CSC 212 Tutorial
Hash

Problem 1

Use the hash function $H(key) = key \,\%\, 7$ to store the following sequence of keys in a hash table: 28, 71, 43, 11, 56, 17, 63, 6, 7. If there is no place for some keys in the table indicate that the table is full.

- Use linear rehashing (take c = 1), and show the number of probes
- Use external chaining
- Use coalesced chaining with a cellar size of 3, and show the final location of *epla*

Problem 2

Assuming the keys are integers, denoted by $d_n d_{n-1} \ldots d_k \ldots d_2 d_1$, where d_i is the $i-th$ decimal digit in the key, d_n being the leftmost decimal digit. The hash function is given by: $H(key) = (d_1 d_2 + d_{n-1} d_n + d_k)\ mod\ 11$ where $d_1 d_2$ is a two-digit number composed by swapping the rightmost two digits, $d_{n-1} d_n$ is two-digit number composed by swapping the leftmost two digits and $k = \lceil n/2 \rceil$

Example 2.1. *H(70934) = (43 + 07 + 9) mod 11 = 59 mod 11= 4*

Assume the keys are: 1234, 519, 911, 7346, 0, 999, 99834, 54 and 40015.

- Compute *H(key)* for each of the above keys
- Insert the above keys in the same order in a hash table with open addressing using linear rehashing
- Find the number of probes required to search for key 11 in the above hash table

Problem 3

Develop a hashing function to convert a character key k of 15 characters into integers in the range of 0 to 999.