ERD

LAB 7

30 POINTS

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CERTIFICATION:

By typing my name below I certify that the enclosed is written by myself without unauthorized assistance, such as seeing answers to versions of specific questions or using AI to get answers. I agree to abide by class restrictions and understand that if I have violated them, I may receive reduced credit (or none) for this assignment.

CONSENT: Kyle Noyes
DATE: August 4, 2024

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You need to use computers for charts and relationships. No hand drawing will be accepted for Problem 5. Please review module 3, the ERD video and a free online tool that I used to demo the materials.

You have read about ERD and database design in this class and perhaps in other classes. We want to look at a hypothetical case and provide responses to the questions. In the video examples in this week's Additional Materials, you can see examples for students, schools, and faculty.

Let's assume that a hospital wants to create a database system. The first thing we want to do is identify the entities within the database systems. You need to consider that at hospitals, there are many entities, such as registration, accounting, staff, patients, and other entities. We also need to consider that within each entity, such as staff, they have doctors who are specialized in one or more areas of medicine; they can visit multiple patients, and patients can see multiple doctors. Each doctor can work with different nurses. Each doctor has a unique identifying number, and so on. Pick five significant entities as the scope of this project.

Problem 1: (3 Points)

Identify entities for this database. Entities could include people, such as staff, patients, registration, and places, such as hospitals, offices, cafeteria, and other similar items. As you saw in the materials, examples for entities could be faculty, students, campuses, and courses. Apply the same example to identify entities within a hospital.

Examples for a school:

1. Student

2, Faculty

Name five hospital entities.

1. Patient
2. Doctor
3. Nurse
4. Room
5. Department

Problem 2 (5 Points)

Identify attributes for these entities you picked. Attributes are fields within each entity, such as student's date of birth, address, zip code, phone #. List all relevant attributes under each of 5 entities you identified above.

Example

Student
GNumber Name PCC_email Phone

Attributes for your five hospital entities.

Entity 1 Patient
Patient - PatientID - Name - Priamry Contact - TruamaLevel - NutritionType - AdmitDate - DischargDate

Entity 2 Doctor
Doctor - DoctorID - Name - Specialty - PrimaryNetwork - OnCallPhone

Entity 3 Nurse

Nurse - NurseID - Name - PrimaryUnit - Speciality - StaffLevel - Supervising Doctor

Entity 4 Room
Room - RoomNum - FloorNum - DepartmentID - PrimaryCare - CareLevel - MobilityRating

Entity 5 Department
Department - PrimaryFunction (Care, Admin, Custodial) - StaffNum - StaffID - Location - MaxTraumaLevel

Problem 3 (4 Points)

Identify primary and foreign keys if they exist for each of the five entities. Pick attributes from each entity and mark them as the primary and foreign key(s). Just name these keys under each entity:

Example

Entity: Assignment
PK AssignmentID FK InstructorID FK DepartmentID FK SemesterID

Keys for your five hospital entities.

Entity 1 Patient
PK PatientID FK PatientName FK PatientContact FK TraumaLevel FK HospitalID FK DepartmentID FK RegionID

Entity 2 Doctor
PK DoctorID FK DoctorName FK DoctorSpecialty FK TraumaLevel FK PriamryNetworkID FK OnCallPhone

Entity 3 Nurse

PK NurseID FK NurseName FK PrimaryUnit FK PriamryFloor FK Speciality FK StaffLevel FK DoctorSupervising

Entity 4 Room
PK RoomID FK FloorNum FK DepartmentID FK PriamryCare FK CareLevel FK MobilityRating

Entity 5 Department
PK DepartmentID FK PriamryFunction FK NumStaff FK StaffID FK HospitalID FK ResgionID FK CareLevel

Problem 4 (6 Points)

Identify all relationships between your five entities and justify your choice. The relationship could be one-to-one, one-to-many, etc. Do not draw the relationship between entities, just list them like the example in both directions.

Example:

Classes and Students

It is a Many to Many relationship. A class can have many students and a student can take many classes.

Relationships for your hospital entities.

Patients and Departments

Many-to-many. One patient could be seeing multiple departments for their care, and one department may have multiple patients

Doctors and Patients

One-to-many. A doctor may be overseeing the care of multiple patients

Nurses and Room

One-to-many. One nurse may be overseeing multiple rooms and those rooms may be on adjacent floors / rooms

Rooms and Patients

One-to-Many. Some rooms may be hosting multiple patients in a ward while patients an only belong to one primary room

Departments and Doctors

One-to-Many. One department may be overseeing multiple doctors depending on the size and scope of care that the department provides

Problem 5 (12 Points)

Draw an ERD for the hospital system that includes entities and relationships. You need to use boxes for entities, list of attributes, which will go inside boxes, PK and FK, and relationships among all 5 entities you have chosen with the cardinalities. No need to include data types.

