Day 21 – SQL Reflection Document

Summary

Day 21 involved solving complex SQL queries on a School Enrollment & Performance System dataset. The dataset simulated a real-world academic scenario with four interconnected tables: Students, Courses, Enrollments, and Performance.

Key Learnings & Experiences

1. All questions were tough and required logical depth and time to implement.

2. Applied JOINs, CTEs, window functions like RANK and ROW_NUMBER, and aggregate functions across questions.

3. The schema design included smart use of constraints like CHECKs, DEFAULTs, and ON UPDATE CASCADE.

4. Introduced indexing for optimization and uniqueness constraints for performance data consistency.

Additional Points from Today's Practice

• For Question 1, changed the approach to focus on students actively enrolled in courses with department details.

• Question 3 and 4 were particularly time-consuming due to their logic-heavy multi-layer JOIN and filtering logic.

• Learned to use correlated subqueries and NOT EXISTS to find students who never scored above 75.

• For Question 6, used STRING_AGG to list courses per student which was a new formatting enhancement.

• Learned to use DISTINCT with JOINs and filter logic on date/year for Question 7.

• Question 10 taught how to compare student marks with course-wise averages using CTEs.

• Bonus Challenge introduced advanced logic to rank students per department and show the top performer using RANK().

Reflection

Day 21 proved to be a tough but rewarding challenge. The increased logical complexity pushed me to experiment with different techniques and deepen my understanding of SQL. From advanced filtering to complex ranking problems, each query helped sharpen my problem-solving instincts.