Database Modeling and the ER Model Project

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Database Administration

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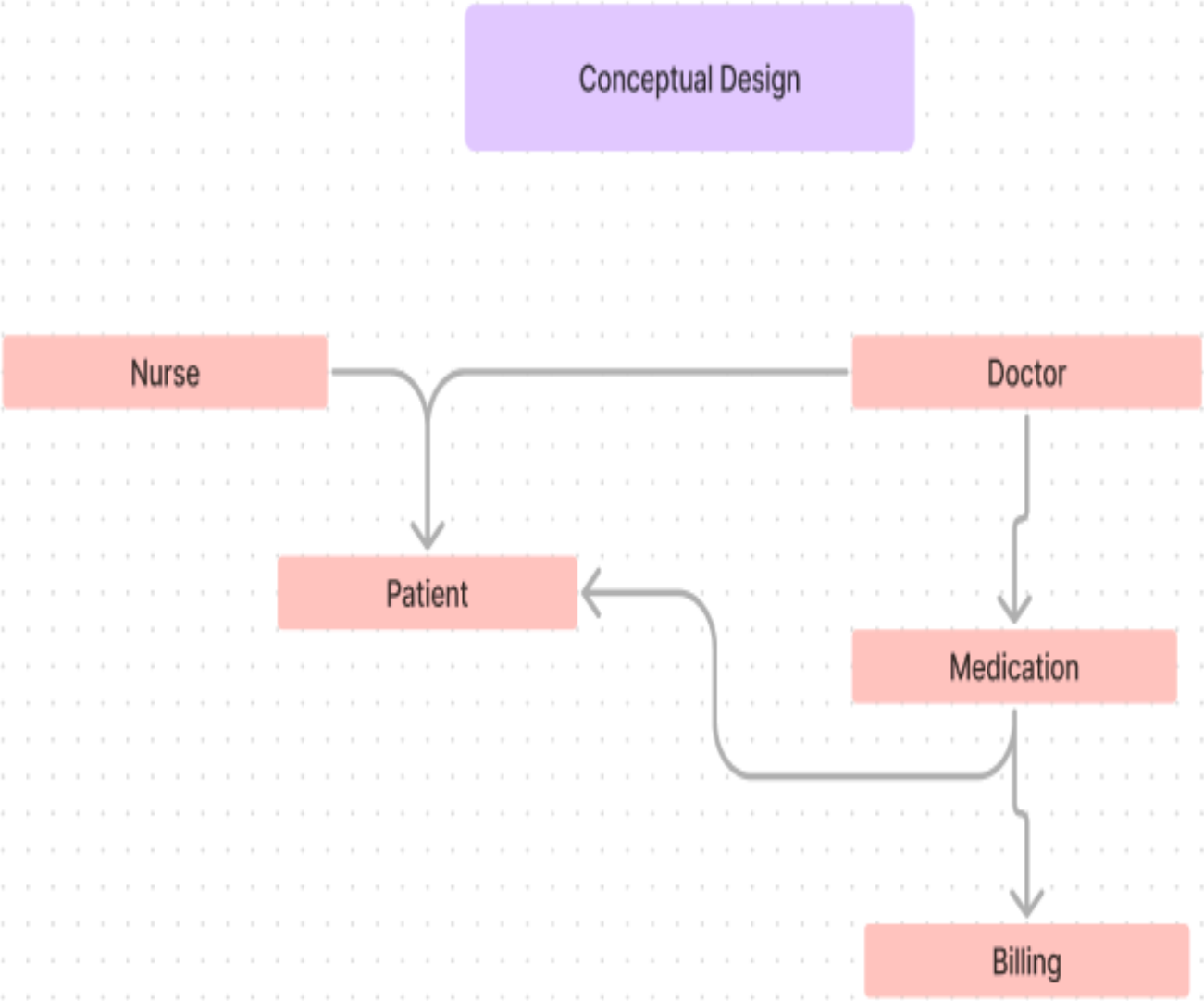
Introduction

I have created a Database Management System (DBMS) specifically suited for a hospital setting for the Database Modeling and the ER Model Project. I used the Entity-Relationship (ER) Model to organize and understand the many parts of the hospital database.

