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Querying Data with Transact-SQL

CODE: **DURÉE:** **PRIX H.T.:**

MCS_20761 40 Hours (5 Jours) €2,850.00

Description

This course is designed to introduce students to Transact-SQL. It is designed in such a way that the first three days can be taught as a course to students requiring the knowledge for other courses in the SQL Server curriculum. Days 4 & 5 teach the remaining skills required to take exam 70-761.

Objectifs

After completing this course, students will be able to:

- Describe key capabilities and components of SQL Server.
- Describe T-SQL, sets, and predicate logic. Write a single table SELECT statement. Write a multi-table SELECT statement.
- Write SELECT statements with filtering and sorting. Describe how SQL Server uses data types. Write DML statements.
- Write queries that use built-in functions. Write queries that aggregate data. Write subqueries.
- Create and implement views and table-valued functions. Use set operators to combine query results.
- Write queries that use window ranking, offset, and aggregate functions.
- Transform data by implementing pivot, unpivot, rollup and cube. Create and implement stored procedures.
- Add programming constructs such as variables, conditions, and loops to T-SQL code.

Audience

The main purpose of the course is to give students a good understanding of the Transact-SQL language which is used by all SQL Server-related disciplines; namely, Database Administration, Database Development and Business Intelligence. As such, the primary target audience for this course is: Database Administrators, Database Developers and BI professionals.

Prérequis

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of relational databases.

Programme

Module 1: Introduction to Microsoft SQL Server

This module introduces SQL Server, the versions of SQL Server, including cloud versions, and how to connect to SQL Server using SQL Server Management Studio.

- The Basic Architecture of SQL Server
- SQL Server Editions and Versions

Lessons Getting Started with SQL Server Management Studio Lab : Working with SQL Server Tools

- Working with SQL Server Management Studio

- Creating and Organizing T-SQL Scripts

- Using Books Online

After completing this module, you will be able to:

- Describe relational databases and Transact-SQL queries.

- Describe the on-premise and cloud-based editions and versions of SQL Server.

- Describe how to use SQL Server Management Studio (SSMS) to connect to an instance of SQL Server, explore the databases contained in the instance, and work with script files that contain T-SQL queries.

Module 2: Introduction to T-SQL Querying

This module describes the elements of T-SQL and their role in writing queries. Describe the use of sets in SQL Server. Describe the use of predicate logic in SQL Server. Describe the logical order of operations in SELECT statements.

- Introducing T-SQL

- Understanding Sets

- Understanding Predicate Logic

Lessons Understanding the Logical Order of Operations in SELECT statements Lab : Introduction to T-SQL Querying

Executing Basic SELECT Statements
 Executing Queries that Filter Data using Predicates
 Executing Queries That Sort Data Using ORDER BY After completing this module, you will be able to:
 Describe the role of T-SQL in writing SELECT statements.
 Describe the elements of the T-SQL language and which elements will be useful in writing queries.
 Describe the concepts of the set theory, one of the mathematical underpinnings of relational databases, and to help you apply it to how you think about querying SQL Server
 Describe predicate logic and examine its application to querying SQL Server.
 Explain the elements of a SELECT statement, delineate the order in which the elements are evaluated, and then apply this understanding to a practical approach to writing queries.

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 Writing Simple SELECT Statements
 Eliminating Duplicates with DISTINCT Eliminating Duplicates Using DISTINCT
 Using Column and Table Aliases Using Column and Table Aliases
 Writing Simple CASE Expressions Lab : Writing Basic SELECT Statements Using a Simple CASE Expression

After completing this module, you will be able to:
 Describe the structure and format of the SELECT statement, as well as enhancements that will add functionality and readability to your queries
 Describe how to eliminate duplicates using the DISTINCT clause Describe the use of column and table aliases
 Understand and use CASE expressions

Module 4: Querying Multiple Tables
 This module describes how to write queries that combine data from multiple sources in Microsoft SQL Server. Lessons
 Understanding Joins Writing Queries that use Inner Joins
 Querying with Inner Joins Writing Queries that use Multiple-Table Inner Joins
 Querying with Outer Joins Writing Queries that use Self-Joins
 Querying with Cross Joins and Self Joins Lab : Querying Multiple Tables Writing Queries that use Outer Joins
 After completing this module, you will be able to: Explain the fundamentals of joins in SQL Server Write inner join queries
 Write queries that use outer joins Use additional join types

Module 5: Sorting and Filtering Data
 This module describes how to implement sorting and filtering. Lessons
 Sorting Data
 Filtering Data with Predicates
 Filtering Data with TOP and OFFSET-FETCH
 Working with Unknown Values
 Writing Queries that Filter Data using a WHERE Clause
 Writing Queries that Sort Data Using an ORDER BY Clause
 Writing Queries that Filter Data Using the TOP Option

Lab : Sorting and Filtering Data Write Queries that filter data using the OFFSET-FETCH clause
 After completing this module, you will be able to:
 Explain how to add an ORDER BY clause to your queries to control the order of rows displayed in your query's output
 Explain how to construct WHERE clauses to filter out rows that do not match the predicate.
 Explain how to limit ranges of rows in the SELECT clause using a TOP option.
 Explain how to limit ranges of rows using the OFFSET-FETCH option of an ORDER BY clause.
 Explain how three-valued logic accounts for unknown and missing values, how SQL Server uses NULL to mark missing values, and how to test for NULL in your queries.

