

INFO 605: 900 DATABASE MANAGEMENT SYSTEMS

FINAL PROJECT

Due: June 9th, 2024

Relational Database Term Project

Healthcare Management System

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Requirements:

We have been hired to consult to design a database for a small but rapidly expanding healthcare group. This database will enable the automatic production of patient bill reports, which are presently prepared by hand - taking great effort and expense. The following narrative shows requirements for this database:

The healthcare group needs to know who is receiving care (the patient). Required information includes patientID (PK), first name, last name, date of birth, gender, address (street, city, state, zip), and the patient's phone number.

Patients are associated with insurance. Each patient has 0 to 1 insurance plans. At any given time, we expect each insurance plan to belong to 1 to many patients.

Each insurance coverage needs information about insuranceID, which is the policy number (PK), insurance provider name, coverage plan, date the coverage started, and date the coverage ends.

This database also needs to capture information about the healthcare provider (doctor). This database needs to capture providerID (PK), provider name, specialization (cardiology, etc.), office address (street, city, state, zip), and the office phone number (offices have multiple office phone numbers for different providers/suites).

Additionally, this database must represent the various healthcare services offered, and must contain information about the serviceID (PK) and service description.

Patients have appointments, and this information must be tracked. For each appointment, this database must include information about the appointmentID (PK), date of the appointment, and the reason for the visit.

Each appointment belongs to 1 and only 1 patient and patients can have 1 to many appointments (you are not a patient if you have not had an appointment before). Each appointment has 1 and only 1 provider. Providers belong to 1 to many appointments.

This database needs information about the bill. This must be captured through billID (PK), date the bill was issued, the due date, and the status of the bill.

Each bill belongs to 1 and only 1 appointment, and each appointment has between 0 and 1 bills, preventing a bill being generated before an appointment takes place.

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For each bill, we must capture the details (aka single charges that make up the bill). This must contain information about billDetailID (PK), quantity of the service, rate of the service, and subtotal of the bill detail.

Bill details belong to 1 and only 1 bill. However, each bill has 1 to many bill details. Each bill detail belongs to 1 and only 1 service, and each service can belong to 1 to many bill details (a service doesn't exist if it hasn't been performed before).

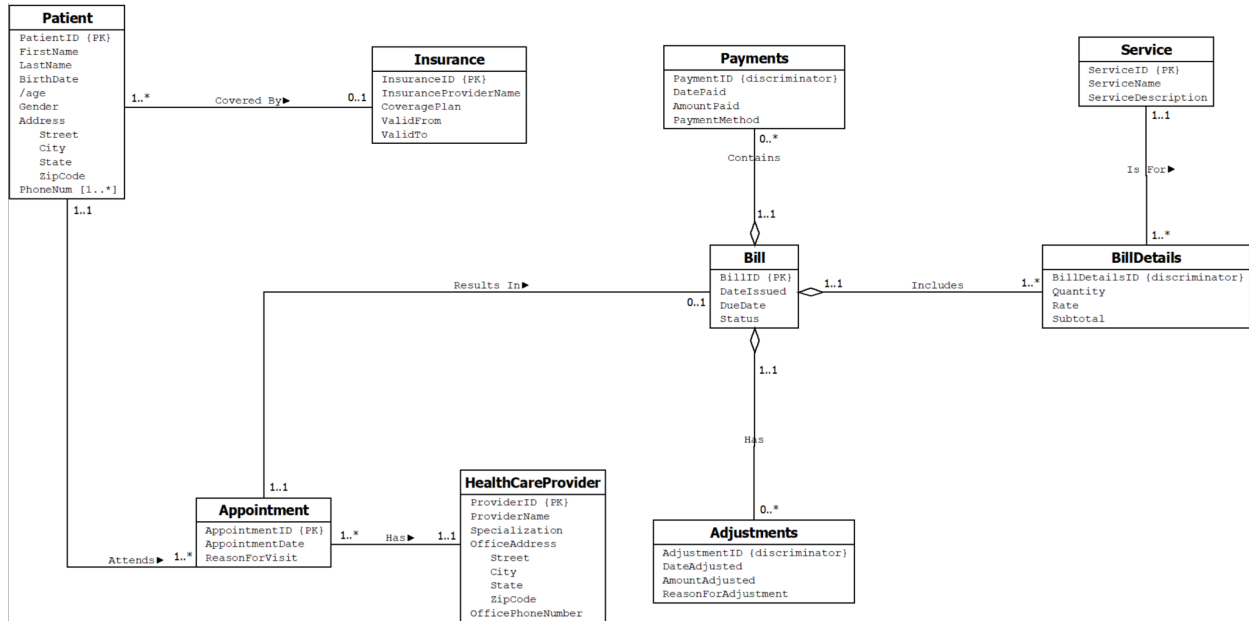
The database needs to capture payment information including paymentID (PK), the date of the payment, the amount paid, and the method of payment (cash, card, etc.).

