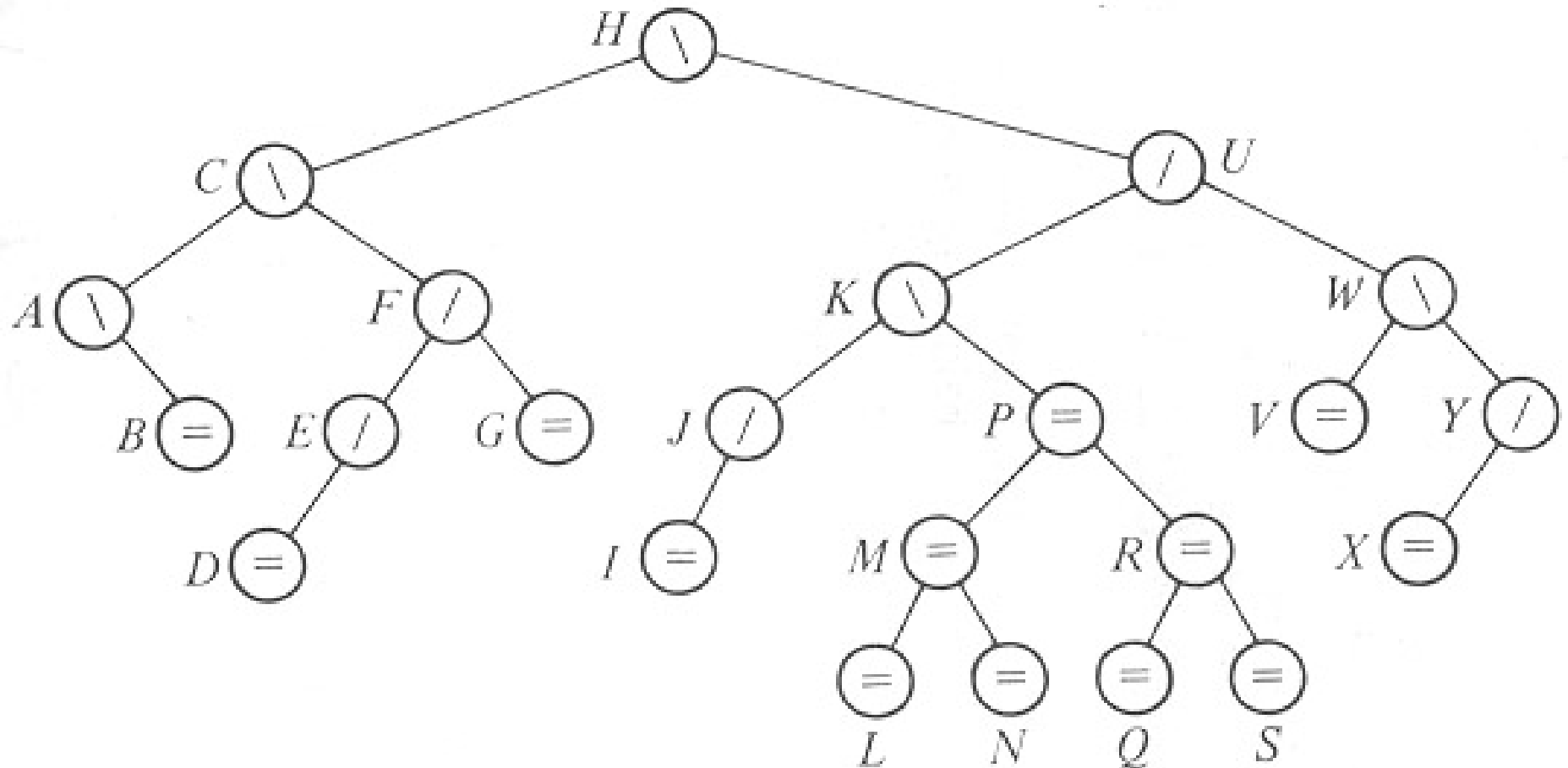
Insert **HA** into the tree, then **DA**, then **O**.
Delete **G** from the original tree, then **I, J**, **V**.

A sample AVL tree

We did the insertions.
Now we will explore how deletions work.
You will write that algorithm for EditorTrees.
We chose to translate the letters into numbers and use a program (same algorithm as Displayable) to draw the tree.

Insert **HA** into the tree, then **DA**, then **O**.
