Student ID:

CW Exam1

10th October 2019 COMP 2611

1. Consider the following data: These data are to be stored in a hashtable with 10 buckets.

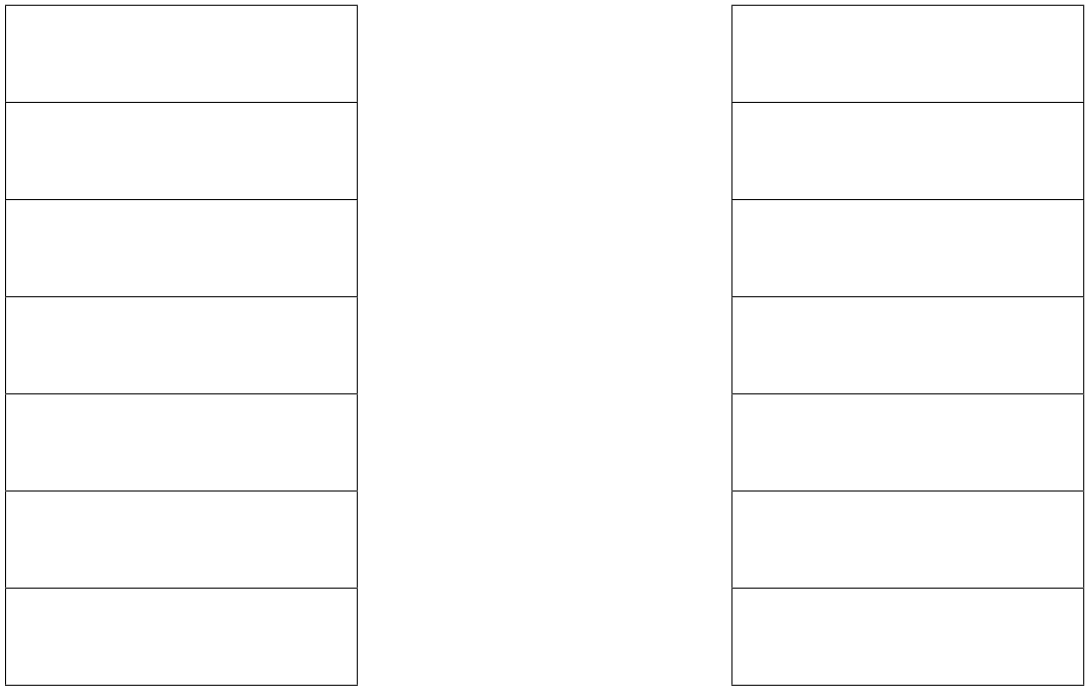
Key	Value
35	Jack
13	Jane
24	Tim
77	David
93	Charlie
84	Annette

Show the final state of this hashtable when the following collision resolution techniques are used:

(a) Chaining [2]

(b) Linear Probing [2]

(c) Quadratic Probing [2]



2. Write pseudocode to insert a key/value pair into a hashtable that uses chaining as its collision resolution technique. Your pseudocode should accept three arguments:

   - *table* - the array for the hashtable
   - *key* - the key in the key/value pair
   - *value* - the value in the key/value in pair

   You may assume that your arrays are dynamic arrays that support an append method. [6]

3. Consider the following operations. State which sparse matrix representation you should use if you need to prioritize each operation:

   (a) Column Splicing [2]

   (b) Row Splicing [2]

   (c) Random access by row and column coordinates [2]

4. Consider the following sparse matrix

$$\begin{bmatrix} 0 & 1 & 0 & 0 \\ 2 & 3 & 0 & -1 \\ 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 2 & 3 & 0 & 0 \end{bmatrix}$$

   Give the following matrix representations for M:

   (a) CSR (showing A, IA, and JA) [6]

   (b) LIL [3]

   (c) COO [3]