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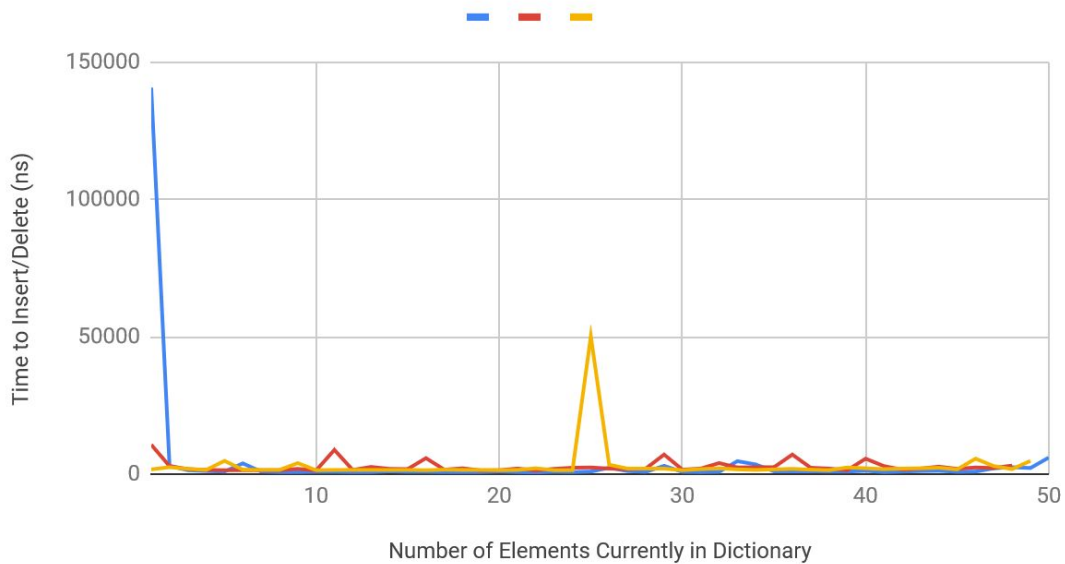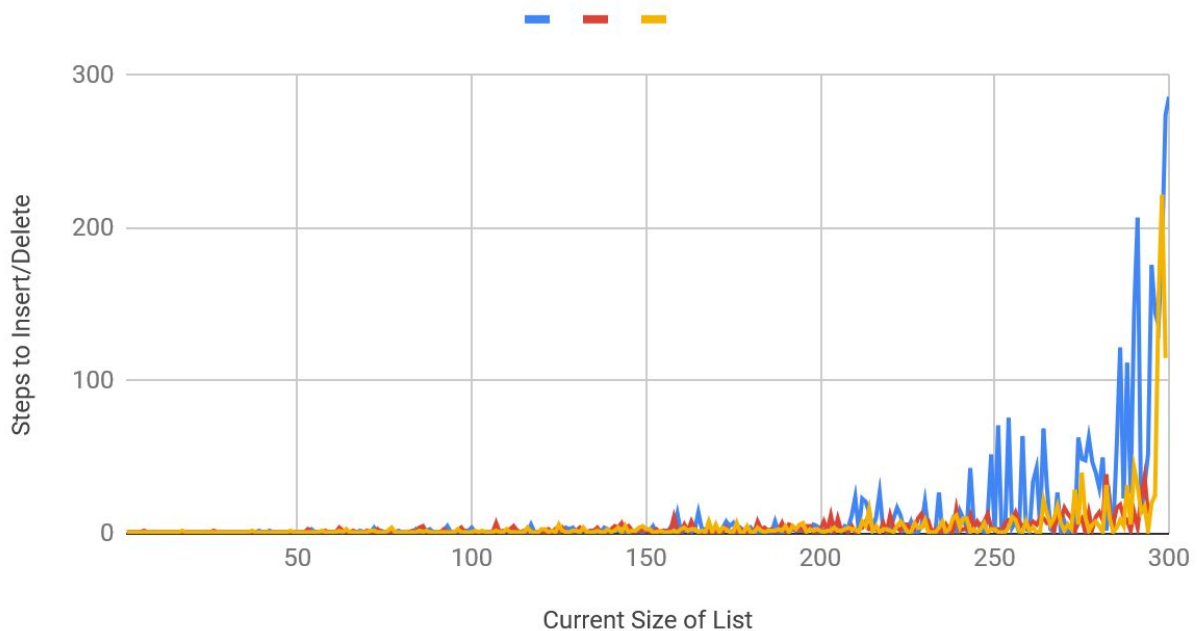
Blue: Linear Probing // Yellow: Quadratic Probing // Red: Pseudo Random Probing

Time to Insert/Delete

Step Comparisons

Analysis of Alternative Probing Methods

There were two experiments conducted for two different versions of analysis of the hash dictionary's use of linear, quadratic, and pseudo random probing. The first was a real system time analysis from analyzing the differences in system time from before and after the insert and delete function were called as the hash dictionary was filled up and emptied respectively. The second was a step analysis of each different probing method. Specifically the steps represented the number of times the probing method had to be called before finding the correct position necessary for the insertion or deletion. As is typical of actual runtime experiments on a heavily volatile environment such as a personal computer, the real runtime experiment was not very helpful in distinguishing differences between the probing methods. Outliers easily skewed data and were impossible to remove completely. However the step runtime experiment held to the expected conclusions from previous analyses. As the load factor increases so does the time to insert or delete. But optimization of probing methods can dampen the effects of this increase in time. From the step analysis, as expected the slowest would be linear probing because of its sequential nature of searching through the table for the next open spot. Next would be the quadratic probing method which would operate relatively similar to the linear probing but would simply jump in quadratic sequences as opposed to linear. This would make it traverse the table quicker but has problems with keys that would have similar modulos throughout their exponentiations. Lastly the quickest would be the pseudo random probe, which would be expected to be the fastest because of its attempt to reach equiprobable probing to all slots of the table no matter the specific key, as opposed to the previous methods which would inherently create patterns of probing which would lead to all general cases of more collisions.