Each payment belongs to 1 and only 1 bill, and each bill can have 0 to many payments.

Lastly, we need to capture any adjustments made to bills. Each adjustment must capture adjustmentID (PK), the date of the adjustment, the amount of the adjustment, and the reason for the adjustment.

Each adjustment belongs to 1 and only 1 bill, and each bill can have 0 to many adjustments.

ER Model:



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Database Schema:

Patient(PatientID, FirstName, LastName, BirthDate, Gender, Address, PhoneNum, InsuranceID)
InsuranceID FK from Insurance table

Insurance(InsuranceID, InsuranceProviderName, CoveragePlan, ValidFrom, ValidTo)
(removed policy number and made insuranceID represent policy number to remove candidate key)

Appointment(AppointmentID, AppointmentDate, ReasonForVisit, PatientID, ProviderID,)
PatientID FK from Patient Table
ProviderID FK from HealthCareProvider table

HealthCareProvider(ProviderID, ProviderName, Specialization, OfficeAddress, OfficePhoneNumber)
(office addresses have multiple phone numbers for different providers/suites - avoids transitive dependency)

Bill(BillID, DateIssued, DueDate, Status, AppointmentID)
AppointmentID FK from Appointment table

Adjustments(AdjustmentID, BillID, DateAdjusted, AmountAdjusted, ReasonForAdjustment)
BillID FK from Bill table

Payments(PaymentID, BillID, DatePaid, AmountPaid, PaymentMethod)
BillID FK from Bill table

BillDetails(BillDetailID, BillID, Quantity, Rate, Subtotal, ServiceID)
BillID FK from Bill table
ServiceID FK from Service table

Service(ServiceID, ServiceDescription)
(removed service name to avoid candidate key)
(the same service can cost different amounts depending on the complexity of the procedure - avoids transitive dependency)

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Data Dictionary:

Patient: Contains information about the patients belonging to the healthcare group.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
PatientID	Patient Identifier	Char(9)	00000000 0-999999 999	No	Yes	No
FirstName	Patient's first name	VarChar(50)	All	No	No	No
LastName	Patient's last name	VarChar(50)	All	No	No	No
BirthDate	Date patient was born	Date	> 1/1/1900	No	No	No
Gender	Patient's gender	Char(1)	'M', 'F', 'O'	No	No	No
Address	Patient's home address	VarChar(100)	All	Yes	No	No
PhoneNum	Patient's phone number	Char(15)	00000000 0000000- 99999999 99999999	Yes	No	No
InsuranceID	Insurance identifier (Policy Number)	VarChar(20)	All	Yes	No	Yes

Insurance: Contains information about a patient's insurance coverage.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
InsuranceID	Insurance identifier	VarChar(20)	All	No	Yes	No
InsuranceProviderName	Name of the insurance provider	VarChar(50)	All	No	No	No
CoveragePlan	Coverage plan details	VarChar(50)	All	No	No	No

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ValidFom	Start date of the coverage	Date	> 1/1/1900	No	No	No
ValidTo	End date of the coverage	Date	> 1/1/1900	No	No	No

Appointment: Contains information about patient appointments.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
AppointmentID	Appointment Identifier	Char(9)	000000000-999999999	No	Yes	No
AppointmentDate	Date of the appointment	Date	> 1/1/1900	No	No	No
ReasonForVisit	Reason the appointment was made	VarChar(100)	All	No	No	No
PatientID	Patient Identifier	Char(9)	000000000-999999999	No	No	Yes
ProviderID	Healthcare Provider Identifier	Char(9)	000000000-999999999	No	No	Yes

HealthCareProvider: Contains information about healthcare providers.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
ProviderID	Healthcare Provider Identifier	Char(9)	000000000-999999999	No	Yes	No
ProviderName	Name of the provider	VarChar(50)	All	No	No	No
Specialization	What the provider is specialized in	VarChar(50)	All	Yes	No	No
OfficeAddress	Address of the provider's office	VarChar(100)	All	Yes	No	No

