Sorting Algorithm Analysis

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1. Introduction

This paper analysis sorting algorithms and finds the differences between them.

1.1. Analysis

The differences were much more drastic than I expected. Quick sort was astronomically faster than the simple Bubble, Selection, and Insertion sort algorithms. I really did not think that even for a relatively medium sized array of numbers the differences would be so big. For 100,000 doubles, the sorting algorithms:
Quick sort: .014 seconds
Selection sort: 12.55 seconds
Bubble Sort: 41.8899 seconds
Insertion Sort: 7.51315 seconds
Quick sort out preformed the other by so much due to its O(nlogn) run time compared to the O(n^2). Even though the Big-Oh run-times are the same for Selection, Insertion, and Bubble sort, Bubble sort was somehow much slower and insertion sort was much faster. This shows the in accuracy of mathematical analysis. I think that C++ has better results than other languages. Empirical analysis is simple but it depends on software, hardware, and the processor of the computer. The time for each sort is very independent on these variables. Also, empirical analysis requires testing and testing uses lots of time. For only 100,000 I had to spend a couple minutes testing it, when I could have used Mathematical Analysis instead to make predictions.