

Fall 2019 - Assign 6

Cole Ternes

13 December 2019

1 Sorting Algorithms Report

For this report, I used the sorting algorithms Bubble Sort, Selection Sort, Insertion Sort, and Merge Sort. I was slightly surprised with the results on the times of these algorithms because they were a little more drastic than I expected. In order to properly test them, I had them sort a document with 100,000 double values. I did this a few times and the results showed that it took Bubble Sort between 45 to 75 seconds, Selection Sort between 30 to 60 seconds, Insertion Sort between 5 to 20 seconds, and Merge Sort less than 1 second. I was most surprised with Merge Sort because it boggles my mind that an algorithm would be able to sort 100,000 values in less than a second. The biggest trade off would be the complexity and resources used for each algorithm. Bubble Sort and Selection Sort are both relatively easy to implement, but the trade off is that they use more memory and have a longer run-time. Insertion Sort has the possibility to run faster if the data is partially sorted, so that's why I see that it was quicker than the previous two; but the trade off is that the implementation is a tad more complex. On to Merge Sort, the complexity is much more intense compared to the previous three, and it uses only some space on the stack because of its recursive nature. Some short comings of this experiment is that we cannot measure the memory used by each algorithm to truly compare the efficiencies of all four.