**DBMS PROJECT**

**GROUP MEMBERS:**

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**Question 3 marks (10) clo4**

Design the database for Hospital Management System.

Note: It should store patient records, including demographics, medical history, diagnoses, medications, and test results. It should also manage appointments, scheduling, and billing information.

1. Design the Data model by applying all three normal forms.

**Tables**

1. Patient
2. Appointment
3. Doctor
4. Diagnosis
5. Medication
6. Test Result
7. Billing
8. Schedule
9. Doctor schedule

**Relationships**

**Patient table:**

Primary Key: Patient ID

**Doctor Table:**

Primary Key: Doctor ID

**Appointment Table:**

Primary Key: AppointmentID

Foreign Keys:

PatientID references Patient(PatientID)

DoctorID references Doctor(DoctorID)

**Diagnosis Table:**

Primary Key: DiagnosisID

Foreign Keys:

PatientID references Patient(PatientID)

DoctorID references Doctor(DoctorID)

**TestResults Table:**

Primary Key: TestResultID

Foreign Keys:

PatientID references Patient(PatientID)

DoctorID references Doctor(DoctorID)

**Medications Table:**

Primary Key: MedicationID

Foreign Keys:

PatientID references Patient(PatientID)

DoctorID references Doctor(DoctorID)

**Billing Table:**

Primary Key: BillingID

Foreign Key:

PatientID references Patient(PatientID)

**Schedule Table:**

Primary Key: ScheduleID

**DoctorSchedule Table:**

Primary Key: DoctorScheduleID

Foreign Keys:

DoctorID references Doctor(DoctorID)

ScheduleID references Schedule(ScheduleID

**QUERIES**

1.Find doctors with their specialties

2.Get all appointments with patient and doctor details

3.List all appointments along with corresponding doctor details

4.List all diagnoses with patient and doctor information

5.Retrieve test results with patient details

6.Retrieve medications for a specific patient

7.Find billing information for a particular patient

8. Retrieve the schedule for a specific doctor

9.List all appointments on a specific date

10.Retrieve the total amount billed for all patients

**IMPLEMENTATION**

-- Create Patient table

DROP TABLE Patient;

CREATE TABLE Patient (

PatientID INT PRIMARY KEY,

FirstName VARCHAR(50),

LastName VARCHAR(50),

DateOfBirth DATE,

Gender VARCHAR(10),

ContactNumber VARCHAR(15),

Address VARCHAR(100)

);

-- Insert data into Patient table

INSERT INTO Patient (PatientID, FirstName, LastName, DateOfBirth, Gender, ContactNumber, Address)

VALUES

(1, 'umer', 'ali', '1990-05-15', 'Male', '123-456-7890', '123 Main St'),

(2, 'anousha', 'shakeel', '1985-08-20', 'Female', '987-654-3210', '456 Mr St'),

(3, 'maira', 'rauf', '1992-02-10', 'Female', '555-123-4567', '789 Jr St');

-- Create Doctor table

DROP TABLE Doctor;

CREATE TABLE Doctor (

DoctorID INT PRIMARY KEY,

FirstName VARCHAR(50),

LastName VARCHAR(50),

Specialization VARCHAR(50),

ContactNumber VARCHAR(15),

Email VARCHAR(50)

);

INSERT INTO Doctor (DoctorID, FirstName, LastName, Specialization, ContactNumber, Email)

VALUES

(1, 'Dr. jameel', 'ali', 'Cardiologist', '555-888-7777', 'ali@example.com'),

(2, 'Dr. Abdul', 'Ahad', 'Orthopedic Surgeon', '555-999-6666', 'ahad@example.com'),

(3, 'Dr. ayesha', 'Nasir', 'Pediatrician', '555-777-8888', 'ayesha@example.com')

-- Create Appointment table

DROP TABLE Appointments;

CREATE TABLE Appointments (

AppointmentID INT PRIMARY KEY,

PatientID INT,

DoctorID INT,

AppointmentDate DATETIME,

Reason VARCHAR(255),

Status VARCHAR(20),

FOREIGN KEY (PatientID) REFERENCES Patient(PatientID),

FOREIGN KEY (DoctorID) REFERENCES Doctor(DoctorID)

