# Oracle AI Database: New Features for Developers Live Class

Oracle Database

| DURATION | MODULES | COURSE CODE |
| --- | --- | --- |
| **2 Days** | **9 Lectures** | **—** |

## Course Overview

This course explores developer-centric features in the Oracle AI Database release. It covers new capabilities in SQL for developers, offering flexibility in writing SELECT, DML, DDL, and Materialized View statements. The course also covers improvements in Oracle's analytic capabilities, upgrades to JSON functionality, and introduces new Globalization features.

## What You Will Learn

- I Course Overview
- Presenters I-2
- Prerequisites I-4
- Learning Outcome I-5
- Course Objectives I-6

## Oracle AI Vector Search

- Objectives
- Oracle AI Vector Search Benefits
- Benefits of Oracle AI Vector Search
- VECTOR Data Type
- Examples
- The Complete Workflow
- Vector Embeddings
- Vector Embedding Models
- Import Embedding Models
- Basic Queries and Similarity Search
- Basic Queries
- Basic Queries: Comparison Operations
- Similarity Search
- Exact Similarity Search
- Vector Distance Metrics
- Vector Distance Metric Example: Exact Similarity Search

- Euclidean Metric
- Euclidean Squared Distance Metric Example
- Approximate Similarity Search
- Approximate Similarity Search or Exact Similarity Search?
- Approximate Similarity Search
- Approximate Similarity Search: HNSW
- Approximate Similarity Search: IVF

## SQL Enhancements for DML & DDL

- Objectives
- DEFAULT ON NULL for UPDATE Statements
- Data Analytics: Enhancements to SQL Statements
- Example:
- Annotations
- Data Analytics: Enhancements to SQL Statements
- Example
- IF (NOT) EXISTS Enhancement
- Data Analytics: IF (NOT) EXISTS Enhancement
- Example
- GROUP BY Column Alias or Position
- Data Analytics: Enhancements to SQL Statements
- Example
- SELECT Without FROM Clause
- SQL: SELECT Without FROM Clause
- Example
- RETURNING Clause Enhancement
- Data Analytics: Enhancements to SQL Statements
- Example
- SQL Support for BOOLEAN Datatype
- SQL PLUS Support for Boolean Datatype
- Example:
- Table Value Constructor
- Data Analytics: Enhancements to SQL Statements
- Example
- Table Value Constructor: Example
- Aggregation Over INTERVAL Types
- Aggregation Over INTERVAL Data Types
- Aggregation Over INTERVAL Data Types: Example
- Direct Joins for UPDATE and DELETE
- Data Analytics: Enhancements to SQL Statements
- Example
- Summary

## JSON

- Objectives

- JSON Schema Support
- Data Analytics: JSON Schema Support
- JSON Schema Support: Example
- Example:
- SODA Enhancements
- Why are these SODA Enhancements important?
- Enhancement to JSON_TRANSFORM
- Example
- Comparing and Sorting JSON Datatypes
- Database Version Comparison: Example
- JSON Type Comparison: Example
- Sorting Mixed JSON Type Values: Example
- Predicates for JSON_VALUE and JSON_QUERY
- Example
- JSON-Relational Duality View
- Introduction: Object□Relational Mismatch
- Relational Data vs JSON Document
- Document Data Example
- Oracle as Document Database
- Limitations of Document Database
- The Best of Both Worlds: Document Relational Duality
- JSON Duality Views
- Example
- Lock-Free Concurrency Control
- What are ETAGs?
- Example
- CREATE_VIEW_ON_PATH
- Example
- Oracle Supports All Dimensions of JSON Relational Duality
- Summary

## Analytic Platform

- Objectives
- Data Quality Operators
- Example:
- JSON Materialized Views Enhancements
- Enhanced JSON Support for Materialized Views
- Summary

## Other New Features

- Objectives
- Vectorized Query Processing
- Restrictions
- Usage
- Staging Tables

- Creating Staging Tables: Methods
- Example:
- LPCT for Materialized View Refresh and Staleness Tracking
- LPCT: MV Refresh and Staleness Tracking
- Summary

## SQL Enhancements for Materialized Views

- Objectives
- Semi-Join Materialized View
- Benefits of a Semi-Join MV
- How to Define the Syntax of a Semi-Join MV – Example
- Example (Cont.)
- ANSI Join Materialized View
- Benefits of an ANSI Join MV
- Example: ANSI Join
- Materialized View (MV) Refresh Enhancements Techniques
- Concurrent Refresh
- Example: Enabling Concurrent Materialized View Refresh
- Conditions That Allow Concurrent Materialized View Refresh
- DBMS_MVIEWS Package
- DBMS_MVIEW Package APIs
- Example: DBMS_MVIEW Package
- Summary

## Other SQL Enhancements

- Objectives
- Transportable Binary XML (TBX)
- Overview of Transportable Binary XML (TBX)
- How It Fits into the Big Picture
- Benefits of Transportable Binary XML (TBX)
- Privileges if creating XMLType table in different DB schema
- Example
- Indexes with Automatic Maintenance
- Overview of Indexes with Automatic Maintenance
- Problems Automatic Maintenance Indexes Solves
- Benefits of Automatic Maintenance Indexes
- Maintenance Types: Configuration Setting
- Restrictions of Automatic Maintenance Indexes
- Monitoring Maintenance Events
- Enable Automatic Maintenance Indexes
- Enable Automatic Maintenance Indexes: Cont
- Disable Automatic Maintenance Indexes
- Switching Between Automatic and Manual Maintenance Modes
- Enhanced Automatic Indexing
- Overview of Enhanced Automatic Indexing

- How Automatic Indexing Works
- Maintaining Automatic Indexing
- Drop Automatic Maintenance Indexes
- Summary

## Time and Date Handling Changes

- Objectives
- Enhanced Time Zone Data Upgrade
- Timezone Definitions Change: Considerations
- Optimizing Time Zone File Upgrade
- Benefits of Enhanced Timezone Update
- Tables with TIMESTAMP WITH TIME ZONE Data
- New Parameter in init.ora File
- Configuring Database Parameters
- SYSDATE and SYSTIMESTAMP
- Date and Time in Oracle Databases
- Database Time Versus OS System Time
- Database-Specific Time in Oracle Database 23ai
- Setting Database-Specific Time Example
- Summary

## Globalization Support

- Objectives
- Globalization Improvements
- Unicode IVS Support
- Ideographic Variation Sequence Symbols
- Unicode Standard Supports IVS
- Typical Data Containing Unicode IVS Sequences
- Why Handle IVS Character Combinations as Entities?
- Improving Compliance and Usability
- IVS Use Case Examples
- Adding and Querying IVS Data
- Default IVS Sequence Handling
- Enabled IVS Sequence-as-Entity Recognition
- Unicode 15.0 Support
- Unicode Support Evolution
- New Unicode 15.0 Standard
- Improved Compliance and Competitiveness
- Use Cases and Database 23ai Unicode 15.0 Implementation
- Summary