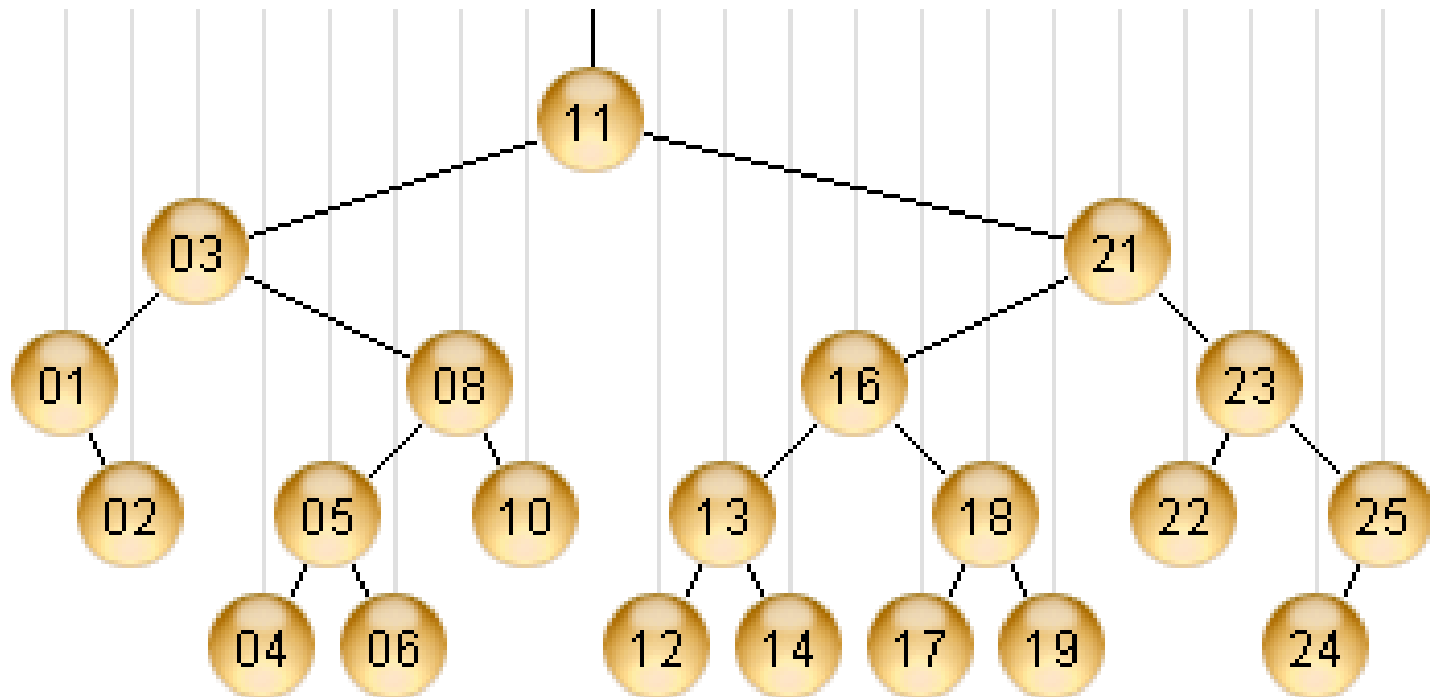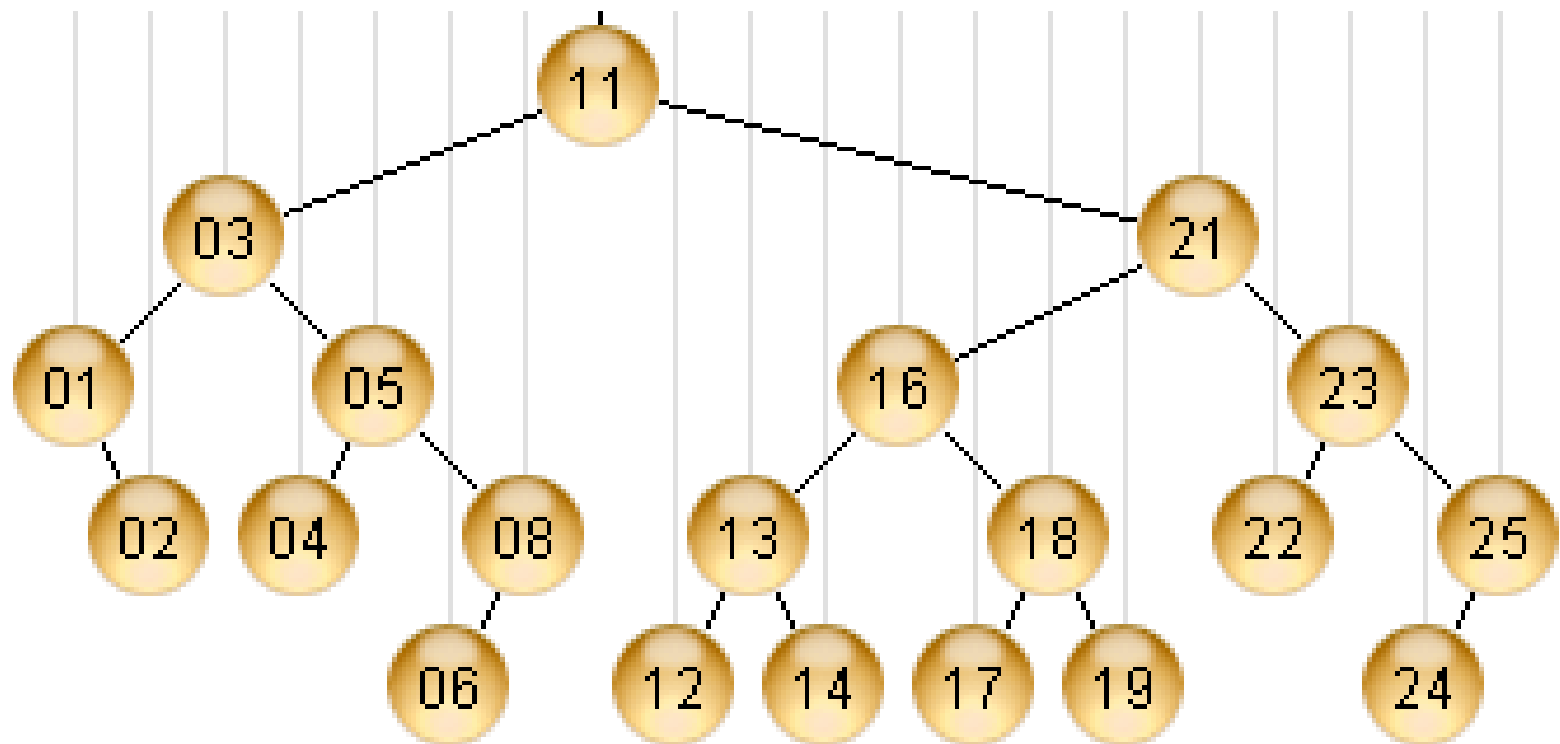Delete **G** from the original tree, then **I, J**, **V**.
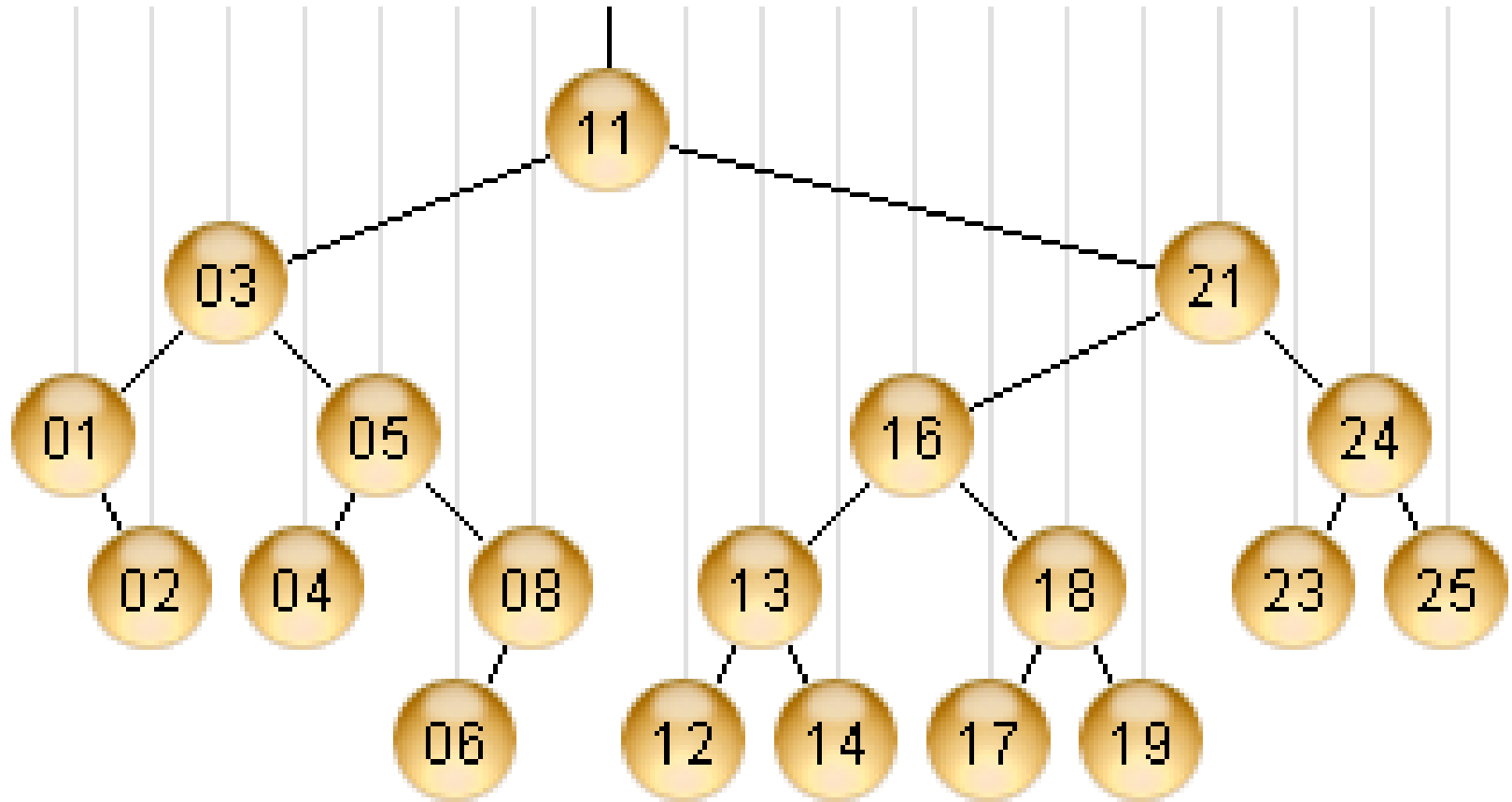
