Oracle AI Vector Search Fundamentals Live Class

Oracle Database

DURATION	MODULES	COURSE CODE
2 Days	**13 Lectures**	**—**

Course Overview

Leverage the key capability of Oracle AI Databaseto design and manage Artificial Intelligence (AI) workloads using the new Oracle AI Vector Search feature. Learn how to create tables with vector data type, load data, and the query them based on semantics, rather than keywords. You will learn to perform semantic search on unstructured data by combining it with your relational data in one single system. With hands-on practices, you'll be be able to reinforce the learning of the new AI Vector Search feature and its capabilities.

What You Will Learn

- I Course Overview
- Course Outline I-2
- Target Audience I-6
- Learning Outcomes I-7
- What’s next? I-9

Overview of Oracle AI Vector Search

- Objectives
- VECTOR Data Type
- Vector Embeddings
- Similarity Search
- Vector Embedding Models
- Import Embedding Models
- Summary

Why use Oracle AI Vector Search?

- Objectives
- Benefits
- Benefits of Oracle AI Vector Search
- Examples

- Summary

Oracle AI Vector Search Workflow

- Objectives
- Generate Vector Embeddings
- Generate Embeddings Examples
- Example: Load ONNX Model into the DB
- Example: Generate the Embedding
- Store Vector Embeddings
- Vector Indexes
- Query Data with Similarity Searches
- The Complete Workflow
- Summary

Running Basic Queries on Vectors

- Objectives
- Basic Queries
- Basic Queries: Comparison Operations
- Summary

Vector Indexes and Memory

- Objectives
- Vector Indexes
- Vector Index Categories
- Vector Pool in the SGA
- Vector Pool
- Vector Pool: Other Considerations
- Memory Considerations
- Vector Storage
- Memory Considerations: In-Memory Neighbor Graph Indexes
- Memory Considerations: Sample Calculation
- Summary

DML Operations on Vectors

- Objectives
- Create a Table with a Vector Column
- VECTOR Data Type
- Declaration Formats and Explanation
- Vector DML
- Vector DML Using SQL*Loader
- Summary

Vector DDL

- Objectives
- Tables with Different Vector Formats
- Tables with Different Vector Formats: Example
- Tables with Different Vector Formats: Insert Example
- DDL Operations on Vectors
- Prohibited Operations
- VECTOR Data Type Restrictions
- Summary

Creating and Finding the Nearest Vectors

- Objectives
- Vector Constructor
- Vector Constructor Examples
- Vector Distance
- Vector Distance Operand
- Vector Distance Metrics
- Euclidean and Euclidean Squared Distances
- Cosine Similarity
- Dot Product Similarity
- Manhattan Distance
- Hamming Similarity
- Vector Distance Examples
- Shorthand Operators For Distances
- Summary

Finding the Closest Vectors

- Objectives
- Exact Similarity Search
- Euclidean
- Euclidean Squared Distance
- Approximate Similarity Search
- Approximate Similarity Search or Exact Similarity Search?
- Approximate Similarity Search
- Approximate Similarity Search: HNSW
- Approximate Similarity Search: IVF
- Multi-Vector Similarity Search
- Summary

Narrowing Search Results

- Objectives
- Attribute Filtering
- Summary

Testing Other Distance Functions

- Objectives
- Other Distance Functions
- Other Vector Distance Functions
- L1_DISTANCE
- L2_DISTANCE
- COSINE_DISTANCE
- INNER_PRODUCT
- Summary

Testing Other Vector Functions

- Objectives
- Other Vector Functions
- Vector Constructors
- Vector Serializers
- Vector Norm
- Vector Dimension Count
- Vector Dimension Format
- Summary

Course Conclusion

- Learning Summary
- Thank You!