T-SQL Fundamentals

Course Summary

Description

This course is intended for T-SQL developers, DBAs and SQL Server power users who work with SQL Server and need to write queries and develop code using Transact-SQL—SQL Server's dialect of the standard ANSI-SQL language. The course covers querying, including retrieving and modifying data, and also provides an overview of programmable objects supported by SQL Server.

This course is intended both for people who just started working with SQL Server, as well as those with some experience. If you are self-taught, and gained your knowledge "by the seat of your pants," this course can fill the gaps in your knowledge and teach you how to think correctly in SQL terms. This course doesn't get into performance discussions and advanced problems* rather focuses on the logical aspects of T-SQL. Note though that it is not merely a step-by-step course. It doesn't just focus on syntactical elements of T-SQL, rather explains the logic behind the language and its elements.

There are many aspects of SQL that are very different than other programming languages. This course will help students adopt the right state of mind and get a true understanding of the language elements. Students will learn how to think in terms of sets and follow good SQL programming practices. The course is not version specific; it does, however, cover language elements that were introduced in recent versions of SQL Server. Throughout the course the instructor will specify the version in which the elements were introduced. The topics covered in the course include: Background to T-SQL Querying and Programming; Single-Table Queries; Joins; Subqueries; Table Expressions; Set Operators; Window Functions, Pivot, Unpivot and Grouping Sets; Data Modification; Transactions; Overview of Programmable Objects. To complement the learning experience, students will be provided with exercises that will enable them to practice what they've learned.

Objectives
At the end of this course, students will be able to:

- Understand the logic behind T-SQL and thinking in terms of sets
- Write T-SQL code to create tables and define data integrity
- Write queries against single and multiple tables
- Write T-SQL statements that modify data
- Get familiar with T-SQL programmable objects

Topics

- Background to T-SQL Querying and Programming
- Single-Table Queries
- Joins
- Subqueries
- Table Expressions

- Set Operators
- Beyond the Fundamentals of Querying
- Data Modification
- Transactions and Concurrency
- Programmable Objects

Audience

This course is intended for T-SQL Programmers and DBAs, Architects, Analysts and Power Users and those who need to write or review code in SQL Server 2005, 2008, 2012 and SQL Azure.

Prerequisites

Before attending this course, it is recommended that students have familiarity with basic relational database concepts and SQL.

Duration

Four days

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Course Outline

I. Background to T-SQL Querying and Programming
A. Theoretical Background
B. SQL Server's Architecture
C. SQL Server Management Studio
D. Creating Tables
E. Defining Data Integrity
F. Sample Database

II. Single-Table Queries
A. Elements of SELECT Statement
B. Predicates and Operators
C. CASE Expressions
D. NULLs
E. All-At-Once Operations
F. Working with Character Data
G. Working with Date and Time Data
H. Querying Metadata
I. LAB 02A

III. Joins
A. Joins
B. Cross Joins
C. Inner Joins
D. Further Join Examples
E. Outer Joins
F. LAB 03A

IV. Subqueries
A. Self-Contained Subqueries
B. Correlated Subqueries
C. Scalar Subqueries
D. Multi-Valued Subqueries
E. EXISTS
F. Beyond the Fundamentals of Subqueries
G. LAB 04A

V. Table Expressions
A. Derived Tables
B. Common Table Expressions
C. Views
D. Inline Table-Valued Functions
E. APPLY
F. LAB 05A

VI. Set Operators
A. Set Operators, Described
B. UNION
C. INTERSECT
D. EXCEPT
E. Precedence
F. Circumventing Unsupported Logical Phases
G. LAB 06A

VII. Beyond the Fundamentals of Querying
A. Window Functions
B. Pivoting Data
C. Unpivoting Data
D. Grouping Sets
E. LAB 07A

VIII. Data Modification
A. Inserting Data
B. Deleting Data
C. Updating Data
D. Merging Data
E. Modifying Data through Table Expressions
F. Modifications with TOP / OFFSET-FETCH
G. OUTPUT
H. LAB 08A

IX. Transactions and Concurrency
A. Transactions
B. Locks and Blocking
C. Isolation Levels
D. Deadlocks
E. LAB 09A

X. Programmable Objects
A. Variables
B. Batches
C. Flow Elements
D. Cursors
E. Temporary Tables
F. Dynamic SQL
G. Routines
H. Error Handling