RAM Algorithms 3

AVA Fall 2005, week 10

Content: Sorting, Tree representations.

Mandatory assignment:

1. For the *partialsums* problem (mentioned in the exercises for week 9), describe a structure that:
   - takes n words of space. What are the complexities of the two operations?
   - takes $O(n)$ words, and supports the operations in $O(\lg n)$ time.
   - takes $n + o(n)$ words and supports the operations in $O(\lg n)$ time.
2. Given an ordered tree representation that supports finding the *parent*, $firstchild$, *nextsibling* and *subtreesize* of a given node, all in constant time, describe how this can be used to represent an arbitrary binary tree to support *parent*, $leftchild$, *rightchild* and *subtreesize* operations. What are the complexities of each of these operations?