Implement Machine Learning Using Oracle Data Miner LVC

Oracle Database

DURATION	MODULES	COURSE CODE
3 Days	**7 Lectures**	**—**

Course Overview

This course gives you an insight into the following topics: The Fundamentals of Oracle Machine Learning Oracle Machine Learning UIs Classification Models Regression Models Clustering Models Anomaly Detection Models

What You Will Learn

Course Overview

- Learning Objectives
- Course Objectives
- Course Goals
- Target Audience
- Prerequisites
- Proposed Schedule
- Prerequisite Courses
- Summary

Fundamentals of Oracle Machine Learning

- Learning Objectives
- Data Science Landscape
- Terminology Consensus?
- What is Machine Learning?
- Real World Machine Learning Examples
- Examples of Machine Learning Use Cases
- Basic ML Terminology
- ML Approaches
- What is Machine Learning?
- ML Techniques Use Cases
- CRISP-DM – How to manage an ML Project
- CRISP-DM – The Iterative 6 Phases

- Traditional vs. Oracle Machine Learning/Predictive Analytics
- Move the Algorithms, Not the Data!
- Traditional ML vs. Oracle ML Cost Savings
- Oracle Machine Learning
- Oracle Machine Learning Interfaces to Oracle Database
- Oracle Machine Learning for SQL (OML4SQL)
- OML for SQL Model Build & SQL Apply
- Oracle Data Miner
- OML4R
- Oracle Machine Learning
- Oracle Machine Learning for Python
- Coming Soon! | AutoML – new with OML4Py
- The Evolution of the DBA/Database Developer Role
- What Autonomous Database means for DBAs
- Database Developer to Citizen Data Scientist Journey
- The Changing Role of the DBA: Motivation to Learn to Become or Support a Data
- Scientist!
- Summary

Introduction to Oracle Machine Learning UIs

- Learning Objectives
- Oracle Machine Learning Interfaces to Oracle Database
- Highlights of the Oracle Machine Learning API
- Oracle Machine Learning for SQL (OML4SQL)
- Oracle Machine Learning for SQL Features
- Advantages of OML4SQL in the Database Kernel
- Creating an OML4SQL Model
- Creating an OML Model Using PL/SQL API
- Executing an OML Model using SQL Functions
- Interfaces to OML4SQL: OML UIs
- Introduction to Oracle Data Miner
- Oracle Data Miner (ODMr) Architecture
- Connections for Machine Learning
- Setting up Oracle Data Miner
- Step 1: Create a Connection for ODMr User
- Step 2: Make the Data Miner UI Visible
- Step 3: Install the ODMr Repository
- ODMr Repository Installation Process
- Introducing the ODMr Interface
- Creating Oracle Data Miner Projects
- Creating Oracle Data Miner Workflows
- Building a Workflow
- Examining ODMr Nodes – Components
- Examining ODMr Nodes – Data Understanding
- Building a Sample Workflow – Add a Data Source

- Building a Sample Workflow – Add a Graph
- Building a Sample Workflow – Explore Data
- Examining ODMr Nodes – Data Preparation
- Building a Sample Workflow – Filter Data
- Examining ODMr Nodes – Modeling
- Building a Sample Workflow – Add a Classification Node
- Examining ODMr Nodes – Evaluation
- Building a Sample Workflow – Apply the Model
- Examining ODMr Nodes – Additional Nodes
- Completed Sample ODMr Workflow
- Running the ODMr Workflow
- Managing Workflows
- Deploying a Workflow – Deploy SQL Scripts
- Deploying a Workflow – Save SQL
- OML Deployment Use Cases – Query in Code
- OML Deployment Use Cases – Query in APEX
- OML Deployment Use Cases – Query in REST
- Types of Model Scoring In Queries
- Oracle Machine Learning Interfaces to Oracle Database
- OML Notebooks Architecture
- OML Notebooks Web-based UI
- Working with Oracle Machine Learning Notebooks
- OML Notebooks – Work Collaboratively
- OML Notebooks – Easily Access Data
- OML Notebooks – Deploy Models Inside the Database
- Oracle Data Miner or OML Notebooks?
- OML: Algorithm Cheat Sheet
- Summary
- Practice 3: Introduction to Oracle ML Tools

Using Classification Models

- Lesson Objectives
- ML Approaches
- Types of Supervised Learning
- Supervised Modeling
- Training vs Test Data
- How do you classify things?
- Classification: Use Cases
- Classification and Attribute Dependency
- Importance of the Target Attribute
- Classification: Scoring and Deployment
- Building a Simple Classification Model using ODMr
- Phase 1: Business Understanding – Background
- Phase 1: Business Understanding – Requirements
- Phase 1: Business Understanding – Museum Touch Screen Application
- Phase 1: Business Understanding – Summary of Objectives and Success

