Ben Sottile

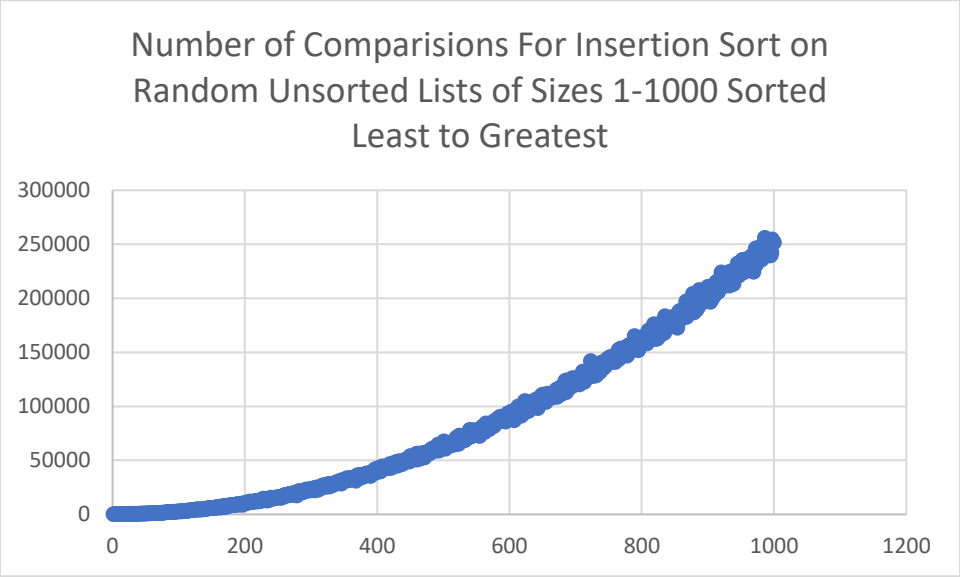
Sort Part 1

Essay describing successes, difficulties, the three plots as described above, and a brief description of the results (Did they agree with the theoretical analysis given in the text? Were there any anomalies in the plots? Etc.) This document must be submitted in PDF format.

Reflective Essay:

I managed to successfully accomplish what was asked, I coded a the insertion, bubble, and shell sorts for lists of integers. One difficulty arose with the string builder class(I was using it to append to a csv and it wasn't printing all the data, because it was hitting its maxed limit). It was solved by switching to the filewriter class and writing as I go rather, than saving and appending. There were also difficulties because of my own mistakes writing the algorithms from the book into the IDE. Also there were difficults making sure the program produced the write information as specified in the directions.

Plots and Output

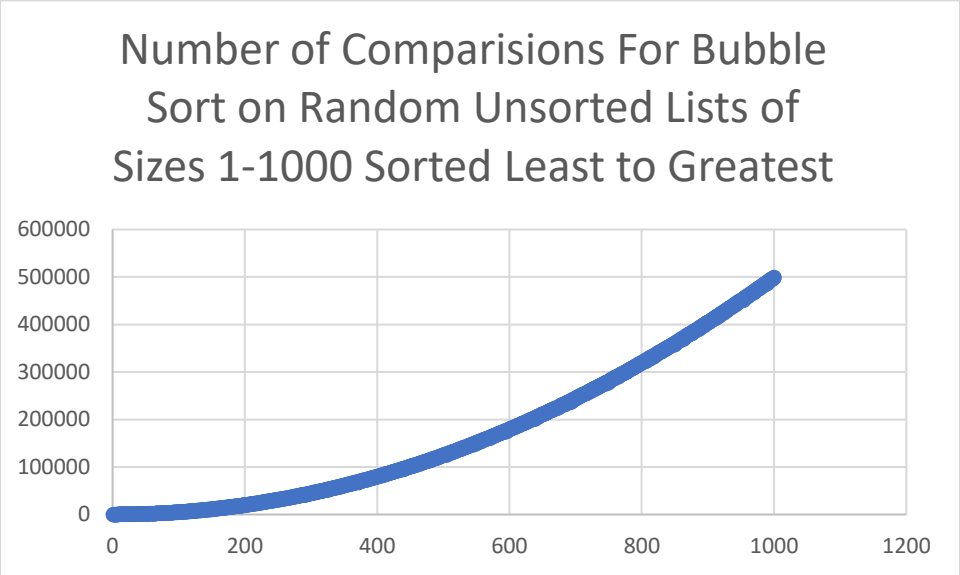


Number of Comparisons For Insertion Sort on a Random Unsorted List of Size 1000 Sorted Least to Greatest

1000 252721

Number of Comparisons For Insertion Sort on a Random Unsorted List of Size 1000 Sorted Greatest to Least

250722 250722

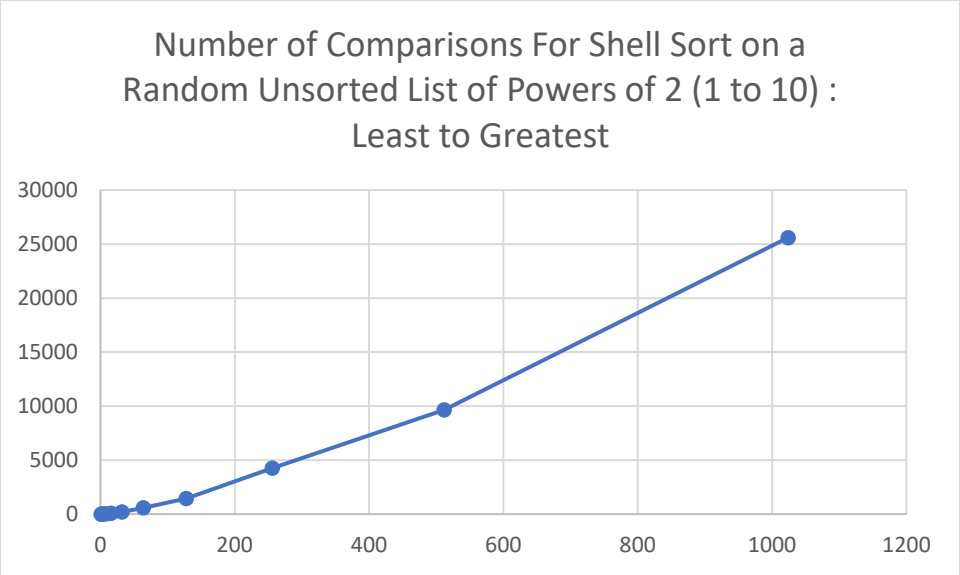


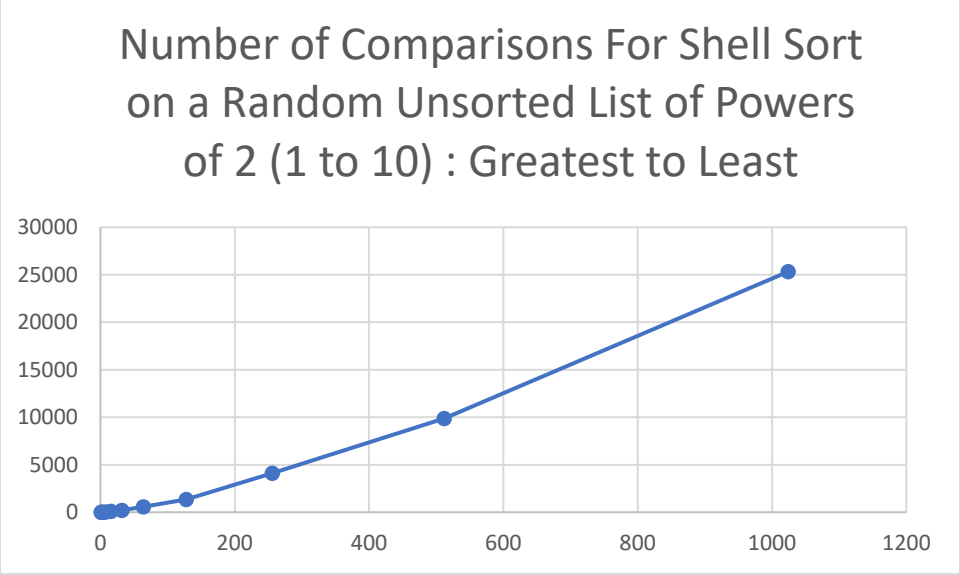
Number of Comparisons For Bubble Sort on a Random Unsorted List of Size 1000 Sorted: Least and Greatest

1000 499175

Number of Comparisons For Bubble Sort on a Random Unsorted List of Size 1000 Sorted: Greatest to Least

1000 499464





Analysis:

The results certainly to an extent agree with the text both my implementation of the insertion and bubble seem to grow exponentially and grow no faster than n^2 , by comparing the results with n^2. The results certainly to an extent agree with the text both my implementation of the shell seem to grow exponentially and grow no faster than $n^{3/5}$, by comparing the results with $n^{2.}$ From my results I can also

see that the Shell Sort works much faster than Bubble and Insertion Sort, with Shell Sort taking around 25,000 comparisons to randomly sort lists of size 1024 and Insertion and Bubble took 250,000 and 500,000 comparisons respectively for randomly sorted lists of size 1000. I wouldn't say there are any anomalies, as I'll attribute most variation to the randomness of the list. One possible anomly might be that my bubble seems to go slower than my insertion with double the comparrisions however both Big Oh's are the same.