CS 122A: Introduction to Data Management – Winter 2015

Homework 2: E/R and Relational Translation (100 points)

Due Date: **Tuesday, Jan 27 (5:00 PM)**

Submission

All homework assignments should have your student ID and name and be submitted in IN CLASS at the start of class, or during the TA's office hour. Thus, you should print out all your work and put it on the front desk in the classroom before Tuesday's lecture starts. Refer to the following table for the submission opportunities. After Thursday's class, no more submission is allowed. That is, we will not accept assignments after that time (and will be publishing the solutions at that time). Please get all your work in on time! Save your one dropped assignment for the end of the term when you are most likely to want/need it.

Date / Time	Place	Remark
Tuesday, Jan 27 (5:00 PM)	Classroom	Due date
Wednesday, Jan 28 (4 – 4:50 PM)	TA's office (DBH 2068)	20 points will be deducted
Thursday, Jan 29 (5:00 PM)	Classroom	40 points will be deducted

E-R based Relational Schema Design [100 pts]

You have successfully designed an E-R diagram for "Deliber". Now, to setup a real database, you are required to design a relational schema to represent the objects described in the E-R diagram that you created. **Specifically, you need to create a SQL DDL statement for each table.** Since you sent your E-R diagram to an external database-consulting firm, "DBInstructor", to check the correctness of your design, "DBInstructor" will provide the final E-R diagram soon. Start designing a relational schema based on your original E-R diagram. However, your final design should be based on the solution that "DBInstructor" provides. It will be released after Thursday's class.

If you see any opportunities to avoid creating excess relations that stem from relationships, avoid them so as to make the relations simpler. Clearly list all of the relations and their attributes (including their types), primary keys, foreign keys (including referenced target relations), and not null constraints by creating a SQL DDL statement for each table. As a result, your design should capture the information and constraints of the E-R diagram as faithfully as possible. For types, use one of the following types for each column.

Category	Type	Remark
NUMBER	INTEGER	A number type for integer values
	DECIMAL(x,y)	A number type for real values where **x** is the maximum number of digits and **y** is the number of digits to the right of the decimal point.
STRING	CHAR(n)	A fixed-length string type where **n** represents the column length.
	VARCHAR(n)	A variable-length string type where **n** represents the maximum column length.
DATETIME	DATE	A type that is used for values with a date part but no time part. The format is '0000-00-00'.
	TIME	A type that is used for values with time part. The format is '00:00:00'.
	DATETIME	A type that is used for values that contain both date and time parts. The format is '0000-00-00 00:00:00'.

Where possible, use the entity, relationship, and attribute names from the final E-R diagram for naming your tables and columns (to make it clear how your design corresponds to their E-R diagram). Again, all of the following should be included in a DDL statement for each table. Be sure to:

(a) [50pts] List the tables and columns in your design.
(b) [20pts] For each of your tables, identify its primary key column(s).
(c) [20pts] For each of your tables, identify its foreign key column(s) (and which other table each one references).
(d) [10pts] For each of your tables, identify not null column(s).

Here is an example DDL statement for a table:

```
CREATE TABLE Professor(
        eid             INTEGER,
        name            VARCHAR(40),
        department      VARCHAR(40),
        phd_year        INTEGER,
        phd_school      VARCHAR(80),
        PRIMARY KEY (eid)
);
```