

Microsoft - Develop AI-enabled database solutions

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Course Number: DP-800T00

Duration: 3 days

Overview

Course Description

This course provides students with the knowledge and skills to design and develop AI enabled database solutions across Microsoft SQL platforms, including SQL Server, Azure SQL, and SQL databases in Microsoft Fabric. It is intended for professionals who build modern data solutions that integrate structured and semi structured data and incorporate AI features into scalable enterprise applications. It will also be valuable for individuals who develop applications that rely on SQL based data services enhanced with vector search, embeddings, and other AI driven capabilities.

Audience Profile

The audience for this course is data professionals who want to learn about designing and developing AI-enabled database solutions across Microsoft's SQL platforms, including SQL Server, Azure SQL, and SQL databases in Microsoft Fabric. This role develops database solutions that include both structured and semi-structured data and integrates AI features into modern and highly scalable enterprise applications.?

Audience

Course Details

Outline

- Design and implement database objects with SQL
 - Understand your SQL Server-based platform choices
 - Build effective tables
 - Optimize with indexes
 - Use specialized table types
 - Enforce data integrity with constraints
 - Manage JSON columns and indexes
 - Partition tables for scale
 - Exercise - Create and maintain database objects
 - Module assessment
- Implement programmability objects with SQL
 - Create views
 - Create stored procedures
 - Create scalar functions
 - Create table-valued functions
 - Create triggers
 - Choose when to use each option
 - Exercise: Implement programmability objects in SQL Server
 - Knowledge check
- Write advanced T-SQL code
 - Organize queries with Common Table Expressions
 - Apply window functions for analytics
 - Process JSON data with built-in functions
 - Match patterns with regular expressions
 - Find approximate matches with fuzzy string functions
 - Traverse relationships with graph queries
 - Compare rows with correlated subqueries
 - Handle errors with TRY...CATCH
 - Exercise - Work with JSON functions
 - Module assessment

- Implement SQL solutions by using AI-assisted tools
 - Describe AI-assisted development tools available for Microsoft SQL platforms
 - Interpret security impact of using AI-assisted tools
 - Enable GitHub Copilot and Fabric Copilot
 - Configure model and Model Context Protocol (MCP) tool options in a GitHub Copilot or Fabric Copilot chat session
 - Create and configure GitHub Copilot instruction files
 - Connect to MCP server endpoints, including Microsoft SQL Server and Fabric Lakehouse
 - Exercise - Configure AI-assisted tools for database development
 - Module assessment
- Implement data security and compliance with SQL
 - Protect data with encryption
 - Configure dynamic data masking
 - Implement row-level security
 - Manage permissions and secure access
 - Implement auditing
 - Configure secure access to AI services
 - Secure data API endpoints
 - Exercise: Implement security features
 - Module assessment
- Optimize database performance
 - Recommend database configurations
 - Preserve data integrity with transaction isolation levels and concurrency controls
 - Evaluate query performance with execution plans and DMVs
 - Monitor and tune queries with Query Store and Query Performance Insight
 - Identify and resolve blocking and deadlocks
 - Exercise: Optimize query performance
 - Knowledge check
- Implement CI/CD by using SQL Database Projects
 - Create, build, and validate SQL Database Projects
 - Configure source control and manage reference data
 - Manage branching, pull requests, and conflict resolution

- Detect and resolve schema drift
- Implement CI/CD pipelines
- Design and implement a testing strategy
- Exercise: Implement CI/CD by using SQL Database Projects
- Knowledge check
- Integrate SQL solutions with Azure services
 - Create configuration files for Data API Builder
 - Define entities for REST and GraphQL
 - Expose database objects, stored procedures, and views
 - Explore deployment options for Data API Builder
 - Recommend Azure Monitor configurations
 - Handle changes with event-driven patterns
 - Exercise - Configure Data API Builder for a product catalog
 - Module assessment
- Design and implement models and embeddings with SQL
 - Understand and evaluate models for SQL database workloads
 - Create and manage external models in SQL
 - Design embeddings for SQL database workloads
 - Generate and maintain embeddings for SQL database workloads
 - Exercise - Generate and update embeddings in Azure SQL Database
 - Knowledge check
- Design and implement intelligent search with SQL
 - Choose an intelligent search approach
 - Implement full-text search
 - Prepare SQL for vector search
 - Implement vector search query patterns
 - Implement hybrid search and ranking
 - Exercise - Implement intelligent search with full-text, vector, and hybrid queries
 - Knowledge check
- Design and implement RAG with SQL
 - Identify RAG use cases and architecture
 - Prepare retrieval context for augmentation

- Augment prompts with database context
- Generate and process RAG responses
- Exercise: Implement a RAG solution
- Knowledge check