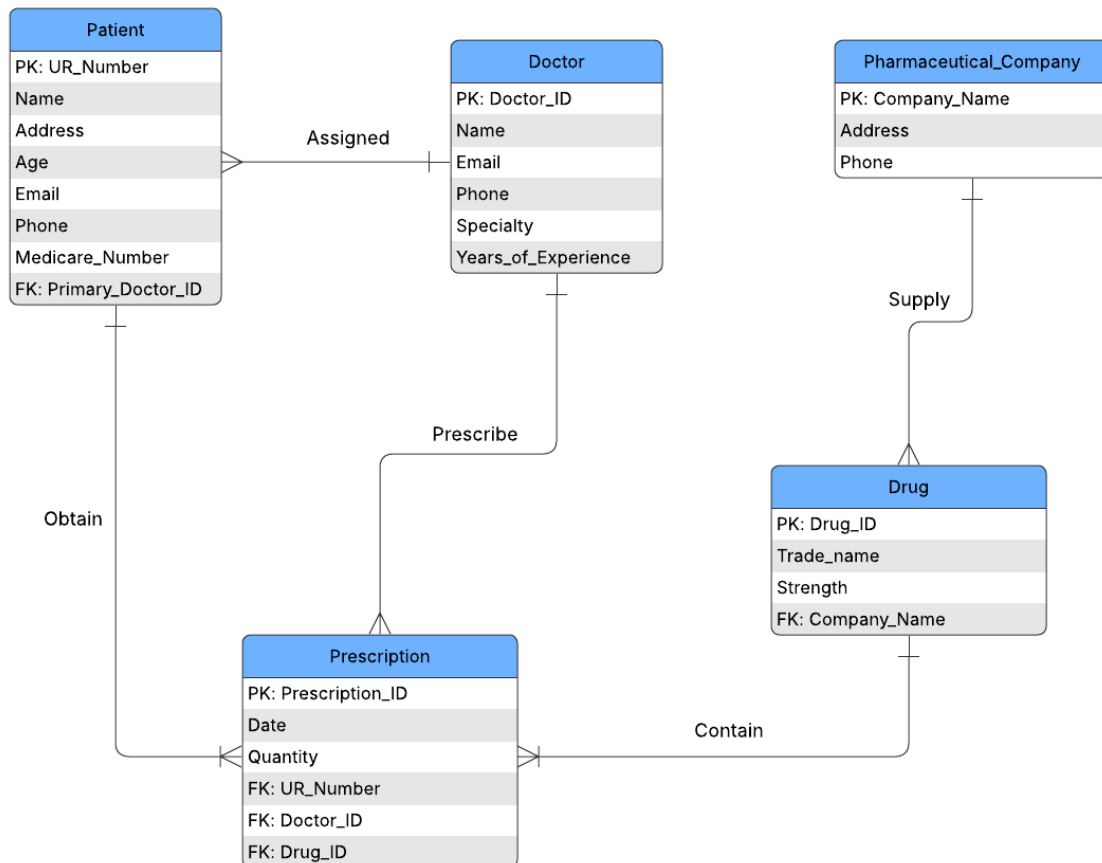


Name: Ngoc Phuong Trang Duong

ID: 223990468

Task 3.1P: Entity Relationship Diagram



Barwon Health Prescription System ERD

Assumptions

To accurately model the system for Barwon Health, the following assumptions were made:

1. Each patient has one and only one primary doctor, while each doctor can be assigned as the primary doctor for multiple patients.
2. A prescription must be associated with exactly one patient, one doctor, and one drug.
3. Each drug is manufactured by a single pharmaceutical company.

4. If a pharmaceutical company is deleted from the system, all associated drugs are also removed via a cascade delete policy.
5. All contact information such as email and phone is mandatory for both patients and doctors to ensure consistent communication.
6. Every prescription must contain the date and quantity of the prescribed drug.

Entities, Attributes, Constraints, and Relationships

The data model comprises five main entities: Patient, Doctor, Prescription, Drug, and Pharmaceutical_Company. Each entity contains relevant attributes to capture essential information for operational and analytical use. Constraints are implemented to ensure data accuracy, such as uniqueness of primary keys and valid foreign key references.

The relationships reflect real-world interactions:

- A patient is associated with a primary doctor.
- Doctors and patients are linked through prescriptions.
- A drug is prescribed through a prescription and linked to its supplying company.

Each relationship is labeled and constructed with appropriate cardinalities following business rules. These include one-to-many and many-to-one relationships, depending on the context.

Primary Keys

Each entity in the model is uniquely identified by a primary key. These keys are chosen based on their ability to uniquely distinguish each record:

- Patients are identified by UR Number.
- Doctors are identified by Doctor ID.
- Drugs are identified by Drug ID.
- Pharmaceutical companies are identified by Company Name.
- Prescriptions are uniquely identified by a generated Prescription ID.

Relationships and Keys

All relationships are implemented through foreign keys, ensuring referential integrity between entities. The Prescription table functions as an associative entity, effectively representing many-to-many relationships among patients, doctors, and drugs. Foreign keys in the Prescription entity ensure traceability and linkage to all relevant entities. The use of foreign keys across the model allows for efficient data retrieval, updates, and ensures consistency.

Justifications

The structure of this ERD is based strictly on the business requirements described in the scenario. Key justifications include:

- The use of a separate associative entity (Prescription) allows for a normalized design, supporting the inclusion of important attributes (date, quantity).
- A clear one-to-many relationship between companies and drugs accommodates future scalability and aligns with the pharmaceutical supply model.
- Defining the patient-doctor relationship via a foreign key in the Patient entity reflects the business rule of a single primary doctor.
- Relationships are designed using Crow's Foot notation to clearly express multiplicities and dependencies between entities.

This ERD provides a scalable, efficient, and integrity-driven structure to support Barwon Health's prescription operations while being aligned with relational database principles and normalization best practices.