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OfficePhoneNumber	Phone number of the provider's office	Char(15)	000000000000000-9999999999999999	Yes	No	No
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Bill: Contains information about bills issued to patients.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
BillID	Bill Identifier	Char(9)	000000000-99999999	No	Yes	No
DateIssued	Date the bill was issued	Date	> 1/1/1900	No	No	No
DueDate	Date the bill is due	Date	> 1/1/1900	No	No	No
Status	Status of the bill	VarChar(20)	'Pending', 'Paid', 'Overdue'	No	No	No
AppointmentID	Appointment Identifier	Char(9)	000000000-99999999	No	No	Yes

Adjustments: Contains information about adjustments made to bills.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
AdjustmentID	Adjustment Identifier	Char(9)	000000000-999999999	No	Yes	No
BillID	Bill Identifier	Char(9)	000000000-999999999	No	Yes	Yes
DateAdjusted	Date of adjustment	Date	> 1/1/1900	No	No	No
AmountAdjusted	Amount of the bill that was adjusted	Number	Between 0 and 100k	No	No	No
ReasonForAdjustment	Why the bill was adjusted	VarChar(100)	All	Yes	No	No

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Payments: Contains information about payments made towards bills.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
PaymentID	Payment Identifier	Char(9)	000000000-999999999	No	Yes	No
BillID	Bill Identifier	Char(9)	000000000-999999999	No	Yes	Yes
DatePaid	Date of payment	Date	> 1/1/1900	No	No	No
AmountPaid	Amount of the bill paid	Number	Between 0 and 100k	No	No	No
PaymentMethod	Method of payment used	VarChar(50)	'Credit Card', 'Debit Card', 'Cash', 'Check', 'Online'	No	No	No

BillDetails: Contains Detailed information about individual services or items listed on a bill.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
BillDetailsID	Bill Details Identifier	Char(9)	000000000-999999999	No	Yes	No
BillID	Bill Identifier	Char(9)	000000000-999999999	No	Yes	Yes
Quantity	Amount of services/items	Number	Between 0 and 100	No	No	No
Rate	Rate per service/item	Number	Between 0 and 100k	No	No	No
Subtotal	Subtotal of bill detail	Number	Between 0 and 10 million	No	No	No
ServiceID	Service Identifier	Char(9)	000000000-999999999	No	No	Yes

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Service: Contains information about services received.

Attribute Name	Description	Datatype	Domain	Nullable	PK	FK
ServiceID	Service Identifier	Char(9)	000000000-999999999	No	Yes	No
ServiceDescription	Description of service	VarChar(100)	All	No	No	No

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DDL:

```
CREATE TABLE Insurance (  
    InsuranceID VARCHAR2(20) PRIMARY KEY CONSTRAINT insurance_PK_null NOT  
    NULL,  
    InsuranceProviderName VARCHAR2(50) CONSTRAINT  
    insurance_InsuranceProviderName_null NOT NULL,  
    CoveragePlan VARCHAR2(50) CONSTRAINT insurance_CoveragePlan_null NOT NULL,  
    ValidFrom DATE CHECK (ValidFrom > DATE '1900-01-01') CONSTRAINT  
    insurance_ValidFrom_null NOT NULL,  
    ValidTo DATE CHECK (ValidTo > DATE '1900-01-01') CONSTRAINT  
    insurance_ValidTo_null NOT NULL  
);
```

```
CREATE TABLE Patient (  
    PatientID CHAR(9) PRIMARY KEY CONSTRAINT patient_PK_null NOT NULL,  
    FirstName VARCHAR2(50) CONSTRAINT patient_FirstName_null NOT NULL,  
    LastName VARCHAR2(50) CONSTRAINT patient_LastName_null NOT NULL,  
    BirthDate DATE CHECK (BirthDate > DATE '1900-01-01') CONSTRAINT  
    patient_BirthDate_null NOT NULL,  
    Gender CHAR(1) CHECK (Gender IN ('M', 'F', 'O')) CONSTRAINT patient_Gender_null  
    NOT NULL,  
    Address VARCHAR2(100),  
    PhoneNum CHAR(15) CONSTRAINT patient_PhoneNum_null NOT NULL,  
    InsuranceID VARCHAR2(20),  
    CONSTRAINT patient_FK_insurance FOREIGN KEY (InsuranceID) REFERENCES  
    Insurance(InsuranceID)  
);
```

```
CREATE TABLE HealthCareProvider (  
    ProviderID CHAR(9) PRIMARY KEY CONSTRAINT healthcareprovider_PK_null NOT  
    NULL,  
    ProviderName VARCHAR2(50) CONSTRAINT healthcareprovider_ProviderName_null  
    NOT NULL,  
    Specialization VARCHAR2(50),  
    OfficeAddress VARCHAR2(100),  
    OfficePhoneNumber CHAR(15)  
);
```

