CMPT 354 - Database Systems I

Assignment 3

Due date: November 16, 2015 — J.P. Delgrande
20 marks, 10% of grade — Oct 26, 2015

Important Note: Students must work individually on this, and other CMPT 354, assignments. You may not discuss the specific questions in this assignment, nor their solutions with any other student. You may not provide or use any solution, in whole or in part, to or by another student.

You are encouraged to discuss the general concepts involved in the questions in the context of completely different problems. If you are in doubt as to what constitutes acceptable discussion, please ask!

For this assignment you will continue working with the database schema and instance that you were using in the previous assignment.

1. (4 marks) Add the following constraints:

   (a) Foreign key constraints.

   (b) A course should start before it ends.

   (c) Enrollments in a section are limited by the section's capacity.

   (d) No two sections may be in the same room at the same time.

   Important note: Trigger syntax for SQL Server is very different from what we've covered in class (which is based on Oracle). So for parts (c) and (d) above, a pen-and-paper solution can be handed in. If you want to try coding a trigger in SQL Server, please see:

   http://msdn.microsoft.com/en-us/library/ms189799.aspx

   As well, for examples, see:

   http://www.codeproject.com/Articles/38808/Overview-of-SQL-Server-database-Triggers#CreateTrigger

   http://www.functionx.com/sqlserver/Lesson36.htm

2. (4 marks) Update the database as follows.

   (a) Add the students:
   250, Jin, Yi, 2012
   251, Liu, Fangzhen, 2012

   (b) At this point all grades are NULL, as are the GPAs of Students.

      i. Update the grades from the file EnrollmentsWithGrades.txt.

      ii. For each student, update their GPA, by calculating the average of the courses that they have taken.

3. (12 marks) For this question you will be producing a summary of the student grades using java and JDBC; the summary will be an XML document. For each student the document will have the student number, student last name, first name, and GPA. The document should be sorted by student number.

   The XML document should have the following structure:

```
<?xml version="1.0" standalone="yes" ?>
   <GPASummary>
      A list of tagged elements, each element giving information about a student
   </GPASummary>
```