

# Introduction to Tuning Oracle SQL

CDT683

This course provides an introduction to tuning SQL and PL/SQL to improve performance. Students will learn concepts including the optimizer, statement processing, and execution plans. They will learn to use several tools to investigate how and why statements are executed in specific ways, how to change execution, and how to measure the effects of various changes. This course does not cover tuning the database itself by means such as adjusting memory allocation.

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## Audience

- Application developers, system analysts, and DBAs who need to know how to improve the performance of their SQL commands and PL/SQL code by changing the code itself.

## Prerequisites

- Students must have a good foundation in the basics of manipulating databases using SQL and PL/SQL, including the ability to use an Oracle interface such as SQL\*Plus or iSQL.

## Course Length

- Three Days

## Teaching Methods

- Lectures and examples
  - Hands-on exercises
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## Course Outline

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### Introduction

- Why Tuning is Needed
- The Goals of SQL Tuning
- The Optimizer
- Barriers to SQL Tuning
- The Process of SQL Tuning
- Other Factors in Oracle Tuning

- Hints
- Joins
- Views
- Subqueries
- Sorts
- SELECT
- Predicates
- RANK

### SQL Statement Processing

- The SQL Statement Processing Steps
- CBO Statistics
- Parsing

### Optimization

- How the Oracle Optimizer works
- Cost-Based Optimization
- Hints

### EXPLAIN PLAN and AUTOTRACE

- Using EXPLAIN PLAN to view the optimizer's execution plan
- Creating a table to hold the execution plan
- Viewing the contents of the plan table with a utility
- Viewing the contents of the plan table with a script to select desired fields
- Clearing the plan table
- Using AUTOTRACE to view the execution plan
- Using AUTOTRACE to generate resource usage statistics
- AUTOTRACE options
- Using TIMING to determine elapsed time

### SQL\_TRACE and TKPROF

- Using SQL\_TRACE to generate execution statistics
- Using TKPROF to format the trace output
- Calculating performance ratios in trace output
- Comparing SQL\_TRACE to AUTOTRACE

### OUTLINE

- Creating a permanent optimization plan

### Special Topics

- Materialized Views and Query Rewrite
- Parallel Query
- Index Clusters
- Bitmapmed Index
- Function-Based Index
- Histograms
- Star Query
- Partitions

### Improving SQL Performance

- Processing Options
- Table Access Methods
- Index Access Methods
- Join Operations
- Table Scans
- Indexes

### Summary

- The Tuning Environment
- A Process for SQL Tuning