

Course Title: Advanced Database Management Systems

Assignment Title:

Query Optimization and Execution Analysis

Objective:

Each student will use a unique SQL query or workload. The goal is to:

1. Analyze the query performance under different execution strategies.
 2. Apply optimization techniques.
 3. Provide performance comparison
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Assignment Structure:

◆ Part 1: Initial Query & Plan

- Write the given SQL query.
- Use the `EXPLAIN` or `EXPLAIN ANALYZE` feature in a DBMS (PostgreSQL, MySQL, or BigQuery).
- Identify the initial execution plan, including:
 - Join order
 - Use of indexes
 - Estimated cost and rows

◆ Part 2: Optimization Techniques

- Apply at least 2 of the following:
 - Rewriting subqueries
 - Pushing selections/projections
 - Creating or modifying indexes
 - Changing join order
 - Using materialized views

◆ Part 3: Performance Comparison

- Compare original vs. optimized plans using execution times and query costs.
- Provide graphs or tables where applicable.

Due Date: 18/5/2025