CS 122A: Introduction to Data Management – Winter 2017

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

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

Submission

All HW assignments should contain both your student ID and your name and must be submitted online, as a SQL script text file (not PDF this time!), via the HW2 dropbox on EEE. See the table below for the HW 2 submission opportunities. Note that after 5 PM on Sunday the 29th no further HW 2 submissions will be accepted. (We will be releasing the solution at that time.) Please strive to get all your work in on time! If possible, try to save the one dropped assignment for the end of the term when you are most likely to want/need it.

Date / Time	**Grade Implications**
Friday, Jan 27 (5:00 PM)	Full credit will be available
Saturday, Jan 28 (5:00PM)	20 points will be deducted
Sunday, Jan 29 (5:00 PM)	40 points will be deducted

E-R based Relational Schema Design [100 pts]

You have successfully designed an E-R diagram for TopicalBirds.com. Now, to setup a real database, you must design a relational schema to represent the objects described in the E-R diagram that you created. **Specifically, you will need to create a SQL DDL statement for each table.** To make sure your design is a good one, you have given your E-R diagram to an external database consulting firm, DBInstructor, Inc., to have their experts check the correctness of your design. DBInstructor will provide your final E-R diagram soon. Since time is of the essence, though, you should start designing the required relational schema now based on your original E-R diagram. Your final design must be based on the E-R schema that DBInstructor provides, however. That schema will appear after Sunday's 5 PM HW 1 "drop dead" deadline has passed.

As you work on your design, when you spot opportunities to avoid creating excess relations that stem from relationships, do avoid them (to make the schema simpler). Clearly list all of the relations and their attributes (including their types), primary keys, foreign keys (including the referenced target relations), and *not null* constraints by writing the SQL DDL statement for each table. The resulting 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** is the column length.
	VARCHAR(n)	A variable-length string type where **n** specifies the maximum column length.
DATETIME	DATE	A type used for values with a date part but no time part. The format is '0000-00-00'.
	TIME	A type used for values with a time part. The format is '00:00:00'.
	DATETIME	A type used for values with both a date part and a time part. The format is '0000-00-00 00:00:00'.

Where possible, use the entity, relationship, and attribute names from the final E-R diagram while naming your tables and columns (to make it clear how your design corresponds to the E-R diagram). Again, all of the following information should be included in the DDL statements 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 indicate which other table each one references).

(d) [10pts] For each of your tables, identify any *not null* column(s).

Here is an example of a DDL statement for a table:

```
CREATE TABLE Professor (
        empid           INTEGER,
        name            VARCHAR(40),
        dept            VARCHAR(20),
        phddate         DATE,
        phdschool       VARCHAR(80),
        PRIMARY KEY (empid),
        FOREIGN KEY (dept) REFERENCES Department
);
```

(This assumes that you have already created a Department table with a dept field as its primary key.) The best way to make sure your solution is sound is to actually try it out on a real system – so you should go ahead and install MySQL on your favorite HW platform (e.g., your laptop) and use it to verify that all of your DDL statements will actually run properly.