**📘 Day 53 – SQL Challenge**

**Dataset: E-Commerce Orders & Payments**

**Customers**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CustomerID** | **Name** | **Country** | **JoinDate** | **Tier** |
| 1 | Alice | USA | 2021-01-01 | Gold |
| 2 | Bob | India | 2021-03-15 | Silver |
| 3 | Charlie | UK | 2022-02-20 | Bronze |
| 4 | David | Canada | 2022-07-10 | Silver |
| 5 | Emma | India | 2023-01-05 | Gold |

**Orders**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OrderID** | **CustomerID** | **OrderDate** | **Status** | **TotalAmount** |
| 101 | 1 | 2023-01-10 | Completed | 300 |
| 102 | 2 | 2023-01-12 | Cancelled | 0 |
| 103 | 3 | 2023-02-01 | Completed | 450 |
| 104 | 4 | 2023-02-18 | Completed | 120 |
| 105 | 5 | 2023-03-01 | Completed | 700 |
| 106 | 1 | 2023-03-05 | Completed | 200 |
| 107 | 2 | 2023-03-12 | Completed | 350 |
| 108 | 3 | 2023-04-01 | Completed | 500 |
| 109 | 4 | 2023-04-10 | Completed | 150 |
| 110 | 5 | 2023-04-15 | Completed | 600 |

**Payments**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PaymentID** | **OrderID** | **PaymentDate** | **Mode** | **Amount** |
| 1 | 101 | 2023-01-10 | Card | 300 |
| 2 | 103 | 2023-02-01 | PayPal | 450 |
| 3 | 104 | 2023-02-18 | Card | 120 |
| 4 | 105 | 2023-03-01 | NetBanking | 700 |
| 5 | 106 | 2023-03-05 | Card | 200 |
| 6 | 107 | 2023-03-12 | UPI | 350 |
| 7 | 108 | 2023-04-01 | Card | 500 |
| 8 | 109 | 2023-04-10 | PayPal | 150 |
| 9 | 110 | 2023-04-15 | Card | 600 |
| 10 | 102 | 2023-01-12 | Card | 0 |

**❓ Day 53 Questions (Intermediate → Advanced + Optimization)**

1. **Revenue by Country**  
   Find the total confirmed revenue contributed by each country.
2. **Customer Lifetime Value**  
   Calculate total spend of each customer and rank them.
3. **Cancellation Rate**  
   Compute the percentage of cancelled orders for each country.
4. **Monthly Sales Trend**  
   Show total monthly revenue and compare with the previous month using LAG.
5. **Top Payment Mode**  
   Identify the most frequently used payment mode for completed orders.
6. **Customer Repeat Rate**  
   Find customers who have placed more than 2 completed orders.
7. **Window Function – Order Timeline**  
   For each customer, display their order history along with previous order amount (LAG).
8. **Revenue by Tier**  
   Find average spend per order for each loyalty tier.
9. **Late Payment Check**  
   Find orders where the payment date was later than the order date.
10. **High-Value Orders**  
    List orders where amount > average order value (use subquery).

**🎯 Bonus Challenge (Advanced & Optimization)**

1. **Query Optimization Scenario**  
   Suppose the Orders table has **10 million rows** and queries involving OrderDate filtering are slow.

* Write a query to get **monthly revenue for 2023**.
* Suggest which **index(es)** you would create to optimize such queries and why.