CSCI 310 – Data Structures – Spring 2019
HW 12 – Hashing (25 points) – Solutions

1. For the given Table Sizes, Hash Functions, Keys, and Probing Strategies, give the *first five* table locations probed.

   (a) (5 points) Table Size = 17; Key = 1235; $hash(x) = x \ \% \ Table\ Size$; Linear Probing function.

   Solution: First five locations probed are:

   1. 11
   2. 12
   3. 13
   4. 14
   5. 15

   (b) (5 points) Table Size = 67; Key = 719; $hash(x) = x \ \% \ Table\ Size$; Quadratic Probing function.

   Solution: First five locations probed are:

   1. 49
   2. 50
   3. 53
   4. 58
   5. 65

   (c) (5 points) Table Size = 23; Key = 88; $hash(x) = x \ \% \ Table\ Size$; Probing function $f(i) = i(i+7)(-1)^i$.

   Solution: First five locations probed are:

   1. 19
   2. 11
   3. 14
   4. 12
   5. 17

   (d) (5 points) Table Size = 43; Key = 594; $hash_1(x) = x \ \% \ Table\ Size$; $hash_2(x) = R - (x \ \% \ R)$; Probing function is Double Hashing.

   Solution: First five locations probed are:

   1. 35
   2. 13
   3. 34
   4. 12
   5. 33

2. (5 points) Consider hashing with:

   - $hash(x) = x \ \% \ TableSize$
   - A table size of 10
   - Quadratic probing

   Show the contents of the hash table after inserting the keys $19, 1230, 217, 428, 3297, 16, 255, 126$.

0	**1230**
1	**3297**
2	**126**
3	
4	
5	**255**
6	**16**
7	**217**
8	**428**
9	**19**

What to turn in: This assignment is to be turned in through Blackboard. You can type up your solution using a computer program or you can prepare your solution by hand and scan it.