Employee & Performance Analytics Using SQL CTEs and Recursion

Project Title:

Employee & Performance Analytics Using SQL CTEs and Recursion

Overview:

This project demonstrates a wide range of SQL Common Table Expressions (CTEs) — from basic aggregation and filtering to complex recursive logic for hierarchy modeling, advanced ranking, and organizational reporting.

It uses a comprehensive HR and project dataset to simulate real-world analytics and dashboards commonly seen in enterprise environments.

Skills Demonstrated:

- Basic and Multi-level CTEs

- Recursive CTEs for hierarchy, reporting chains, and tree flattening

- Aggregation logic: average, count, sum, group by

- Department-level metrics and headcounts

- Performance scoring and grade assignment

- Statistical outlier detection using standard deviation

- Team size computation using recursion

- Employee-project assignments and recency analysis

- Age and birthday tracking using computed fields

Key Highlights:

1. Use of multiple CTEs to separate logic cleanly.

2. Build and flatten employee-manager hierarchies with recursion.

3. Identify top performers using rank functions inside CTEs.

4. Assign grades (A/B/C) based on performance thresholds.

5. Track upcoming birthdays using CTE + date functions.

6. Calculate total team size reporting to each manager using recursion.

7. Analyze project workload and detect outliers by department.

8. Join CTE results with core HR tables for meaningful insights.

Ideal For:

Clients needing structured SQL reports, data pipeline logic, or organizational analytics using advanced SQL CTE techniques — including dashboards, HR tools, and enterprise data transformation logic.