Using Oracle Machine Learning with Autonomous Database 2024 ELS

Data Management

DURATION	MODULES	COURSE CODE
2 Days	**21 Lectures**	**—**

Course Overview

Use this as a launching point for exploring the rich capabilities of Oracle Machine Learning. Benefits to you In this course you will learn about the Oracle Machine Learning components and features available on Oracle Autonomous Database. The Oracle Machine Learning components highlighted include OML4SQL, OML4R, OML4Py, OML Notebooks, Oracle Data Miner, OML AutoML UI, and OML Services. Understand how you can take greater advantage of Oracle Autonomous Database for data science and machine learning from SQL, R, Python, and REST APIs and no-code user interfaces

What You Will Learn

- SECTION I: Introduction to Oracle Machine Learning

Module 1: Oracle Machine Learning Overview

- Cloud-Based Solutions for Analytics
- El Tronics Use Case
- Oracle Autonomous Database
- Basic Machine Learning Flow
- OML Introduction
- Machine Learning: Horizontal Use Cases
- Industry-Specific (Vertical) Use Cases
- Objectives:
- Understand the concept of machine learning in Oracle Cloud.
- Explore industry and horizontal use cases.

Module 2: Features and Components of OML

- OML Components
- Oracle Machine Learning Features
- Steps in the Machine Learning Process
- Objectives:

- Learn the architecture and main components of OML.
- Understand the end-to-end ML workflow.
- SECTION II: Machine Learning Languages in OML

Module 3: Introduction to Machine Learning for Python (OML4Py)

- Features and Advantages
- Using Python for Machine Learning with OML

Module 4: Introduction to Machine Learning for R (OMLR)

- Features and Advantages
- Using R for Machine Learning with OML
- Objectives:
- Compare Python and R ML capabilities in OML.
- Identify scenarios for using OML4Py vs OMLR.
- SECTION III: Workspaces and Projects

Module 5: Creating Workspaces and Projects

- Terry’s Business Problem (Use Case)
- Accessing OML Home Page
- Creating a New Project and Workspace
- Selecting the New Project
- Creating a Workspace

Module 6: Users in Workspaces

- Managing Workspaces
- Workspace Permissions and Types
- Moving Projects Between Workspaces
- Objectives:
- Set up workspaces and projects for ML development.
- Manage user access and permissions effectively.
- SECTION IV: Notebooks and Scratchpad

Module 7: Using the OML Scratchpad Notebook

- Scratchpad Notebook Overview
- Developing Code
- SQL Queries Examples
- Exporting and Importing Notebooks

Module 8: Restrictions on SQL Commands

- Database Options Restrictions
- Database Initialization Parameters
- Modifiable Initialization Parameters

- Objectives:
- Write and test SQL code in scratchpad notebooks.
- Understand limitations and best practices for SQL execution.

Module 9: Introduction to AutoML

- AutoML Concept
- AutoML in OML4Py
- AutoML UI Pipeline
- Algorithm Selection, Feature Selection, Model Tuning

Module 10: AutoML with OML4Py

- Creating DataFrames
- Algorithm Selection and Ranking
- Feature Selection Examples
- Model Tuning and Selection Examples

Module 11: AutoML User Interface (UI)

- AutoML Experiment Pipeline
- Creating AutoML Experiments
- Classification Metrics
- Deploying AutoML Models
- Generating Notebooks from AutoML Models
- Objectives:
- Apply AutoML to automate ML workflows.
- Deploy and generate notebooks from trained models.
- SECTION V: Notebooks and Forms

Module 12: Notebooks

- Creating, Editing, Running Notebooks
- Notebook Examples

Module 13: Forms in Notebooks

- Text Input Forms
- Select Forms
- Check Box Forms
- Output Formats with SET SQLFORMAT

Module 14: Versioning in Notebooks

- Notebook Versions
- Creating and Restoring Versions

Module 15: Templates

- Templates Home Page
- Sharing and Saving Notebooks as Templates
- Personal Templates

Module 16: Instantiating Notebooks from Templates

- Creating Notebooks from Templates
- Sharing Templates and Editing Template Settings
- Example Templates
- Objectives:
- Use notebooks to document, share, and version ML experiments.
- Leverage templates to standardize ML workflows.
- SECTION VI: Jobs and Monitoring

Module 17: Working with Jobs

- Creating Jobs in OML
- Viewing Job Logs
- Job Examples

Module 18: OML Data Monitoring UI

- Value of Data Monitoring
- Data Drift and Metrics
- Creating and Monitoring Data Monitors
- Feature Statistics and Metrics

Module 19: OML Model Monitoring UI

- Value of Model Monitoring
- Concept Drift
- Creating Model Monitors
- Monitoring Metrics, Predictions, and Feature Impact
- Objectives:
- Automate and monitor ML jobs.
- Track data and model performance over time.
- SECTION VII: Administration and Connections

Module 20: Administering Oracle Machine Learning

- Workflow for Managing OML
- User Data Management
- Compute Resource Management
- Creating User Accounts

Module 21: Connection Groups

- (Details TBD based on continuation of content)
- Objectives:
- Administer users, compute resources, and access in OML.
- Set up and manage connection groups for ML projects.

This structure creates 21 clear, learning-focused modules, which follow the logical flow from introduction, setup, development, AutoML, monitoring, and administration.