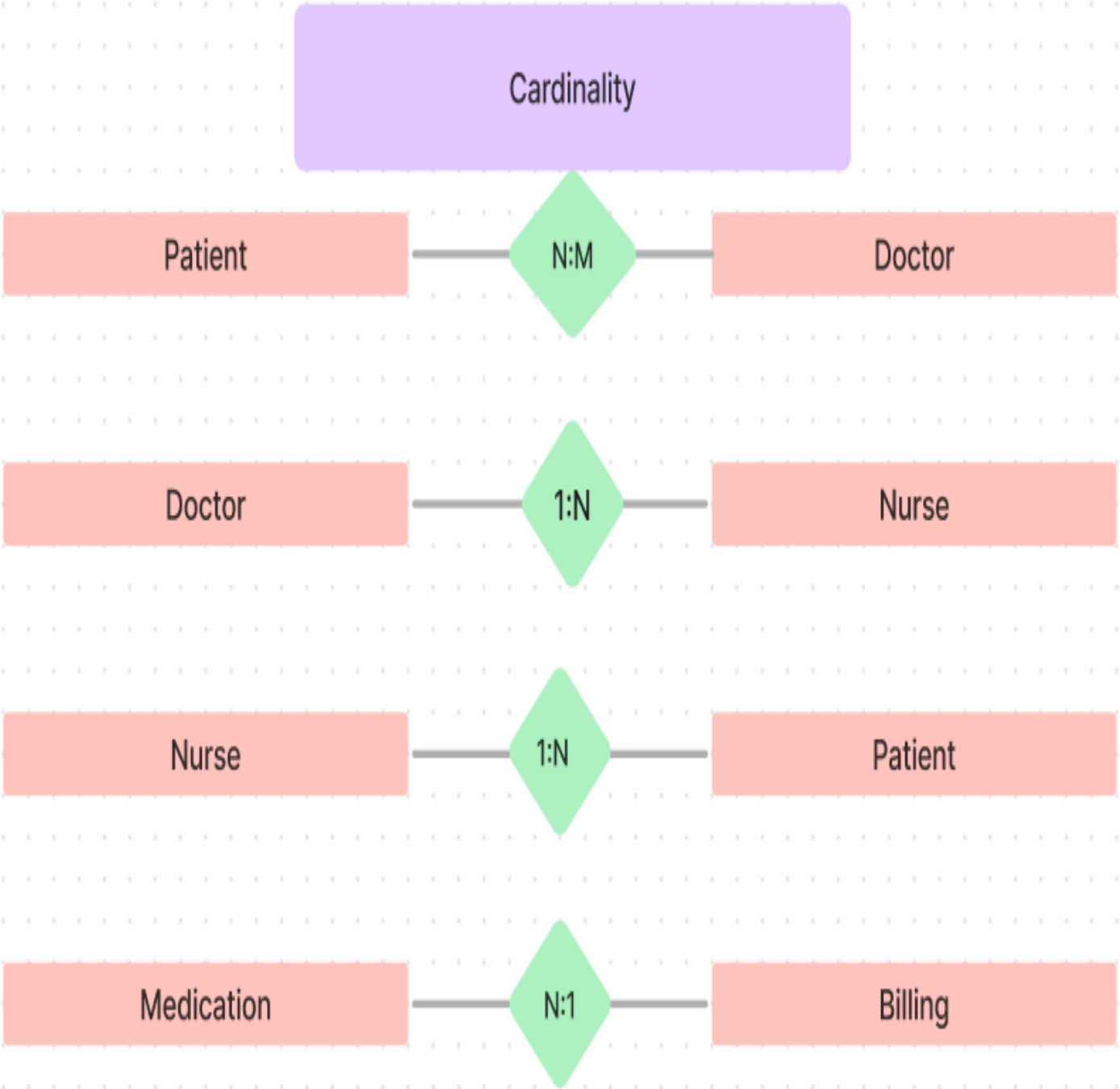
Hospital Database Management Systems are used to expedite patient care, facilitate medical operations, and guarantee accurate documentation of medical data. The healthcare sector significantly depends on effective information management systems. In addition to increasing operational effectiveness, a well-designed hospital DBMS is essential for bettering patient outcomes and the provision of healthcare as a whole.

I used entities such as patient, nurse, doctor, medication, and billing to simulate the Hospital use case. I used identifiers such as IDs and attributes such as first name, last name, date of birth, and cost, to name a few. I also showed the steps of ideation for the hospital use case by showing my conceptual, logical, and physical model. The reasoning behind the cardinality I used was imagining the hospital was a larger hospital, as seen usually in the DMV area, which is why there are no one-to-one relationships.

