Session 3 – SQL Basics for Analysts

Database Schema

Doctors Table

```
CREATE TABLE doctors (
    doctor_id SERIAL PRIMARY KEY,
    doctor_name VARCHAR(100),
    department VARCHAR(50)
);
```

Patients Table

```
CREATE TABLE patients (
    patient_id SERIAL PRIMARY KEY,
    patient_name VARCHAR(100),
    age INT,
    department VARCHAR(50),
    doctor_id INT,
    admission_date DATE,
    FOREIGN KEY (doctor_id) REFERENCES doctors(doctor_id)
);
```

Donations Table

```
CREATE TABLE donations (
    donation_id SERIAL PRIMARY KEY,
    patient_id INT,
    donation_date DATE,
    amount DECIMAL(10,2),
    FOREIGN KEY (patient_id) REFERENCES patients(patient_id)
);
```

Sample Data

Doctors

```
INSERT INTO doctors (doctor_name, department) VALUES
('Dr. Sharma', 'Cardiology'),
('Dr. Mehta', 'Neurology'),
('Dr. Patel', 'Orthopedics'),
('Dr. Khan', 'Oncology'),
('Dr. Iyer', 'Pediatrics');
```

Patients

```
INSERT INTO patients (patient_name, age, department, doctor_id,
   admission_date) VALUES
('Amit Verma', 45, 'Cardiology', 1, '2025-01-15'),
('Riya Sharma', 30, 'Neurology', 2, '2025-02-10'),
('Kunal Patel', 55, 'Orthopedics', 3, '2025-03-05'),
('Sana Khan', 40, 'Oncology', 4, '2025-03-12'),
('Arjun Vankani', 28, 'Cardiology', 1, '2025-04-01'),
('Meera Joshi', 35, 'Pediatrics', 5, '2025-04-15'),
('Vikram Singh', 60, 'Cardiology', 1, '2025-05-10'),
('Priya Desai', 25, 'Neurology', 2, '2025-05-20'),
('Rohan Gupta', 50, 'Oncology', 4, '2025-06-01'),
('Sneha Nair', 33, 'Orthopedics', 3, '2025-06-10'),
('Aditya Shah', 29, 'Cardiology', 1, '2025-06-18'),
('Neha Kapoor', 42, 'Pediatrics', 5, '2025-07-02'),
('Manish Yadav', 36, 'Neurology', 2, '2025-07-15'),
('Alok Tiwari', 48, 'Oncology', 4, '2025-08-01'),
('Pooja Chauhan', 39, 'Cardiology', 1, '2025-08-12');
```

Donations

```
INSERT INTO donations (patient_id, donation_date, amount) VALUES
(1, '2025-01-20', 5000),
(2, '2025-02-15', 2000),
(3, '2025-03-07', 8000),
(4, '2025-03-20', 12000),
(5, '2025-04-05', 3000),
(6, '2025-04-18', 2500),
(7, '2025-05-15', 7000),
(8, '2025-05-22', 1500),
(9, '2025-06-03', 4000),
(10, '2025-06-12', 6000),
(11, '2025-06-20', 2000),
(12, '2025-07-05', 3500),
(13, '2025-07-18', 4500),
(14, '2025-08-05', 9000),
(15, '2025-08-15', 10000),
(1, '2025-02-25', 3000),
(3, '2025-04-01', 5000),
(7, '2025-06-25', 6000),
```

```
(9, '2025-07-01', 4000),
(15, '2025-08-25', 8000);
```

Concepts and Examples

SELECT

```
SELECT patient_name, age FROM patients;
```

WHERE

```
SELECT * FROM donations WHERE amount > 5000;
```

ORDER BY

```
SELECT * FROM patients ORDER BY admission_date DESC;
```

GROUP BY

```
SELECT department, COUNT(*) AS total_patients
FROM patients
GROUP BY department;
```

HAVING

```
SELECT department, COUNT(*) AS total_patients
FROM patients
GROUP BY department
HAVING COUNT(*) > 3;
```

JOIN

```
SELECT p.patient_name, d.doctor_name, dn.amount
FROM patients p
JOIN doctors d ON p.doctor_id = d.doctor_id
JOIN donations dn ON p.patient_id = dn.patient_id;
```

Practice Queries

1. Average donation by month

```
SELECT DATE_TRUNC('month', donation_date) AS month,
       AVG(amount) AS avg_donation
FROM donations
GROUP BY DATE_TRUNC('month', donation_date)
ORDER BY month;
```

2. Patients per department

```
SELECT department, COUNT(*) AS num_patients
FROM patients
GROUP BY department
ORDER BY num_patients DESC;
```

3. Find total donations received by each doctor's patients.
4. Get the top 5 patients who donated the most.
5. List doctors with more than 20 patients.
6. Show average patient age per department.
7. Find the department with the highest number of patients.
8. Get monthly donation trends (sum per month).
9. Show patients who never made a donation.
10. Find doctors who handled patients contributing more than 50,000 in donations.
11. Show the distribution of donation amounts (bucketed ranges).
12. List the last 5 admitted patients.