DATABASE MANAGEMENT SYSTEM - CSA0593

ASSIGNMENT 4

N.MOKSHA SAI

192372374

QUESTION:

Design and implement a database management system for a healthcare facility to efficiently manage doctor-patient interactionsModel tables for doctors, patients, appointments, and medical records.

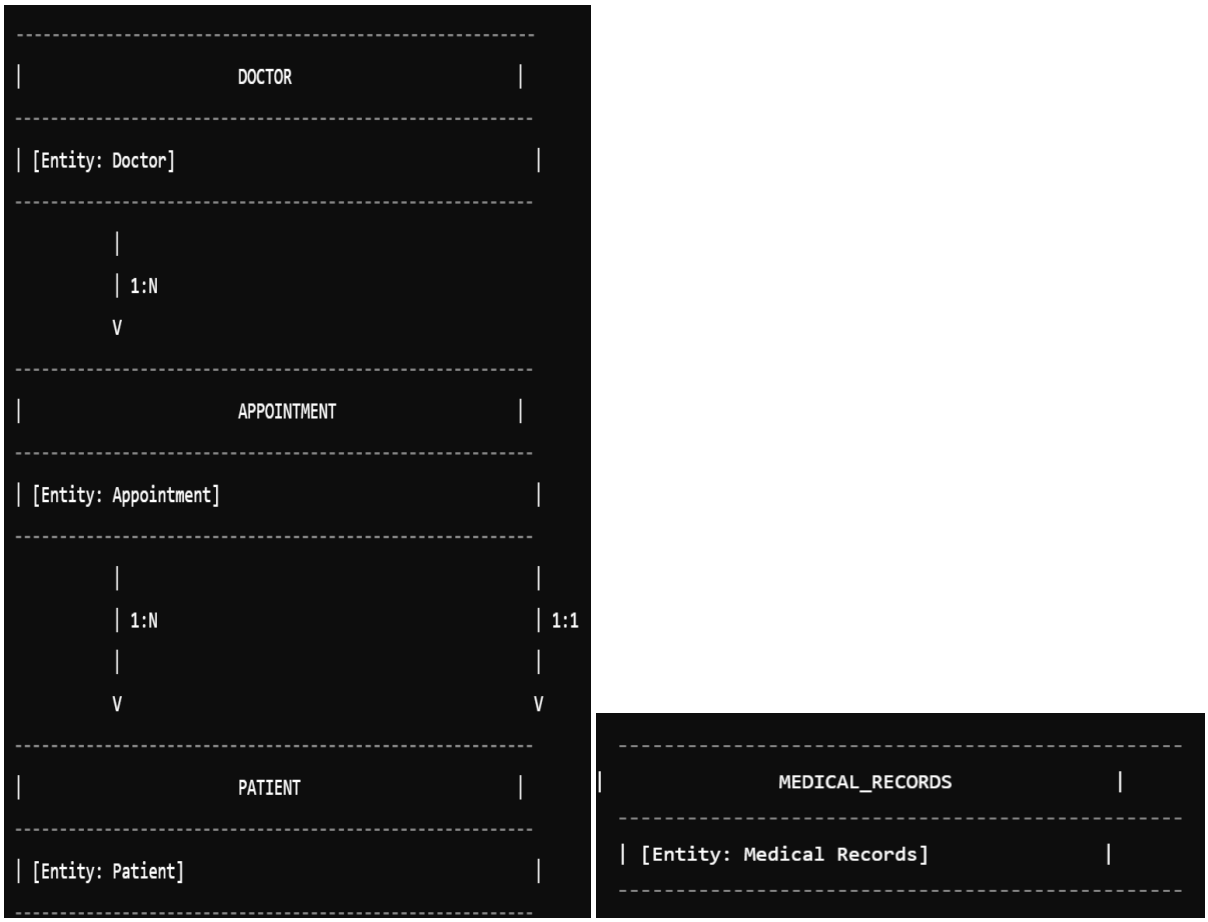
Write stored procedures for scheduling, canceling, and updating appointments.

Implement triggers to notify patients about upcoming appointments.