- Criteria
- Phase 1: Business Understanding – Sharp Questions
- Phase 1: Business Understanding – Initial Assessment of ML Techniques
- Phase 2: Data Understanding – Defined
- Phase 2: Data Understanding – Explore Data Node
- Titanic Data Set
- Phase 2: Data Understanding with Explore Data Node
- Phase 2: Data Understanding Target
- Phase 2: Data Understanding – Graph Node
- Phase 2: Data Understanding with Graph Data Node
- Phase 3: Data Preparation – Transforms Nodes
- Phase 3: Data Preparation – The Transform Node
- Phase 3: Data Preparation – Cleaning Null Values
- Phase 3: Data Preparation – Binning
- Phase 3: Data Preparation – Transformed Fields
- Phase 3: Data Preparation – SQL Query Node
- Phase 3: Data Preparation – Explore Data on Transformed Fields
- Phase 3: Data Preparation – Filter Columns Node
- Phase 3: Data Preparation – Attribute Importance Technique
- Phase 3: Data Preparation with Filter Columns Node
- Phase 3: Data Preparation Phase Complete
- Phase 3: Data Preparation Phase Complete – Dataset
- Phase 4: Modeling – Models Nodes
- Revisiting Classification: Modeling
- Phase 4: Modeling – Classification Build Node
- Phase 4: Modeling – Advanced Settings (Optional)
- Phase 4: Modeling – Training vs Test Dataset Settings
- Phase 4: Modeling – Building the Classification Model
- Phase 4: Modeling – Compare Model Performance
- Phase 4: Modeling – Comparing Test Results – Performance Tab
- Phase 4: Modeling – Comparing Test Results – Performance Matrix

Phase 4: Modeling – Comparing Test Results – Receiver Operating Characteristics

- (ROC)
- Some Algorithms are Transparent
- Phase 4: Modeling – Selecting the Decision Tree Algorithm
- Phase 4: Modeling Phase Complete
- Phase 5: Evaluation 1 of 2
- Phase 5: Evaluation 2 of 2
- Phase 6: Deployment – Model Operations Nodes
- Revisiting Classification: Scoring and Deployment
- Phase 6: Deployment – Scoring Dataset
- Phase 6: Deployment – Apply Node
- Phase 6: Deployment – Edit Apply Node
- Phase 6: Deployment – View Scoring Results
- Phase 6: Deployment – Deploy Apply Node for Real Time Scoring
- Phase 6: Deployment – View Apply Node SQL in SQL Worksheet

- Phase 6: Deployment – Demo Scoring Web UI (with Apply Node SQL)
- Traditional ML Process vs Automated OML Process
- Automated OML Process – Automatic Data Preparation (ADP)
- Titanic Use Case using Automated OML Process
- Automated OML Process – Model Performance
- Automated OML Process – Performance Matrix aka Confusion Matrix
- Traditional ML Process vs Automated OML Process – Performance
- Summary
- Practice 4: Overview

Using Regression Models

- Lesson Objectives
- Revisiting Supervised Learning – OML Algorithms
- Regression: Data 1 of 3
- Regression: Data 2 of 3 – Sample Data
- Regression: Data 3 of 3 – Training vs Test Data
- Regression: Modeling
- Regression: Scoring and Deployment
- Building a Regression Model using Oracle Data Miner
- Boston Housing Sample Dataset for Regression
- Phase 1: Business Understanding – Requirements
- Phase 2: Data Understanding – Data Nodes
- Phase 2: Data Understanding –Explore Data Node
- Phase 2: Data Understanding with Explore Data Node
- Phase 2: Data Understanding – ODMr Graph Node
- Phase 2: Data Understanding with Graph Data Node – Box Plot and Outliers
- Phase 2: Data Understanding with Graph Data Node – Scatter Plots and Correlations
- Phase 3: Data Preparation –Transform Nodes
- Phase 3: Data Preparation – Transform Node
- Phase 3: Data Preparation – Outlier Treatment
- Phase 3: Data Preparation – Transformed Fields
- Phase 3: Data Preparation – Filter Columns Node
- Phase 3: Data Preparation – Attribute Importance Technique
- Phase 3: Data Preparation with Filter Columns Node
- Phase 3: Data Preparation Phase Complete – Prepared Dataset
- Phase 3: Data Preparation Phase Complete
- Phase 4: Modeling – Models Nodes
- Revisiting Regression: Modeling
- Phase 4: Modeling – Regression Node
- Phase 4: Modeling – Regression Build Node
- Phase 4: Modeling – Advanced Settings (Optional)
- Phase 4: Modeling – Training vs Test Dataset Settings
- Phase 4: Modeling – Building the Regression Model
- Phase 4: Modeling – Compare Model Performance
- Phase 4: Modeling – Comparing Test Results – Performance Tab