);

-- Insert data into Appointment table

INSERT INTO Appointment (AppointmentID, PatientID, DoctorID, AppointmentDate, Reason, Status)

VALUES

(101, 1, 1, '2023-01-15 10:00:00', 'Regular Checkup', 'Scheduled'),

(102, 2, 2, '2023-02-20 14:30:00', 'Knee Pain', 'Completed'),

(103, 3, 3, '2023-03-05 09:45:00', 'Child Vaccination', 'Scheduled');

-- Create Diagnosis table

DROP TABLE Diagnosis;

CREATE TABLE Diagnosis (

DiagnosisID INT PRIMARY KEY,

PatientID INT,

DoctorID INT,

DiagnosisDate DATETIME,

Description VARCHAR(255),

FOREIGN KEY (PatientID) REFERENCES Patient(PatientID),

FOREIGN KEY (DoctorID) REFERENCES Doctor(DoctorID)

);

INSERT INTO Diagnosis (DiagnosisID, PatientID, DoctorID, DiagnosisDate, Description)

VALUES

(201, 1, 1, '2023-01-20', 'Healthy'),

(202, 2, 2, '2023-02-25', 'Strained Ligament'),

(203, 3, 3, '2023-03-10', 'Normal');

-- Create Medication table

DROP TABLE Medication;

CREATE TABLE Medication (

MedicationID INT PRIMARY KEY,

PatientID INT,

DoctorID INT,

MedicationName VARCHAR(50),

Dosage VARCHAR(50),

Frequency VARCHAR(50),

StartDate DATE,

EndDate DATE,

FOREIGN KEY (PatientID) REFERENCES Patient(PatientID),

FOREIGN KEY (DoctorID) REFERENCES Doctor(DoctorID)

);

INSERT INTO Medication (MedicationID, PatientID, DoctorID, MedicationName, Dosage, Frequency, StartDate, EndDate)

VALUES

(301, 1, 1, 'Aspirin', '1 tablet', 'Once a day', '2023-01-20', '2023-01-27'),

(302, 2, 2, 'Ibuprofen', '1 tablet', 'Twice a day', '2023-02-25', '2023-03-10'),

(303, 3, 3, 'Multivitamin', '1 tablet', 'Once a day', '2023-03-10', '2023-03-17');

-- Create TestResult table

DROP TABLE TestResult;

CREATE TABLE TestResult (

TestResultID INT PRIMARY KEY,

PatientID INT,

TestDate DATETIME,

TestName VARCHAR(50),

Result VARCHAR(255),

FOREIGN KEY (PatientID) REFERENCES Patient(PatientID)

);

INSERT INTO TestResult (TestResultID, PatientID, TestDate, TestName, Result)

VALUES

(401, 1, '2023-01-25', 'Blood Pressure', '120/80'),

(402, 2, '2023-03-01', 'X-Ray', 'Normal'),

(403, 3, '2023-03-15', 'Blood Test', 'Healthy');

-- Create Billing table

DROP TABLE Billing;

CREATE TABLE Billing (

BillingID INT PRIMARY KEY,

PatientID INT,

DoctorID INT,

AppointmentID INT,

BillingDate DATETIME,

TotalAmount DECIMAL(10, 2),

PaymentStatus VARCHAR(20),

FOREIGN KEY (PatientID) REFERENCES Patient(PatientID),

FOREIGN KEY (DoctorID) REFERENCES Doctor(DoctorID),

FOREIGN KEY (AppointmentID) REFERENCES Appointments(AppointmentID)

);

-- Insert data into Billing table

INSERT INTO Billing (BillingID, PatientID, DoctorID, AppointmentID, BillingDate, TotalAmount, PaymentStatus)

VALUES

(501, 1, 1, 101, '2023-01-15', 150.00, 'Paid'),

(502, 2, 2, 102, '2023-02-20', 200.00, 'Paid'),

(503, 3, 3, 103, '2023-03-05', 100.00, 'Unpaid');

-- Create Schedule table

DROP TABLE Schedule

create table Schedule(

ScheduleID int Primary Key Not Null,

DayofWeek varchar(10),

StartTime Time,

EndTime Time

);