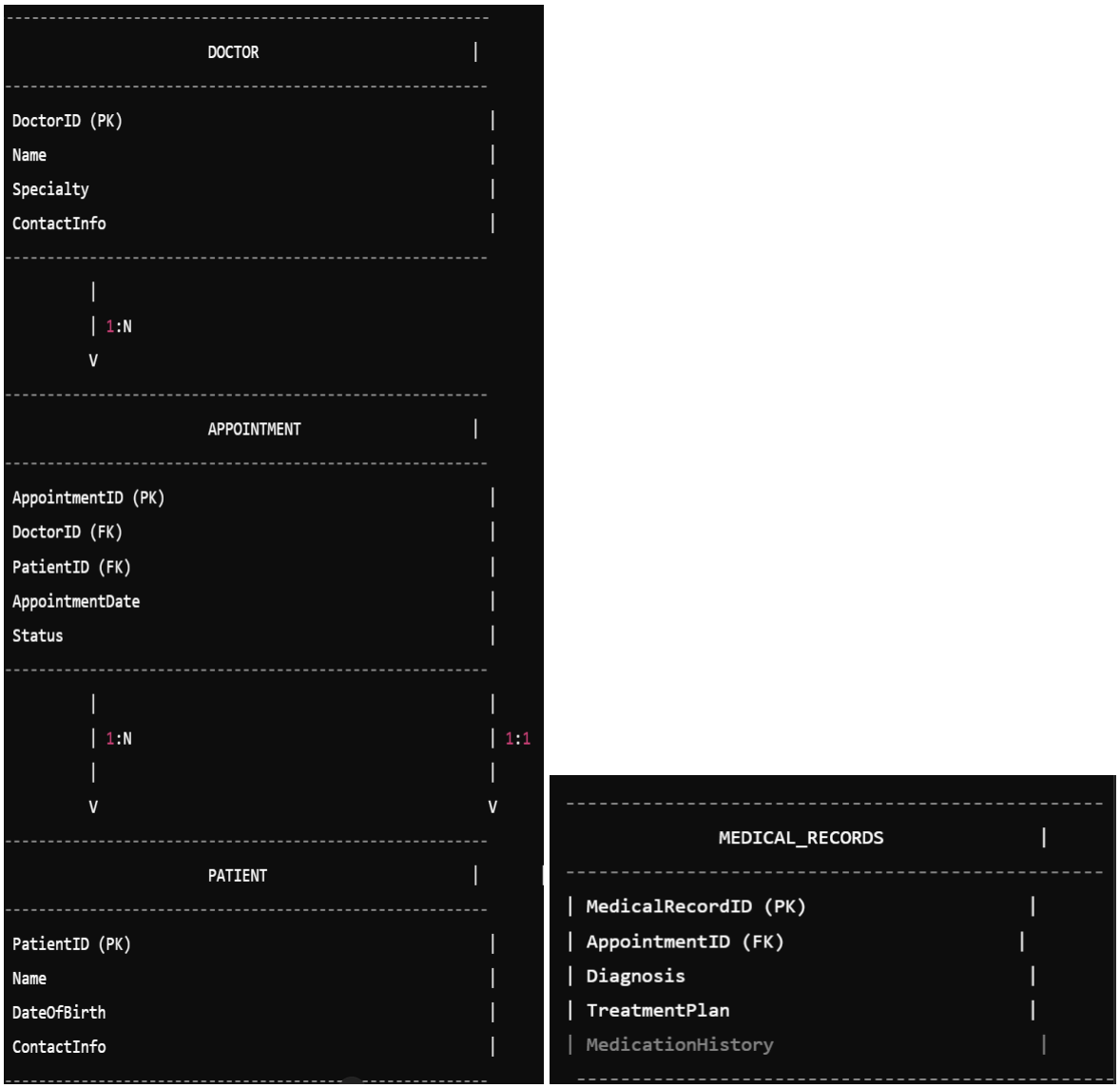
Write SQL queries to analyze doctor availability and patient appointment history.

