Course Outline

ProTech Professional Technical Services, Inc.

Developing SQL Databases

Course Summary

Description

This course will help you to learn how to use SQL Server product features and tools related to developing a database.

Objectives

At the end of this course, students will be able 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

Topics

- Introduction to Database Development
- Designing and Implementing Tables
- Advanced Table Designs
- Ensuring Data Integrity through Constraints
- Introduction to Indexes
- Designing Optimized Index Strategies
- Columnstore Indexes
- Designing and Implementing Views
- Designing and Implementing Stored Procedures
- Designing and Implementing User-Defined Functions
- Responding to Data Manipulation via Triggers
- Using In-Memory Tables
- Implementing Managed Code in SQL Server
- Storing and Querying XML Data in SQL Server
- Storing and Querying Spatial Data in SQL Server
- Storing and Querying BLOBs and Text Documents in SQL Server
- SQL Server Concurrency
- Performance and Monitoring

Audience

The targeted audience for this course is IT Professionals and Developers.

Prerequisites

This course provides you with the knowledge and skills to develop a Microsoft SQL Server database.

Pre-Requisites: Students should have familiar with

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

Duration

Five days

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I. Introduction to Database Development
- A. Introduction to the SQL Server Platform
- B. SQL Server Database Development Tasks

II. Designing and Implementing Tables
- A. Designing Tables
- B. Data Types
- C. Working with Schemas
- D. Creating and Altering Tables

III. Advanced Table Designs
- A. Partitioning Data
- B. Compressing Data
- C. Temporal Tables

IV. Ensuring Data Integrity through Constraints
- A. Enforcing Data Integrity
- B. Implementing Domain Integrity
- C. Implementing Entity and Referential Integrity

V. Introduction to Indexes
- A. Core Indexing Concepts
- B. Data Types and Indexes
- C. Heaps, Clustered, and Nonclustered Indexes
- D. Single Column and Composite Indexes

VI. Designing Optimized Index Strategies
- A. Index Strategies
- B. Managing Indexes
- C. Execution Plans
- D. The Database Engine Tuning Advisor
- E. Query Store

VII. Columnstore Indexes
- A. Introduction to Columnstore Indexes
- B. Creating Columnstore Indexes
- C. Working Columnstore Indexes

VIII. Designing and Implementing Views
- A. Introduction to Views
- B. Creating and Managing Views
- C. Performance Considerations for Views

IX. Designing and Implementing Stored Procedures
- A. Introduction to Stored Procedures
- B. Working with Stored Procedures
- C. Implementing Parameterized Stored Procedures
- D. Controlling Execution Context

X. Designing and Implementing User-Defined Functions
- A. Overview of Functions
- B. Designing and Implementing Scalar Functions
- C. Designing and Implementing Table-Valued Functions
- D. Alternatives to Functions

XI. Responding to Data Manipulation via Triggers
- A. Designing DML Triggers
- B. Implementing DML Triggers
- C. Advanced Trigger Concepts

XII. Using In-Memory Tables
- A. In-Memory Tables
- B. Native Stored Procedures

XIII. Implementing Managed Code in SQL Server
- A. Introduction to CLR Integration in SQL Server
- B. Implementing and Publishing CLR Assemblies

XIV. Storing and Querying XML Data in SQL Server
- A. XML and XML Schemas
- B. Storing XML Data and Schemas in SQL Server
- C. Implementing the XML Data Type
- D. Using the T-SQL FOR XML Statement
- E. Getting Started with xQuery
- F. Shredding XML

XV. Storing and Querying Spatial Data in SQL Server
- A. Introduction to Spatial Data
- B. Working with SQL Server Spatial Data Types
- C. Using Spatial Data in Applications

XVI. Storing and Querying BLOBs and Text Documents in SQL Server
- A. Considerations for BLOB Data
- B. Working with FileStream
- C. Using Full-Text Search

XVII. SQL Server Concurrency
- A. Concurrency and Transactions
- B. Locking Internals

XVIII. Performance and Monitoring
- A. Extended Events
- B. Working with extended Events
- C. Live Query Statistics
- D. Optimize Database File Configuration
- E. Metrics