## CSE 562 Assignement #1: SQL, Relational Algebra and ER Diagrams

Date: January 27, 2014

\*\*\*\*\* Due on February 3rd, 2014 at or before 11.59 PM. \*\*\*\*\*

## Please follow all the instructions given below :

- 1. This assignment has four questions. You need to submit one zip file named **ubitname\_assignement1.zip** through the CSE submit facility. The zip file should contain four files which answer each question individually. More explanation about each file is provided below.
- 2. For problems 1 and 2 you need to submit files named "q1.sql" and "q2.sql" respectively. Make sure that every new line is a different query and **do not** use any formatting. Your queries should work on a standard MySQL database. We will directly execute these files and you will receive **zero** credit if the files fail to execute for any reason.
- 3. For problem 3 submit a file named "q3.pdf" which has your relational algebra query.
- 4. For problem 4 submit a file named "q4.pdf" which has the ER diagram and a note about any assumptions.
- 5. Note that you will receive zero credit if you name the files differently.

Problem 1. [25 pts] Consider the following schema of an online flight reservation agency.

Customer(cid, lastName, firstName, dob)
Flight(<u>fid</u>, airline, fromCity, toCity, stops, onTime)
Reservation(cid, fid, date)

Attribute dob is the customer's date of birth, stops is the number of stops (0-??) a flight requires, and onTime is a percentage (0-100) indicating how often a flight is on time. Keys are underlined. The set {lastName, firstName, dob} *is also a key* for Customer. However, the set {airline, fromCity, toCity, stops, onTime} *is not a key* for Flight since an airline may provide, say, different flights with two stops from Buffalo to Orlando, one stopping in Atlanta and one in New York, both of which are always on time. Attributes cid and fid in Reservation are foreign keys referencing homonymous attributes in Customer and Flight, respectively.

Write a CREATE TABLE command for each relation. Include all constraints described above.

Problem 2. [25 pts] Consider the following schema and some sample tuples for a student database management system.

```
student(<u>sid</u>, sname, sage, saddr)
student: 123, a, 25, Buffalo
student: 234, b, 27, Detroit
student: 678, c, 21, NYC
enrolled(<u>sid, cid</u>, grade)
enrolled: 123, cse_562, A
enrolled: 123, cse_589, B
enrolled: 234, cse_574, C
course(<u>cid</u>, cname)
course: cse_562, DB
course: cse_589, MNC
course: cse_574, ML
```

For this given schema write a SQL query which gives the student id for all students who are not enrolled in 'cse\_562'.

**Problem 3. [25 pts]** For the schema described in Problem 2, write the Relational Algebra query which gives the student id for all students who are not enrolled in 'cse\_562'.

**Problem 4. [25 pts]** Consider an application that needs to manage data for a travel agency. It needs to store the following entities and relationships:

Hotels: have attributes name, address, price

Resorts: are Hotels, that also have an attribute minimum-stay

Activities: have attributes name, season

Has: is a relationship between Resorts and Activities

You could make other assumptions. It is OK as long as you state them clearly. Design an E/R diagram for this application.