Developing SQL Databases

Description

This five-day instructor-led course provides students with the knowledge and skills to develop a Microsoft SQL Server database. The course focuses on teaching individuals how to use SQL Server product features and tools related to developing a database.

Delegates will learn how to

- Design and Implement Tables.
- Describe advanced table designs
- Ensure Data Integrity through Constraints.
- Describe indexes, including Optimized and Columnstore indexes
- Design and Implement Views.
- Design and Implement Stored Procedures.
- Design and Implement User Defined Functions.
- Respond to data manipulation using triggers.
- Design and Implement In-Memory Tables.
- Implement Managed Code in SQL Server.
- Store and Query XML Data.
- Work with Spatial Data.
- Store and Query Blobs and Text Documents.

Audience

The primary audience for this course is IT Professionals who want to become skilled on SQL Server product features and technologies for implementing a database.

The secondary audiences for this course are individuals who are developers from other product platforms looking to become skilled in the implementation of a SQL Server

database.

Outline

Module 1: Introduction to Database Development

- Introduction to the SQL Server Platform
- SQL Server Database Development Tasks

Module 2: Designing and Implementing Tables

- Designing Tables
- Data Types
- Working with Schemas
- Creating and Altering Tables

Module 3: Advanced Table Designs

- Partitioning Data
- Compressing Data
- Temporal Tables

Module 4: Ensuring Data Integrity through Constraints

- Enforcing Data Integrity
- Implementing Data Domain Integrity
- Implementing Entity and Referential Integrity

Module 5: Introduction to Indexes

- Core Indexing Concepts
- Data Types and Indexes
- Heaps, Clustered, and Nonclustered Indexes
- Single Column and Composite Indexes

Module 6: Designing Optimized Index Strategies

- Index Strategies
- Managing Indexes
- Execution Plans
- The Database Engine Tuning Advisor
- Query Store

Module 7: Columnstore Indexes

- Introduction to Columnstore Indexes
- Creating Columnstore Indexes

Module 8: Designing and Implementing Views

- Introduction to Views
- Creating and Managing Views
- Performance Considerations for Views

Module 9: Designing and Implementing Stored Procedures

- Introduction to Stored Procedures
- Working with Stored Procedures
- Implementing Parameterized Stored Procedures
- Controlling Execution Context

Module 10: Designing and Implementing User-Defined Functions

- Overview of Functions
- Designing and Implementing Scalar Functions
- Designing and Implementing Table-Valued Functions
- Considerations for Implementing Functions
- Alternatives to Functions

Module 11: Responding to Data Manipulation via Triggers

- Designing DML Triggers
- Implementing DML Triggers
- Advanced Trigger Concepts

Module 12: Using In-Memory Tables

- Memory-Optimized Tables
- Natively Compiled Stored Procedures

Module 13: Implementing Managed Code in SQL Server

- Introduction to CLR Integration in SQL Server
- Implementing and Publishing CLR Assemblies

Module 14: Storing and Querying XML Data in SQL Server

- Introduction to XML and XML Schemas
- Storing XML Data and Schemas in SQL Server
- Implementing the XML Data Type
- Using the Transact-SQL FOR XML Statement
- Getting Started with XQuery
- Shredding XML

Module 15: Storing and Querying Spatial Data in SQL Server

- Introduction to Spatial Data
- Working with SQL Server Spatial Data Types
- Using Spatial Data in Applications

Module 16: Storing and Querying BLOBs and Text Documents in SQL Server

- Considerations for BLOB Data
- Working with FILESTREAM
- Using Full-Text Search

Module 17: SQL Server Concurrency

- Concurrency and Transactions
- Locking Internals

Module 18: Performance and Monitoring

- Working with extended Events
- Live Query Statistics
- Optimize Database File Configuration
- Metrics

Prerequisites

Working knowledge of Transact-SQL.