Module 6: Working with SQL Server Data Types This module introduces the data types SQL Server uses to store data. Lessons
 Introducing SQL Server Data Types
 Working with Character Data
 Working with Date and Time Data Lab : Working with SQL Server Data Types
 Writing Queries that Return Date and Time Data
 Writing Queries that use Date and Time Functions
 Writing Queries That Return Character Data
 Writing Queries That Return Character Functions After completing this module, you will be able to:
 Explore many of the data types SQL Server uses to store data and how data types are converted between types
 Explain the SQL Server character-based data types, how character comparisons work, and some common functions you may find useful in your queries
 Describe data types that are used to store temporal data, how to enter dates and times so they will be properly parsed by SQL Server, and how to manipulate dates and times with built-in functions.

Module 7: Using DML to Modify Data This module describes how to create DML queries, and why you would want to. Lessons
 Adding Data to Tables Inserting Records with DML
 Modifying and Removing Data Updating and Deleting Records Using DML
 Generating automatic column values Lab : Using DML to Modify Data

After completing this module, you will be able to: Use INSERT and SELECT INTO statements
 Use UPDATE, MERGE, DELETE, and TRUNCATE.

Module 8: Using Built-In Functions
 This module introduces some of the many built in functions in SQL Server. Lessons
 Writing Queries with Built-In Functions
 Using Conversion Functions
 Using Logical Functions
 Using Functions to Work with NULL

Writing Queries That Use Conversion Functions

Writing Queries that use Logical Functions

Lab : Using Built-In Functions Writing Queries that Test for Nullability After completing this module, you will be able to:

- Describe the types of functions provided by SQL Server, and then focus on working with scalar functions
- Explain how to explicitly convert data between types using several SQL Server functions
- Describe how to use logical functions that evaluate an expression and return a scalar result.
- Describe additional functions for working with NULL

Module 9: Grouping and Aggregating Data

Using Aggregate Functions

Using the GROUP BY Clause

This module describes how to use aggregate functions. Lessons Filtering Groups with HAVING

Writing Queries That Use the GROUP BY Clause

Writing Queries that Use Aggregate Functions

Writing Queries that Use Distinct Aggregate Functions

Lab : Grouping and Aggregating Data Writing Queries that Filter Groups with the HAVING Clause

After completing this module, you will be able to: Describe the built-in aggregate function in SQL Server and write queries using it.

- Write queries that separate rows using the GROUP BY clause. Write queries that use the HAVING clause to filter groups.

Module 10: Using Subqueries This module describes several types of subquery and how and when to use them. Lessons

Writing Self-Contained Subqueries

Writing Correlated Subqueries

Using the EXISTS Predicate with Subqueries Lab : Using Subqueries

Writing Queries That Use Self-Contained Subqueries

Writing Queries That Use Scalar and Multi-Result Subqueries

Writing Queries That Use Correlated Subqueries and an EXISTS Clause After completing this module, you will be able to:

- Describe where subqueries may be used in a SELECT statement.
- Write queries that use correlated subqueries in a SELECT statement
- Write queries that use EXISTS predicates in a WHERE clause to test for the existence of qualifying rows

Use the EXISTS predicate to efficiently check for the existence of rows in a subquery. Module 11: Using Table Expressions

Previously in this course, you learned about using subqueries as an expression that returned results to an outer calling query. Like subqueries, table expressions are query expressions, but table expressions extend this idea by allowing you to name them and to work with their results as you would work with data in any valid relational table. Microsoft SQL Server supports four types of table expressions: derived tables, common table expression (CTEs), views, and inline table-valued functions (TVFs). In this module, you will learn to work with these forms of table expressions and learn how to use them to help create a modular approach to writing queries.

Using Views

Using Inline Table-Valued Functions

Using Derived Tables

Lessons Using Common Table Expressions Lab : Using Table Expressions

Writing Queries That Use Views

Writing Queries That Use Derived Tables

Writing Queries That Use Common Table Expressions (CTEs)

Writing Queries That Use Inline Table-Valued Expressions (TVFs) After completing this module, you will be able to:

- Write queries that return results from views. Use the CREATE FUNCTION statement to create simple inline TVFs.
- Write queries that create and retrieve results from derived tables.
- Write queries that create CTEs and return results from the table expression.