-- Insert values into the Schedule table

INSERT INTO Schedule (ScheduleID, DayofWeek, StartTime, EndTime)

VALUES

(1, 'Monday', '09:00:00', '17:00:00'),

(2, 'Tuesday', '10:30:00', '18:30:00'),

(3, 'Wednesday', '08:00:00', '16:00:00');

-- Create DoctorSchedule table

DROP TABLE DoctorSchedule

create table DoctorSchedule(

DoctorScheduleID int Primary Key Not Null,

DoctorID int Foreign Key References Doctor,

ScheduleID int Foreign Key References Schedule

);

-- Insert values into the DoctorSchedule table

INSERT INTO DoctorSchedule (DoctorScheduleID, DoctorID, ScheduleID)

VALUES

(1, 1, 1),

(2, 2, 2),

(3, 3, 3);

SELECT \* FROM Patient;

SELECT \* FROM Doctor;

SELECT \* FROM Appointments;

SELECT \* FROM Diagnosis;

SELECT \* FROM Medication;

SELECT \* FROM TestResult;

SELECT \* FROM Billing;

SELECT \* FROM Schedule;

SELECT \* FROM DoctorSchedule;

--Find doctors with their specialties

SELECT DoctorID, Specialization FROM Doctor;

--2.Get all appointments with patient and doctor details:

SELECT AppointmentID, Patient.PatientID, Patient.FirstName, Doctor.DoctorID, Doctor.FirstName, AppointmentDate, Reason, Status

FROM Appointments

JOIN Patient ON Appointments.PatientID = Patient.PatientID

JOIN Doctor ON Appointments.DoctorID = Doctor.DoctorID;

--List all appointments along with corresponding doctor details:

SELECT Appointments.\*, Doctor.FirstName AS DoctorFirstName, Doctor.LastName AS DoctorLastName, Doctor.Specialization

FROM Appointments

JOIN Doctor ON Appointments.DoctorID = Doctor.DoctorID;

--List all diagnoses with patient and doctor information

SELECT DiagnosisID, Patient.PatientID, Patient.FirstName, Doctor.DoctorID, Doctor.FirstName, DiagnosisDate, Description

FROM Diagnosis

JOIN Patient ON Diagnosis.PatientID = Patient.PatientID

JOIN Doctor ON Diagnosis.DoctorID = Doctor.DoctorID;

--Retrieve test results with patient details

SELECT TestResultID, Patient.PatientID, Patient.FirstName,TestDate, Result

FROM TestResult

JOIN Patient ON TestResult.PatientID = Patient.PatientID;

--Retrieve medications for a specific patient

SELECT MedicationID, Patient.PatientID, Patient.FirstName, Doctor.DoctorID, Doctor.FirstName, MedicationName, Dosage, Frequency, StartDate, EndDate

FROM Medication

JOIN Patient ON Medication.PatientID = Patient.PatientID

JOIN Doctor ON Medication.DoctorID = Doctor.DoctorID

WHERE Patient.PatientID = 1;

--Find billing information for a particular patient:

SELECT BillingID, Patient.PatientID, Patient.FirstName, BillingDate, TotalAmount, PaymentStatus

FROM Billing

JOIN Patient ON Billing.PatientID = Patient.PatientID

WHERE Patient.PatientID = 1;

--Retrieve the schedule for a specific doctor:

SELECT DoctorSchedule.DoctorScheduleID, Doctor.DoctorID, Doctor.FirstName, Schedule.DayOfWeek, Schedule.StartTime, Schedule.EndTime

FROM DoctorSchedule

JOIN Doctor ON DoctorSchedule.DoctorID = Doctor.DoctorID

JOIN Schedule ON DoctorSchedule.ScheduleID = Schedule.ScheduleID

WHERE Doctor.DoctorID = 2;

--List all appointments on a specific date:

SELECT AppointmentID, Patient.PatientID, Patient.FirstName, Doctor.DoctorID, Doctor.FirstName, AppointmentDate, Status

FROM Appointments

JOIN Patient ON Appointments.PatientID = Patient.PatientID

JOIN Doctor ON Appointments.DoctorID = Doctor.DoctorID

WHERE DATE(AppointmentDate) = '2024-01-05';

