**💼 Day 70 – SQL Challenge: Sales, Profit & Customer Retention Analytics**

**Dataset Overview**  
Customers, Products, Sales, and Returns.

1️⃣ **Customers**

|  |  |  |  |
| --- | --- | --- | --- |
| **CustomerID** | **Name** | **Region** | **JoinDate** |
| 1 | Priya Nair | South | 2020-03-15 |
| 2 | Rohan Mehta | North | 2021-02-10 |
| 3 | Maria Garcia | West | 2020-06-05 |
| 4 | David Lee | East | 2022-01-20 |
| 5 | Fatima Noor | South | 2019-12-01 |

2️⃣ **Products**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ProductID** | **ProductName** | **Category** | **UnitPrice** | **CostPrice** |
| 101 | Laptop | Electronics | 60000 | 48000 |
| 102 | Smartphone | Electronics | 30000 | 22000 |
| 103 | Chair | Furniture | 5000 | 3500 |
| 104 | Table | Furniture | 8000 | 6000 |
| 105 | Headphones | Accessories | 2000 | 1000 |

3️⃣ **Sales**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SaleID** | **CustomerID** | **ProductID** | **Quantity** | **SaleDate** | **PaymentMode** | **Region** |
| 201 | 1 | 101 | 2 | 2022-07-05 | Card | South |
| 202 | 2 | 102 | 3 | 2022-07-07 | UPI | North |
| 203 | 3 | 103 | 5 | 2022-07-08 | Wallet | West |
| 204 | 4 | 105 | 6 | 2022-07-10 | Card | East |
| 205 | 5 | 104 | 4 | 2022-07-12 | Card | South |
| 206 | 1 | 102 | 2 | 2022-08-01 | Card | South |
| 207 | 2 | 101 | 1 | 2022-08-05 | Wallet | North |
| 208 | 3 | 105 | 4 | 2022-08-07 | UPI | West |
| 209 | 5 | 103 | 2 | 2022-08-10 | Card | South |
| 210 | 4 | 102 | 3 | 2022-08-15 | Wallet | East |

4️⃣ **Returns**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ReturnID** | **SaleID** | **ReturnDate** | **RefundAmount** | **Reason** |
| 301 | 203 | 2022-07-15 | 2500 | Damaged Product |
| 302 | 204 | 2022-07-20 | 4000 | Wrong Item |
| 303 | 209 | 2022-08-20 | 5000 | Customer Dissatisfaction |

**💡 Day 70 – Advanced SQL Questions (Real-World & Analytical)**

1. **JOIN Practice**  
   Display each sale with customer name, product name, category, and total sale amount (Quantity \* UnitPrice).
2. **CTE + Profit Analysis**  
   Using a CTE, calculate profit ((UnitPrice - CostPrice) \* Quantity) for each sale and find which category generated the highest total profit.
3. **Subquery + Filtering**  
   List customers whose total sales value exceeds the *average total sales value* of all customers.
4. **CASE + Conditional Logic**  
   Classify customers as:
   * “High Value” (Total purchase > ₹1,00,000)
   * “Medium Value” (₹50,000–₹1,00,000)
   * “Low Value” (<₹50,000)
5. **Window Function (RANK)**  
   Rank each customer by total profit contribution across all orders.
6. **LAG Function (Time Gap)**  
   For each customer, calculate the number of days between consecutive purchases.
7. **Nested CTE + Category Analysis**  
   Using nested CTEs, calculate total revenue and return loss for each category, and compute the **net category profit**.
8. **Correlated Subquery**  
   Find customers who purchased a product that was later returned by any other customer.
9. **Analytical Query (Percentage Contribution)**  
   For each region, find the percentage contribution of each category to total regional revenue (rounded to 2 decimals).
10. **Real-World KPI (Customer Retention)**  
    Identify **repeat customers** — customers who made purchases in more than one month — and show their total spend and profit.
11. **🚀 Bonus Challenge (Complex Analytical Logic)**  
    Find the **most profitable region** after adjusting for returns.  
    Formula:  
    Net Profit = Total Sales Profit – Total Refund Amount  
    Display region name, total profit, total refunds, and net profit percentage.