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```
CREATE TABLE Appointment (  
    AppointmentID CHAR(9) PRIMARY KEY CONSTRAINT appointment_PK_null NOT  
    NULL,  
    AppointmentDate DATE CHECK (AppointmentDate > DATE '1900-01-01') CONSTRAINT  
    appointment_AppointmentDate_null NOT NULL,  
    ReasonForVisit VARCHAR2(100) CONSTRAINT appointment_ReasonForVisit_null NOT  
    NULL,  
    PatientID CHAR(9) CONSTRAINT appointment_patientFK_null NOT NULL,  
    ProviderID CHAR(9) CONSTRAINT appointment_providerFK_null NOT NULL,  
    CONSTRAINT appointment_FK_patient FOREIGN KEY (PatientID) REFERENCES  
    Patient(PatientID),  
    CONSTRAINT appointment_FK_provider FOREIGN KEY (ProviderID) REFERENCES  
    HealthCareProvider(ProviderID)  
);
```

```
CREATE TABLE Bill (  
    BillID CHAR(9) PRIMARY KEY CONSTRAINT bill_PK_null NOT NULL,  
    DateIssued DATE CHECK (DateIssued > DATE '1900-01-01') CONSTRAINT  
    bill_DateIssued_null NOT NULL,  
    DueDate DATE CHECK (DueDate > DATE '1900-01-01') CONSTRAINT bill_DueDate_null  
    NOT NULL,  
    Status VARCHAR2(20) CHECK(Status IN ('Pending', 'Overdue', 'Paid')) CONSTRAINT  
    bill_Status_null NOT NULL,  
    AppointmentID CHAR(9) CONSTRAINT bill_FK_null NOT NULL,  
    CONSTRAINT bill_FK_appointment FOREIGN KEY (AppointmentID) REFERENCES  
    Appointment(AppointmentID)  
);
```

```
CREATE TABLE Adjustments (  
    AdjustmentID CHAR(9) CONSTRAINT adjustment_AdjustmentID_null NOT NULL,  
    BillID CHAR(9) CONSTRAINT adjustment_FK_null NOT NULL,  
    DateAdjusted DATE CHECK (DateAdjusted > DATE '1900-01-01') CONSTRAINT  
    adjustments_DateAdjusted_null NOT NULL,  
    AmountAdjusted NUMBER CHECK(AmountAdjusted BETWEEN 0 AND 100000)  
    CONSTRAINT adjustments_AmountAdjusted_null NOT NULL,  
    ReasonForAdjustment VARCHAR2(100),  
    CONSTRAINT adjustments_PK PRIMARY KEY (AdjustmentID, BillID),  
    CONSTRAINT adjustment_FK_bill FOREIGN KEY (BillID) REFERENCES Bill(BillID)  
);
```

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```
CREATE TABLE Payments (  
    PaymentID CHAR(9) CONSTRAINT payments_PK_null NOT NULL,  
    BillID CHAR(9) CONSTRAINT payments_FK_null NOT NULL,  
    DatePaid DATE CHECK (DatePaid > DATE '1900-01-01') CONSTRAINT  
payments_DatePaid_null NOT NULL,  
    AmountPaid NUMBER CHECK(AmountPaid BETWEEN 0 AND 100000) CONSTRAINT  
payments_AmountPaid_null NOT NULL,  
    PaymentMethod VARCHAR2(50) CHECK(PaymentMethod IN ('Credit Card', 'Debit Card',  
'Cash', 'Check', 'Online')) CONSTRAINT payments_PaymentMethod_null NOT NULL,  
    CONSTRAINT payments_PK PRIMARY KEY (PaymentID, BillID),  
    CONSTRAINT payments_FK_bill FOREIGN KEY (BillID) REFERENCES Bill(BillID)  
);
```

```
CREATE TABLE Service (  
    ServiceID CHAR(9) PRIMARY KEY CONSTRAINT service_PK_null NOT NULL,  
    ServiceDescription VARCHAR2(100) CONSTRAINT service_ServiceDescription_null NOT  
NULL  
);
```

```
CREATE TABLE BillDetails (  
    BillDetailID CHAR(9) CONSTRAINT billdetails_PK_null NOT NULL,  
    BillID CHAR(9) CONSTRAINT billdetails_FK_BillID_null NOT NULL,  
    Quantity NUMBER CHECK(Quantity BETWEEN 0 AND 100) CONSTRAINT  
billdetails_Quantity_null NOT NULL,  
    Rate NUMBER CHECK(Rate BETWEEN 0 AND 100000) CONSTRAINT  
billdetails_Rate_null NOT NULL,  
    Subtotal NUMBER CHECK(Subtotal BETWEEN 0 AND 10000000) CONSTRAINT  
billdetails_Subtotal_null NOT NULL,  
    ServiceID CHAR(9) CONSTRAINT billdetails_FK_ServiceID_null NOT NULL,  
    CONSTRAINT billdetails_PK PRIMARY KEY (BillDetailID, BillID),  
    CONSTRAINT billdetails_FK_bill FOREIGN KEY (BillID) REFERENCES Bill(BillID),  
    CONSTRAINT billdetails_FK_service FOREIGN KEY (ServiceID) REFERENCES  
Service(ServiceID)  
);
```

