**📘 Day 49 – SQL Challenge**

**Dataset: Hospital Management System**

**Doctors**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DoctorID** | **Name** | **Specialty** | **JoinDate** | **Salary** |
| 1 | Dr. Smith | Cardiology | 2020-01-01 | 120000 |
| 2 | Dr. Lee | Neurology | 2021-03-10 | 110000 |
| 3 | Dr. Patel | Orthopedics | 2019-06-20 | 95000 |
| 4 | Dr. Brown | Pediatrics | 2022-01-15 | 90000 |
| 5 | Dr. Green | General Surgery | 2020-09-01 | 100000 |

**Patients**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PatientID** | **Name** | **Age** | **Gender** | **Country** |
| 1 | Alice | 34 | F | USA |
| 2 | Bob | 45 | M | India |
| 3 | Charlie | 29 | M | UK |
| 4 | David | 55 | M | Canada |
| 5 | Emma | 40 | F | India |

**Appointments**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **AppointmentID** | **PatientID** | **DoctorID** | **AppointmentDate** | **Status** | **Fees** |
| 101 | 1 | 1 | 2023-01-05 | Completed | 300 |
| 102 | 2 | 2 | 2023-01-06 | Cancelled | 0 |
| 103 | 3 | 3 | 2023-02-01 | Completed | 250 |
| 104 | 4 | 1 | 2023-02-15 | Completed | 350 |
| 105 | 5 | 4 | 2023-02-20 | No Show | 0 |
| 106 | 1 | 5 | 2023-03-01 | Completed | 400 |
| 107 | 2 | 2 | 2023-03-05 | Completed | 320 |
| 108 | 3 | 3 | 2023-03-10 | Completed | 270 |
| 109 | 5 | 1 | 2023-04-01 | Completed | 310 |
| 110 | 4 | 5 | 2023-04-05 | Completed | 380 |

**❓ Day 49 Questions (Intermediate → Advanced)**

1. **Doctor Revenue**  
   Find the total revenue generated by each doctor (Completed appointments only).
2. **Most Frequent Patients**  
   List patients who visited the hospital more than **2 times**.
3. **Specialty Popularity**  
   Rank doctor specialties based on the number of appointments.
4. **Cancellation & No-Show Rate**  
   Calculate the % of appointments that were Cancelled or No Show per doctor.
5. **High Revenue Patients**  
   Identify patients whose total spend is **greater than 500**.
6. **Monthly Revenue Trend**  
   Show month-wise total revenue and compare with the previous month using LAG.
7. **Average Fees by Specialty**  
   Find average consultation fees per specialty.
8. **Doctors with Cross-Country Patients**  
   Find doctors who treated patients from **more than 1 country**.
9. **Longest Serving Doctor**  
   Find the doctor with the longest tenure in the hospital.
10. **Window Function – Patient Ranking**  
    Rank patients by their total spend within their country.

**🎯 Bonus Challenge (Advanced)**

1. **Doctor Utilization Rate**  
   Assume each doctor can take **20 appointments per month**.  
   Calculate doctor utilization = (Completed Appointments ÷ 20) × 100 for each month.