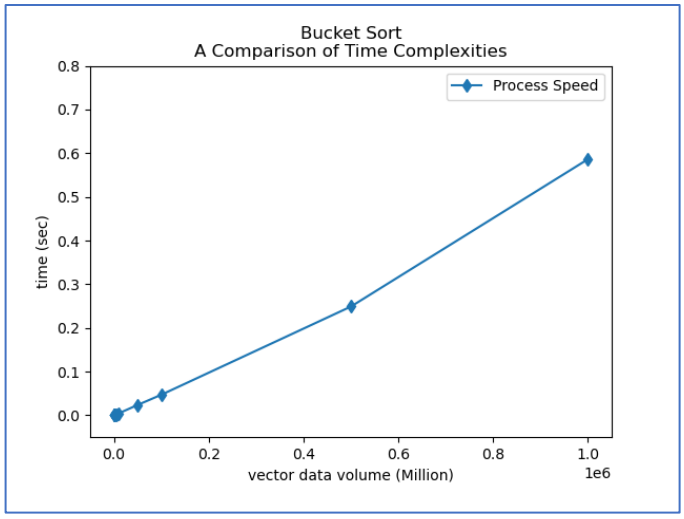
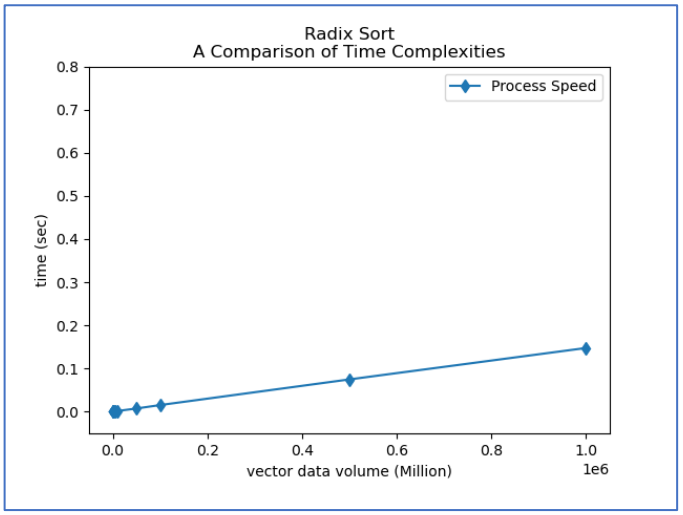
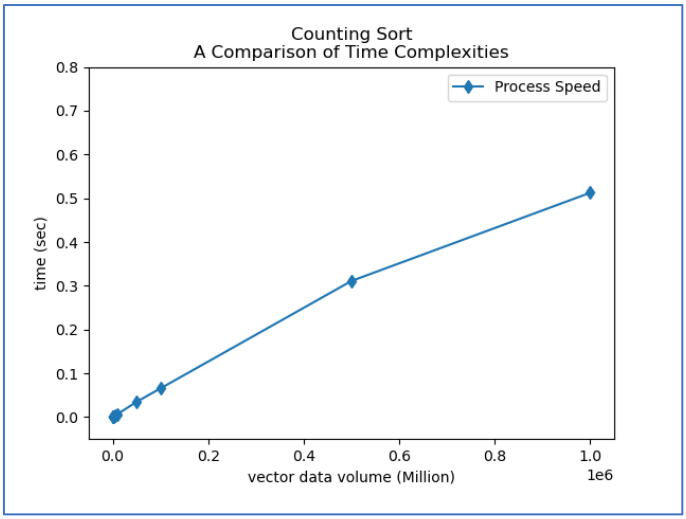
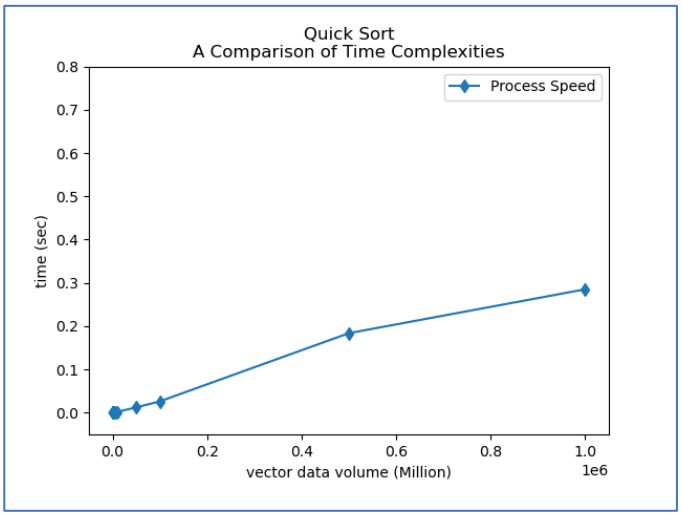
Plotted Time Complexities of Various Algorithms