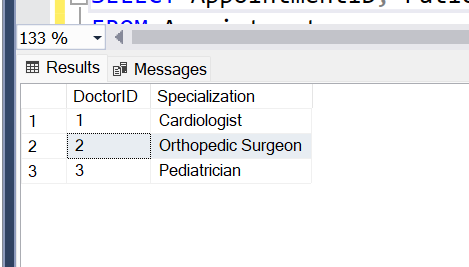
--Retrieve the total amount billed for all patients:

SELECT SUM(TotalAmount) AS TotalAmountBilled

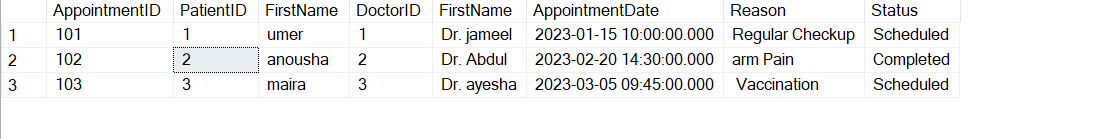
FROM Billing;

**OUTPUTS**

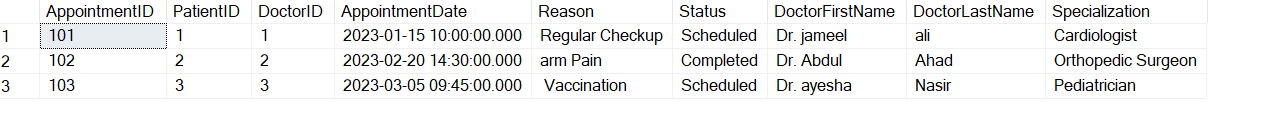
Query1:



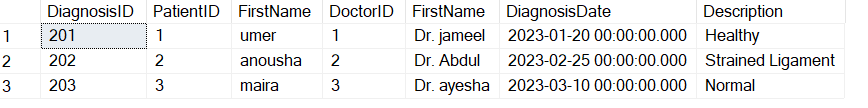
Query2:



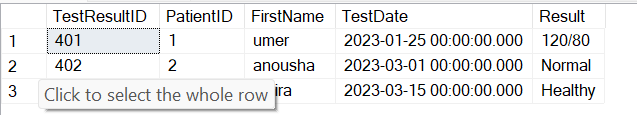
Query 3:



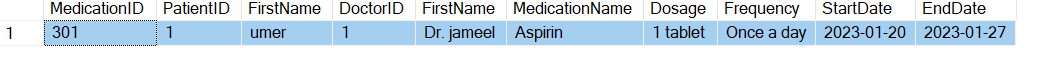
Query 4:



Query 5:



Query 6:



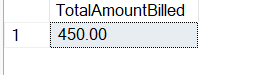
Query 7:



Query 8:



Query 10:



**SCHEMA MODEL**

**Doctor**

DoctorID (PK)

DoctorName

PhoneNo

DoctorType

**Patient**

PatientID (PK)

PatientName

Address

PhoneNo

DateOfBirth

Gender

BloodType

**Appointment**

AppointmentID (PK)

PatientID ( FK)

DoctorID (FK)

AppointmentDate

Status

**Diagnosis**

DiagnosisID ( PK)

|PatientID (FK)

DoctorID ( FK)

DiagnosisDate

**TestResults**

TestResultID (PK)

PatientID (FK)

DoctorID (FK)

TestDate

Result

**Medications**

MedicationID (pk)

PatientID ( Fk)

DoctorID ( Fk)

MedicationName

Dosage

Frequency

StartDate

EndDate

**Billing**

BillingID ( pk)

PatientID (Fk)

Total Amount

PaymentStatus|

**Schedule**

ScheduleID ( Pk)

->Relationships between tables are indicated by foreign keys that reference primary keys in other tables.

* **(PK)** denotes the primary key.
* **(FK)** denotes a foreign key, and the table and column it references are specified

|DayofWeek

StartTime

EndTime

**DoctorSchedule**

DoctorScheduleID ( Pk)

DoctorID ( Fk)

|ScheduleID ( Fk )