ANSWER:

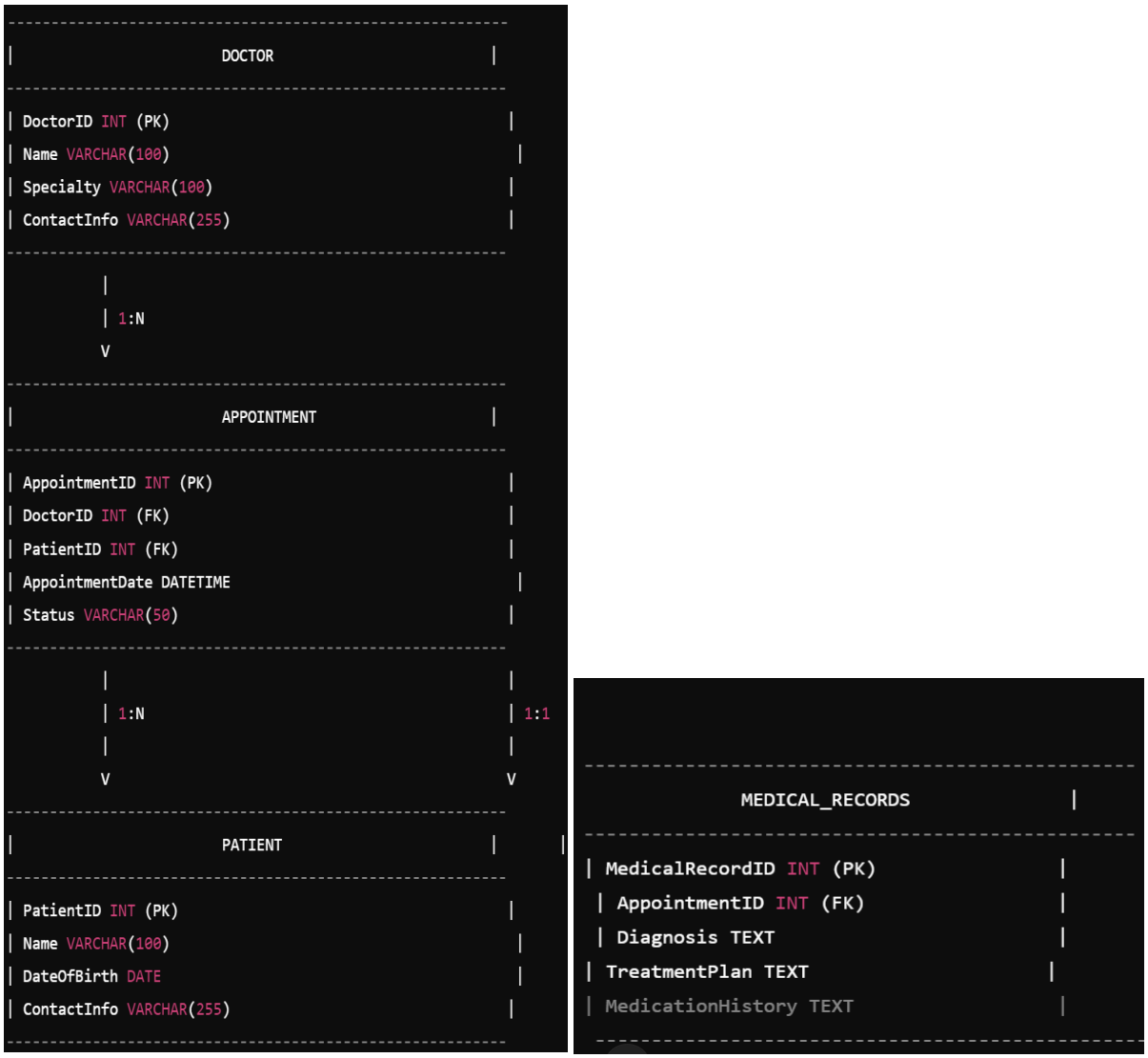
CONCEPTUAL E.R.DIAGRAM:



LOGICAL E.R.DIAGRAM:



PHYSICAL E.R DIAGRAM:



MYSQL STATEMENTS:

Here are the MySQL statements and conclusion for the topic:

