DBM Assignment 1

Due date: Before the next class (week3)

Create a **full** Entity Relationship Model. It should be a result of normalization (3rd NF)

- Full E-R Model: includes table names, their relationships, all data attributes for each table, Primary key and Foreign key identified, etc.

CareFirst Project (100 points)

You are a database consulting company specializing in developing databases for the medical industry. You have just been awarded the contract to develop a data model for a database application system for a mid-size healthcare organization, CareFirst. The system will keep track of health claims and essential details related to patient information, healthcare providers, patient visits, and prescription drugs.

The system requires comprehensive data for each patient, including personal details (name, address, phone number, email, date of birth, gender, etc.), primary care physician, insurance ID, and insurance provider. Each patient has only one primary care physician but they may visit different physicians for their health care. For simplicity, assume each patient has only one insurance provider.

For each healthcare provider, the database must store personal details, specialty information, affiliated hospitals, UPIN (Unique Physician Identification Number – board certification number), license number, position, office, etc. Each physician may have more than one hospital affiliation.

Regarding the hospitals, it should capture location, bed size, types, and contact details.

The database will track prescribed medications. It should store essential information for each drug – name, purpose, and potential side effects – to assess claims and check for prescription conflicts to avoid adverse drug effects. Each patient visit record may include more than one drug prescription. In the future, the database will support trend analysis and predictive modeling based on the accumulated data.

Based on this scenario, identify database requirements and develop a conceptual model to meet these needs. If needed, research medical information to better understand your topic – this is a training for business domain understanding.

* Please review the additional notes on the next page before designing your E-R Model. These notes will address some of the business needs and your questions.

* You will have at least 8 tables as a result. Start with Patient, Physician, Visits, Hospital, Prescription, and Drugs.

Additional Notes:

- [Visits] Patients' visits to their doctors may be for a new issue or illness, or they may be follow-up visits. For follow-ups, we need to monitor the patient's progress related to the diagnosis. In other words, we should be able to trace back to the original visit if it's a follow-up.
- [Prescription] Each prescription issued by a doctor must contain the prescription date, dosage, maximum renewals (number of allowed renewals), and the duration of the prescription.
- [Drugs] Each drug can be uniquely identified by its own NDC (National Drug Code). It also includes generic name, brand name, strength, route of administration (e.g. intravenous, oral)
- The possible relationship types are one-to-one and one-to-many. Any many-to-many relationships must be resolved. For example, each doctor may be affiliated with many hospitals, and each hospital has many doctors affiliated with it.
- Ensure that each entity (table) has been normalized to 3NF.
- You don't need to include Insurance table. Simply assume that each patient has only one insurance.

Review the business needs and details, then identify potential entities (tables) and their attributes. Use these to create an Entity Relationship Diagram (ERD) that aligns with the business requirements. Explain each relationship in the ERD (e.g., each patient has one primary doctor, while each doctor can have multiple patients) and document any reasonable assumptions made during the design process.