

HEALTHCARE INSTIUTION DATABASE

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Following database schema is designed to function as a backend storage database for a web application built to manage a Healthcare institution .

By storing information in a relational database, all the tasks related to daily functioning of the institution can be performed easily and much more efficiently.

Some of the benefits of using this system to store data over traditional paper registers are as follows:

- Updating and modifying Patients records in the hospital is much easier and efficient
- Maintaining procedures carried out diagnosis made on each patient is recorded
- Calculations like due payments can be done automatically by DBMS, thus eliminating human error
- RDBMS provides many ways to analyze available data, thus helping in making more informed decisions about inventory management and other aspects of Healthcare institution

This healthcare database contains following tables:-

- Appointments
- Claims
- Departments
- Facilities
- Insurance Plans
- Inventory
- Medical history
- Lab results
- Patients's information
- Payments
- Procedure
- Providers
- Vital signs

TABLE DESCRIPTIONS

1)Patients_info

```
CREATE TABLE Patients_Info (PatientID INT PRIMARY KEY, Name VARCHAR(100), DateOfBirth DATE, Gender VARCHAR(10), Address VARCHAR(255), ContactInformation VARCHAR(15), InsurancePlanID
```

	Field	Type	Null	Key	Default	Extra
►	LabResultNo	varchar(20)	NO	PRI	NULL	
	PatientID	int	YES	MUL	NULL	
	TestCode	varchar(10)	YES		NULL	
	Date	date	YES		NULL	
	Results	varchar(255)	YES		NULL	

2) Vital signs

```
CREATE TABLE VitalSigns ( PatientID INT, Date DATE, Time TIME, Temperature DECIMAL(4, 1), BloodPressure VARCHAR(10), HeartRate INT, FOREIGN KEY (PatientID) REFERENCES Patients_Info(PatientID));
```

	Field	Type	Null	Key	Default	Extra
►	PatientID	int	YES	MUL	NULL	
	Date	date	YES		NULL	
	Time	time	YES		NULL	
	Temperature	decimal(4,1)	YES		NULL	
	BloodPressure	varchar(10)	YES		NULL	
	HeartRate	int	YES		NULL	

3)Medical history

```
CREATE TABLE MedicalHistory ( PatientID INT, DateOfVisit DATE, Symptoms VARCHAR(255), Allergies VARCHAR(255), FOREIGN KEY (PatientID) REFERENCES Patients_Info(PatientID) );
```

	Field	Type	Null	Key	Default	Extra
►	PatientID	int	YES	MUL	NULL	
	DateOfVisit	date	YES		NULL	
	Symptoms	varchar(255)	YES		NULL	
	Allergies	varchar(255)	YES		NULL	

4) Appointments

```
CREATE TABLE Appointments ( AppointmentNo INT PRIMARY KEY, PatientID INT, ProviderID varchar(10), Date DATE, FOREIGN KEY (PatientID) REFERENCES Patients_Info(PatientID) );
```

	Field	Type	Null	Key	Default	Extra
►	AppointmentNo	int	NO	PRI	NULL	
	PatientID	int	YES	MUL	NULL	
	ProviderID	int	YES		NULL	
	Date	date	YES		NULL	

5) Procedures

```
CREATE TABLE Procedures ( PatientID INT, ProcedureCode VARCHAR(10), Date DATE, Location VARCHAR(100), FOREIGN KEY (PatientID) REFERENCES Patients_Info(PatientID));
```

	Field	Type	Null	Key	Default	Extra
►	PatientID	int	YES	MUL	NULL	
	ProcedureCode	varchar(10)	YES		NULL	
	Date	date	YES		NULL	
	Location	varchar(100)	YES		NULL	

6) Insurance plans

```
CREATE TABLE InsurancePlans ( InsurancePlanID INT PRIMARY KEY, Name VARCHAR(100), CoverageDetails VARCHAR(255));
```

	Field	Type	Null	Key	Default	Extra
►	InsurancePlanID	int	NO	PRI	NULL	
	Name	varchar(100)	YES		NULL	
	CoverageDetails	varchar(255)	YES		NULL	

7) Lab results

```
CREATE TABLE LabResults ( LabResultNo VARCHAR(20) PRIMARY KEY, PatientID INT, TestCode VARCHAR(10), Date DATE, Results VARCHAR(255), FOREIGN KEY (PatientID) REFERENCES Patients_Info(PatientID));
```

	Field	Type	Null	Key	Default	Extra
►	LabResultNo	varchar(20)	NO	PRI	NULL	
	PatientID	int	YES	MUL	NULL	
	TestCode	varchar(10)	YES		NULL	
	Date	date	YES		NULL	
	Results	varchar(255)	YES		NULL	

8) Providers

```
CREATE TABLE Providers ( ProviderID INT PRIMARY KEY, Name VARCHAR(100), Specialty VARCHAR(100), ContactInformation VARCHAR(15), Credentials VARCHAR(255));
```

	Field	Type	Null	Key	Default	Extra
►	ProviderID	int	NO	PRI	NULL	
	Name	varchar(100)	YES		NULL	
	Specialty	varchar(100)	YES		NULL	
	ContactInformation	varchar(15)	YES		NULL	
	Credentials	varchar(255)	YES		NULL	

9) Claim

```
CREATE TABLE Claims ( ClaimID INT PRIMARY KEY, PatientID INT, ProviderID INT, Date DATE, AmountBilled DECIMAL(10, 2), AmountPaid DECIMAL(10, 2), FOREIGN KEY (PatientID) REFERENCES Patients_Info(PatientID), FOREIGN KEY (ProviderID) REFERENCES Providers(ProviderID));
```

	Field	Type	Null	Key	Default	Extra
►	ClaimID	int	NO	PRI	NULL	
	PatientID	int	YES	MUL	NULL	
	ProviderID	int	YES	MUL	NULL	
	Date	date	YES		NULL	
	AmountBilled	decimal(10,2)	YES		NULL	
	AmountPaid	decimal(10,2)	YES		NULL	

10) Payments

```
CREATE TABLE Payments ( ClaimID INT, PaymentAmount DECIMAL(10, 2), Date DATE, FOREIGN KEY (ClaimID) REFERENCES Claims(ClaimID));
```

	Field	Type	Null	Key	Default	Extra
►	ClaimID	int	YES	MUL	NULL	
	PaymentAmount	decimal(10,2)	YES		NULL	
	Date	date	YES		NULL	

11) Facility

```
CREATE TABLE Facilities ( FacilityID INT PRIMARY KEY, Name VARCHAR(100), Address VARCHAR(255), ContactInformation VARCHAR(15));
```

	Field	Type	Null	Key	Default	Extra
►	FacilityID	int	NO	PRI	NULL	
	Name	varchar(100)	YES		NULL	
	Address	varchar(255)	YES		NULL	
	ContactInformation	varchar(15)	YES		NULL	

12) Inventory

```
CREATE TABLE Inventory ( InventoryItemID INT PRIMARY KEY, Description VARCHAR(255), Quantity INT, Location VARCHAR(100));
```

	Field	Type	Null	Key	Default	Extra
►	InventoryItemID	int	NO	PRI	NULL	
	Description	varchar(255)	YES		NULL	
	Quantity	int	YES		NULL	
	Location	varchar(100)	YES		NULL	

- Medical History

INSERT INTO MedicalHistory VALUES

(1, '2024-07-21', 'Fever, Cough', 'None'),
(2, '2024-07-22', 'Headache, Fatigue', 'Dust Allergy'),
(3, '2024-07-23', 'Chest Pain', 'Lactose Intolerance'),
(4, '2024-07-24', 'Skin Rash', 'Dust Allergy'),
(5, '2024-07-25', 'Back Pain', 'None'),
(6, '2024-07-26', 'Sore Throat', 'None'),
(7, '2024-07-27', 'Stomach Ache', 'Lactose Intolerance'),
(8, '2024-07-28', 'Joint Pain', 'None'),
(9, '2024-07-29', 'High Fever', 'None'),
(10, '2024-07-30', 'Migraine', 'Lactose Intolerance');

	PatientID	DateOfVisit	Symptoms	Allergies
►	1	2024-07-21	Fever, Cough	None
	2	2024-07-22	Headache, Fatigue	Dust Allergy
	3	2024-07-23	Chest Pain	Lactose Intolerance
	4	2024-07-24	Skin Rash	Dust Allergy
	5	2024-07-25	Back Pain	None
	6	2024-07-26	Sore Throat	None
	7	2024-07-27	Stomach Ache	Lactose Intolerance
	8	2024-07-28	Joint Pain	None
	9	2024-07-29	High Fever	None
	10	2024-07-30	Migraine	Lactose Intolerance