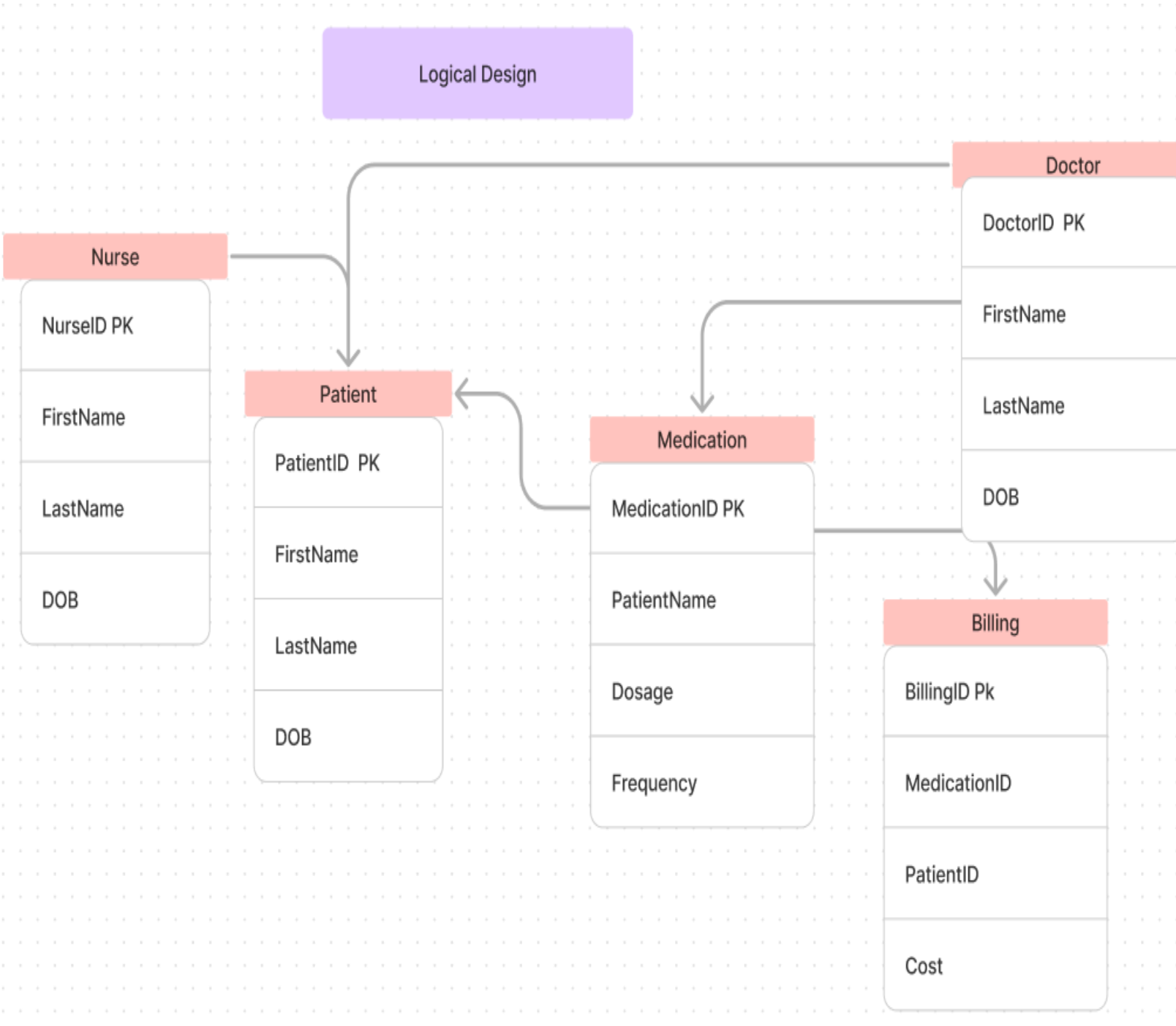
Conceptual Design



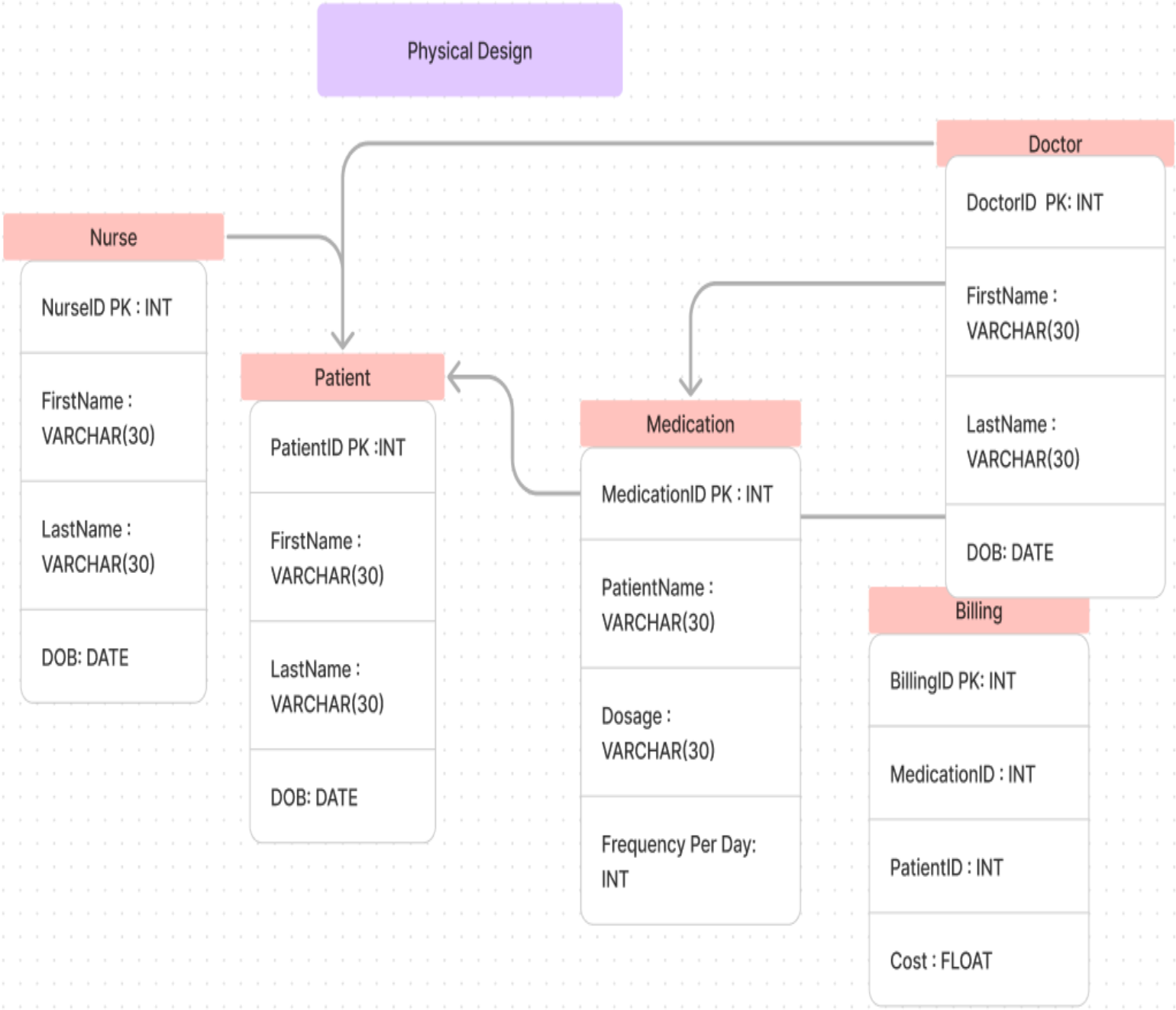
Cardinality



Logical Design

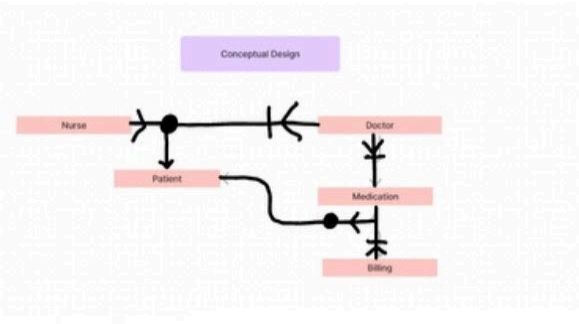


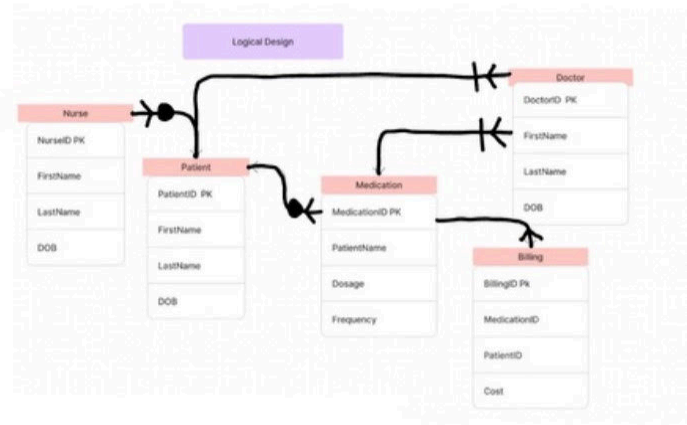
The Physical Model



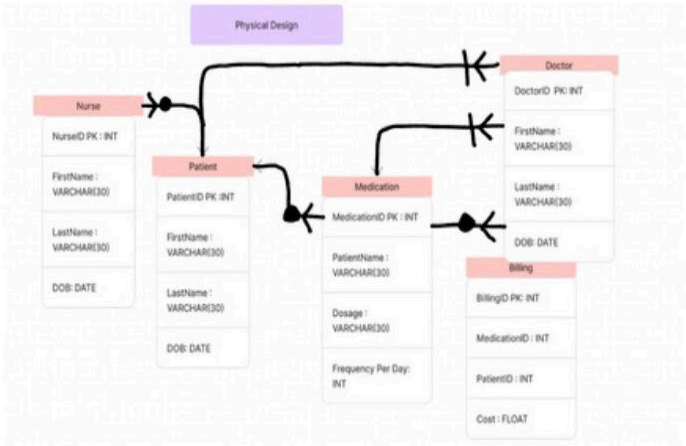
The Final Model Using Crow's Notation

Conceptual Design





Physical Design



Implementation

```
-- Create database Hospital
CREATE DATABASE Hospital

-- Use Hospital database
USE Hospital

-- Create table Patient
CREATE TABLE Patient (
   PatientID INT PRIMARY KEY NOT NULL,
   FirstName VARCHAR(30) NOT NULL,
   LastName VARCHAR(30) NOT NULL,
   DateOfBirth DATE NOT NULL
)

-- Insert sample values into the Patient table
INSERT INTO Patient (PatientID, FirstName, LastName, DateOfBirth)
VALUES
   (0001, 'Tanya', 'Jones', '01/01/1988'),
