CS3431-A19: Project Description
Building a Database Application
Phase 1: Initial Design and Implementation

Due Date: R 9/19 at 11:59pm
Late Policy: 10% off until F 9/20 at 11:59pm
Teams: The project is done in teams of two. Form your teams by going to Canvas and selecting People -> Groups tab and then selecting one of the created Project Teams. Let your teammate know which Project Team number for her or him to join. I highly recommend completing the assignment one day in advance to give yourselves time to debug and combine your code together for submission. **If you are not submitting the assignment, verify that your teammate has!!!**
Submission: Make sure to include both of your names on the project submission. The ERD and relational schema is to be submitted in either a Word or PDF file. Use LucidChart to draw the ERD. The SQL code files should be in a project1.sql file that includes a comment with your names on it at the top. Zip your files and submit them using the Project 1 link.

Description:
In the United States, organ transplants involve doctors who are treating patients (Primary Care Physicians - PCPs), doctors who are responsible for organs ready for transplanting (Organ Procurement Doctors – OP Doctors), and surgeons who perform the transplantation of the organ into a patient.

The database includes the following:

- Each patient has unique health care ID, first name, last name, city, state, blood type, and birthDate properties
- Doctors have a physician number (unique ID), first name, last name
- PCPs have a specialty and an associated medical facility. PCPs can treat many patients but a patient may have only one PCP.
- OP doctors have an associated organ bank and the type of organ they work with. For example, livers or kidneys. OPs may care for many organs available to be matched, but each organ must have a single OP doctor assigned to it.
- Surgeons are a third type of doctor and can be board-certified or not. A surgeon can operate on many patients and a patient can be operated on by many surgeons.
- There may be other unspecified types of doctors.
- For the purposes of this database application, doctors can be only one of the following types of doctor – PCP, surgeon, OP – **or some other type of doctor that is not specified.**
- Organs have a unique number assigned per OP doctor, but that number can be used by other OP doctors. Organs also have a blood type and the date it was removed from a person.
- For each patient-organ transplant, there a single patient that is matched to a single organ. A surgeon performs the operation. We need to capture the date of the operation and whether it was successful. There is a unique invoice number associated with the operation and the amount charged for the operation.

Requirements:

1. Design a conceptual ERD that captures the above requirements. Follow the notations given in the course slides, and also follow the given guidelines for Good Design. State any assumptions that you make in addition to the above requirements. Do not add any fields to the ones listed above.
2. Create a relational schema for the above application including the foreign keys. For example:

   Books(ISBN, title, ***publisherID***)
   Foreign key (Books.publisherID) references (Publishers.publisherID)

You need to follow the rules in the PowerPoint slides to convert the ERD to relational schema. If you have any ISA relationships, use ISA method A2 solution (take a look at the PowerPoint slides and especially the demo PersonA2.sql). The only field(s) that may be added would be to support the ISA relationship.

3. Write the SQL code in a file named project1.sql to create the tables including the constraints. Use the following data types for the fields:
    a. All **primary key IDs** are number sequences that begin with 100 and are incremented by 5
    b. Boolean fields are **char(1)** fields with the values of 'T' or 'F'
    c. All names are variable strings of up to 25 characters
    d. Phone numbers should be stored as variable strings of 10 characters
4. Enter data for the tables and include these SQL commands in the project1.sql file.
    a. 20 patients
    b. 5 PCPs
    c. 5 surgeons
    d. 3 OP doctors
    e. 20 surgeries, one for each of the 20 patients
    f. fill any additional tables that were created for the relationships
5. Include select * for each of your tables and include these commands in the project1.sql file.