Summer 2003 **CMSC 351: Homework 7** Clyde Kruskal

Due at the start of class Friday, June 27, 2003.

Problem 1. Do Exercise 6.5-8 on page 142 of CLRS (7.5-6 on page 151 of CLR).

Problem 2.

(a) Illustrate the operations of radix sort on the following English words: TOP, POT, TOO, OPT, OPS, SOT, POP, SOP

(b) Write an English sentence using both "SOT" and "SOP" (that indicates you understand the meanings of both words).

Problem 3. Consider the following algorithm for finding the smallest two values in an array: Keep track of the two smallest values so far in their proper order. Each new value compares with the current second smallest. If it is larger then throw it away and continue with the next value. If it is smaller throw the current second smallest away and compare the new value to the current smallest.

(a) Exactly how many comparisons does this algorithm do in the worst case? Justify.

(b) Exactly how many comparisons does this algorithm do on average? Justify.

Problem 4. For this problem you may use a calculator for a few calculations.

Consider $\sum_{k=1}^{100} k^{3/2}$.

(a) Use a non-integral method to show that the sum is between 15,000 and 70,000.

(b) Approximate the sum using integrals. Make sure to get an upper and lower bound.