Course Syllabus

SQL Server Machine Learning Services using Python, R and Java

Course #:   **55335A**

Number of Days: 1

Format: **Instructor-led / Workshop**

Note: Course content, prices, and availability are subject to change without notice.

Course Overview

This lab intensive one-day course will help database administrators, data scientists and developers to utilize the full potential of SQL Server Machine Learning Services using Python, R & Java. Students will gain hands-on experience creating ML tasks on SQL Server to get more value from their data. The course is designed for SQL Server 2022 and newer versions. The format of the class can be Instructor-led or Workshop.

Course Audience

Data professionals who want to use ML tools on data residing in SQL Server databases. A basic knowledge of T-SQL and one of the three programming languages used for the labs (Python or R or Java) is recommended. This is a SQL Server Machine Learning course. Although programming is necessary (and scripted) for some of the exercises, the focus of the material is the ML capabilities of SQL Server.

Course Value

This course empowers data professionals to extract maximum value from their datasets without the hassle of moving or copying data from its source. By learning to use Python, R, or Java to perform machine learning tasks directly on the SQL Server instance, students will unlock the full value of their data while gaining security, performance and efficient workflow advantages.

At Course Completion

After completing this course, students will be able to:

- Leverage Python, R, and Java for ML tasks within SQL Server
- Implement text analysis, natural language processing, and anomaly detection
- Develop image processing and computer vision solutions
- Create predictive analytics models integrated with SQL Server
- Apply time series forecasting techniques
- Optimize ML model performance within the database environment
- Implement security best practices for in-database ML services
- Understand the advantages of on-premises ML solutions

Prerequisites

- A basic knowledge of Transact-SQL
- A basic knowledge of command-line scripting (PowerShell, Shell or Batch)
- Working knowledge of one of the programming languages (Python, R or Java)
- Working knowledge of SQL Server database management

Course Outline:

Module 1: Configuring Machine Learning in SQL Server

This module explains how to setup, configure and test SQL Server Machine Learning Services for Python, R and Java functionality.

Lessons
▪ Lesson 1: Install SQL Server Machine Learning Services ▪ Lesson 2: Supported Languages ▪ Lesson 3: Configure SQL Server Machine Learning Services
Lab 1: Configuring Machine Learning in SQL Server
• Exercise 1: Enable the use of external scripts • Exercise 2: Install R • Exercise 3: Register R runtime with SQL Server • Exercise 4: Test R runtime in SQL Server • Exercise 5: Install Python • Exercise 6: Register Python runtime with SQL Server • Exercise 7: Test Python runtime in SQL Server • Exercise 8: Install Java • Exercise 9: Register Java runtime with SQL Server • Exercise 10: Test java runtime in SQL Server

After completing this module, students will be able to:
- Install SQL Server Machine Learning Services
- Configure programming languages to work on a SQL Server instance
- Configure programming languages to work on a SQL Server database
- Test Python, R and Java functionality in SQL Server

Module 2: Using Machine Learning in SQL Server

This module explains how to use Python, R and Java to perform ML tasks in SQL Server using internal and external datasets.

Lessons
- Lesson 1: Text Analysis and Natural Language Processing   - Lesson 2: Anomaly Detection in Data   - Lesson 3: Image Processing and Computer Vision Tasks   - Lesson 4: Predictive Analytics with SQL Server   - Lesson 5: Time Series Forecasting
Lab 2: Using Machine Learning in SQL Server
- Exercise 1: Text Analysis and Natural Language Processing   - Exercise 2: Anomaly Detection in Data   - Exercise 3: Image Processing and Computer Vision Tasks   - Exercise 4: Predictive Analytics with SQL Server   - Exercise 5: Time Series Forecasting

After completing this module, students will be able to:
- Perform ML tasks in SQL Server using Python
- Perform ML tasks in SQL Server using R
- Perform ML tasks in SQL Server using Java