CS 1555/2055: Database Management Systems

Department of Computer Science, University of Pittsburgh

Homework: ER Modeling

Goal

    To gain familiarity with relational database design and ER modeling.

Questions [100 points total]

1. [60 points] A car insurance company called InsureCo wants a database that keeps track of their customers, their customers' policies, the cars that they insure, and claims made against these policies. The company wants to ensure that they keep track of each car's make, model, year, VIN number, and color. For each of their customers, InsureCo needs to store a name (first, last, and middle initial), and Social Security Number. For each policy, InsureCo needs to keep track of the unique policy id, the deductible, the starting date, the current expiration date for the policy, and the customer (or customers) who own that policy. Assume that a policy can cover multiple cars but that a car can only be covered under a single policy. All claims should note the date that the claim was made and the amount of damage claimed. Claims must be filed by individual customers. To be compensated for damages to multiple cars, a customer must file multiple claims (e.g., if two of their cars covered by different policies are both destroyed by a flood). To seek compensation through multiple policies, a customer must file multiple claims.

   Use this as the mini-world for your homework, and produce a conceptual schema for the InsureCo database using ER modeling. In order to enhance the readability of your ER diagram, you should first produce a diagram for each entity type showing all of its attributes. Then, produce a diagram showing the relationships between entity types and the attributes (if any) of those relationships. State your assumptions carefully and clearly. You don't need to keep track of the insurance agents' information for this homework, the mini-world you are examining is limited to what is described above.

2. [40 points] Translate the ER schema created in the previous exercise into a relational schema. Specify what tables you would create as well as any primary keys *PK*, foreign keys *FK* (including mention of what the foreign key references), and alternative keys (if any). This does not need to be expressed in SQL, you simply need to list the relations that you would create, the attributes of those relations (name and type), and any primary keys, foreign keys, or alternate keys.

What To Submit

    You must submit a single zip file for this assignment titled "hw_er-<your_username>.zip" (e.g., your instructor would create "hw_er-nlf4.zip"). That zip file should contain the following:

- **<your_username>-erX**
  X should be a number, starting from 1, indicating the order that the TA should view your ER modeling files (if you create multiple).

  This (these) file(s) should contain your ER diagrams for the situation described above. It is allowable to hand draw the diagrams for this assignment, however note that any unreadable submissions will not be graded.

- **<your_username>-rel.txt**
  This file should contain the relational schema built to match your ER schema.