Term Project

Project Description
You are designing a database for Dave's GetWell Hospital.

As a large service organization, Dave's GetWell Hospital depends on a large number of persons for its continued success. There are four groups of people on whom the hospital is most dependent: employees, physicians, patients and volunteers. Of course some common attributes are shared by all of these persons such as birthdates and contract information.

Each of the four groups has at least one unique attribute of its own. Employees have a hire date and volunteers have zero or more Skills, Physicians have a Specialty and Pager#, and patients have a contact date.   Additional personnel in the hospital community do not belong to one of these four groups (their numbers are relatively small). However, a particular person may belong to two (or more) of these groups at any given time (for example, Patient and Volunteer).

Each patient has one (and only one) physician responsible for that patient. A given physician may not be responsible for any patients at a given time or may be responsible for one or more patients. Patients are divided into two groups: resident and outpatient. Each resident has an admitted date attribute. Each outpatient is scheduled for zero or more visits. The entity visit has three attributes: Visit Date Comments and the physician that the patient visited. Notice that an instance of visit cannot exist without an outpatient owner entity.

Employees are subdivided into three groups: nurse, staff, and technician. Only nurses have the attribute Certificate, which indicates the qualification. Only staff has the attribute job class, and only technicians have skills. Each nurse is assigned to one (and only one) care center. Examples of care centers are Maternity, Emergency, and Cardiology. Attributes of the care center are Name and Location. A care center may have one or more nurses assigned to it. Also for each care center, a nurse is appointed nurse in charge. The nurse in charge may or may not be assigned to that care center. A nurse cannot be appointed nurse in charge of a care center unless she or he has an RN certificate.

Each technician is assigned to one or more laboratories. Attributes of laboratory include Name and Location. A laboratory must have at least one technician assigned to it and may have any number of technicians assigned.

There may be no beds assigned to a care center, or a care center may have one or more beds (up to any number) assigned to it. The only attributes of bed are Bed# and Room#. Each resident patient must be assigned to a bed. A bed may or may not have a resident patient assigned to it at a given time. .

Technology

Note that this project is to be completed in MySQL. Nothing else will meet the requirements. Each of you will be issued an individual account, and each team will be issued a database as well. All of the team members of a given team will be able to login using their individual account, and then jointly access the team database within MySQL. For that reason, it's important that everyone on the team make sure that you can access the campus MySQL server both through BeachNet+ as well as from home so that you don't all have to be here on campus to work together on this. Generally speaking, your individual database will be used for development work. Once you are confident that your work is ready to share, you will run those scripts in the group database so that the rest of the team can benefit from your work. You will **not** be able to grant access to any objects in your personal database to the rest of your team.

The relation scheme diagram for this project is going to be very large. Do not try to do it by hand, you will be frustrated trying to lay it out properly, and I will be frustrated trying to read it. If you cannot use DIA for some reason, I've seen folks do a good job with Excel, believe it or not. But whatever tool you use, be sure to make it readable. The more of a struggle it is for me to read your diagram, the harder I will be in my grading.

Design

You need to create five more business rules (other than the one explicitly described above) that are likely to be used in a hospital environment. Add your rules to the above requirements to be implemented. Your design must support the requirements of the enterprise stated above along with the five business rules you created.

Model this enterprise using only the information supplied here. Do not model any processes not mentioned here such as payments, insurance, etc. unless they are part of your five business rules.

When doing your design work, be careful to take into account the queries to make sure that your design will provide data to the queries.

Output

Output of the database must support the following features. You do not need to develop "pretty" printed or on-screen reports. You will run the views/queries in MySQL Query Browser in the lab.

- o Use the Create View statement to create the following views:
    1. Employees-Hired: This view returns the First Name, Last Name, and Date Hired of all Hospital Employees.
    2. NursesInCharge: This view returns the name of the Nurse in Charge for each Care Center along with the phone number of the Nurse.
    3. GoodTechnician: This view returns all the Technicians who have at least one skill.
    4. CareCenter-Beds: This view returns the name for each Care Center along with the number of beds that are assigned to patients (occupied beds), the number of beds not assigned to patients (free beds), and the total number of beds.

5. OutPatientsNotVisited: This view returns all OutPatients who have not been visited by a Physician yet.
- Create the following Queries. Feel free to use any of the views that you created
    1. For each Job Class list all the staff members belonging to this class.
    2. Find all Volunteers who do not have any skills.
    3. List all Patients who are also Volunteers at the Hospital.
    4. Find each Outpatient who has been visited exactly once.
    5. For each Skill list the total number of volunteers and technicians that achieve this skill.
    6. Find all Care Centers where every bed is assigned to a Patient (i.e. no beds are available).
    7. List all Nurses who have an RN certificate but are not in charge of a Care Center.
    8. List all Nurses that are in charge of a Care Center to which they are also assigned.
    9. List all Laboratories, where all assigned technicians to that laboratory achieve at least one skill.
    10. List all Resident patients that were admitted after the most current employee hire date.
    11. Find all Patients who have been admitted within one week of their Contact Date.
    12. Find all Outpatients who have not been visited by a Physician within one week of their Contact Date.
    13. List all Physicians who have made more than 3 visits on a single day.
    14. List all Physicians that are responsible for more Outpatients than Resident Patients.
    15. Find each Physician who visited an Outpatient for whom he or she was not responsible for.
    16. Three more queries that involve the business rules that you added. Feel free to create more views for this.

Teams
This project will be done in teams of four people, whom you may self-select.

Deliverables
Your work will be done in two parts with one submission of each part for each team. See the class schedule for due dates.

The first part, design, will consist of:

- Your five additional business rules
- Class diagram.
- English description of all classes and associations.
- An explanation of the denormalization that you did in your design.
    - Somewhere in your design, decide on at least one place where you are going to denormalize the design. It could be to roll a given categorization up or down, in whole or in part.
    - Explain how you are going to implement the needed constraints in triggers rather than the database structure.

- ▪ Explain why this denormalization makes your queries easier and/or faster.

The second part, implementation, will include:

- o A revised design, based on feedback from the first part. This includes class diagrams and English descriptions of classes and associations.
- o English description of all attributes.
- o The relation scheme, based on the design.
  - ▪ Please do what you can to arrange your relation scheme in about the same layout as your UML diagram. It makes the grading process go much faster if I don't have to hunt for every relation in the diagram as I'm looking to make sure that it squares with your UML.
- o DDL used to create all the tables and the DML used to insert the data
  - ▪ When you do your inserts, be sure to stipulate the columns that you are inserting to. Merely putting in a values clause and putting the values in in the right order is not enough. This makes the DML hard to read, is prone to error, and overall is a bad habit to get into.
- o Queries to produce the reports, as described above **along with sample output** for each of these queries, including the ones to support your additional business rules..
  - ▪ Be aware that **every** query needs to produce data in the final output.
  - ▪ If your population of data doesn't produce output for a given query, then add more data until it does.
  - ▪ If your query returns no data, I'm going to assume there is something wrong with the query and grade accordingly.