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Class/ Section: BSCS – 2A

Course: Database Systems

Project: Hospital System

1. Project Overview

The Hospital Management System is a database project made to help manage the important activities of a hospital. It covers everything from doctor and patient records to appointments, admissions, treatments, prescriptions, and billing. The system is designed to make sure data is stored efficiently, stays consistent, and can be easily retrieved when needed.

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2. Schema Design Decisions

Entities Chosen:

- We picked core entities like **Doctor**, **Patient**, **Department**, **Ward**, and **Medicine** based on how a hospital works in real life.
- Additional entities like **Treatment**, **Prescription**, **Appointment**, **Admission**, **Bill**, and **Payment** help track all hospital processes and records.

Normalization:

- The schema is kept in **Third Normal Form (3NF)**. That means every table has no unnecessary duplication, and all data is related to the key and nothing else.
- A **Person** entity was added in the Enhanced ER Diagram (EERD) to act as a parent for both Doctor and Patient, since both share common details like name, contact info, gender, and date of birth. This helped avoid repeating those fields.

EERD Features:

- **Generalization**: We used generalization to group Doctor and Patient under Person.
- **Aggregation**: The Treatment table is linked to either an Appointment (for outpatients) or an Admission (for inpatients). This is shown as an aggregation in the EERD.

Department & Specialization:

- We kept Department and Specialization as separate entities. This helps reduce redundancy and makes it easier to manage each independently. A doctor belongs to one department and has one specialization.

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3. Entity-Attribute Relationships

Person:

- A common base entity with: PersonID, Name, Gender, DOB, Phone, Address.

Doctor (inherits from Person):

- DoctorID, Email, JoiningDate, DepartmentID, SpecializationID.

Patient (inherits from Person):

- PatientID.

Department:

- DepartmentID, Name.

Specialization:

- SpecializationID, Title.

Appointment:

- AppointmentID, PatientID, DoctorID, AppointmentDate, AppointmentTime, Status, Notes.

Admission:

- AdmissionID, PatientID, WardID, AdmissionDate, DischargeDate.

Ward:

- WardID, Type, Capacity.

Treatment:

- TreatmentID, AdmissionID, AppointmentID, Description, Date, DoctorID.

Prescription:

- PrescriptionID, TreatmentID, MedicineID, Dosage, Duration.

Medicine:

- MedicineID, Name, Type, PricePerUnit.

Bill:

- BillID, PatientID, Amount, BillDate, Status, TreatmentID, AdmissionID, DoctorID, Notes.

Payment:

- PaymentID, BillID, PaymentDate, AmountPaid, Method.

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4. Assumptions Made

- Each doctor belongs to just one department and one specialization.
- A patient can only be admitted to one ward at a time.
- A treatment can be based on either an appointment or an admission — not both.
- Doctors write prescriptions only after a treatment.
- Every bill is made for one patient, and payments are linked to bills.
- No doctor is also a patient at the same time in the system.
- All departments and specializations are predefined and not entered dynamically.

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5. Diagrams

Figure 1: Entity Relationship Diagram (ERD)

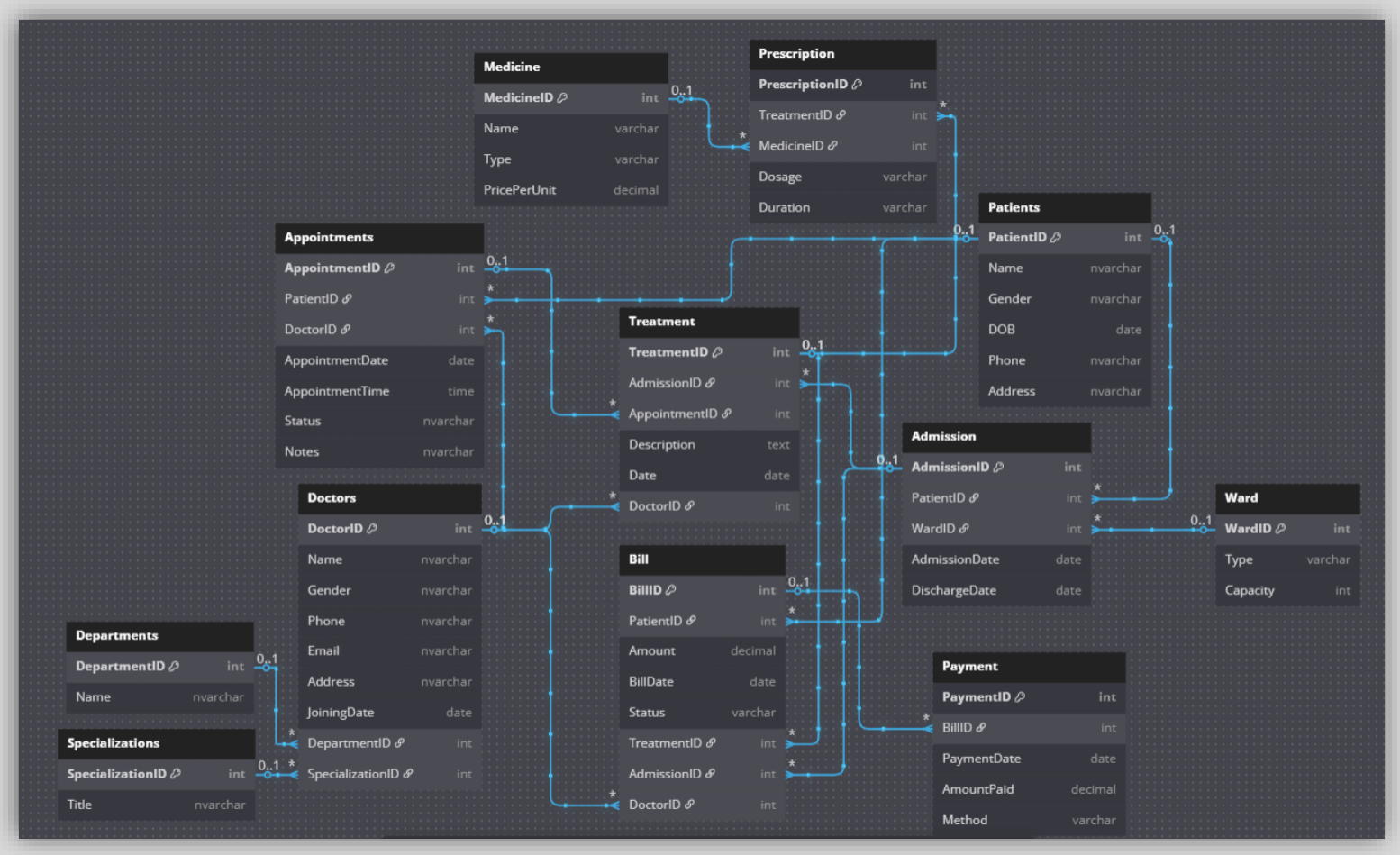

Figure 2: Enhanced ER Diagram (EERD)