Homework 6

Due Date: April 27 by 4:15PM via GitHub

9 Points Total

We've implemented a few hash functions in class. This assignment will tackle another – the extraction method. You'll recall that the extraction method uses a portion of the key to calculate the address, e.g.

Key	Hashed Address
345678	357
234137	243
952671	927

But what if collisions occur? There are several options for resolving collisions; here we'll consider quadratic probing.

Your task: Develop functionality to read in a file of integers. The file is comma delimited. (You've done this before so feel free to use your existing code.) This file (included in the assignment) is named "everybodys_socials.txt". You just hacked the iTunes store. Score, you now have the world's social security numbers. So they are all 9 digits and range from 100000000 to 999999999. The extraction method will extract the third, fifth, seventh and eighth digits. So, say that my social was 123456789, the hashed address would be 3578. Before you begin hashing, ask the user via the console for a number between 1 and 450 million. (Can you figure out where I came up with this number?) You'll use this number for your quadratic probing. You then hash the numbers from the file. When a collision occurs, you will resolve it via quadratic probing without replacement. When you have properly hashed the file, you will next write a function to write out the hash table to file. It should be comma delimited. (Note, do not include spaces between numbers. The last number should not be followed by a comma.) The file should be named "hashed_socials.txt".

Grading:

3 pts Implementation of the extraction method
3 pts Implementation of the quadratic probing without replacement method
1 pt functionality to read in the file and interact with the user via the console
1 pt proper use of data storage for hash table
1 pt correct output (this will be generated during grading using your code for a new data set)
There are no points awarded for commenting. It is expected that your code will be commented. No comments, no grade.

Submit your code via GitHub.