Due at the start of class Thursday, September 30, 2004.

Problem 1.

(a) Exactly how many comparisons do you need to find the MINIMUM of \( n \) values. Give an algorithm.
(b) Prove your algorithm is optimal (by proving a matching lower bound).

Problem 2. Consider the problem of finding both the MINIMUM and MAXIMUM values in a list.

(a) Give an algorithm for this problem that takes substantially fewer than \( 2n \) comparisons.
(b) Challenge problem. Prove your algorithm is optimal (by proving a matching lower bound).

Problem 3.

(a) Write a summation for the AVERAGE number of moves in (linear) insertion sort.
(b) Simplify the summation.