University of Asia Pacific

Department of Computer Science and Engineering
Course Title: Database System Lab
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Database Project

Medical Center Management System

Submitted By: **Submitted To:**

1.Name: Sheikh Muhammad Ashik 　**ID:** 21201118 **2.Name:** Tridip Barua Shuvro 　**ID:** 21201116 **3.Name:** Soma Das 　**ID:** 21201111 **4.Name:** Ikramul Haque Shaon 　ID: 21201106	**Sabiha Tahsin Soha** Lecturer, Department of CSE, University of Asia Pacific

Medical Center Management System

Medical center management is the systematic and efficient administration of healthcare facilities, such as hospitals, clinics, and healthcare practices. It involves organizing and coordinating various aspects of healthcare delivery to ensure the optimal functioning of the facility. This includes patient registration, appointment scheduling, medical record keeping, staff and resource management, billing and financial operations, and compliance with healthcare regulations. Effective medical center management is essential for providing high-quality patient care, optimizing resource utilization, and maintaining the financial health of healthcare institutions. It often relies on the use of information technology and software systems to streamline operations and enhance patient experiences.

Entities:

1. **Patients**: Individuals personal information, including email, name, address, and gender.
2. **Medical History**: Records of a patient's medical conditions, surgeries, and medications.
3. **Doctors:** Information about healthcare professionals, including email, name, gender, and password.
4. **Schedule**: Schedules of Appointments, specifying working hours, breaks, and days.
5. **Appointments:** Scheduled medical appointments with date, time, and status.
6. **Patients Attend Appointments:** Records of patients attending appointments, including concerns and symptoms.
7. **Doctors Schedules:** Schedules of doctors, specifying working hours, breaks, and days.
8. **Patients Fill History:** Records of patients filling out their medical history.
9. **Diagnoses:** Records of diagnoses provided by doctors during appointments, including prescriptions.
10. **Doctors View History:** Records of doctors viewing patient medical history.

Attributes:

- ❖ Patients:

    - ➢ **Email → Primary key**
    - ➢ Password
    - ➢ Name
    - ➢ Address
    - ➢ Gender

- ❖ Medical History:

    - ➢ **ID - Primary Key**
    - ➢ Date
    - ➢ Condition
    - ➢ Surgeries
    - ➢ Medication

- ❖ Doctors:

    - ➢ **Email - Primary Key**
    - ➢ Name
    - ➢ Gender
    - ➢ Password

- ❖ Appointments

    - ➢ **ID - Primary Key**
    - ➢ Date
    - ➢ Start Time
    - ➢ End Time
    - ➢ Status

- ❖ Patient Attend Appointments

    - ➢ **Patient Email - Primary Key**
    - ➢ **Appointment id - Primary Key**
    - ➢ Concerns
    - ➢ Symptoms

- ❖ Schedule

  - ➢ **ID - Primary Key**
  - ➢ **Start Time - Primary Key**
  - ➢ **Endt Time - Primary Key**
  - ➢ **Break Time - Primary Key**
  - ➢ **Day - Primary Key**

- ❖ Patient Filling out Medical History

  - ➢ **Patient Email - Primary Key**
  - ➢ **History ID - Primary Key**

- ❖ Diagnoses:

  - ➢ **Appointment ID - Primary Key**
  - ➢ **Doctor Email - Primary Key**
  - ➢ Diagnosis
  - ➢ Prescription

