Algorithm
Problem Set 1

September 17, 2012

1. Implement counting sort and merge sort in your favorite programming language.

2. **Extra Credit.** Implement Bubble Sort. Let i be the smallest number such that your algorithm takes more than one minute on your machine to sort 2^i numbers. Now implement Counting Sort. How long does it take to sort 2^i numbers?
   Your deliverable is: Bubble Sort and Counting Sort implementations, the value of i, the amount of time it takes for your Counting Sort implementation to sort 2^i numbers. You may use your favorite programming language.

3. **Extra Credit.** Write a program that on input n a power of 2 outputs a sequence of $O(nlog^2n)$ pairs (i, j) such that on any input of n numbers, performing the Compare-Exchange given by the sequence correctly sorts the input.
   Your deliverable is: The code of your program, the output of your program for $n = 64$. You may use your favorite programming language.

Due on 09/19 Wednesday midnight.