ALGORITHM

Due Date: 9:20 AM, December 6

Autumn, 2012

The following problem sets are all from CLRS.

Homework 8

1. What is the smallest possible depth of a leaf in a decision tree for a comparison sort?

2. Using the figure in page 12 of Lecture Note 8 as a model, illustrate the operation of COUNTING-SORT on the array $A = \langle 6, 0, 2, 0, 1, 3, 4, 6, 1, 3, 2 \rangle$.

3. Show how to sort n integers in the range 0 to $n^2 - 1$ in $O(n)$ time.

4. Using the figure in page 15 of Lecture Note 8 as a model, illustrate the operation of RADIX-SORT on the following list of English words: COW, DOG, SEA, RUG, ROW, MOB, BOX, TAB, BAR, EAR, TAR, DIG, BIG, TEA, NOW, FOX.

5. What is the worst-case running time for the bucket-sort algorithm? What simple change to the algorithm preserves its linear expected running time and makes its worst-case running time $O(n \lg n)$?