CS434 – Data Base Theory and Design

Project #1

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Points: This assignment is worth 15 points.

Team Database Application (TDA): Part 1 - Project Plan & Database Design

Description

The main objective of this part of the TDA assignment is for your team to get to know each other and start thinking about your TDA. Specifically, you must complete the following three tasks:

1. (0 points) Your first task is to identify the domain you would like to manage with your TDA. We suggest that you pick an application that you will enjoy working with, since you'll be stuck with it for the whole semester! In previous years, students who built a database about something they were interested in—a hobby, material from another course, a research project, etc.—got the most out of this part of the course. In order to keep things relatively simple we recommend that your application comes from one of the four domains: Manufacturing, Travel, Banking, or University.

   If you are a graduate student, we do require you to use real world data and a data set with at least 100,000 entries. Good data is available from data.medicare.gov and the national bureau of transportation statistics. You will have to write a program to insert the data into a relational database, so make sure you can get CSV files. **If you are an undergrad, you may create a database for anything you want**; at some point you will need to create hundreds of thousands of data elements, but you can simply generate junk data. Undergrads can choose to use a real world data set; in fact, a real world data set is more fun.

   Try to pick an application that is relatively substantial, but not too enormous. For example, when expressed in the entity-relationship model, you might want your design to have in the range of twelve or so entity sets, and a similar number of relationships. Please note that this is a ballpark figure only!

2. (5 points) Briefly (1-2 pages) describe the general nature of the application incl. The **proposed functionality of the application program**, and **the data that you plan to store in the database** to support the application (it is OK to say you will generate random data). Your description

should be brief and relatively informal. If there are any unique or particularly difficult aspects of your proposed application, please point them out. Your description will be graded only on suitability and conciseness. **You MUST provide a bulleted list of 4 questions** that you want to ask about the data in your database. These questions must not be trivial to answer. The questions will help guide your database design.

This document (i.e., project plan) will serve as your road map for the development of your TDA and give us an overview of what you are trying to do and how difficult it is. Please note that it is ok to deviate from this plan as the semester progresses and you understand the details of your application better. **Please submit an updated project plan with your deliverable whenever you make changes**.

3. (10 points) A paper & pencil design of the underlying database using the E/R data model discussed in class. Specifically, your data design should support the needs of the application and should contain **approximately 6-8 entity types**, each with their **associated attributes (3-5)**. Your design must include at least one subclass and a weak entity set.

   In addition, you must specify approximately **4-6 relationships** among the entity types of your schema, at least one of which **must be ternary**.

   Finally, specify a **set of constraints** for the domains, entity types, and relationships. At a minimum, you must indicate key attributes for each entity. Feel free to include as many constraints as you need to support the application (and as you can model using E/R constructs). At this point, do not worry about how to enforce the constraints in the DBMS.

   Please use the E/R notation introduced in the lectures or the textbook OR slides.

What to Hand in

Hand in your **project plan** as well as your **E/R database design**. You may use an E/R design tool if you have access to one. Otherwise, a paper&pencil design is perfectly ok. You only need to hand in one deliverable per team but make sure you write the **names and e-mail addresses of all teams members** on the assignment.

We shall look at the project plan quickly to catch major problems before you have to hand in the next deliverable for your TDB in assignment #2. Also, to make sure we can tell you of a problem with your design, please don't forget to provide us with a valid e-mail address.

Don't forget to **save a copy of your TDA** design for reference as you are getting ready to complete the next deliverable for the TDA.

If you are having trouble thinking of an application, or if you are unsure whether your proposed application is appropriate, please feel free to consult with one of the course staff.

Some general suggestions: If your submission contains multiple pages, please staple them together. Also, it is a good idea to make copies of all your submissions before handing them in.

Deliverables Checklist

- A 1-2 page project plan. See the description of above for the required contents.
- An ER diagram. Either a digital drawing or an image of a hand drawn diagram is fine. If a photo of a hand drawn diagram is used, be sure it has sufficient lighting; you may need to use a flashlight to ensure it is bright enough. Remember to specify constraints. If constraints are not specified, you will lose points.
- 4 interesting questions that a user of the database would like to ask. At least 3 of your questions must be sufficiently complex. To be sufficiently complex, a question must (at a minimum) require that the information representing 2-3 entities be examined in order to find the solution.