20100992
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I confirm that this submission is my own work and is consistent with the Queen's regulations on Academic Integrity

Part 1:

For the character to integer conversion, I decided to convert each character to an integer representing its corresponding position in the letters of the alphabet (ie. A to 1, B to 2, C to 3.. etc.). I decided to choose this method because it was a method that allowed me to give a unique code for each letter in the alphabet, and no codes are exactly the same.

Part 4:

Hypothesis: for d >= 2, DH(d) < QP(d)

Here are the results I got:

<u>d < 2:</u>
QP(2) Hashtable size: 2309
QP Average Search Length: 4.9663902226102135
DH(2) Hashtable size: 2333
DH Average Search Length: 4.847228284591881

<u>d < 3:</u>
QP(3) Hashtable size: 2357
QP Average Search Length: 3.956350938454823
DH(3) Hashtable size: 2383
DH Average Search Length: 3.9711916193801833

<u>d < 4:</u>
QP(4) Hashtable size: 2503
QP Average Search Length: 2.9938891313836753
DH(4) Hashtable size: 2539
DH Average Search Length: 2.9092099519860324

<u>d < 5:</u>
QP(5) Hashtable size: 2969
QP Average Search Length: 1.9554779572239196
DH(5) Hashtable size: 2971
DH Average Search Length: 1.9978175469227413

QP(2) < DH(2)
QP(3) < DH(3)
QP(4) < DH(4)
QP(5) < DH(5)

Based on the results that I obtained for this experiment, the hypothesis does not hold true, since DH(d) is greater than QP(d) for all of the experiments, albeit only by a small number of spaces each time. It's also important to note that the average search length slightly differs between each other for each d value, which further makes this experiment inconclusive and does not support the hypothesis.