You can review Lecture 7, Database Design.

See *Entity Relationship Diagrams (ERDs)* in Week 3 contents for example ERDs for some of the databases we have been using. The format to use in this lab is the first one, for AP, though minimum cardinalities are not required. Use Visio or other drawing tools to demo these relationships. Hand drawings will not be accepted.

State which tool you used,

Tool used for the ERD. draw.io

Paste your ERD here.

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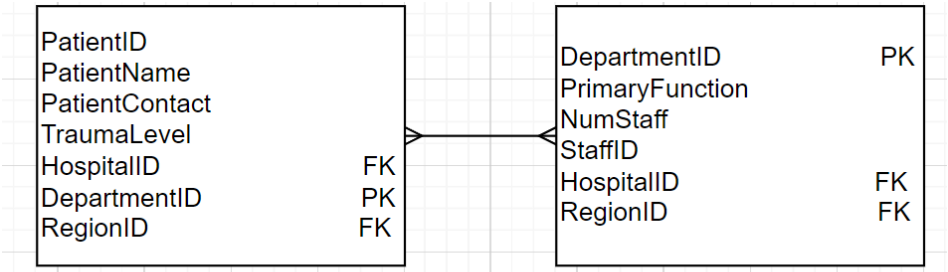
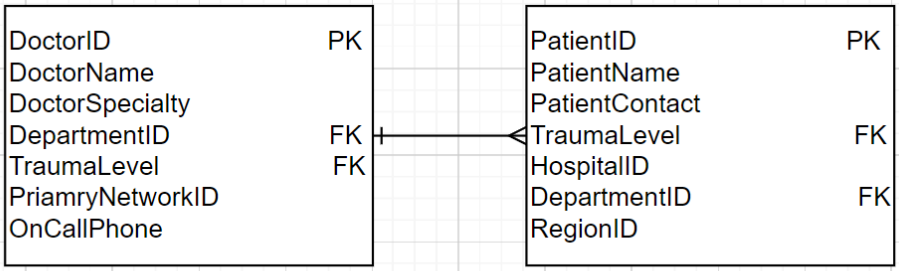
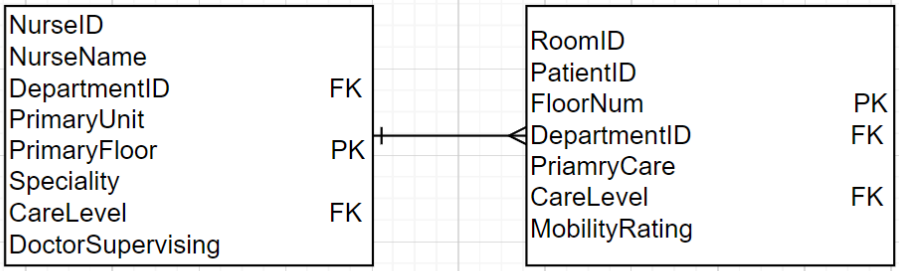


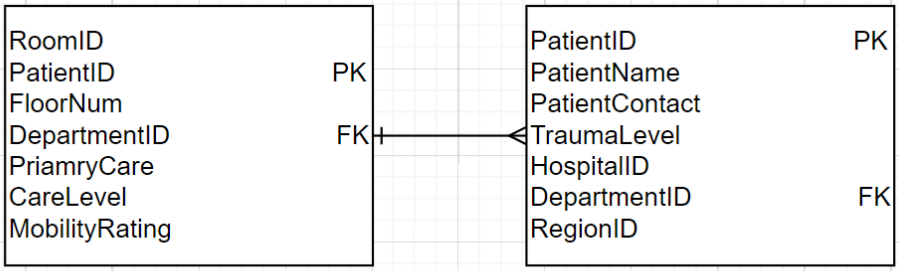
Patients and Departments; Many-to-Many



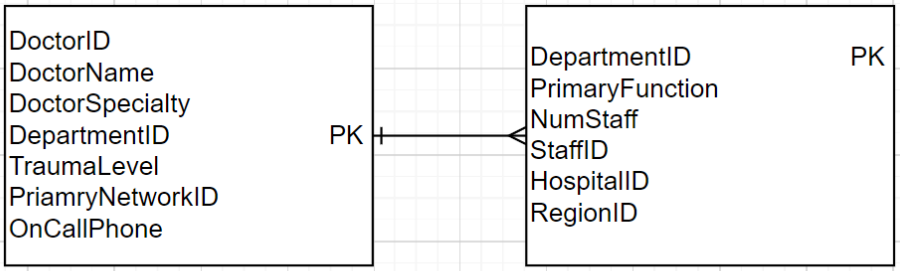
Doctors and Patients; One-to-Many



Rooms and Patients; One-to-Many



Nurses and Rooms; One-to-Many



Department and Doctors; One-To-Many