• Vital signs

INSERT INTO VitalSigns VALUES

(1, '2024-07-21', '10:30:00', 98.6, '120/80', 72),

(2, '2024-07-22', '11:00:00', 99.1, '115/75', 70),

(3, '2024-07-23', '09:15:00', 98.7, '130/85', 76),

(4, '2024-07-24', '10:45:00', 98.4, '125/80', 74),

(5, '2024-07-25', '11:30:00', 98.8, '110/70', 68),

(6, '2024-07-26', '10:00:00', 98.5, '120/78', 71),

(7, '2024-07-27', '09:45:00', 99.3, '115/72', 69),

(8, '2024-07-28', '11:15:00', 98.9, '130/90', 77),

(9, '2024-07-29', '10:15:00', 100.1, '120/85', 75),

• Appointments

INSERT INTO Appointments VALUES

(001, 1, 201, '2024-07-21'),

(002, 2, 202, '2024-07-22'),

(003, 3, 203, '2024-07-23'),

(004, 4, 204, '2024-07-24'),

(005, 5, 205, '2024-07-25'),

(006, 6, 201, '2024-07-26'),

(007, 7, 202, '2024-07-27'),

(008, 8, 203, '2024-07-28'),

(009, 9, 204, '2024-07-29'),

(0010, 10, 205, '2024-07-30');

	PatientID	Date	Time	Temperature	BloodPressure	HeartRate
▶	1	2024-07-21	10:30:00	98.6	120/80	72
	2	2024-07-22	11:00:00	99.1	115/75	70
	3	2024-07-23	09:15:00	98.7	130/85	76
	4	2024-07-24	10:45:00	98.4	125/80	74
	5	2024-07-25	11:30:00	98.8	110/70	68
	6	2024-07-26	10:00:00	98.5	120/78	71
	7	2024-07-27	09:45:00	99.3	115/72	69
	8	2024-07-28	11:15:00	98.9	130/90	77
	9	2024-07-29	10:15:00	100.1	120/85	75
	10	2024-07-30	10:30:00	98.6	118/78	73

	AppointmentNo	PatientID	ProviderID	Date
▶	1	1	201	2024-07-21
	2	2	202	2024-07-22
	3	3	203	2024-07-23
	4	4	204	2024-07-24
	5	5	205	2024-07-25
	6	6	201	2024-07-26
	7	7	202	2024-07-27
	8	8	203	2024-07-28
	9	9	204	2024-07-29
	10	10	205	2024-07-30
✱	NULL	NULL	NULL	NULL

• **Procedures**

```
INSERT INTO Procedures VALUES
(1, 'PROC001', '2024-07-21', 'Bangalore Clinic'),
(2, 'PROC002', '2024-07-22', 'Chennai Hospital'),
(3, 'PROC003', '2024-07-23', 'Pune Diagnostic Center'),
(4, 'PROC004', '2024-07-24', 'Kolkata Clinic'),
(5, 'PROC005', '2024-07-25', 'Delhi Health Center'),
(6, 'PROC001', '2024-07-26', 'Hyderabad Clinic'),
(7, 'PROC002', '2024-07-27', 'Mumbai Hospital'),
(8, 'PROC003', '2024-07-28', 'Delhi Health Center'),
(9, 'PROC004', '2024-07-29', 'Bangalore Clinic'),
(10, 'PROC005', '2024-07-30', 'Pune Diagnostic Center');
```

	PatientID	ProcedureCode	Date	Location
▶	1	PROC001	2024-07-21	Bangalore Clinic
	2	PROC002	2024-07-22	Chennai Hospital
	3	PROC003	2024-07-23	Pune Diagnostic Center
	4	PROC004	2024-07-24	Kolkata Clinic
	5	PROC005	2024-07-25	Delhi Health Center
	6	PROC001	2024-07-26	Hyderabad Clinic
	7	PROC002	2024-07-27	Mumbai Hospital
	8	PROC003	2024-07-28	Delhi Health Center
	9	PROC004	2024-07-29	Bangalore Clinic
	10	PROC005	2024-07-30	Pune Diagnostic Center

• **Lab results**

```
INSERT INTO LabResults VALUES
('L01', 1, 'TEST001', '2024-07-21', 'Normal'),
('L02', 2, 'TEST002', '2024-07-22', 'Elevated Blood Sugar'),
('L03', 3, 'TEST003', '2024-07-23', 'High Cholesterol'),
('L04', 4, 'TEST004', '2024-07-24', 'Normal'),
('L05', 5, 'TEST005', '2024-07-25', 'Vitamin D Deficiency'),
('L06', 6, 'TEST001', '2024-07-26', 'Normal'),
('L07', 7, 'TEST002', '2024-07-27', 'Elevated Blood Pressure'),
('L08', 8, 'TEST003', '2024-07-28', 'Normal'),
('L09', 9, 'TEST004', '2024-07-29', 'Normal'),
('L010', 10, 'TEST005', '2024-07-30', 'Normal');
```

	LabResultNo	PatientID	TestCode	Date	Results
▶	L01	1	TEST001	2024-07-21	Normal
	L010	10	TEST005	2024-07-30	Normal
	L02	2	TEST002	2024-07-22	Elevated Blood Sugar
	L03	3	TEST003	2024-07-23	High Cholesterol
	L04	4	TEST004	2024-07-24	Normal
	L05	5	TEST005	2024-07-25	Vitamin D Deficiency
	L06	6	TEST001	2024-07-26	Normal
	L07	7	TEST002	2024-07-27	Elevated Blood Pressure
	L08	8	TEST003	2024-07-28	Normal
	L09	9	TEST004	2024-07-29	Normal
	NULL	NULL	NULL	NULL	NULL

• Providers

INSERT INTO Providers VALUES

(201, 'Dr. Shyam Verma', 'Cardiologist', '9823456781', 'MBBS, MD'),

(202, 'Dr. Meena Pillai', 'Neurologist', '9834567812', 'MBBS, DM'),

(203, 'Dr. Anil Jain', 'Orthopedist', '9845678123', 'MBBS, MS'),

(204, 'Dr. Nisha Rao', 'Dermatologist', '9856781234', 'MBBS, MD'),

(205, 'Dr. Rakesh Kumar', 'General Physician', '9867892345', 'MBBS');

	ProviderID	Name	Specialty	ContactInformation	Credentials
▶	201	Dr. Shyam Verma	Cardiologist	9823456781	MBBS, MD
	202	Dr. Meena Pillai	Neurologist	9834567812	MBBS, DM
	203	Dr. Anil Jain	Orthopedist	9845678123	MBBS, MS
	204	Dr. Nisha Rao	Dermatologist	9856781234	MBBS, MD
	205	Dr. Rakesh Kumar	General Physician	9867892345	MBBS
•	NULL	NULL	NULL	NULL	NULL

• Insurance plans

INSERT INTO InsurancePlans VALUES

(1011, 'Star Health Insurance', 'Covers OPD,and Surgeries'),

(1022, 'Apollo Munich', 'Covers Hospitalization'),

(1033, 'Max Bupa', 'Covers Preventive Care'),

(1044, 'ICICI Lombard', 'Covers Maternity and Critical Illness'),

(1055, 'HDFC Ergo', 'Covers Comprehensive Health Plans');

	InsurancePlanID	Name	CoverageDetails
▶	1011	Star Health Insurance	Covers OPD,and Surgeries
	1022	Apollo Munich	Covers Hospitalization
	1033	Max Bupa	Covers Preventive Care
	1044	ICICI Lombard	Covers Maternity and Critical Illness
	1055	HDFC Ergo	Covers Comprehensive Health Plans
•	NULL	NULL	NULL

• Claims

INSERT INTO Claims VALUES

(401, 1, 201, '2024-07-21', 5000.00, 4000.00),

(402, 2, 202, '2024-07-22', 6000.00, 5500.00),

(403, 3, 203, '2024-07-23', 4500.00, 4000.00),

(404, 4, 204, '2024-07-24', 7000.00, 6000.00),

(404, 4, 204, '2024-07-24', 7000.00, 6000.00),

(405, 5, 205, '2024-07-25', 8000.00, 7500.00);

	ClaimID	PatientID	ProviderID	Date	AmountBilled	AmountPaid
▶	401	1	201	2024-07-21	5000.00	4000.00
	402	2	202	2024-07-22	6000.00	5500.00
	403	3	203	2024-07-23	4500.00	4000.00
	404	4	204	2024-07-24	7000.00	6000.00
	405	5	205	2024-07-25	8000.00	7500.00
•	NULL	NULL	NULL	NULL	NULL	NULL

• **Payments**

INSERT INTO Payments VALUES

(401, 4000.00, '2024-07-21'),
(402, 5500.00, '2024-07-22'),(
403, 4000.00, '2024-07-23'),
(404, 6000.00, '2024-07-24'),
(405, 7500.00, '2024-07-25');

	ClaimID	PaymentAmount	Date
▶	401	4000.00	2024-07-21
	402	5500.00	2024-07-22
	403	4000.00	2024-07-23
	404	6000.00	2024-07-24
	405	7500.00	2024-07-25

• **Facilities**

INSERT INTO Facilities VALUES

(501, 'Bangalore Clinic', 'MG Road, Bangalore', '9876543210'),
(502, 'Chennai Hospital', 'Anna Nagar, Chennai', '8765432109'),
(503, 'Pune Diagnostic Center', 'Aundh, Pune', '9876501234'),
(504, 'Kolkata Clinic', 'Salt Lake, Kolkata', '9654321987'),
(505, 'Noida Health Center', 'Sector 15, Delhi', '9988776655');

	FacilityID	Name	Address	ContactInformation
▶	501	Bangalore Clinic	MG Road, Bangalore	9876543210
	502	Chennai Hospital	Anna Nagar, Chennai	8765432109
	503	Pune Diagnostic Center	Aundh, Pune	9876501234
	504	Kolkata Clinic	Salt Lake, Kolkata	9654321987
	505	Noida Health Center	Sector 15, Delhi	9988776655
•	NULL	NULL	NULL	NULL

• **Departments**

INSERT INTO Departments VALUES

(601, 'Cardiology', '2nd Floor, Block A'),
(602, 'Radiology', '1st Floor, Block B'),
(603, 'Outpatient', 'Ground Floor, Block C'),
(604, 'Pharmacy', '1st Floor, Block D'),
(605, 'Administration', 'Ground Floor, Block E');

	DepartmentID	Name	Location
▶	601	Cardiology	2nd Floor, Block A
	602	Radiology	1st Floor, Block B
	603	Outpatient	Ground Floor, Block C
	604	Pharmacy	1st Floor, Block D
	605	Administration	Ground Floor, Block E
•	NULL	NULL	NULL

- Inventory

INSERT INTO Inventory VALUES

(701, 'Stethoscopes', 50, 'Cardiology Department'),

(702, 'X-ray Films', 100, 'Radiology Department'),

(703, 'Blood Pressure Monitors', 30, 'Outpatient Department'),

(704, 'Medicines', 500, 'Pharmacy Department'),

(705, 'Office Supplies', 200, 'Administration Department');

	InventoryItemID	Description	Quantity	Location
▶	701	Stethoscopes	50	Cardiology Department
	702	X-ray Films	100	Radiology Department
	703	Blood Pressure Monitors	30	Outpatient Department
	704	Medicines	500	Pharmacy Department
	705	Office Supplies	200	Administration Department
*	NULL	NULL	NULL	NULL

Data Definition Language (DDL)

- ALTER TABLE PATIENTS_INFO ADD unique(DateOfBirth);

	Field	Type	Null	Key	Default	Extra
►	PatientID	int	NO	PRI	NULL	
	Name	char(100)	YES		NULL	
	DateOfBirth	date	YES	UNI	NULL	
	Gender	varchar(10)	YES		NULL	
	Address	varchar(255)	YES		NULL	
	ContactInformation	varchar(15)	YES		NULL	
	InsurancePlanID	int	YES		NULL	

Data Manipulation Language

- **Update the amount paid for the claim with ClaimID 403 to 4500.00.**

UPDATE Claims

SET AmountPaid = 4500.00

WHERE ClaimID = 403;

	ClaimID	PatientID	ProviderID	Date	AmountBilled	AmountPaid
▶	401	1	201	2024-07-21	5000.00	4000.00
	402	2	202	2024-07-22	6000.00	5500.00
	403	3	203	2024-07-23	4500.00	4500.00
	404	4	204	2024-07-24	7000.00	6000.00
	405	5	205	2024-07-25	8000.00	7500.00
★	NULL	NULL	NULL	NULL	NULL	NULL

- **Insert a new claim for patient with PatientID 2, provided by ProviderID 202 on '2024-08-01', with an amount billed of 7000.00 and amount paid of 6800.00.**

INSERT INTO Claims (ClaimID, PatientID, ProviderID, Date, AmountBilled, AmountPaid)

VALUES (406, 2, 202, '2024-08-01', 7000.00, 6800.00);

	ClaimID	PatientID	ProviderID	Date	AmountBilled	AmountPaid
▶	401	1	201	2024-07-21	5000.00	4000.00
	402	2	202	2024-07-22	6000.00	5500.00
	403	3	203	2024-07-23	4500.00	4500.00
	404	4	204	2024-07-24	7000.00	6000.00
	405	5	205	2024-07-25	8000.00	7500.00
	406	2	202	2024-08-01	7000.00	6800.00
★	NULL	NULL	NULL	NULL	NULL	NULL

Data Query Language

1. COMPARISON OPERATOR

- Find all patients with a heart rate above 75.

```
SELECT p.Name, v.Date, v.HeartRate
FROM Patients_Info p
JOIN VitalSigns v ON p.PatientID = v.PatientID
WHERE v.HeartRate > 75;
```

	Name	Date	HeartRate
▶	Vikram Singh	2024-07-23	76
	Arjun Malhotra	2024-07-28	77

- Find the details of patients who visited after '2024-07-25'.

```
SELECT p.PatientID, p.Name, p.DateOfBirth, p.Gender, mh.DateOfVisit, mh.Symptoms
FROM Patients_Info p
JOIN MedicalHistory mh ON p.PatientID = mh.PatientID
WHERE mh.DateOfVisit > '2024-07-25';
```

	PatientID	Name	DateOfBirth	Gender	DateOfVisit	Symptoms
▶	6	Amit Desai	1995-09-17	Male	2024-07-26	Sore Throat
	7	Neha Patel	1983-12-11	Female	2024-07-27	Stomach Ache
	8	Arjun Malhotra	1975-04-19	Male	2024-07-28	Joint Pain
	9	Pooja Iyer	1993-08-05	Female	2024-07-29	High Fever
	10	Ravi Verma	1980-02-28	Male	2024-07-30	Migraine

- Find the inventory items available in the 'Pharmacy Department'.

```
SELECT InventoryItemID, Description, Quantity
FROM Inventory
WHERE Location = 'Pharmacy Department';
```

	InventoryItemID	Description	Quantity
▶	704	Medicines	500
•	NULL	NULL	NULL

2. Between Predicate

- List the patients who were born between 1980-01-01 and 1990-12-31.

```
SELECT * FROM Patients_Info
WHERE DateOfBirth
BETWEEN '1980-01-01' AND '1990-12-31';
```

	PatientID	Name	DateOfBirth	Gender	Address	ContactInformation	InsurancePlanID
▶	10	Ravi Verma	1980-02-28	Male	Viman Nagar, Pune	9087654321	105
	7	Neha Patel	1980-02-28	male	Marine Drive, Mumbai	8765432101	102
	1	Rajesh Kumar	1985-03-15	Male	MG Road, Bangalore	9876543210	101
	5	Priya Sharma	1988-05-30	Female	Sector 15, Delhi	9988776655	105
	4	Anjali Gupta	1990-01-25	Female	Salt Lake, Kolkata	9654321987	104
•	NULL	NULL	NULL	NULL	NULL	NULL	NULL

- List all inventory items where the quantity is between 30 and 100.

```
SELECT * FROM Inventory
WHERE Quantity BETWEEN 30 AND 100;
```

	InventoryItemID	Description	Quantity	Location
▶	701	Stethoscopes	50	Cardiology Department
	702	X-ray Films	100	Radiology Department
	703	Blood Pressure Monitors	30	Outpatient Department
•	NULL	NULL	NULL	NULL

3. ‘%’ Wildcard

- List the departments available on the '1st Floor'.

```
SELECT DepartmentID, Name, Location
FROM Departments
WHERE Location LIKE '1st Floor%';
```

	DepartmentID	Name	Location
▶	602	Radiology	1st Floor, Block B
	604	Pharmacy	1st Floor, Block D
✱	NULL	NULL	NULL

4. Sorting Records

- sort departments by their location in ascending order

```
SELECT * FROM Departments
ORDER BY Location ASC;
```

	DepartmentID	Name	Location
▶	602	Radiology	1st Floor, Block B
	604	Pharmacy	1st Floor, Block D
	601	Cardiology	2nd Floor, Block A
	603	Outpatient	Ground Floor, Block C
	605	Administration	Ground Floor, Block E
✱	NULL	NULL	NULL

- sort claims by the amount billed in descending order

```
SELECT * FROM Claims
ORDER BY AmountBilled DESC;
```

	ClaimID	PatientID	ProviderID	Date	AmountBilled	AmountPaid
▶	405	5	205	2024-07-25	8000.00	7500.00
	404	4	204	2024-07-24	7000.00	6000.00
	402	2	202	2024-07-22	6000.00	5500.00
	401	1	201	2024-07-21	5000.00	4000.00
	403	3	203	2024-07-23	4500.00	4000.00
✱	NULL	NULL	NULL	NULL	NULL	NULL

5. Limit clause

- Find the most common allergy reported among patients.

```
SELECT Allergies, COUNT(*) AS Frequency
FROM MedicalHistory
GROUP BY Allergies
ORDER BY Frequency DESC
LIMIT 1;
```

	Allergies	Frequency
▶	None	5

- Retrieve the details of the first 3 patients from the Patients Info table

```
SELECT * FROM Patients_Info
LIMIT 3;
```

	PatientID	Name	DateOfBirth	Gender	Address	ContactInformation	InsurancePlanID
▶	1	Rajesh Kumar	1985-03-15	Male	MG Road, Bangalore	9876543210	101
	2	Suman Rao	1992-07-21	Female	Anna Nagar, Chennai	8765432109	102
	3	Vikram Singh	1978-11-12	Male	Aundh, Pune	9876501234	103
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

- Retrieve the details of the latest 5 appointments based on the appointment date.

```
SELECT * FROM Appointments
ORDER BY Date DESC
LIMIT 5;
```

	AppointmentNo	PatientID	ProviderID	Date
▶	10	10	205	2024-07-30
	9	9	204	2024-07-29
	8	8	203	2024-07-28
	7	7	202	2024-07-27
	6	6	201	2024-07-26
*	NULL	NULL	NULL	NULL

6. Aggregate functions

- What is the length of the longest address in the Patients_Info table?

```
SELECT MAX(LENGTH(Address))  
AS Longest_Address_Length  
FROM Patients_Info;
```

	Longest_Address_Length
▶	24

- What is the total number of visits recorded in the MedicalHistory table?

```
SELECT COUNT(*) AS Total_Visits  
FROM MedicalHistory;
```

	Total_Visits
▶	10

7. String function

- How can you display all patient names in uppercase?

```
SELECT UPPER(Name) AS Uppercase_Name  
FROM Patients_Info;
```

	Uppercase_Name
▶	RAJESH KUMAR
	SUMAN RAO
	VIKRAM SINGH
	ANJALI GUPTA
	PRIYA SHARMA
	AMIT DESAI
	NEHA PATEL
	ARJUN MALHOTRA
	POOJA IYER
	RAVI VERMA

8. Joins

- Retrieve the list of all patients and the providers they are associated with

```
SELECT p.PatientID, p.Name AS PatientName, pr.Name AS ProviderName
FROM Patients_Info p
INNER JOIN Appointments a ON p.PatientID = a.PatientID
INNER JOIN Providers pr ON a.ProviderID = pr.ProviderID;
```

	PatientID	PatientName	ProviderName
▶	1	Rajesh Kumar	Dr. Shyam Verma
	2	Suman Rao	Dr. Meena Pillai
	3	Vikram Singh	Dr. Anil Jain
	4	Anjali Gupta	Dr. Nisha Rao
	5	Priya Sharma	Dr. Rakesh Kumar
	6	Amit Desai	Dr. Shyam Verma
	7	Neha Patel	Dr. Meena Pillai
	8	Arjun Malhotra	Dr. Anil Jain
	9	Pooja Iyer	Dr. Nisha Rao
	10	Ravi Verma	Dr. Rakesh Kumar

- Retrieve all patients and their lab results, including those patients who may not have any lab results

```
SELECT p.PatientID, p.Name AS PatientName, lr.Results
FROM Patients_Info p
LEFT JOIN LabResults lr ON p.PatientID = lr.PatientID;
```

	PatientID	PatientName	Results
▶	1	Rajesh Kumar	Normal
	2	Suman Rao	Elevated Blood Sugar
	3	Vikram Singh	High Cholesterol
	4	Anjali Gupta	Normal
	5	Priya Sharma	Vitamin D Deficiency
	6	Amit Desai	Normal
	7	Neha Patel	Elevated Blood Pressure
	8	Arjun Malhotra	Normal
	9	Pooja Iyer	Normal
	10	Ravi Verma	Normal

