COSC 240
Homework 5 **(REVISED to add the underline text in Question 2)**
Due April 2, 2019

40 points

1. (20 points) A *palindrome* is a nonempty string over some alphabet that reads the same forward and backward. Examples of palindromes include, *civic*, *raceca, aibohphobia* (fear of palindromes), all strings of length 1, and *nitin*.

   Give an efficient algorithm (based on dynamic programming approach) to find the longest palindrome that is a subsequence of a given input string. For example, given the input character, your algorithm should return *carac*.

   What is the running time of your algorithm? Suppose that the input string length is denoted as S.

2. (20 points) Suggest a perfect hashing scheme for the following keys (decimal values): 17, 23, 90, 102, 69**, 4, 9, 14, 19, 49, 70. Assume that the first-level hash table has size m=5.** Describe the universal hashing scheme used to design your perfect hashing scheme, and also the specific hash functions used for the primary and secondary hash tables.

SUGGESTED EXERCISE:

- Consider hashing with open addressing (and linear or quadratic probing). Show where a set of keys (such as that in Question 2) may be inserted with your hashing scheme.