

Sorting Report

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1 Time Differences

The time difference was not as drastic as I expected. The only ones that seemed to struggle up to datasets of a million were insertion and selection sort. Bubble sort started to drag towards the billions, and merge sort remained relatively capable throughout.

2 Tradeoffs

Each algorithm has its own strengths and weaknesses. Bubble Sort is good for cases where you don't have access to outside resources and just need to quickly write a sorting algorithm. Selection Sort is faster than Bubble Sort, but has slightly more complexity. Insert Sort allows you to indicate if a part of the dataset is already sorted, which improves its performance, as well as just being a more efficient algorithm overall. Merge Sort is recursive, which reduces the amount of code needed to achieve the same result as the others.

3 Programming Language

Coding in C++ may have affected performance in terms of optimization due to compiling, but I don't foresee results being drastically different were this coded in languages such as Java or Python.

4 Shortcomings

Since I was only able to test it on my laptop, my results may have been skewed as the datasets increased in size and I approached the limits of my CPU and RAM space.