CIS263 Assignment Six

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Complete the following 2 exercises:

1. Given input {4371, 1323, 6173, 4199, 4344, 9679, 1989} and a hash function:
   h(x) = x mod 10
   Show the resulting Hash Table. Note: the hash table will start at 0 and end at 9 for a size of 10.
   a. Separate chaining hash table
   b. Hash table using linear probing
   c. Hash table using quadratic probing
   d. Hash table with second hash function $h_2(x) = 7 - (x \ mod \ 7)$

2. Write a program to compute the number of collisions required in a long random sequence of insertions using linear probing, quadratic probing and double hashing. For simplicity, use only integers for your long random sequence. The simulation should continue until the first 500 numbers from the random sequence have been inserted. Hash function h(x) = x % D where D is the size of the table (fixed size of 1001). Second hash function: $h_2(x) = 7 - (x \ mod \ 7)$

Approved programming languages: C, C++, C#, Python, Java.

Hand-in:

1. The hash tables for exercise 1.
2. The output demonstrating the functionality of your program for exercise number 2
3. A file containing the source code for exercise 2 (no zip files)

Grading Rubric

	0%	50%	100%
Separate Chaining Hash table (10%)	Not completed; 2 or more mistakes in hash table	Completed, but 1 mistake in the hash table	Correct hash table
Hash table using linear probing (10%)	Not completed; 2 or more mistakes in hash table	Completed, but 1 mistake in the hash table	Correct hash table
Hash table using quadratic probing (10%)	Not completed; 2 or more mistakes in hash table	Completed, but 1 mistake in the hash table	Correct hash table
Hash table with second hash function (10%)	Not completed; 2 or more mistakes in hash table	Completed, but 1 mistake in the hash table	Correct hash table
Functionality demonstrated of exercise 2 (60%)	Not demonstrated clearly	Limited demonstration	Clearly demonstrated

See blackboard for point breakdown.