- ❖ Doctors viewing patient history

  - ➢ **History ID- Primary Key**
  - ➢ **Doctor Email - Primary Key**
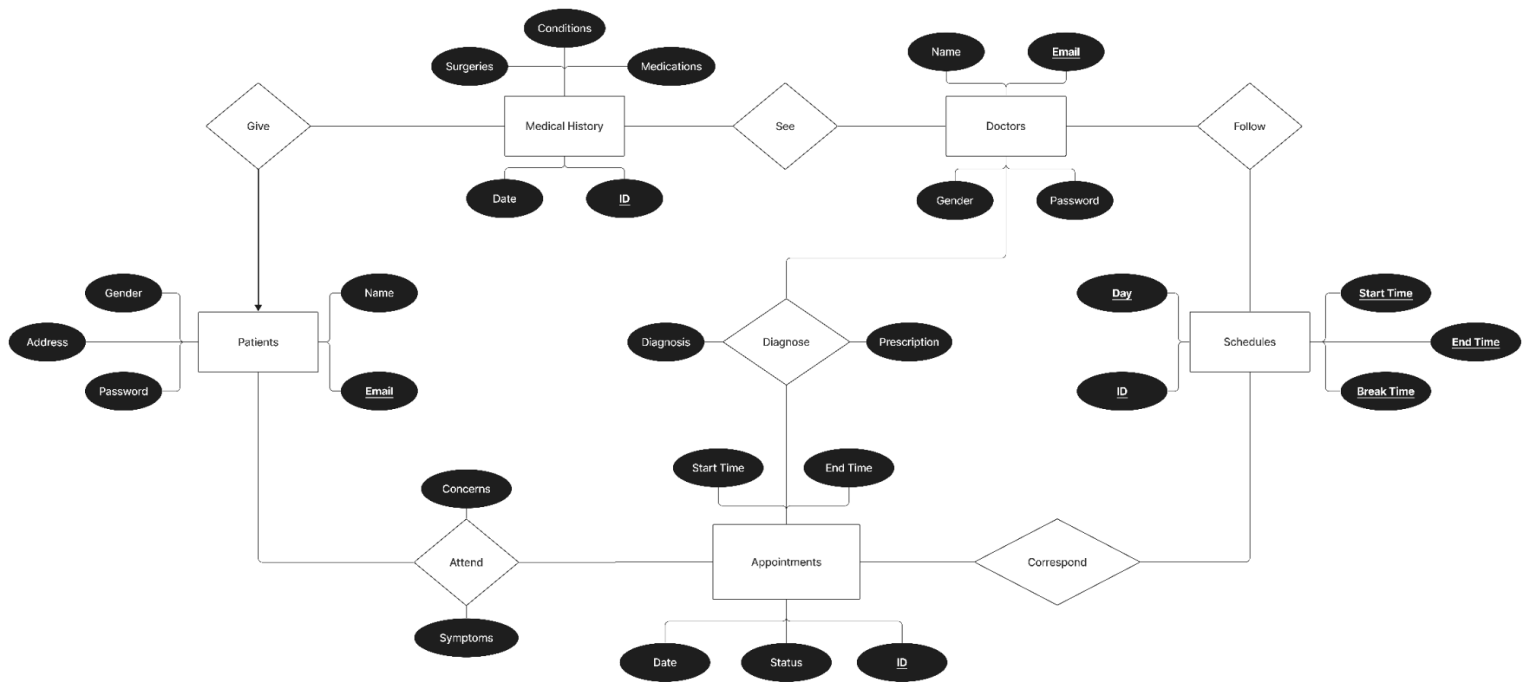
- ❖ Doctors Schedule
  - ➢ **Schedule - Primary Key**
  - ➢ **Doctor - Primary Key**

Relationship Set:

- Patients have many Medical History

    - **Relationship Type -** One to Many (1- M) Relationship

    - Each Patient can have multiple Medical History records but each medical history is associated with only one patient.

- Many Patients can attend many appointments

    - **Relationship Type -** Many to Many (M - M) Relationship

    - It establishes a many-to-many relationship between Patients and Appointments.

- Many Doctors can diagnose Many Appointments.

    - **Relationship Type -** Many to Many (M - M) Relationship

    - It represents the relationship between Doctors and Appointments where doctors diagnose patients during appointments.

- Doctor viewing history

    - **Relationship Type -** Many to Many (M -M) Relationship

    - Many Doctors can view Many Patient Medical History records. It establishes a many-to-many relationship between Doctors and MedicalHistory.

- Doctors Schedules

    - **Relationship Type:** Many to Many (M - M) Relationship

    - Many Doctors can have Many Schedules. It represents the relationship between Doctors and their schedules.

- Appointments

    - **Relationship Type:** Many to Many (M - M) Relationship

○ Many Patients can have Appointments with Many Doctors. It represents the appointments made by patients with doctors.

ER Diagram

Schema Diagram

Medical History
🔑 **id**	int
Date	date
Medication	varchar
Surgeries	varchar
Condition	varchar

Patient
🔑 **Email**	varchar
Password	varchar
Name	varchar
Address	varchar
Gender	varchar

Doctors History
🔑 **History**	varchar
🔑 **Doctor**	varchar

Patients Fill History
Patient	varchar
🔑 **History**	varchar

Diagnose
🔑 **Appointment**	varchar
🔑 **Doctor**	varchar
Diagnosis	varchar
Prescription	varchar

Doctor
🔑 **Email**	varchar
Password	varchar
Name	varchar
Gender	varchar
Post	varchar

Patient Attend Appointments
🔑 Patient	varchar
🔑 Appointments	varchar
Concerns	varchar
Symptoms	text

Appointments
🔑 **id**	int
Date	date
Start Time	time
End Time	time
Status	varchar

Schedules
🔑 **id**	int
🔑 **Start Time**	time
🔑 **End Time**	time
🔑 **Break Time**	time
🔑 **Day**	varchar

Doctor Schedules
🔑 **Schedules**	varchar
🔑 **Doctor**	varchar

drawSQL

SQL QUERIES:

1. **Retrieve all patient names and addresses.**
   Answer: SELECT name, address FROM Patients;

name	address
MAHI KHAN	123 Main St
NABILA AKHTER	456 Elm St
REJAUL KARIM	789 Oak St

