CS121 - Computer Science II
Lab Assignment #11
Fall 2011

The purpose of this exercise is to study the runtime behavior of several sorting algorithms.

You are to write and instrument several sorting algorithms - you can use the routines given in the book, handed out in class, or any other source as a starting point for your code. We will study the following sorting algorithms:

- The standard bubble sort, where premature termination occurs if the list is sorted before all passes are completed.

- The bubble sort, modified so that each pass starts from the opposite end of the list - recall that this tends to make the elements move more quickly into position.

- The selection sort

- The standard Quicksort

- The Quicksort, modified so that if any list to be sorted contains less than 10 elements, the selection sort is used rather than another call to Quicksort.

- The radix sort.

The data to be sorted consists of words (ie., strings) of arbitrary length (the maximum word size is 25 characters). Several files are available on the class website, ranging in size from 100 to 100000 words; the words are in random order.

You should measure the number of key moves for each algorithm. For the radix sort, you should measure the number of character comparisons, while for all the others, you can record the number of key comparisons.

For turn-in, write a short report of your findings, including graphs of your results of the algorithms' performance on different size datasets. Compare your results with the expected results, and note any significant discrepancies. Also, turn in your source code. Your submission should be a tar or zip file that includes your source code and report.