Database Design

CREATE DATABASE healthcare;

USE healthcare;

```
CREATE TABLE doctors (
  doctor_id INT PRIMARY KEY,
  name VARCHAR(255),
  specialty VARCHAR(255),
  email VARCHAR(255),
  phone VARCHAR(20)
);

CREATE TABLE patients (
  patient_id INT PRIMARY KEY,
  name VARCHAR(255),
  date_of_birth DATE,
  contact_info VARCHAR(255)
);

CREATE TABLE appointments (
  appointment_id INT PRIMARY KEY,
  doctor_id INT,
  patient_id INT,
  appointment_date DATE,
  appointment_time TIME,
  status VARCHAR(20),
  FOREIGN KEY (doctor_id) REFERENCES doctors(doctor_id),
  FOREIGN KEY (patient_id) REFERENCES patients(patient_id)
);
```

```
CREATE TABLE medical_records (
  record_id INT PRIMARY KEY,
  patient_id INT,
  doctor_id INT,
  appointment_date DATE,
  diagnosis TEXT,
  treatment TEXT,
  FOREIGN KEY (patient_id) REFERENCES patients(patient_id),
  FOREIGN KEY (doctor_id) REFERENCES doctors(doctor_id)
);
```

Stored Procedures

```
DELIMITER //

CREATE PROCEDURE schedule_appointment(
  IN doctor_id INT,
  IN patient_id INT,
  IN appointment_date DATE,
  IN appointment_time TIME
)
BEGIN
  INSERT INTO appointments (doctor_id, patient_id, appointment_date,
appointment_time, status)
```

```
  VALUES (doctor_id, patient_id, appointment_date, appointment_time,
'Scheduled');
END //

CREATE PROCEDURE cancel_appointment(
  IN appointment_id INT
)
BEGIN
  UPDATE appointments
  SET status = 'Canceled'
  WHERE appointment_id = appointment_id;
END //

CREATE PROCEDURE update_appointment(
  IN appointment_id INT,
  IN appointment_date DATE,
  IN appointment_time TIME
)
BEGIN
  UPDATE appointments
  SET appointment_date = appointment_date,
    appointment_time = appointment_time
  WHERE appointment_id = appointment_id;
END //
```

Triggers

```
DELIMITER //

CREATE TRIGGER notify_patient_before_appointment
BEFORE UPDATE ON appointments
FOR EACH ROW
BEGIN
  IF NEW.status = 'Scheduled' THEN
    INSERT INTO notifications (patient_id, message)
    VALUES (NEW.patient_id, 'You have an upcoming appointment on ' +
NEW.appointment_date);
  END IF;
END //

CREATE TRIGGER notify_patient_after_cancellation
AFTER UPDATE ON appointments
FOR EACH ROW
BEGIN
  IF NEW.status = 'Canceled' THEN
    INSERT INTO notifications (patient_id, message)
    VALUES (NEW.patient_id, 'Your appointment on ' + NEW.appointment_date +
' has been canceled');
  END IF;
END //
```

SQL Queries

```
-- Analyze doctor availability
SELECT
  doctors.doctor_id,
  doctors.name,
  COUNT(appointments.appointment_id) AS number_of_appointments
FROM
  doctors
  LEFT JOIN appointments ON doctors.doctor_id = appointments.doctor_id
GROUP BY
  doctors.doctor_id;

-- Patient appointment history
SELECT
  patients.patient_id,
  patients.name,
  appointments.appointment_date,
  appointments.appointment_time,
  appointments.status
FROM
  patients
  JOIN appointments ON patients.patient_id = appointments.patient_id
ORDER BY
  appointments.appointment_date DESC;
```

Conclusion:

Designing a database management system for a healthcare facility requires careful consideration of doctor-patient interactions, appointment scheduling, and medical record management.

Key benefits of this system include:

1. Efficient appointment scheduling and management.
2. Automated notifications for patients.
3. Centralized storage of medical records.
4. Data-driven insights into doctor availability and patient appointment history.

By implementing this database management system, healthcare facilities can improve operational efficiency, patient satisfaction, and overall quality of care.