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Assignment 6 Write up

Were the time differences more drastic than you expected?

The time differences were definitely more drastic than I expected. Even though it is only a matter of seconds of a difference, each additional second counts. Overall, Bubble sort consistently was the slowest. Quick sort and Merge sort were the fastest consistently. The size of my text file was around 2000 doubles so I am sure if I had more or less it would impact the time.

What tradeoffs are involved in picking one algorithm over another?

The tradeoffs involved in picking one algorithm over another comes down to the runtime and the space-time complexity. Bubble, selection, and insertion sort all have a runtime of O(n^2). Quicksort and Merge sort have a run time of O(n log n). Although O(n log n) is the faster runtime, it also really depends on the data set. A small data set could efficiently be completed with bubble, selection, and insertion sort. But, I will say that it is more complex to run O(n log n). Between Merge and Quick sort they were also harder to overall implement. In the end, I would probably pick Quick sort over Merge because Merge sort requires additional memory.

How did your choice of programming language affect the results?

C++ affects the overall results because of the use of pointers throughout. If we had used Java instead of C++ that could have led to slower results overall. That is because Java doesn't support pointers explicitly; they use references instead. So using C++ was ideal for this assignment and comparing the results.

What are some shortcomings of this empirical analysis?

The shortcomings of this empirical analysis come down to the size of the dataset. The larger the data set, the longer the runtimes will be. The smaller the data set, the shorter the runtimes will be.