COMP 312
Assignment 7
Due at 9:00 am, Thursday, April 21, 2005
All problems are of equal value.

Reading
Brassard & Bratley, Chapter 12, sections 12.1, 12.2, 12.3 and 12.5.

Practice

To Be Handed In
2. Consider the problem of merging two sorted lists of length $n$ using a comparison-based algorithm. (Assume that all $2^n$ elements are distinct.)
   (a) Compute the number of comparisons used in the worst-case when this problem is solved using the standard algorithm.
   (b) Use an information-theoretic argument to show that $\Omega(n)$ comparisons are required to solve this problem in the worst-case.
   (c) Use an adversary argument to show that $2^n - 1$ comparisons are needed in the worst-case.

Bonus
Show that $n - 2 + \lceil \log n \rceil$ comparisons are necessary and sufficient to find the second largest item among $n$ distinct items.