COMP 3380 – Databases: Concepts and Usage

Department of Computer Science
The University of Manitoba
Fall 2006

Assignment 1

Course Number: COMP 338 (Section A01)
Instructor: Dr. Carson K. Leung **Due Date: Thu, Oct 05, 2006**
Hand-in: In class (at 11:30 in EITC E2-105)

Instructions:

- Submit all answers on 8.5" x 11" paper in a letter-size folder.
- Clearly indicate your name, student number, and section on the outside of the folder.
- Include a *signed* Honesty Declaration as the *first page* of your assignment.
- For Question 1, you may use HSQLDB or other available systems provided that they produce the same (or similar) results.
- For Questions 2 & 3, neat hand-drawn diagrams (or diagrams formed by ASCII text) are acceptable.

Questions:

1. Download the given file "HSQLDB-07R.zip" from the WebCT. Unzip the file and follow the instructions in the "GettingStarted" document. Then run the following SQL queries against the Students database and print the results. Note that the Students database already exists.

```
SELECT * FROM Students;
SELECT * FROM Courses;
SELECT * FROM Enrolled;
INSERT INTO Courses VALUES ('COMP 4060', 'Topics in CS');
SELECT * FROM Courses;
DELETE FROM Courses WHERE courseID='COMP 4060';
SELECT * FROM Courses;
INSERT INTO Students VALUES (8000000, 'James Bond');
SELECT * FROM Students;
UPDATE Students
SET studentName='Jesse James' WHERE studentID=8000000;
SELECT * FROM Students;
DELETE FROM Students WHERE studentID = 8000000;
SELECT * FROM Students;
DELETE FROM Students WHERE studentID = 9000000;
SELECT * FROM Students;
SELECT Students.studentName, Courses.courseName, Enrolled.grade
FROM Students, Courses, Enrolled
WHERE Students.studentID=Enrolled.studentID AND
      Courses.courseID=Enrolled.courseID;
```

2. Draw an ER diagram that shows the organization of a simple student database. The database is to contain information on students (student number and name), courses (course number and title), and sections (section number within a course and the grade that the student has achieved in that section). Here, we assume that a student can take only one section of a course, and the student cannot repeat any courses. Make sure you clearly identify the primary key of each entity set, and the primary key & the cardinality ratio of each relationship set

3. Draw the ER diagram that represents the information described below. It is not necessary to add attributes that are not specifically required. Show all relationship sets, primary keys, and the mapping cardinality of the relationship sets.
   Hint: First identify all entity sets and relationship sets.

   "Farmers grow a variety of grains (canola, wheat, rye, etc.), which can uniquely identified by a grain ID. Each farmer has a name and a unique farmer ID, and may have several telephone numbers. Each farmer maintains one or more sections of land on which one or more varieties of grain may be grown. The farmer knows the amount of grain (measured in tonnes) that is produced by each section of land. Sections are not necessarily the same size and do not necessarily contain the same grains or amounts of grain. When the grains are harvested, each farmer makes a contract to sell some of his/her grain to a specific grain pool (distribution centre). There are many pools, but each pool handles only one specific type of grain, and the price per tonne is constant for each individual pool. There may be any number of pools that purchase a specific type of grain. A farmer will have only one contract with a specific pool for a specific amount of the type of grain handled by that pool. However, a farmer may have contracts with any number of pools. Each pool then contracts with a business to sell a specific quantity of grain to that business at an agreed-upon price. This price may vary from contract to contract. A pool may have any number of contracts with any number of businesses, including multiple contracts with the same business. Each pool must maintain the total amount of grain that it has purchased from all of its farmers and the total amount of grain that it has contracted to sell."

Acknowledgements:
- Thanks Dr. David Scuse for providing us the "GettingStarted" document for HSQLDB.

--- End of Assignment 1 ---