CS348: Introduction to Database Systems

(Winter 2017)

Assignment 3 (due on Thursday, March 16th)

Overview: This assignment consists of two questions. As an aid to scheduling your work on this assignment, you should plan on spending three to four hours total on the questions.

Assignment submission: Either hand-written or printed copies of your answers must be submitted by 5pm on the assignment due date in the assignment boxes. The first page of your submission must include this cover page with your name and student number indicated in the space provided below.

Student name: _____

Student number: _____

Question 1.

Assume your company is developing a digital camera online purchasing system for sale to camera stores. An initial analysis phase of the project has resulted in the following informal description of relevant data for the system.

- A store will be selling a variety of digital cameras and lenses. The digital cameras can have a combination of the following features.

  1. An ability to replace lenses.
  2. Cameras with an electronic viewfinder.
  3. Cameras with an optical viewfinder.
  4. Cameras with a "through the lens" optical viewfinder.
  5. Cameras with an optical rangefinder.

  Note that any combination of these features is possible with the exception that no camera will have more than one feature from the following set: {3, 4, 5}.

- Properties of all cameras that are relevant include the manufacturer, model number, date of product release, sensor size, pixel number, retail price and the number currently in stock.

- Properties of cameras without an ability to replace lenses that are relevant include a focal length range and an aperture range.

- Cameras with an ability to replace lenses are related to at least two or more lenses.

- Properties of a lens that are relevant include the manufacturer, model number, date of product release, focal length range, aperture range, retail price and the number currently in stock.

- A prime lens is any lens with only one possible value for a focal length range, i.e., will have the low end of the range equal to the high end of the range.

- Online customers are either domestic customers or foreign customers.

- Properties of customers that are relevant include a unique customer number, a customer name, an email address and a shipping address.

- Each customer has any number of purchase orders (including possibly none at all). A subset of the purchase orders are in the process of being prepared for shipment and are therefore outstanding.
- Each purchase order is for either a camera or a lens, and will also have a selling price.
- Each camera or lens with have at least one customer evaluation.
- A customer evaluation is given by an individual customer and consists of a score between 1 and 5 (from bad to good) and a customer comment.

Specify a conceptual design with an ER diagram that is capable of storing such information that formalizes as much of the informal description as possible. Also, add comments that clarify any parts of the above informal description that are not captured by your ER diagram.

Question 2.

Translate the ER diagram you produced for the previous question into a set of **create table** commands that define a relational schema in the SQL language. The commands should include primary and foreign key constraints where appropriate. In addition, add SQL **create assertion** commands to capture any parts of your ER specification or the informal description above for which this is possible and that are not otherwise enforced by the **create table** commands. And finally, add comments that clarify

1. any unusual translation decisions, and
2. (as in the case of your ER diagram) any remaining parts of the informal description not captured, directly or indirectly, by your **create table** and **create assertion** commands.