

## DB2 for z/OS Application Performance &amp; Tuning

**LENGTH: 2 Days**

**Course Description:** Review overall DB2 SQL Performance Considerations. Discuss the issues in Performance “problems”. Discuss the “behavior” or “mis-behavior” of the DB2 Optimizer. Explore DB2 SQL performance issues as revealed via the EXPLAIN Plan / VISUAL EXPLAIN feature. The major columns PLAN\_TABLE and DSN\_STATEMNT\_TABLE are analyzed in detail. The results of the DB2 EXPLAIN Plan / VISUAL EXPLAIN process are reviewed to obtain insights into the Way(s) that the Optimizer chooses the access path to access DB2 data.

Extensive workshops allow the students to test the performance “goodness” of several SQL statements.

The Performance Guidelines are applied to COBOL Application programs. Discuss how & when the Optimizer uses Filter Factors based on Valid Statistics & Defaults

**Audience:** This course is for experienced Data Processing personnel who have used SQL and need to explore Application Performance and Tuning issues for BOTH standalone SQL and in COBOL Application programs.

**Prerequisites:** At least six months experience using DB2 SQL and COBOL Programming experience is needed.

**Topics:****Day 1**

- DB2 SQL Performance Introduction
- What makes up the Major elements of DB2 SQL Performance?
- What “causes” DB2 SQL Performance Problems?
- How can we “improve” DB2 SQL Performance?
- Filter Factors
- Indexes are NOT free & How to determine their cost
- Performance Overview with Guidelines
- Workshop - EXPLAIN Plan / VISUAL EXPLAIN and analyze results
- Stage 1 and Stage 2 Predicates
- Tuning Guidelines and Examples
- EXPLAIN Plan / VISUAL EXPLAIN with Examples – TS, MIS, NMIS, IXONLY, SORT, Part Scan
- WorkShop - More EXPLAIN Plan / VISUAL EXPLAIN exercises - Part 1
- SQL RE-Coding Guidelines
- WorkShop – Re-Formatting SQL Statements
- Using EXPLAIN Plan / VISUAL EXPLAIN to improve SQL Performance
- WorkShop - More EXPLAIN Plan / VISUAL EXPLAIN exercises - Part 2
- The DSN\_STATEMNT\_TABLE
- Improving SQL statements using EXPLAIN Plan / VISUAL EXPLAIN results



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- WorkShop - EXPLAIN Plan / VISUAL EXPLAIN - DSN\_STATEMNT\_TABLE / PLAN\_TABLE

### Day 2

- Join Performance Analysis - The 3 Join Methods, Influencing the Join Method????
- WorkShop - EXPLAIN Plan / VISUAL EXPLAIN –Join Performance Analysis
- SubQuery Analysis - Single Valued, Multiple Valued, Correlated
- WorkShop - EXPLAIN Plan / VISUAL EXPLAIN –SubQuery Performance Analysis
- UNION Analysis - The “Good” and the “Bad” of UNION
- WorkShop - EXPLAIN Plan / VISUAL EXPLAIN –UNION Performance Analysis
- Application Program Performance Analysis – REOPT, Optimize for N rows, Dynamic SQL, PK & FK, Prefetch, Correlated Columns, Massive Batch Jobs, Massive Online Jobs
- WorkShop - EXPLAIN Plan / VISUAL EXPLAIN – COBOL Program Performance Analysis
- VQUBE – Very Quick Upper Bound Estimate
- Accounting Trace
- Performance Monitors
- Visual Explain, Performance Analyzer

### Appendices

Appendix A - IBM Sample Tables
Appendix B – Bibliography
Appendix C - EXPLAIN PLAN Statement – PLAN_TABLE and DSN_STATEMNT_TABLE
Appendix D - Plan Analyzer
Appendix E – Workshop Exercises



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Notes: