**Day 4 – Lab Document**

**Track**: SQL Fundamentals for Analytics  
**Focus**: Joins, Aggregations, Filtering, Subqueries, and Window Functions

**Lab 1: Multi-table Joins and Filtering**

**Objective**

Practice joining multiple tables and applying filters using WHERE and HAVING clauses.

**Dataset**

* customers (id, name, region)
* orders (id, customer\_id, order\_date, amount)
* regions (region\_id, region\_name)

**Tasks**

1. Write an SQL query to join customers and orders to get customer names with their total order amount.
2. Extend the query to include region name from the regions table.
3. Filter records where the total order amount > 10,000.
4. Use HAVING clause to filter customers with more than 2 orders.

**Expected Output**

A list of high-value customers with their regions and order stats.

**Lab 2: Subqueries and Conditional Aggregation**

**Objective**

Learn to apply subqueries inside SELECT and WHERE clauses. Use conditional logic in aggregation.

**Dataset**

* Use the same dataset as Lab 1.

**Tasks**

1. Get the most recent order amount per customer using a subquery.
2. Create a query to count:
   * Total orders
   * Number of orders above 5000
   * Number of orders below 1000  
     (Hint: Use SUM(CASE WHEN ...))
3. Use a subquery to get the customer with the **highest number of orders**.

**Expected Output**

Tables showing aggregate metrics with condition-based counts.

**Lab 3: Window Functions – Ranking and Deduplication**

**Objective**

Apply SQL window functions like ROW\_NUMBER, RANK, and LAG to generate insights and remove duplicates.

**Dataset**

* page\_views (id, user\_id, page, view\_time)

**Tasks**

1. Use ROW\_NUMBER() to get the latest page view per user.
2. Use LAG() to calculate the time difference between consecutive page views per user.
3. Use RANK() to list top 3 viewed pages per user based on frequency.

**Expected Output**

Windowed tables with row numbers, time gaps, and rank per user.

| **File/Query Name** | **Description** |
| --- | --- |
| lab1\_joins.sql | Joins with filtering and group conditions |
| lab2\_subqueries.sql | Subqueries and conditional aggregates |
| lab3\_window\_funcs.sql | Window functions and deduplication logic |