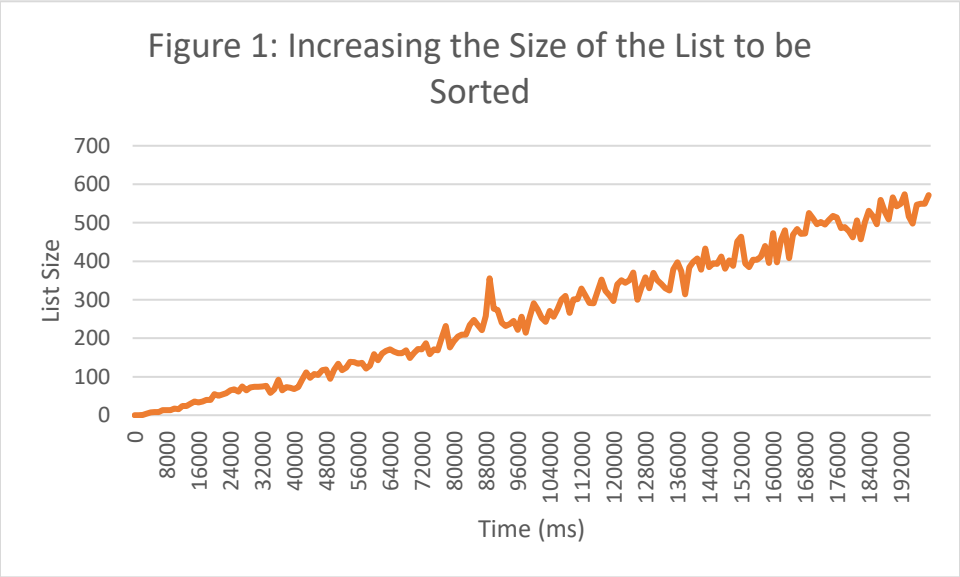
Homework 5 Individual Writeup

Sanjeev Janarthanan

Experiment 1

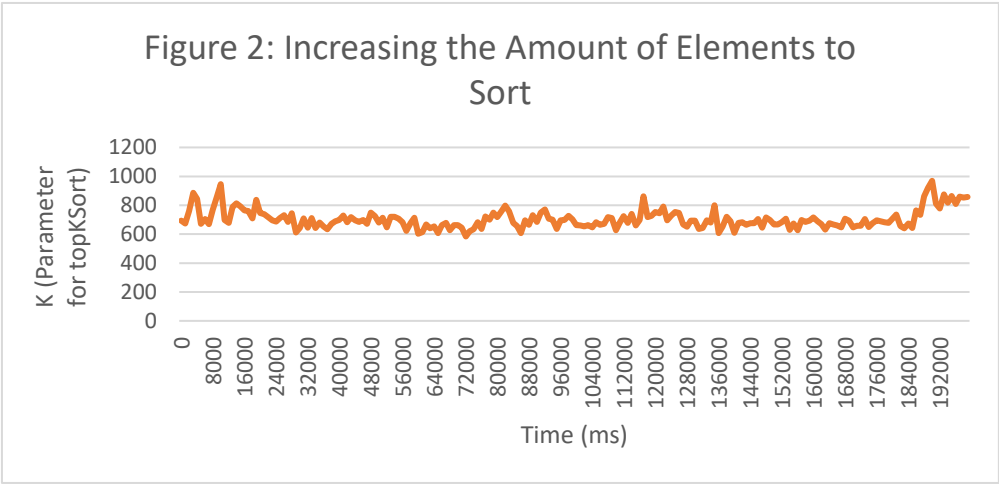
This experiment tests how increasing the size of the input list affects the runtime of the topKSort method.



The results of the experiment matched up with my prediction. The runtime of topKSort is O(n*log(k)), so it makes sense that if k is kept constant, the runtime of topKSort will grow at a linear rate.

Experiment 2

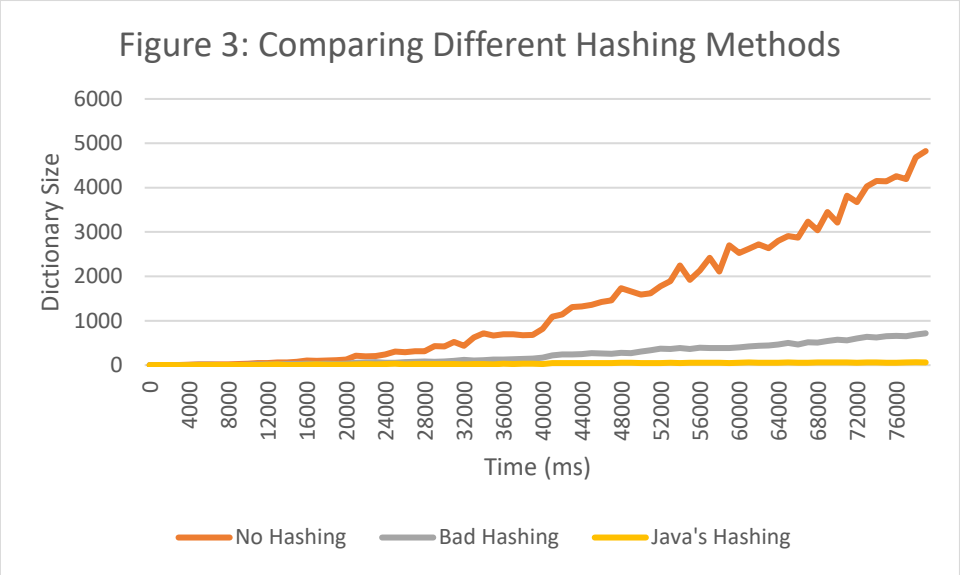
This experiment test how varying the parameter k for topKSort affects the runtime of the topKSort method. The parameter k determines how many elements of the list to be sorted and returned.



The results of the experiment were surprising to me. I knew that since k only affects the runtime in terms of log(k) it would have a minimal effect on the runtime, but I didn't realize it would have almost no impact on runtime. This does make sense though because for large n, log(k) will have almost no impact on n and we can basically treat it as a constant.

Experiment 3

This experiment tests how different forms of hashing affect the runtime of methods in a ChainedHashDictionary.



The results of this experiment were the same as I predicted. As you improve your method for hashing, you reduce the number of collisions in your dictionary, resulting in a much faster runtime.