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CPSC 335
M:7pm-10pm

Project 2

The Hypothesis:

1. Randomization can be used to generate data for testing an algorithm and determining performance.
2. Two algorithms of the same efficiency class can have different average running times and different ranges of performance.

Testing:

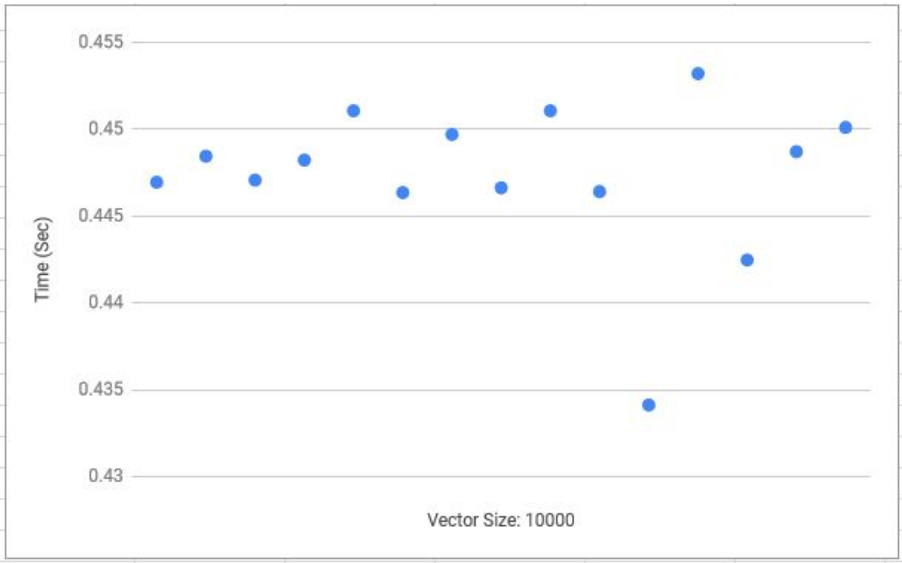
To test the efficiency of both algorithms, I needed to run them with different amount of inputs. To do so I've shuffled a string vector so we have different inputs every time.

Outcome:

Mergesort

Vector size = 10000

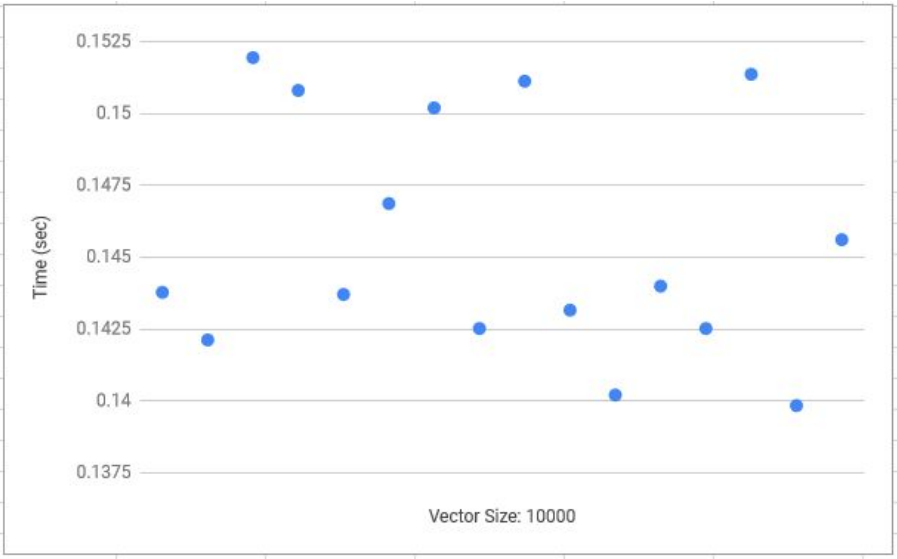
Vector Size	Time (sec)
10000	0.446953
10000	0.448451
10000	0.447076
10000	0.448229
10000	0.451069
10000	0.446357
10000	0.449705
10000	0.446632
10000	0.451069
10000	0.446412
10000	0.434123
10000	0.45321
10000	0.442473
10000	0.4487136
10000	0.450109
Average:	0.4473721067



Quicksort

Vector size = 10000

Vector Size	Time (sec)
10000	0.143783
10000	0.142126
10000	0.151947
10000	0.150806
10000	0.143708
10000	0.146872
10000	0.150197
10000	0.142523
10000	0.151128
10000	0.143162
10000	0.1402101
10000	0.143998
10000	0.1425231
10000	0.151368
10000	0.139842
Average:	0.14561288



Conclusion:

With my data I can conclude that the hypothesis is correct.Both mergesort and quicksort are in the efficiency class of 0(nlogn), but after running multiple test, I can conclude that quicksort is slightly more efficient compared to mergesort. The data is reliable due to the face each set of vectors are randomized so I can get the best overall outcome.