- Phase 4: Modeling – Comparing Test Results – Residuals Tab
- Phase 4: Modeling – Selecting the SVM Algorithm
- Phase 4: Modeling Phase Complete
- Phase 5: Evaluation
- Phase 5: Evaluation Phase
- Phase 6: Deployment – Model Operations Nodes
- Phase 6: Deployment – Scoring Data set
- Phase 6: Deployment – ODMr Scoring Dataset
- Phase 6: Deployment – Apply Node
- Phase 6: Deployment – View Scoring Results
- Phase 6: Deployment – Deploy Apply Node for Real Time Scoring
- Phase 6: Deployment – View Apply Node SQL in SQL Worksheet
- Phase 6: Deployment Phase Complete – Deployment
- Revisiting Traditional ML process vs Automated OML Process
- Automated OML Process – Automatic Data Preparation (ADP)
- Summary
- Practice 5: Overview

Using Clustering Models

- Objectives
- Revisiting ML Techniques 1 of 2
- Revisiting Unsupervised Learning: OML Algorithms
- Clustering: Data 1 of 3
- Clustering: Data 2 of 3: Sample Data
- Clustering: Modeling
- Clustering: Scoring and Deployment
- Building a Clustering Model Using Oracle Data Miner
- Insurance Customers Dataset for Clustering
- Phase 1: Business Understanding – Requirements
- Phase 2: Data Understanding – ODMr Data Nodes
- Phase 2: Data Understanding – ODMr Explore Data Node
- Phase 2: Data Understanding with Explore Data Node
- Phase 3: Data Preparation – ODMr Transforms Nodes
- Phase 4: Modeling – ODMr Model Nodes
- Phase 4: Modeling – ODMr Clustering Node
- Phase 4: Modeling – Edit Clustering Build Node
- Phase 4: Modeling – k-Means Advanced Settings
- Phase 4: Modeling – O-Cluster Advanced Settings
- Phase 4: Modeling – Expectation Maximization Advanced Settings
- Phase 4: Modeling – Building the Clustering Model
- Phase 4: Modeling – ODMr Models Nodes
- Phase 4: Modeling – k-Means Model Results
- Phase 4: Modeling – k-Means Model Results – Tree Navigation
- Phase 4: Modeling – k-Means Model Results – Rules Tab
- Phase 4: Modeling – k-Means Model – Cluster Details Tab

- Phase 4: Modeling – k-Means Model – Cluster Compare Tab
- Phase 4: Modeling – k-Means Model – Compare Tab Rename Clusters
- Phase 4: Modeling – Select a Clustering Model
- Phase 5: Evaluation
- Phase 6: Deployment – ODMr Model Operations Nodes
- Phase 6: Deployment – ODMr Scoring Dataset
- Phase 6: Deployment – ODMr Apply Node
- Phase 6: Deployment – View Scoring Results
- Phase 6: Deployment Phase Complete – ODMr Deployment
- Revisiting Traditional ML Process vs Automated OML Process
- Automated OML Process: Automatic Data Preparation (ADP)
- Summary
- Practice 6: Overview

Using Anomaly Detection Models

- Objectives
- Revisiting Unsupervised Learning Algorithms
- Anomaly Detection: Data 1 of 2
- Anomaly Detection: Data 2 of 2 – Sample Data
- Anomaly Detection: Modeling
- Anomaly Detection: Scoring and Deployment
- Building an Anomaly Detection Model Using CRISP –DM and ODMr
- Phase 1: Business Understanding – Requirements
- Phase 1: Business Understanding – Initial Assessment of ML Techniques
- Phase 2: Data Understanding – Sample Dataset 1 of 2
- Phase 2: Data Understanding – Sample Dataset 2 of 2
- Phase 2: Data Understanding – ODMr Data Nodes
- Phase 2: Data Understanding – ODMr Explore Data Node
- Phase 2: Data Understanding with Explore Data Node
- Phase 3: Data Preparation – ODMr Transforms Nodes
- Phase 3: OML Automatic Data Preparation (ADP)
- Phase 4: Modeling – ODMr Model Nodes
- Revisiting Anomaly Detection: Modeling
- Phase 4: Modeling – ODMr Anomaly Detection Node
- Phase 4: Modeling – Edit Anomaly Detection Build Node
- Phase 4: Modeling – Building the Anomaly Detection Model
- Phase 5: Evaluation – ODMr Model Nodes
- Phase 5: Evaluation – Anomaly Detection Model Results
- Phase 5: Evaluation Phase Complete
- Phase 6: Deployment – ODMr Model Operation Nodes
- Phase 6: Deployment – ODMr Apply Node
- Phase 6: Deployment – View Scoring Results
- Phase 6: Deployment Phase Complete – ODMr Deployment
- Summary
- Practice 7: Overview