

The Knotty Problem

- We need a program to count the number of nodes in a tree structure.
- We don't care what's in the nodes. We just want to count them.
- We may destroy the tree in doing so, since we will be dealing with a copy of the tree.
- We want the solution to be object-oriented.

1

What is a Tree?

- Collection of nodes connected by (directed) edges.
- Each node has only one parent (except the root).
- Theorem: If you split a tree by removing one of the edges, you get two trees.

2

Node Counting Algorithm

- Get the original tree, and put it onto a pile of trees, which is initially empty.
- Set a node counter to zero.
- As long as the pile is not empty, do the following:
 - Get a tree (at random) from the pile.
 - If the tree consists of more than one node, split it into two trees and put them back onto the pile.
 - Otherwise (i.e., the tree is only one node), increment the node counter by one and discard the tree.
- When the pile is finally empty, display the value of the counter on the standard output device.

3

Find the Classes

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