Assignment 4

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 $O(sort(n))$ 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 $O(sort(n))$ I/O algorithm that computes the connected components of $F$, that is a labeling $\lambda$ of nodes of $F$ such that $\lambda(v) = \lambda(w)$ if and only if $v$ and $w$ belong to the same component.