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DML:

```
INSERT INTO INSURANCE (InsuranceID, InsuranceProviderName, CoveragePlan, ValidFrom, ValidTo)
```

```
VALUES ('0000000001', 'Blue Cross Blue Shield', 'A', TO_DATE('2023-01-13', 'YYYY-MM-DD'), TO_DATE('2024-01-13', 'YYYY-MM-DD'));
```

```
INSERT INTO INSURANCE (InsuranceID, InsuranceProviderName, CoveragePlan, ValidFrom, ValidTo)
```

```
VALUES ('0000000002', 'Blue Cross Blue Shield', 'B', TO_DATE('2023-07-11', 'YYYY-MM-DD'), TO_DATE('2024-07-11', 'YYYY-MM-DD'));
```

```
INSERT INTO INSURANCE (InsuranceID, InsuranceProviderName, CoveragePlan, ValidFrom, ValidTo)
```

```
VALUES ('0000000003', 'United Healthcare', 'S', TO_DATE('2023-02-22', 'YYYY-MM-DD'), TO_DATE('2024-02-22', 'YYYY-MM-DD'));
```

```
INSERT INTO INSURANCE (InsuranceID, InsuranceProviderName, CoveragePlan, ValidFrom, ValidTo)
```

```
VALUES ('0000000004', 'Humana', 'D', TO_DATE('2023-09-13', 'YYYY-MM-DD'), TO_DATE('2024-09-13', 'YYYY-MM-DD'));
```

```
INSERT INTO INSURANCE (InsuranceID, InsuranceProviderName, CoveragePlan, ValidFrom, ValidTo)
```

```
VALUES ('0000000005', 'Cigna', 'A', TO_DATE('2023-11-20', 'YYYY-MM-DD'), TO_DATE('2024-11-20', 'YYYY-MM-DD'));
```

```
INSERT INTO PATIENT (PatientID, FirstName, LastName, BirthDate, Gender, Address, PhoneNum, InsuranceID)
```

```
VALUES ('0000000001', 'Randy', 'Marsh', TO_DATE('1978-02-13', 'YYYY-MM-DD'), 'M', '123 Fake Road Dr. South Park, CO 11111', '+1-876-555-6308', '0000000005');
```

```
INSERT INTO PATIENT (PatientID, FirstName, LastName, BirthDate, Gender, Address, PhoneNum, InsuranceID)
```

```
VALUES ('0000000002', 'Skip', 'Bayless', TO_DATE('1960-09-29', 'YYYY-MM-DD'), 'M', '465 Fake Road Ln. New York, NY 22222', '+1-123-555-0926', '0000000003');
```

```
INSERT INTO PATIENT (PatientID, FirstName, LastName, BirthDate, Gender, Address, PhoneNum, InsuranceID)
```

```
VALUES ('0000000003', 'Michelle', 'Obama', TO_DATE('1971-04-03', 'YYYY-MM-DD'), 'F', '932 Fake Road Cir. Fairfax, VA 33333', '+1-544-555-0007', '0000000001');
```

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```
INSERT INTO PATIENT (PatientID, FirstName, LastName, BirthDate, Gender, Address,
PhoneNum, InsuranceID)
VALUES ('000000004', 'Casey', 'Bryant', TO_DATE('2000-12-24', 'YYYY-MM-DD'), 'O', '324
Fake Road Dr. San Francisco, CA 44444', '+1-998-555-7874', '0000000004');
```

```
INSERT INTO PATIENT (PatientID, FirstName, LastName, BirthDate, Gender, Address,
PhoneNum, InsuranceID)
VALUES ('000000005', 'Randy', 'Moss', TO_DATE('1982-01-27', 'YYYY-MM-DD'), 'M', '886
Fake Road Ln. Boston, MA 55555', '+1-443-555-1114', '0000000002');
```

