Homework 5

OPTIONAL PROBLEMS
(No due date)

1 Written Problems

First Common Ancestor

Design an algorithm and write code to find the first (farthest from the root) common ancestor of two nodes in a binary tree. Avoid storing additional nodes in a data structure.
**Note:** This is not necessarily a binary *search* tree.

Next Node

Write an algorithm to find the 'next' node (e.g., in-order successor) of a given node in a binary search tree where each node has a link to its parent.

External Nodes

An extended binary tree is a tree, such as the one pictured below, in which each missing child is replaced with an external node (labled with an E). Prove by strong induction that an extended binary tree with n internal nodes has n+1 external nodes.
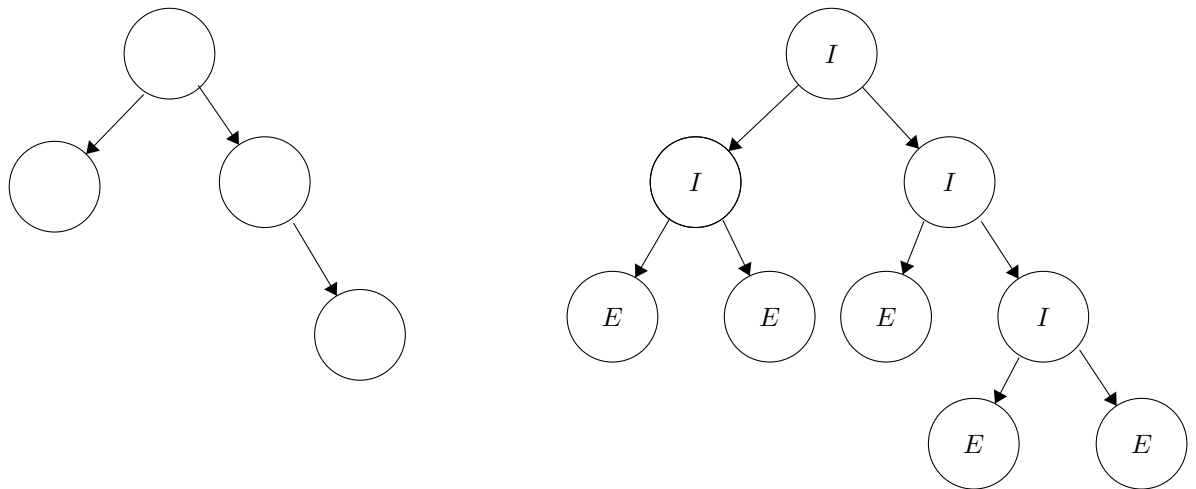
Reverse Leaves

Write an algorithm to reverse the order of the leaves in a given binary tree. The tree can be manipulated and changed, so long as the leaves are reversed. For example: