**🏥 Day 68 – SQL Challenge: Healthcare Data Analytics**

**Dataset Overview**

We’ll work with **4 interconnected tables**: Patients, Doctors, Appointments, and Bills.

**1️⃣ Patients**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PatientID** | **Name** | **Gender** | **Age** | **City** | **RegistrationDate** |
| 1 | Priya Nair | F | 28 | Bengaluru | 2021-01-05 |
| 2 | Rohan Mehta | M | 35 | Delhi | 2021-03-10 |
| 3 | Fatima Noor | F | 40 | Dubai | 2020-09-15 |
| 4 | David Lee | M | 50 | New York | 2022-01-20 |
| 5 | Maria Garcia | F | 31 | Madrid | 2021-06-11 |

2️⃣ **Doctors**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DoctorID** | **Name** | **Specialization** | **Experience** | **City** |
| 101 | Dr. Sharma | Cardiologist | 15 | Delhi |
| 102 | Dr. Khan | Neurologist | 10 | Dubai |
| 103 | Dr. Patel | Orthopedic | 8 | Bengaluru |
| 104 | Dr. Watson | General | 20 | New York |
| 105 | Dr. Lopez | Dermatologist | 12 | Madrid |

3️⃣ **Appointments**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **AppointmentID** | **PatientID** | **DoctorID** | **AppointmentDate** | **Diagnosis** | **FollowUp** | **Status** |
| 201 | 1 | 103 | 2022-07-10 | Knee Pain | Yes | Completed |
| 202 | 2 | 101 | 2022-07-12 | Chest Pain | No | Completed |
| 203 | 3 | 102 | 2022-08-01 | Migraine | Yes | Completed |
| 204 | 4 | 104 | 2022-08-05 | Fever | No | Cancelled |
| 205 | 5 | 105 | 2022-08-08 | Skin Allergy | Yes | Completed |
| 206 | 1 | 103 | 2022-09-05 | Fracture | No | Completed |
| 207 | 2 | 101 | 2022-09-07 | BP Checkup | No | Completed |
| 208 | 3 | 102 | 2022-09-09 | Migraine Follow | No | Completed |
| 209 | 5 | 105 | 2022-09-15 | Acne | Yes | Completed |
| 210 | 4 | 104 | 2022-09-20 | Cold & Cough | No | Completed |

4️⃣ **Bills**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **BillID** | **AppointmentID** | **Amount** | **PaymentMode** | **BillDate** |
| 301 | 201 | 1200 | Card | 2022-07-10 |
| 302 | 202 | 2000 | UPI | 2022-07-12 |
| 303 | 203 | 2500 | Wallet | 2022-08-01 |
| 304 | 205 | 1800 | Card | 2022-08-08 |
| 305 | 206 | 2200 | Card | 2022-09-05 |
| 306 | 207 | 1900 | UPI | 2022-09-07 |
| 307 | 208 | 2700 | Card | 2022-09-09 |
| 308 | 209 | 1600 | Wallet | 2022-09-15 |
| 309 | 210 | 900 | Card | 2022-09-20 |

**💡 Day 68 – Advanced SQL Questions (Interview-Level)**

1. **JOIN Practice**  
   Display patient name, doctor name, diagnosis, and bill amount for all completed appointments.
2. **CTE + Aggregation**  
   Using a CTE, find each doctor’s total billed amount and number of patients treated.
3. **Window Function (RANK)**  
   Rank doctors by their total revenue earned from appointments.
4. **Subquery + Filtering**  
   List patients who have visited more than one doctor.
5. **CASE + Conditional Aggregation**  
   Classify each doctor based on average billing amount:
   * “High Revenue” (>2000)
   * “Moderate Revenue” (1000–2000)
   * “Low Revenue” (<1000)
6. **Correlated Subquery**  
   Find doctors who have an average bill higher than the overall hospital average.
7. **Date Functions**  
   Find patients who visited again within 30 days of a previous appointment.
8. **Nested CTE + Analytics**  
   Using nested CTEs, calculate each city’s total hospital revenue and find the top-performing doctor in each city.
9. **Window Function (LAG)**  
   For each patient, calculate the number of days between consecutive appointments.
10. **Real-World Hospital KPI Query (Advanced)**  
    Find the **doctor with the highest repeat patient percentage** (number of follow-up appointments ÷ total appointments \* 100).
11. **🚀 Bonus Challenge (Complex Analytical Logic)**  
    Identify the **most profitable city**, where the average bill per appointment multiplied by the number of appointments is the highest — show city name, total revenue, and top contributing doctor.