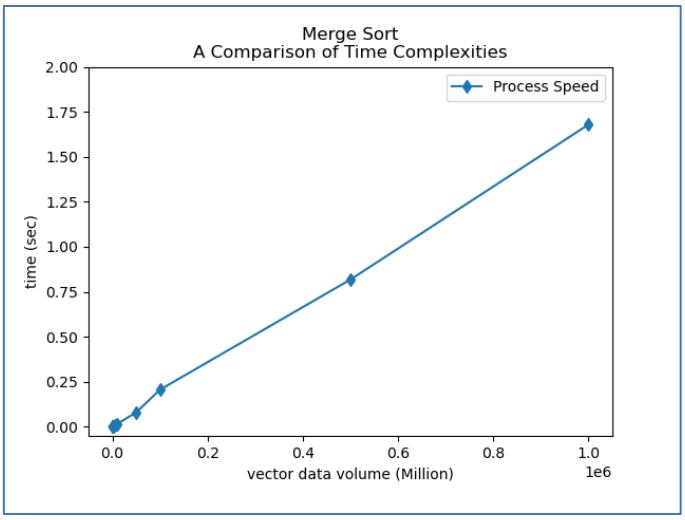
Seven different algorithms were fed various sized randomly generated numbers. Vectors ranged from 10 to one million in volume. Below are plots of each algorithm reflecting their processing times. In general, excluding insertion sort, a trend of O(n) or O(n lg n) time was observed. The y axis represents the time in seconds. Most algorithms produced results well under one second or even a half. Insertion sort took about 36 minutes to sort a million input values. It was an impressive lesson in why asymptotic time complexities, data structures, and algorithms are a valuable study.

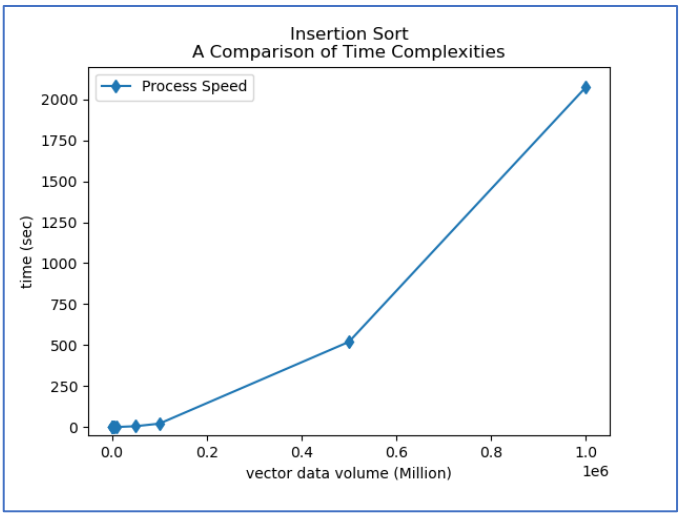









Merge Sort
A Comparison of Time Complexities
Process Speed
time (sec)
vector data volume (Million)
1e6
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.0
0.2
0.4
0.6
0.8
1.0


Insertion Sort
A Comparison of Time Complexities
Process Speed
time (sec)
vector data volume (Million)
1e6
2000
1750
1500
1250
1000
750
500
250
0
0.0
0.2
0.4
0.6
0.8
1.0