```
INSERT INTO PATIENT (PatientID, FirstName, LastName, BirthDate, Gender, Address,
PhoneNum)
VALUES ('000000006', 'Gerald', 'Green', TO_DATE('1948-04-01', 'YYYY-MM-DD'), 'M', '454
Fake Road Rd. Charleston, SC 12345', '+1-443-555-8866');
```

```
INSERT INTO HEALTHCAREPROVIDER (ProviderID, ProviderName, Specialization,
OfficeAddress, OfficePhoneNumber)
VALUES ('000000001', 'Stephen Miller', 'Cardiology', '731 Fake Road Rd. Knoxville, TN
66666', '+1-865-555-4809');
```

```
INSERT INTO HEALTHCAREPROVIDER (ProviderID, ProviderName, Specialization,
OfficeAddress, OfficePhoneNumber)
VALUES ('000000002', 'Randall Smith', 'Dermatology', '4800 Fake Road Dr. Philadelphia, PA
19121', '+1-856-555-1234');
```

```
INSERT INTO HEALTHCAREPROVIDER (ProviderID, ProviderName, Specialization,
OfficeAddress, OfficePhoneNumber)
VALUES ('000000003', 'William Ball', 'Gastroenterology', '2700 Fake Road Cir. Dallas, TX
77777', '+1-123-555-9977');
```

```
INSERT INTO HEALTHCAREPROVIDER (ProviderID, ProviderName, Specialization,
OfficeAddress, OfficePhoneNumber)
VALUES ('000000004', 'Ian Gallagher', 'Neurology', '173 Fake Road Dr. Chicago, IL 88888',
'+1-444-555-3498');
```

```
INSERT INTO HEALTHCAREPROVIDER (ProviderID, ProviderName, Specialization,
OfficeAddress, OfficePhoneNumber)
VALUES ('000000005', 'Chloe Bryant', 'Cardiology', '444 Fake Road Ln. Nashville, TN 99999',
'+1-423-555-3336');
```


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```
INSERT INTO APPOINTMENT (AppointmentID, AppointmentDate, ReasonForVisit,
PatientID, ProviderID)
VALUES ('000000001', TO_DATE('2024-02-28', 'YYYY-MM-DD'), 'Sharp pain in chest',
'000000003', '000000001');
```

```
INSERT INTO APPOINTMENT (AppointmentID, AppointmentDate, ReasonForVisit,
PatientID, ProviderID)
VALUES ('000000002', TO_DATE('2024-05-05', 'YYYY-MM-DD'), 'Skin uncontrollably
breaking out', '000000005', '000000002');
```

```
INSERT INTO APPOINTMENT (AppointmentID, AppointmentDate, ReasonForVisit,
PatientID, ProviderID)
VALUES ('000000003', TO_DATE('2023-09-28', 'YYYY-MM-DD'), 'Fingers tingle and loss of
feeling in extremities', '000000001', '000000004');
```

```
INSERT INTO APPOINTMENT (AppointmentID, AppointmentDate, ReasonForVisit,
PatientID, ProviderID)
VALUES ('000000004', TO_DATE('2023-11-18', 'YYYY-MM-DD'), 'Sharp pain in chest',
'000000002', '000000005');
```

```
INSERT INTO APPOINTMENT (AppointmentID, AppointmentDate, ReasonForVisit,
PatientID, ProviderID)
VALUES ('000000005', TO_DATE('2024-01-21', 'YYYY-MM-DD'), 'Difficulty swallowing',
'000000004', '000000003');
```

```
INSERT INTO BILL (BillID, DateIssued, DueDate, Status, AppointmentID)
VALUES ('000000001', TO_DATE('2024-01-22', 'YYYY-MM-DD'), TO_DATE('2024-04-22',
'YYYY-MM-DD'), 'Overdue', '000000005');
```

```
INSERT INTO BILL (BillID, DateIssued, DueDate, Status, AppointmentID)
VALUES ('000000002', TO_DATE('2023-11-19', 'YYYY-MM-DD'), TO_DATE('2024-02-19',
'YYYY-MM-DD'), 'Paid', '000000004');
```

```
INSERT INTO BILL (BillID, DateIssued, DueDate, Status, AppointmentID)
VALUES ('000000003', TO_DATE('2024-05-06', 'YYYY-MM-DD'), TO_DATE('2024-08-06',
'YYYY-MM-DD'), 'Pending', '000000002');
```

```
INSERT INTO BILL (BillID, DateIssued, DueDate, Status, AppointmentID)
VALUES ('000000004', TO_DATE('2024-03-01', 'YYYY-MM-DD'), TO_DATE('2024-05-01',
'YYYY-MM-DD'), 'Overdue', '000000001');
```

