I/O-Efficient Algorithms

Roman Dementiev Summer 06
http://algo2.iti.uka.de/dementiev/courses/ioeff06/

Assignment 4

Deadline: August 21, 2006

Exercise 1: 12 Points
Given an undirected tree T with n nodes develop an algorithm that computes a 2-coloring of the tree. The algorithm must perform at most $\mathcal{O}(\text{sort}(n))$ I/Os in the worst case.

Exercise 2: 25 Points
Given an undirected forest F with n nodes — that is, a graph F whose connected components are trees — develop a deterministic $\mathcal{O}(\text{sort}(n))$ I/O algorithm that computes the connected components of F, that is a labeling λ of nodes of F such that $\lambda(v) = \lambda(w)$ if and only if v and w belong to the same component.