   (0002, 'Maurice', 'Tom', '02/02/1998'),
   (0003, 'Janae', 'Blue', '03/03/1997')

-- Create table Nurse
CREATE TABLE Nurse (
   NurseID INT PRIMARY KEY,
   FirstName VARCHAR(30),
   LastName VARCHAR(30),
   DateOfBirth DATE
)

-- Insert sample values into the Nurse table
INSERT INTO Nurse (NurseID, FirstName, LastName, DateOfBirth)
VALUES
   (0001, 'Emily', 'Smith', '05/05/1956'),
   (0002, 'John', 'Doe', '10/22/1999'),
   (0003, 'Alice', 'Johnson', '03/06/2001')

-- Create table Doctor
CREATE TABLE Doctor (
   DoctorID INT PRIMARY KEY,
   FirstName VARCHAR(30),
   LastName VARCHAR(30),
   DateOfBirth DATE
)
```

```
-- Insert sample values into the Doctor table
INSERT INTO Doctor (DoctorID, FirstName, LastName, DateOfBirth)
VALUES
   (0001, 'Michael', 'Johnson', '08/25/1978'),
   (0002, 'Jennifer', 'Jones', '01/12/1988'),
   (0003, 'David', 'Wong', '06/17/1975')

-- Create table Medication
CREATE TABLE Medication (
   MedicationID INT PRIMARY KEY,
   PatientID INT,
   Dosage VARCHAR(30),
   FrequencyPerDay INT
)

-- Insert sample values into the Medication table
INSERT INTO Medication (MedicationID, PatientID, Dosage, FrequencyPerDay)
VALUES
   (0001, 0001, '10mg', 2),
   (0002, 0003, '20mg', 3),
   (0003, 0002, '15mg', 1)

-- Create table Billing
CREATE TABLE Billing (
   BillingID INT PRIMARY KEY,
   MedicationID INT,
   PatientID INT,
   Cost FLOAT
)

-- Insert sample values into the Billing table
INSERT INTO Billing (BillingID, MedicationID, PatientID, Cost)
VALUES
   (01, 11, 001, 50.00),
   (02, 22, 002, 75.50),
   (03, 33, 003, 100.25)
```

References

For references, I used the Chapter 5 slides and the Database Querying Assignment.