CS 241
Data Organization
More trees

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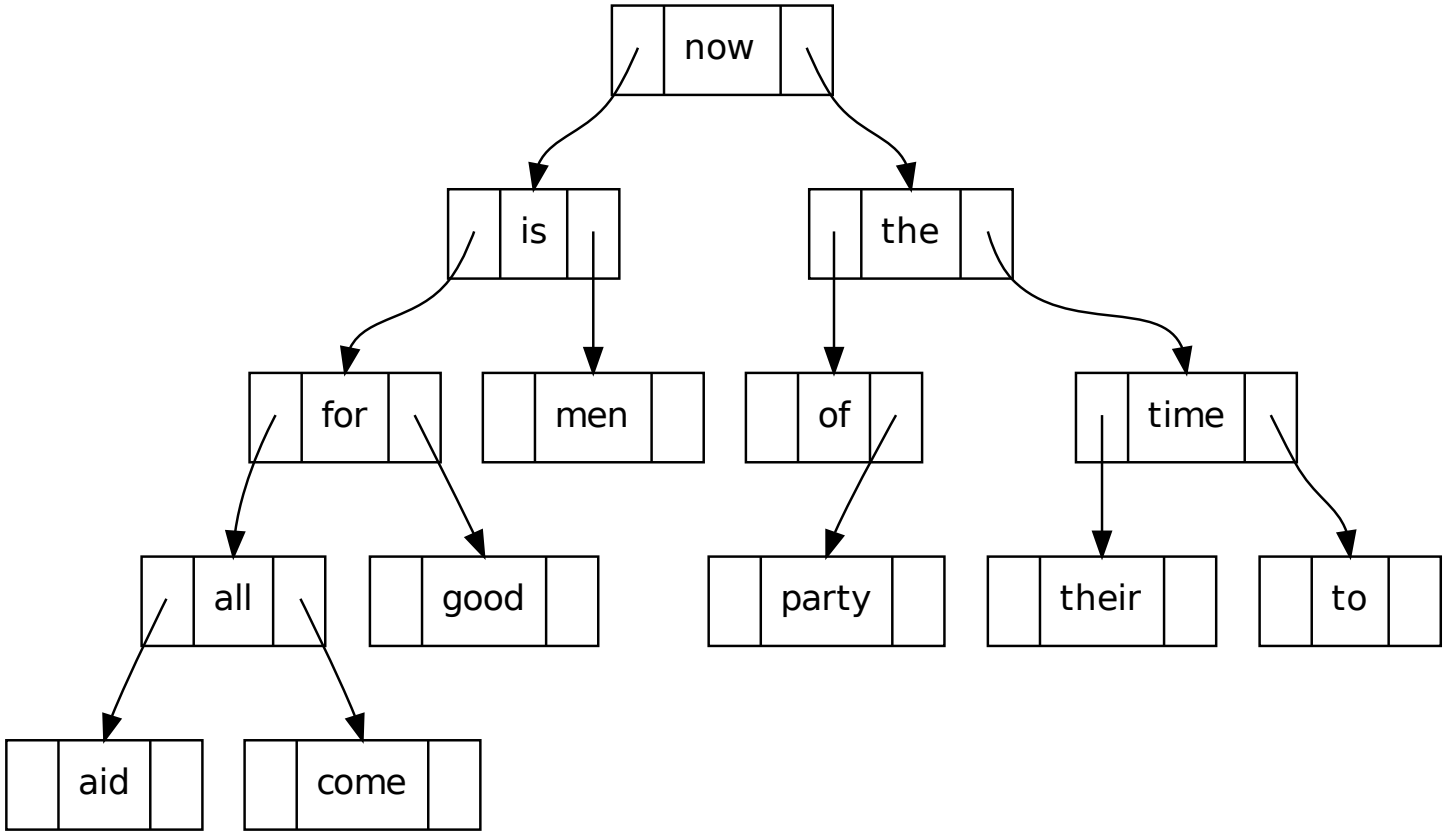
Removing Node from Ordered Tree

How can we remove an item from this tree, keeping it ordered? aid? of? the?



Three possible cases

- Node has no children (is a leaf): Just remove the node.
- Node has one child: Remove node, replace with child.
- Node has two children: Replace value in node with value from in-order successor (or predecessor) node and delete that node instead.

