

Course 20461D: Querying Microsoft SQL Server® 2014
Exam Code: 70-461

Course Outline

Module 1: Introduction to Microsoft SQL Server 2014

This module introduces the SQL Server platform and major tools. It discusses editions, versions, tools used to query, documentation sources, and the logical structure of databases.

Lessons

The Basic Architecture of SQL Server

SQL Server Editions and Versions

Getting Started with SQL Server Management Studio

Lab : Working with SQL Server 2014 Tools

Module 2: Introduction to T-SQL Querying

This module introduces Transact SQL as the primary querying language of SQL Server. It discusses the basic structure of T-SQL queries, the logical flow of a SELECT statement, and introduces concepts such as predicates and set-based operations.

Lessons

Introducing T-SQL

Understanding Sets

Understanding Predicate Logic

Understanding the Logical Order of Operations in SELECT statements

Lab : Introduction to Transact-SQL Querying

Module 3: Writing SELECT Queries

This module introduces the fundamentals of the SELECT statement, focusing on queries against a single table.

Lessons

Writing Simple SELECT Statements

Eliminate Duplicates with DISTINCT

Using Column and Table Aliases

Write Simple CASE Expressions

Lab : Writing Basic SELECT Statements

Module 4: Querying Multiple Tables

This module explains how to write queries which combine data from multiple sources in SQL Server. The module introduces the use of JOINS in T-SQL queries as a mechanism for retrieving data from multiple tables.

Lessons

Understanding Joins

Querying with Inner Joins

Querying with Outer Joins

Querying with Cross Joins and Self Joins

Lab : Querying Multiple Tables

Module 5: Sorting and Filtering Data

This module explains how to enhance queries to limit the rows they return, and to control the order in which the rows are displayed. The module also discusses how to resolve missing and unknown results.

Lessons

Sorting Data

Filtering Data with Predicates

Filtering with the TOP and OFFSET-FETCH

Working with Unknown Values

Lab : Sorting and Filtering Data

Module 6: Working with SQL Server 2014 Data Types

This module explains the data types SQL Server uses to store data. It introduces the many types of numeric and special-use data types. It also explains conversions between data types, and the importance of type precedence.

Lessons

Introducing SQL Server 2014 Data Types

Working with Character Data

Working with Date and Time Data

Lab : Working with SQL Server 2014 Data Types

Module 7: Using DML to Modify Data

This module describes the use of Transact-SQL Data Manipulation Language to perform inserts, updates, and deletes to your data.

Lessons

Inserting Data

Modifying and Deleting Data

Lab : Using DML to Modify Data

Module 8: Using Built-In Functions

This module introduces the use of functions that are built in to SQL Server Denali, and will discuss some common usages including data type conversion, testing for logical results and nullability.

Lessons

Writing Queries with Built-In Functions

Using Conversion Functions

Using Logical Functions

Using Functions to Work with NULL

Lab : Using Built-In Functions

Module 9: Grouping and Aggregating Data

This module introduces methods for grouping data within a query, aggregating the grouped data and filtering groups with HAVING. The module is designed to help the student grasp why a SELECT clause has restrictions placed upon column naming in the GROUP BY clause as well as which columns may be listed in the SELECT clause.

Lessons

Using Aggregate Functions

Using the GROUP BY Clause

Filtering Groups with HAVING

Lab : Grouping and Aggregating Data

Module 10: Using Subqueries

This module will introduce the use of subqueries in various parts of a SELECT statement. It will include the use of scalar and multi-result subqueries, and the use of the IN and EXISTS operators.

Lessons

Writing Self-Contained Subqueries

Writing Correlated Subqueries

Using the EXISTS Predicate with Subqueries

Lab : Using Subqueries

Module 11: Using Table Expressions

This module introduces T-SQL expressions which return a valid relational table, typically for further use in the query. The module discusses views, derived tables, common table expressions and inline table-valued functions.

Lessons

Using Views

Using Inline Table-Valued Functions

Using Derived Tables

Using Common Table Expressions

Lab : Using Table Expressions

Module 12: Using Set Operators

This module introduces the set operators UNION, INTERSECT, and EXCEPT to compare rows between two input sets

Lessons

Writing Queries with the UNION Operator

Using EXCEPT and INTERSECT

Using APPLY

Lab : Using Set Operators

Module 13: Using Window Ranking, Offset, and Aggregate Functions

This module introduces window functions including ranking, aggregate and offset functions. Much of this functionality is new to SQL Server 2012. It will cover the use of T-SQL functions such as ROW_NUMBER, RANK, DENSE_RANK, NTILE, LAG, LEAD, FIRST_VALUE and LAST_VALUE to perform calculations against a set, or window, of rows.

Lessons

Creating Windows with OVER

Exploring Window Functions

Lab : Using Window Ranking, Offset and Aggregate Functions

Module 14: Pivoting and Grouping Sets

This module discusses techniques for pivoting data in T-SQL as well to introduce the fundamentals of the GROUPING SETS clause. It will also cover the use of GROUP BY ROLLUP and GROUP BY CUBE syntax in SQL Server.

Lessons

Writing Queries with PIVOT and UNPIVOT

Working with Grouping Sets

Lab: Pivoting and Grouping Sets

Module 15: Querying data with Stored Procedures

This module introduces the use of existing stored procedures in a T-SQL querying environment. It discusses the use of EXECUTE, how to pass input and output parameters to a procedure, and how to invoke system stored procedures.

Lessons

Writing Queries with PIVOT and UNPIVOT

Passing Parameters to Stored Procedures

Creating Simple Stored Procedures

Working with Dynamic SQL

Lab : Executing Stored Procedures

Module 16: Programming with T-SQL

This module provides a basic introduction to T-SQL programming concepts and objects. It discusses batches, variables, control of flow elements such as loops and conditionals, how to create and execute dynamic SQL statements, and how to use synonyms.

Lessons

T-SQL Programming Elements

Controlling Program Flow

Lab : Programming with T-SQL

Module 17: Implementing Error Handling

This module introduces the use of error handlers in T-SQL code. It will introduce the difference between compile errors and run-time errors, and will cover how errors affect batches. The module will also cover how to control error handling using TRY/CATCH blocks, the use of the ERROR class of functions, and the use of the new THROW statement.

Lessons

Using TRY / CATCH Blocks

Working with Error Information

Lab : Implementing Error Handling

Module 18: Implementing Transactions

This module introduces the concepts of transaction management in SQL Server. It will provide a high-level overview of transaction properties, cover the basics of marking transactions with BEGIN, COMMIT and ROLLBACK.

Lessons

Transactions and the Database Engine

Controlling Transactions

Lab : Implementing Transactions

Module 19: Appendix 1: Improving Query Performance

This module presents several key guidelines for writing well-performing queries, as well as ways to monitor the execution of your queries and their impact on Microsoft SQL Server

Lessons

Factors in Query Performance

Displaying Query Performance Data

Lab : Improving Query Performance

Module 20: Appendix 2: Querying SQL Server Metadata

SQL Server provides access to structured metadata by using a variety of mechanisms, such as system catalog views, system functions, dynamic management objects, and system stored procedures. In this module, you will learn how to write queries to return system metadata using these mechanisms.

Lessons

Querying System Catalog Views and Functions

Executing System Stored Procedures

Querying Dynamic Management Objects

Lab : Querying SQL Server Metadata