

King Saud University
College of Computer and Information Sciences
Computer Science Department

CSC 212

First Semester 1437-1438

Tutorial # 12

Important: No online tutorial

Problem 1

Use the hash function $H(\text{key}) = \text{key} \bmod 11$ to store the sequence of integers: 82, 31, 28, 4, 45, 27, 59, 79, 35 in the hash table of TableSize = 11.

- (a) Use linear rehashing
- (b) Use external chaining
- (c) Use coalesced chaining with a cellular size of four and the hash function $H(\text{key}) = \text{key} \bmod 7$.

Problem 2

Assuming the keys are integers, denoted by $d_n d_{n-1} \dots d_k \dots d_2 d_1$ where d_i is the i -th decimal digit in the key, d_n being the leftmost decimal digit. The hash function $H(\text{key})$ is given by:

$$H(\text{key}) = (d_1 d_2 + d_{n-1} d_n + d_k) \bmod 11$$

where is a two digit number (composed by swapping the rightmost two digits), is also a two digit number (composed by swapping the leftmost two digits), and $k = \lfloor n/2 \rfloor$

for example : $H(70934) = (43 + 07 + 9) \bmod 11 = 59 \bmod 11 = 4$.

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

- (a) Compute $H(\text{key})$ for each of the above keys.
- (b) Insert the above keys (in exactly the same order) in a hash table with open addressing (linear rehashing).
- (c) Find the number of probes required to search for keys 54 and 11 in the above hash table.

Problem 3

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