2. **Find the number of male and female patients.**
   Answer: SELECT gender, COUNT(*) as count FROM Patients GROUP BY gender;

gender	count
Female	1
Male	2

3. **List all appointments scheduled for '2023-04-01'.**
   Answer: SELECT * FROM Appointments WHERE date = '2023-04-01';

id	date	start_time	end_time	status
1	2023-04-01	09:00:00	10:00:00	Scheduled

4. Get the patients who attended an appointment with 'Fever' as a concern.

Answer:
SELECT Patients.name FROM Patients INNER JOIN
PatientsAttendAppointments ON Patients.email =
PatientsAttendAppointments.patient_email
WHERE PatientsAttendAppointments.concerns = 'Fever';

name
MAHI KHAN

5. Find patient information for a specific email address.

Answer: SELECT * FROM Patients WHERE email = 'nabila@gmail.com';

email	password	name	address	gender
nabila@gmail.com	password2	NABILA AKHTER	456 Elm St	Female

6. List all medical history records for a specific patient.

Answer: SELECT * FROM MedicalHistory WHERE patient_email = 'mahi12@gmail.com';

id	date	conditions	surgeries	medication	patient_email
1	2023-01-10	Allergies	None	Antihistamine	mahi12@gmail.com

7.List all diagnoses for a specific doctor.

Answer: SELECT * FROM Diagnoses WHERE doctor_email = 'drtonmoy3@gmail.com';

appointment_id	doctor_email	diagnosis	prescription
3	drtonmoy3@gmail.com	Food Poisoning	Antibiotics

8. List all doctors' schedules for a specific time range.

Answer:

SELECT * FROM DoctorSchedules WHERE start_time >= '08:00:00' AND end_time <= '17:00:00';

id	start_time	end_time	break_time	day
1	08:00:00	17:00:00	12:00:00	Monday
1	08:00:00	17:00:00	12:00:00	Wednesday

9. List all patients and their medical history (if available).

Answer:SELECT Patients.email, Patients.name, MedicalHistory.conditions FROM Patients LEFT JOIN MedicalHistory ON Patients.email = MedicalHistory.patient_email;

email	name	conditions
mahi12@gmail.com	MAHI KHAN	Allergies
nabila@gmail.com	NABILA AKHTER	Hypertension
karim63@gmail.com	REJAUL KARIM	Diabetes

10. Get the medical history records filled out by 'REJAUL KARIM'.

Answer:

SELECT MedicalHistory.date, MedicalHistory.conditions, MedicalHistory.surgeries, MedicalHistory.medication FROM MedicalHistory WHERE MedicalHistory.patient_email = 'karim63@gmail.com';

date	conditions	surgeries	medication
2023-03-20	Diabetes	None	Metformin

11. Retrieve patient names and their scheduled appointments on a specific date.

Answer:

SELECT P.name AS PatientName, A.date, A.start_time, A.end_time

FROM Patients P JOIN PatientsAttendAppointments PAA ON P.email = PAA.patient_email JOIN Appointments A ON PAA.appointment_id = A.id WHERE A.date = '2023-04-01';

PatientName	date	start_time	end_time
MAHI KHAN	2023-04-01	09:00:00	10:00:00

12. List the doctors who have diagnosed patients with 'Common Cold'.
Answer:
SELECT D.name AS DoctorName
FROM Doctors D JOIN Diagnoses Dg ON D.email = Dg.doctor_email WHERE Dg.diagnosis = 'Common Cold';

DoctorName
Dr. Sagor

13. Retrieve the date and status of appointments for a specific patient.
Answer: SELECT A.date, A.status FROM Patients P JOIN PatientsAttendAppointments PAA ON P.email = PAA.patient_email JOIN Appointments A ON PAA.appointment_id = A.id WHERE P.email = 'mahi12@gmail.com';

date	status
2023-04-01	Scheduled

14. Retrieves the names and email addresses of all patients.
Answer: SELECT name, email FROM Patients;

name	email
MAHI KHAN	mahi12@gmail.com
NABILA AKHTER	nabila@gmail.com
REJAUL KARIM	karim63@gmail.com

15. Retrieve a list of patients along with their appointment details and concerns.
Answer:
SELECT P.name AS PatientName, A.date, A.start_time, A.end_time,PA.concerns
FROM Patients P JOIN PatientsAttendAppointments PA ON P.email =
PA.patient_email JOIN Appointments A ON PA.appointment_id = A.id;

PatientName	date	start_time	end_time	concerns
MAHI KHAN	2023-04-01	09:00:00	10:00:00	Fever
NABILA AKHTER	2023-04-02	10:30:00	11:30:00	Headache
REJAUL KARIM	2023-04-03	14:00:00	15:00:00	Nausea