Lindsey Bieda and Joe Frambach
Reduction and Parallel Problems
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22. Give a parallel algorithm for the following problem that runs in time O(log n) on an EREW PRAM. The input is a binary tree with n nodes. Assume that each processor has a pointer to a unique node in the tree. The problem is determine the balance factor of each node in the tree. The balance factor of a node is the height of its left subtree minus the height of its right subtree.

24. Design a parallel algorithm that takes a binary expression tree, where the leaves are Boolean values 0 or 1, and the internal nodes are the three standard logical operations: NOT, OR, and AND. The output should be the value of the expression represented by the tree. Your algorithm should run in O(log n) time on a CREW PRAM with n processors, where n is the number of nodes in the tree. You may assume that each processor initially has a pointer to a unique node in the tree.