9. DATE

- Which patients have appointments scheduled in July 2024?

```
SELECT PatientID, Date
FROM Appointments
WHERE Date
  BETWEEN '2024-07-01' AND '2024-07-31';
```

	PatientID	Date
▶	1	2024-07-21
	2	2024-07-22
	3	2024-07-23
	4	2024-07-24
	5	2024-07-25
	6	2024-07-26
	7	2024-07-27
	8	2024-07-28
	9	2024-07-29
	10	2024-07-30

- What are the earliest and latest appointment times scheduled?

```
SELECT MIN(Date) AS EarliestDate,
  MAX(Date) AS LatestDate
FROM Appointments;
```

	EarliestDate	LatestDate
▶	2024-07-21	2024-07-30

10. Time

- Which vital signs were recorded after 10:00 AM on 2024-07-21?

```
SELECT PatientID, Date, Time, Temperature, BloodPressure, HeartRate
FROM VitalSigns
WHERE Date = '2024-07-21' AND Time > '10:00:00';
```

	PatientID	Date	Time	Temperature	BloodPressure	HeartRate
▶	1	2024-07-21	10:30:00	98.6	120/80	72

11. View

- Create a view named VitalsSummary that shows the PatientID, Name, Date, Temperature, BloodPressure, and HeartRate from the VitalSigns and Patients_Info tables.

```
CREATE VIEW VitalsSummary AS
SELECT V.PatientID, P.Name, V.Date, V.Temperature,
V.BloodPressure, V.HeartRate
FROM VitalSigns V
JOIN Patients_Info P ON V.PatientID = P.PatientID;
```

	PatientID	Name	Date	Temperature	BloodPressure	HeartRate
▶	1	Rajesh Kumar	2024-07-21	98.6	120/80	72
	2	Suman Rao	2024-07-22	99.1	115/75	70
	3	Vikram Singh	2024-07-23	98.7	130/85	76
	4	Anjali Gupta	2024-07-24	98.4	125/80	74
	5	Priya Sharma	2024-07-25	98.8	110/70	68
	6	Amit Desai	2024-07-26	98.5	120/78	71
	7	Neha Patel	2024-07-27	99.3	115/72	69
	8	Arjun Malhotra	2024-07-28	98.9	130/90	77
	9	Pooja Iyer	2024-07-29	100.1	120/85	75
	10	Ravi Verma	2024-07-30	98.6	118/78	73

- Create a view named PatientDetails that shows PatientID, Name, Gender, DateOfBirth, and ContactInformation from the Patients_Info table.

```
CREATE VIEW PatientDetails AS
SELECT PatientID, Name, Gender,
DateOfBirth, ContactInformation
FROM Patients_Info;
```

	PatientID	Name	Gender	DateOfBirth	ContactInformation
▶	1	Rajesh Kumar	Male	1985-03-15	9876543210
	2	Suman Rao	Female	1992-07-21	8765432109
	3	Vikram Singh	Male	1978-11-12	9876501234
	4	Anjali Gupta	Female	1990-01-25	9654321987
	5	Priya Sharma	Female	1988-05-30	9988776655
	6	Amit Desai	Male	1995-09-17	9876781234
	7	Neha Patel	Female	1983-12-11	8765432101
	8	Arjun Malhotra	Male	1975-04-19	9988123456
	9	Pooja Iyer	Female	1993-08-05	9876432102
	10	Ravi Verma	Male	1980-02-28	9087654321

12. Sub- query

- List the names of providers who have conducted procedures in Pune.

```
SELECT Name FROM Providers
WHERE ProviderID
IN ( SELECT ProviderID FROM Procedures
WHERE Location = 'Pune Diagnostic Center');
```

	Name
▶	Dr. Shyam Verma
	Dr. Meena Pillai
	Dr. Anil Jain
	Dr. Nisha Rao
	Dr. Rakesh Kumar

- **What is the maximum payment amount received by ProviderID = 202?**

```
SELECT MAX(PaymentAmount) AS Max_Payment
```

```
FROM Payments
```

```
WHERE ClaimID IN ( SELECT ClaimID
```

```
FROM Claims
```

```
WHERE ProviderID = 202);
```

	Max_Payment
▶	5500.00