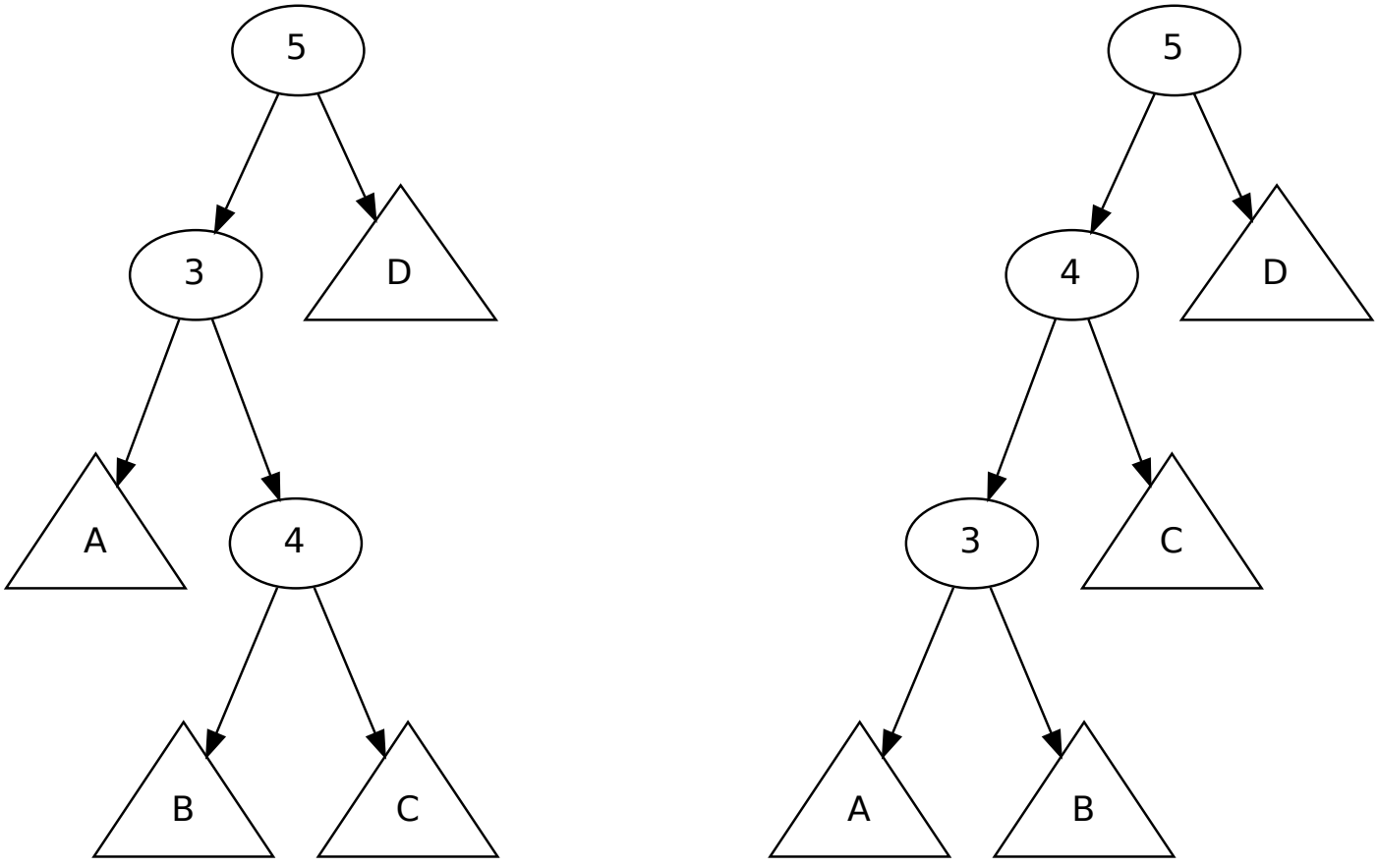
Balanced Binary Tree

- A binary tree is *balanced* if height of left and right children of every node differ by at most 1.
- A balanced BST has height of $O(\log n)$, so operations run in $O(\log n)$ time.

AVL Tree

- An AVL tree is a *self-balancing* binary search tree.
- Named after its Soviet inventors: Adelson-Velskii and Landis
- Add/remove as usual, but follow with *tree rotations* to restore balance.

AVL tree: Example



AVL tree: Example