Advanced Analytics Using SQL Window Functions

Project Title:

Advanced Analytics Using SQL Window Functions

Overview:

This project demonstrates the power of SQL window functions for advanced analytics and business insights. It goes beyond basic ranking to solve real-world challenges involving normalization, trend analysis, contribution tracking, and conditional logic.

Using a rich sales and customer dataset, the project implements performance segmentation, rolling averages, loyalty labeling, and contribution breakdowns — making it ideal for data analysts, reporting developers, and dashboard teams.

Skills Demonstrated:

- Z-Score Normalization using AVG and STDEV with CROSS JOIN
- 3-record moving average with ROWS BETWEEN in OVER()
- Contribution % of product sales to region totals using nested aggregates
- Conditional ranking using CASE inside RANK()
- Labeling top customers per region with custom tags using RANK + CASE
- Time-based trend smoothing and categorical filtering
- Composite metrics and smart formatting

Key Highlights:

1. Standardize customer loyalty scores using statistical methods.
2. Smooth sales data trends using 3-row moving averages.
3. Show % contribution of each product to regional monthly totals.

4. Rank and label top 3 loyal customers in every region.

5. Apply category-based ranking logic using CASE inside window functions.

6. Use formatted and flattened outputs suitable for business dashboards.

Ideal For:

Clients looking for SQL-based solutions for analytics, dashboards, customer segmentation, trend tracking, and marketing insight generation.