Oracle 21c SQL - Course Details

Course Objective

To provide a thorough understanding of Oracle 21c SQL for querying, managing, and manipulating relational databases, including new features and enhancements introduced in Oracle Database 21c.

Target Audience

- Students and IT graduates
- Aspiring Database Developers and Administrators
- Data Analysts and Business Intelligence professionals
- Software Developers using Oracle as backend

Prerequisites

- No prior SQL experience required

Learning Outcomes:

- Master SQL fundamentals using Oracle 21c
- Write efficient queries to extract, filter, and analyze data
- Create and manage database structures (tables, indexes, views)
- Understand Oracle-specific enhancements in SQL
- Use advanced features like JSON, Analytical Functions, and Multitenancy

Course Content

Introduction to Oracle 21c

Introduction to databases.

Overview of Oracle Database 21c.

What's new in 21c.

Oracle Client Tools: SQL*Plus, SQL Developer, Oracle Live SQL.

Database setup (local/cloud), using Oracle Live SQL.

SQL Basics

What is SQL? Types of SQL (DQL, DDL, DML, DCL, TCL.

SQL Syntax and execution flow.

SELECT statements.

WHERE clause and filtering.

ORDER BY clause.

Aliasing, Literals, and Expressions.

Functions and Operators

- Arithmetic, Comparison, Logical operators
- Single-row functions:
    - String (UPPER, LOWER, SUBSTR)
    - Number (ROUND, TRUNC)
    - Date functions (SYSDATE, MONTHS_BETWEEN)
    - Conversion functions (TO_CHAR, TO_DATE, CAST)
- NVL, COALESCE, NULLIF

Data Aggregation and Grouping

GROUP BY and HAVING clauses.

Aggregate functions (SUM, COUNT, AVG, MIN, MAX).

GROUPING SETS, ROLLUP, CUBE.

Joins and Subqueries

Types of joins: INNER, LEFT OUTER, RIGHT OUTER, FULL OUTER.

Cross join, Self join.

Subqueries: Scalar, Correlated, EXISTS/NOT EXISTS.

Using subqueries in SELECT, WHERE, and FROM clauses.

Data Manipulation (DML)

INSERT, UPDATE, DELETE statements.

MERGE (UPSERT) operations.

RETURNING INTO clause.

Transaction control: COMMIT, ROLLBACK, SAVEPOINT.

Data Definition (DDL)

CREATE, ALTER, DROP statements.

Table constraints: PRIMARY KEY, FOREIGN KEY, NOT NULL, UNIQUE, CHECK.

Creating and modifying tables, sequences, indexes.

Working with temporary and virtual columns.

Views and Synonyms

Creating and querying views.

Inline views and materialized views.

Simple and complex views.

Public and private synonyms.

Advanced SQL Features in Oracle 21c

- **Analytical Functions**:
    - RANK, DENSE_RANK, ROW_NUMBER, LAG, LEAD
    - PARTITION BY and ORDER BY in analytics

- **JSON in Oracle**:
    - JSON data types and storage
    - JSON_TABLE and JSON functions (JSON_VALUE, JSON_OBJECT)
- **Blockchain Tables** (overview and creation)
- **Multitenant Architecture** (CDB and PDB overview)

Performance and Optimization

Indexes and their impact on queries.

EXPLAIN PLAN and AUTOTRACE.

Bind variables and query tuning basics.

Project and Final Assessment

- Build a mini database system
- Design ER diagram → Create schema → Populate → Query
- Submit SQL scripts, queries, and reports

Total Duration of the Course

- Total duration: 1 month(s)
- Days: Monday to Friday (1 hr daily)
- Mode: Online

Certificate

A course completion certificate will be awarded once you have successfully completed this course.

Wishing you a Smooth Coding ahead!