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```
INSERT INTO BILL (BillID, DateIssued, DueDate, Status, AppointmentID)
VALUES ('000000005', TO_DATE('2023-09-29', 'YYYY-MM-DD'), TO_DATE('2023-12-29',
'YYYY-MM-DD'), 'Paid', '000000003');
```

```
INSERT INTO ADJUSTMENTS (AdjustmentID, BillID, DateAdjusted, AmountAdjusted,
ReasonForAdjustment)
VALUES ('000000001', '000000001', TO_DATE('2024-02-01', 'YYYY-MM-DD'), 547.00,
'Insurance Applied');
```

```
INSERT INTO ADJUSTMENTS (AdjustmentID, BillID, DateAdjusted, AmountAdjusted,
ReasonForAdjustment)
VALUES ('000000001', '000000005', TO_DATE('2023-09-30', 'YYYY-MM-DD'), 5000.00,
'Insurance Applied');
```

```
INSERT INTO ADJUSTMENTS (AdjustmentID, BillID, DateAdjusted, AmountAdjusted,
ReasonForAdjustment)
VALUES ('000000002', '000000005', TO_DATE('2023-10-03', 'YYYY-MM-DD'), 2000.00,
'Overcharged');
```

```
INSERT INTO ADJUSTMENTS (AdjustmentID, BillID, DateAdjusted, AmountAdjusted,
ReasonForAdjustment)
VALUES ('000000001', '000000003', TO_DATE('2024-06-01', 'YYYY-MM-DD'), 100.00,
'Insurance Applied');
```

```
INSERT INTO ADJUSTMENTS (AdjustmentID, BillID, DateAdjusted, AmountAdjusted,
ReasonForAdjustment)
VALUES ('000000001', '000000002', TO_DATE('2023-11-30', 'YYYY-MM-DD'), 1050.00,
'Insurance Applied');
```

```
INSERT INTO PAYMENTS (PaymentID, BillID, DatePaid, AmountPaid, PaymentMethod)
VALUES ('000000001', '000000001', TO_DATE('2024-03-11', 'YYYY-MM-DD'), 100.00,
'Credit Card');
```

```
INSERT INTO PAYMENTS (PaymentID, BillID, DatePaid, AmountPaid, PaymentMethod)
VALUES ('000000001', '000000002', TO_DATE('2024-02-18', 'YYYY-MM-DD'), 1050.00,
'Debit Card');
```

```
INSERT INTO PAYMENTS (PaymentID, BillID, DatePaid, AmountPaid, PaymentMethod)
```

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```
VALUES ('000000001', '000000004', TO_DATE('2024-04-01', 'YYYY-MM-DD'), 100.00, 'Cash');
```

```
INSERT INTO PAYMENTS (PaymentID, BillID, DatePaid, AmountPaid, PaymentMethod) VALUES ('000000001', '000000005', TO_DATE('2023-12-11', 'YYYY-MM-DD'), 3000.00, 'Check');
```

```
INSERT INTO PAYMENTS (PaymentID, BillID, DatePaid, AmountPaid, PaymentMethod) VALUES ('000000002', '000000001', TO_DATE('2024-03-15', 'YYYY-MM-DD'), 100.00, 'Online');
```

```
INSERT INTO SERVICE (ServiceID, ServiceDescription) VALUES ('000000001', 'Heart Cath');
```

```
INSERT INTO SERVICE (ServiceID, ServiceDescription) VALUES ('000000002', 'Acne Treatment');
```

```
INSERT INTO SERVICE (ServiceID, ServiceDescription) VALUES ('000000003', 'Decompression Surgery');
```

```
INSERT INTO SERVICE (ServiceID, ServiceDescription) VALUES ('000000004', 'Bypass Surgery');
```

```
INSERT INTO SERVICE (ServiceID, ServiceDescription) VALUES ('000000005', 'Fundoplication');
```

```
INSERT INTO BILLDETAILS (BillDetailID, BillID, Quantity, Rate, Subtotal, ServiceID) VALUES ('000000001', '000000005', 1, 3000.00, 3000.00, '000000005');
```

```
INSERT INTO BILLDETAILS (BillDetailID, BillID, Quantity, Rate, Subtotal, ServiceID) VALUES ('000000001', '000000004', 1, 400.00, 400.00, '000000001');
```

```
INSERT INTO BILLDETAILS (BillDetailID, BillID, Quantity, Rate, Subtotal, ServiceID) VALUES ('000000001', '000000001', 1, 1000.00, 1000.00, '000000005');
```

```
INSERT INTO BILLDETAILS (BillDetailID, BillID, Quantity, Rate, Subtotal, ServiceID) VALUES ('000000001', '000000003', 1, 100.00, 100.00, '000000002');
```

```
INSERT INTO BILLDETAILS (BillDetailID, BillID, Quantity, Rate, Subtotal, ServiceID) VALUES ('000000001', '000000002', 1, 2000.00, 2000.00, '000000004');
```