Delete 7 and Rebalance
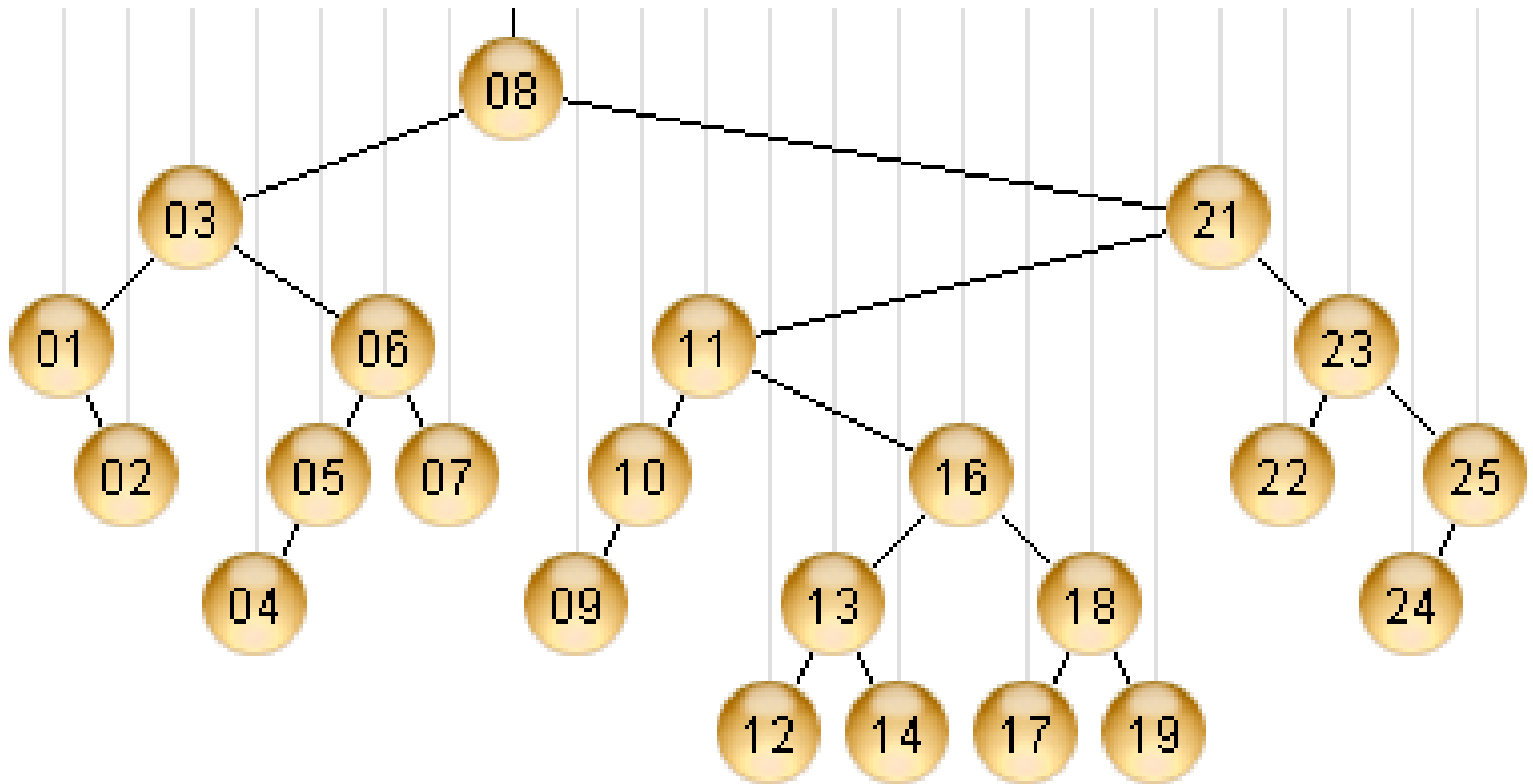
Delete 9 and Rebalance
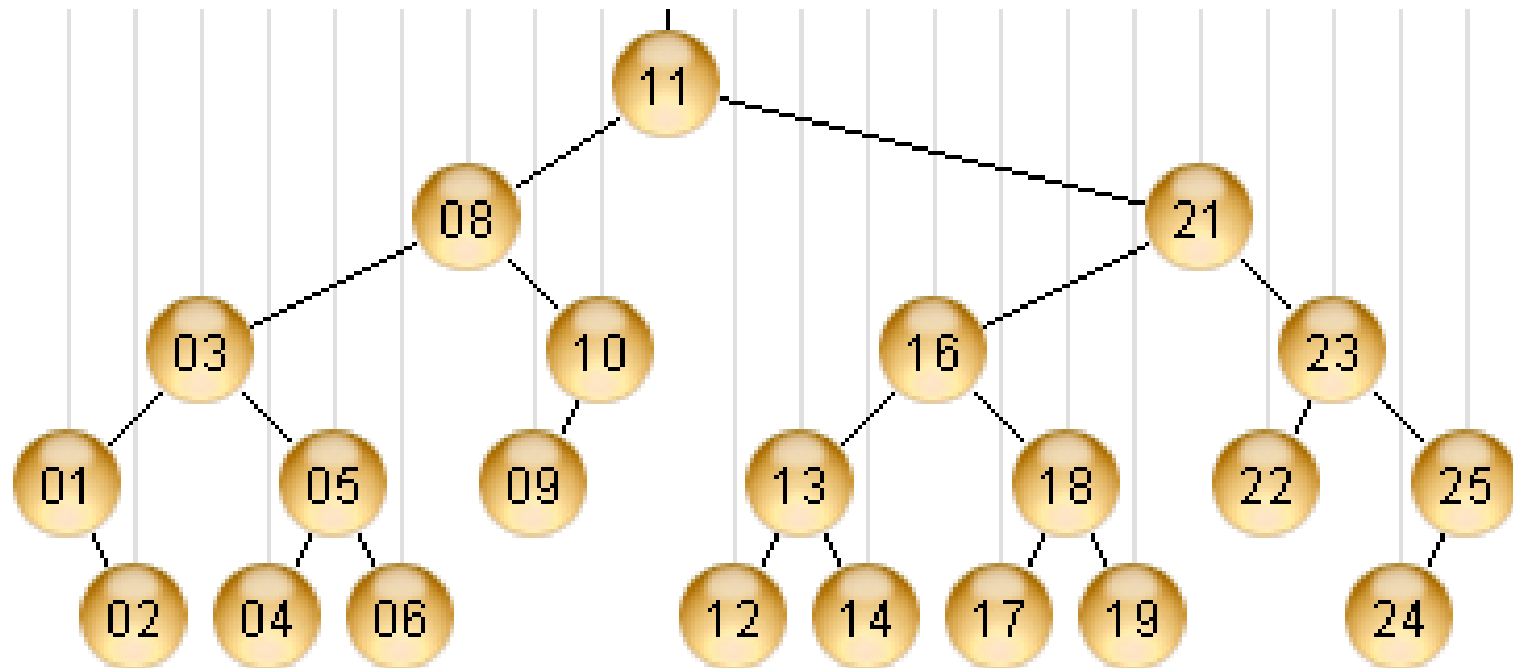
Delete 10 and Rebalance

Delete 22 and Rebalance

Final result

Your turn (with a partner or two)

- ▸ Do today's quiz
- ▸ Check your work as you go with your partner
- ▸ The demo website at the given URL is very nice!

Work with your EditorTrees team.
When you finish, work on EditorTrees.
Or write the rotateDoubleRight code from yesterday's slide.