Module 12: Using Set Operators

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

Writing Queries with the UNION operator

Using EXCEPT and INTERSECT

Lessons Using APPLY Lab : Using Set Operators

Writing Queries That Use UNION Set Operators and UNION ALL

Writing Queries That Use CROSS APPLY and OUTER APPLY Operators

Writing Queries That Use the EXCEPT and INTERSECT Operators After completing this module, students will be able to:

- Write queries that use UNION to combine input sets.
- Write queries that use UNION ALL to combine input sets
- Write queries that use the EXCEPT operator to return only rows in one set but not another.
- Write queries that use the INTERSECT operator to return only rows that are present in both sets
- Write queries using the CROSS APPLY operator.
- Write queries using the OUTER APPLY operator

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

This module describes the benefits to using window functions. Restrict window functions to rows defined in an OVER clause, including partitions and frames. Write queries that use window functions to operate on a window of rows and return ranking, aggregation, and offset comparison results.

Creating Windows with OVER

Lessons Exploring Window Functions Lab : Using Windows Ranking, Offset, and Aggregate Functions

Writing Queries that use Ranking Functions

Writing Queries that use Offset Functions

Writing Queries that use Window Aggregate Functions After completing this module, students will be able to:

Describe the T-SQL components used to define windows, and the relationships between them.

Write queries that use the OVER clause, with partitioning, ordering, and framing to define windows

Write queries that use window aggregate functions.

Write queries that use window ranking functions.

Write queries that use window offset functions

Module 14: Pivoting and Grouping Sets

This module describes write queries that pivot and unpivot result sets. Write queries that specify multiple groupings with grouping sets

Writing Queries with PIVOT and UNPIVOT

Lessons Working with Grouping Sets

Lab : Pivoting and Grouping Sets

Writing Queries that use the PIVOT Operator

Writing Queries that use the UNPIVOT Operator

Writing Queries that use the GROUPING SETS CUBE and ROLLUP Subclauses

After completing this module, students will be able to:

Describe how pivoting data can be used in T-SQL queries.

Write queries that pivot data from rows to columns using the PIVOT operator.

Write queries that unpivot data from columns back to rows using the UNPIVOT operator.

Write queries using the GROUPING SETS subclause.

Write queries that use ROLLUP AND CUBE.

Write queries that use the GROUPING_ID function.

Module 15: Executing Stored Procedures

This module describes how to return results by executing stored procedures. Pass parameters to procedures. Create simple stored procedures that encapsulate a SELECT statement. Construct and execute dynamic SQL with EXEC and sp_executesql.

Querying Data with Stored Procedures

Passing Parameters to Stored procedures

Creating Simple Stored Procedures

Lessons Working with Dynamic SQL

Lab : Executing Stored Procedures

Using the EXECUTE statement to Invoke Stored Procedures

Passing Parameters to Stored procedures

Executing System Stored Procedures

After completing this module, students will be able to:

Describe stored procedures and their use.

Write T-SQL statements that execute stored procedures to return data.

Write EXECUTE statements that pass input parameters to stored procedures.

Write T-SQL batches that prepare output parameters and execute stored procedures.

Use the CREATE PROCEDURE statement to write a stored procedure.

Create a stored procedure that accepts input parameters.

Describe how T-SQL can be dynamically constructed.

Write queries that use dynamic SQL.

Module 16: Programming with T-SQL

T-SQL Programming Elements

This module describes how to enhance your T-SQL code with programming elements. Lessons Controlling Program Flow

Declaring Variables and Delimiting Batches

Using Control-Of-Flow Elements

Using Variables in a Dynamic SQL Statement

Lab : Programming with T-SQL Using Synonyms

After completing this module, students will be able to:

Describe how Microsoft SQL Server treats collections of statements as batches.

Create and submit batches of T-SQL code for execution by SQL Server.

Describe how SQL Server stores temporary objects as variables.

Write code that declares and assigns variables.

Create and invoke synonyms

Describe the control-of-flow elements in T-SQL.

Write T-SQL code using IF...ELSE blocks.

Write T-SQL code that uses WHILE.

Module 17: Implementing Error Handling

Implementing T-SQL error handling

This module introduces error handling for T-SQL. Lessons Implementing structured exception handling

Redirecting errors with TRY/CATCH

Lab : Implementing Error Handling Using THROW to pass an error message back to a client

Implement T-SQL error handling.

After completing this module, students will be able to: Implement structured exception handling.

Module 18: Implementing Transactions

This module describes how to implement transactions. Lessons

Transactions and the database engines

Controlling transactions

Lab : Implementing Transactions

Controlling transactions with BEGIN, COMMIT, and ROLLBACK

Adding error handling to a CATCH block

After completing this module, students will be able to:

Describe transactions and the differences between batches and transactions.

Describe batches and how they are handled by SQL Server.

Create and manage transactions with transaction control language (TCL) statements.

Use SET XACT_ABORT to define SQL Servers handling of transactions outside TRY/CATCH blocks.

Additional ReadingTo help you prepare for this class, review the following resources:

Dates de session

Sur demande. [Merci de nous contacter](#)

Informations

Complémentaires

Cette formation est également disponible sous forme de formation sur site. Veuillez nous contacter pour en savoir plus.