# Oracle Database 11g: SQL Tuning Workshop

This Database 11g SQL Tuning Workshop training teaches database developers, DBAs and SQL developers to identify and tune inefficient SQL statements. Learn how to investigative methods to reveal how the Oracle database executes the SQL statement.

## Learn To

This Oracle Database 11g: SQL Tuning Workshop Release 2 training assists database developers, DBAs and SQL developers in identifying and tuning inefficient SQL statements. You'll explore investigative methods to reveal varying levels of detail about how the Oracle database executes the SQL statement; this helps you determine the root causes of the inefficient SQL statements.

**Learn To:**

- Use Oracle tools to identify inefficient SQL statements.
- Use Automatic SQL Tuning.
- Use Real Time SQL monitoring.
- Write more efficient SQL statements.
- Monitor and trace high load SQL statements.
- Manage optimizer statistics on database objects.
- Interpret execution plans, and the different ways in which data can be accessed.

**Benefits to You**

Gain expertise in relational database data management as you learn how to effectively use SQL commands against your business data. These features will help you query and manipulate data within the database, use the dictionary views to retrieve metadata and create reports about their schema objects.

**Explore the Optimizer**

Expert instructors will also help you explore how the optimizer chooses the path. You'll also learn how to influence the optimizer to ensure the best method is used.

**Automatic SQL Tuning Tools**

This course covers Automatic SQL Tuning tools and resources available in the Automatic Workload Repository. Furthermore, take advantage of bind variables, trace files and different types of indexes.

**Note: this course is based on Oracle Database 11g Release 2.**

## Prerequisites

## Audience

- Administrator
- Database Administrator
- Developer

## Course Objectives

- Trace an application through its different levels of the application architecture
- Understand how the Query Optimizer makes decisions about how to access data
- Define how optimizer statistics affect the performance of SQL
- List the possible methods of accessing data, including different join methods
- Identify poorly performing SQL
- Modify a SQL statement to perform at its best

# Course Topics

### Exploring the Oracle Database Architecture

- Oracle Database Server Architecture: Overview
- Connecting to the Database Instance
- Physical Structure
- Oracle Database Memory Structures: Overview
- Automatic Shared Memory Management
- Automated SQL Execution Memory Management
- Database Storage Architecture, Logical and Physical Database Structures
- Segments, Extents, and Blocks & SYSTEM and SYSAUX Tablespaces

### Introduction to SQL Tuning

- Reason for Inefficient SQL Performance
- Performance Monitoring Solutions
- Monitoring and Tuning Tools: Overview
- CPU and Wait Time Tuning Dimensions
- Scalability with Application Design, Implementation, and Configuration
- Common Mistakes on Customer systems & Proactive Tuning Methodology
- Simplicity in Application Design
- Data Modeling, Table Design, Index Design, Using Views, SQL Execution Efficiency, Overview of SQL*Plus & SQL Developer

### Introduction to the Optimizer

- Structured Query Language
- SQL Statement Parsing: Overview
- Why Do You Need an Optimizer?
- Optimization During Hard Parse Operation
- Transformer & Estimator
- Cost-Based Optimizer
- Plan Generator
- Controlling the Behavior of the Optimizer, Optimizer Features and Oracle Database Releases

### Interpreting Execution Plans

- What Is an Execution Plan? Where To Find Execution Plans and Viewing Execution Plans
- Plan Table & AUTOTRACE
- Using the V$SQL_PLAN View
- Automatic Workload Repository (AWR)
- SQL Monitoring: Overview
- Interpreting an Execution Plan
- Reading More Complex Execution Plans and Reviewing the Execution Plan

- Looking Beyond Execution Plans

## Application Tracing

- End-to-End Application Tracing Challenge
- Location for Diagnostic Traces
- What is a Service? Use Services with Client Applications & Tracing Services
- Use Enterprise Manager to Trace Services
- Session Level Tracing: Example
- The trcsess Utility and SQL Trace File Contents
- Invoking the tkprof Utility and Output of the tkprof Command
- tkprof Output with and without Index: Example

## Optimizer: Table and Index Operations

- Row Source Operations, Main Structures and Access Paths
- Full Table Scan
- Indexes: Overview and B*-tree Indexes and Nulls
- Using Indexes: Considering Nullable Columns
- Index-Organized Tables
- Bitmap Indexes, Bitmap Operations and Bitmap Join Index
- Composite Indexes and Invisible Index
- Guidelines for Managing Indexes and Investigating Index Usage