

CLASS: Optimizing Oracle SQL, Intensive – 5 Days

The five-day course is approximately 60% instructor-led lecture and discussion, 40% in-class exercises on provided on-line Oracle environment. Each environment is configured to provide a standalone Oracle unit testing database in which to complete lab exercises and conduct experiments.

The instructors place a special emphasis on teaching students to think and test for themselves instead of relying on widely believed but unfortunately unreliable rules of thumb.

Introduction

Course welcome, instructor and student introductions.

Fundamentals

Course unit testing environment

Terms and definitions: LIO, PIO, latching, buffer cache, library cache, etc.

Fundamentals of testing: Understanding and measuring statement resource consumption

SQL statement execution fundamentals: PARSE, EXECUTE, BIND, FETCH, arraysize issues, etc. Tools for SQL

Statement Problem Diagnosis and Repair: statistics report, block and row selectivity report, execution plans

Oracle 10046 and 10053 trace data collection and analysis

The Optimizer

Oracle query optimizer technologies (RBO, CBO)

Optimizer query transformation behaviors : view merging, subquery unnesting, predicate pushing, etc.

Optimizer parameters, Optimizer hints, Stored outlines

Statistics collection, Managing and manipulating statistics , Histograms, Extended Column statistics

Selectivity

Access methods

Compare and contrast access methods: table access full, access by rowid, etc.

Index scan type overview: index unique scan, index range scan, index skip scan, index fast full scan, index full scan, index joins, etc.

Join methods

Compare and contrast join methods: nested loops, hash join, sort/merge join, and cartesian join

Review conditions under which each method offers best and worst performance

Execution plans

Capturing and displaying execution plans

Review dynamic views associated with execution plans: V\$SQL\_PLAN, V\$SQL\_PLAN\_STATISTICS, etc.

How to read and analyze execution plans Creating and using plan tree diagrams

Using Indexes Effectively

Coding techniques that may prevent index use:

- column expressions
- implicit datatype conversion
- indexing null values
- impact of composite key order

Indexes and Performance

Function-based indexes, Index-organized tables, Bitmap indexes, etc.

Writing SQL "Right"

IN-Lists: how they work and alternatives Expressions using CASE, COALESCE and NULLIF ANTI and SEMI joins

Scalar subqueries

WITH clause subquery factoring

Analytic functions

Using ROWNUM