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Radix Sort:
The sorting algorithm in which I implemented is least significant digit radix sort. LSD radix sort first looks at the digit farthest to the right (least significant digit) for all numbers in the list to be sorted and places it into what is called a “bucket”. For example, all numbers with an LSD of 0 would be placed in the 0 bucket, all numbers with an LSD of 1 would be placed in the 1 bucket, so on and so forth all the up to the base ,i.e. base 10, of the numbers being sorted. Once all of the numbers have been sorted into the appropriate buckets, the buckets are merged in order and the process repeats itself for all place values of the largest number in the list. Once the final merge is complete, all the numbers should be in order. Radix sort has a big O of kN where N is the number of numbers in the list and k is the average length of those numbers. Compared to comparison sorts such as merge and heap sort, radix sort can be more, less or equal to the efficiency of these algorithms depending on the value of k. The smaller the average size of numbers in a list passed to this algorithm the faster the algorithm will be. Radix sort avoids the use of things such as comparison and recursion and instead uses iteration to place numbers in the appropriate buckets to sort the list. The strengths of this algorithm are its speed and avoidance of comparisons, however, if the average length of the items of the list passed to this algorithm is high then the algorithm is likely to become less efficient than sorts such as merge and heap sort.

Python Sort:
Both radix sort and python sort are faster for sorting lists of numbers in sequential order, however, the built in python sort is by far the fastest to sort. That could be partially due to pythons sort being written as C and thus does not need to be interpreted as the code is run. According to python's wiki, python sort has a Big O of n*log(n) which leads me to believe that it utilizes something similar to one of the quick comparison sorts such as heap or merge sort.

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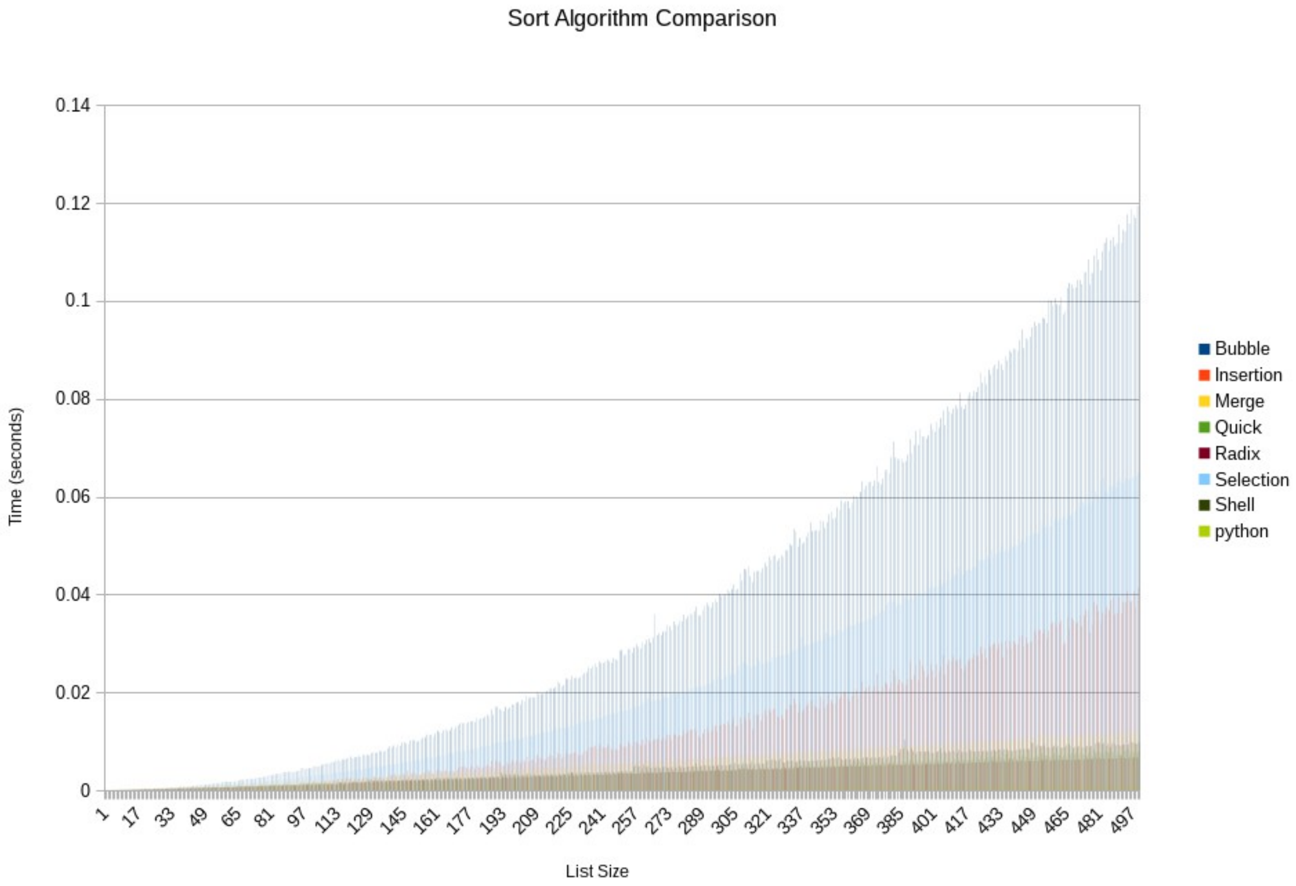
Sort Algorithm Comparison
Time (seconds)
List Size
Bubble
Insertion
Merge
Quick
Radix
Selection
Shell
python