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Queries:

Amount due for Patient Randy Moss

```
SELECT p.FirstName, p.LastName, SUM(bd.Subtotal) AS AmountDue
FROM BILLDETAILS bd JOIN Bill b ON bd.BillID = b.BillID JOIN Appointment a ON
a.AppointmentID = b.AppointmentID JOIN Patient p ON p.PatientID = a.PatientID
WHERE p.FirstName = 'Randy' AND p.LastName = 'Moss'
GROUP BY b.BILLID, p.FirstName, p.LastName;
```

	FIRSTNAME	LASTNAME	AMOUNTDUE
1	Randy	Moss	100

Office Address for Dr. Chloe Bryant

```
SELECT H.OfficeAddress
FROM HealthCareProvider H
WHERE H.ProviderName = 'Chloe Bryant';
```

	OFFICEADDRESS
1	444 Fake Road Ln. Nashville, TN 99999

Appointments on 01/21/2024 for William Ball

```
SELECT A.*
FROM Appointment A
JOIN HealthCareProvider H ON A.ProviderID = H.ProviderID
WHERE A.AppointmentDate = TO_DATE('01/21/2024', 'MM/DD/YYYY')
AND H.ProviderID = '000000003';
```

	APPOINTMENTID	APPOINTMENTDATE	REASONFORVISIT	PATIENTID	PROVIDERID
1	000000005	21-JAN-24	Difficulty swallowing	000000004	000000003

Gross Amount of Bypass Surgery done from 01/01/2021 - 05/30/2024

```
SELECT SUM(BD.Subtotal) AS Gross
FROM BillDetails BD
JOIN Service S ON BD.ServiceID = S.ServiceID
JOIN Bill B ON BD.BillID = B.BillID
WHERE S.ServiceDescription = 'Bypass Surgery'
AND B.DateIssued BETWEEN TO_DATE('2021-01-01', 'YYYY-MM-DD') AND
TO_DATE('2024-05-30', 'YYYY-MM-DD');
```

	GROSSAMOUNT
1	2000

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Payments made by patient Casey Bryant towards bill '000000001'

```
SELECT P.*
FROM Payments P
JOIN Bill B ON P.BillID = B.BillID
JOIN Appointment A ON B.AppointmentID = A.AppointmentID
JOIN Patient PA ON A.PatientID = PA.PatientID
WHERE PA.FirstName = 'Casey'
AND PA.LastName = 'Bryant'
AND B.BillID = '000000001';
```

	PAYMENTID	BILLID	DATEPAID	AMOUNTPAID	PAYMENTMETHOD
1	000000001	000000001	11-MAR-24	100	Credit Card
2	000000002	000000001	15-MAR-24	100	Online

Adjustments made for Bill '000000002' where reason for adjustment = 'Insurance Applied'

```
SELECT A.*
FROM Adjustments A
WHERE A.BillID = '000000002'
AND A.ReasonForAdjustment = 'Insurance Applied';
```

	ADJUSTMENTID	BILLID	DATEADJUSTED	AMOUNTADJUSTED	REASONFORADJUSTMENT
1	000000001	000000002	30-NOV-23	1050	Insurance Applied

Office Address for providers where specialty = 'Cardiology'

```
SELECT H.OfficeAddress
FROM HealthCareProvider H
WHERE H.Specialization = 'Cardiology';
```

	OFFICEADDRESS
1	731 Fake Road Rd. Knoxville, TN 66666
2	444 Fake Road Ln. Nashville, TN 99999

Select all patients where insurance is null

```
SELECT P.*
FROM Patient P
WHERE P.InsuranceID IS NULL;
```

	PATIENTID	FIRSTNAME	LASTNAME	BIRTHDATE	GENDER	ADDRESS	PHONENUM	INSURANCEID
1	000000006	Gerald	Green	01-APR-48	M	454 Fake Road Rd. Charleston, SC 12345	+1-443-555-8866	(null)