# CS3305-XL Assignment 9

**Requirements**

The goal of this assignment is to implement a hash table data structure for the given application. The assignment requires students to implement a hash function, linear probing and suggest a data structure for chaining if there is a collision.

For this assignment, you will be provided with a model assignment of a game server that services requests from its clients. Using this program create your own hash function for the given problem.

**Please do not use the same hash function used in this program.**

**You may use the linear probing algorithm used in this program.**

Given below is the description of the problem that you requires a hash table implementation to write a program.

Scheduling instructors to a course is tedious task that occurs every semester in every college / university within academic institutions around the word. Instructors have an **instructor id** which is a unique key that identifies the instructor at a particular institution.

You are required to do the following things:

1. Design a hash table that stores information about the instructor such as First Name, Last Name, Instructor ID and the course name along with the course IDs. The program will take in as input all this information and store it in a hash table with the instructor id being the key used to create the hash function.

2. Describe what data structure do you think will be appropriate if there is a collision and you have to implement chaining. Describe your data structure in a Word document within 3 sentences ( 100 -150 words)

3. The look-up table when provided with the course number will give the instructor’s name and the course name. Similarly, when provided with the course id the program should return the name of the course and the instructor’s first and last name.

Use linear probing to find the course and instructor information.

Below is the description of the program that can be used as a model to design the program.

**Description:**

The program is designed to simulate how a game server might handle its connection with clients. A game server must be able to receive incoming packets and then take appropriate actions for certain players by determining what player object belongs to a certain client. Every client for a UDP server will have a unique IP + port combination. Therefore, we use the ClientID struct to maintain this information and to be used as the key type for the key-value pairs in the hash map. The main feature is the hash map used for the Clients class. This class is used to map a given key (ClientID in this case) to a value (a pointer to a Player object). So, when the server receives a packet from a client, it is able to determine what action they want to perform and what player object they are assigned. (Credit: JHasty, TA, CS 3305)

# Submitting Assignment

Submit your assignment zip file through D2L using the appropriate assignment link. Please use the submission guidelines provided in D2L.   
Please submit a word doc and the required .cpp files to the assignment submission folder in D2L bythe due date posted in D2L. **Do NOT submit file main.cpp provided with the assignment.**