Develop AI-enabled database solutions

CODICE	**DP-800T00**
DURATA	**4 gg**
PREZZO	**1.590,00 €**
EXAM	

DESCRIZIONE

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.

TARGET

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.

CONTENUTI

Design and develop database solutions

Design and implement database objects with SQL

- Understand 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

Implement programmability objects with SQL

- Create and use views
- Build stored procedures
- Develop scalar functions
- Implement table-valued functions
- Configure triggers
- Choose the appropriate programmability object

Write advanced T-SQL code

- Common Table Expressions (CTEs)
- Recursive CTEs
- Window functions
- JSON functions
- Regular expressions
- Fuzzy string matching
- Graph queries
- Correlated subqueries
- Error handling with TRY…CATCH

Implement SQL solutions by using AI-assisted tools

- GitHub Copilot for SQL development
- Fabric Copilot
- AI-assisted development across SQL Server, Azure SQL, and Microsoft Fabric

Secure, optimize, and deploy database solutions

Implement data security and compliance with SQL

- Data encryption (Always Encrypted, column encryption)
- Dynamic Data Masking
- Row-Level Security
- Object-level permissions
- Auditing
- Secure access to AI services
- Secure Data API endpoints

Optimize database performance

- Service tier selection
- Transaction isolation levels
- Query execution plans
- Dynamic Management Views (DMVs)
- Query Store

- Blocking and deadlock troubleshooting

Implement CI/CD by using SQL Database Projects

- SQL Database Projects (SDK-style)
- Source control integration
- Branching and pull requests
- Schema drift detection
- Automated deployments with GitHub Actions and Azure DevOps

Integrate SQL solutions with Azure services

- Data API Builder
- REST APIs
- GraphQL APIs
- Azure hosting
- Monitoring and diagnostics
- Event-driven integration patterns

Implement AI capabilities in database solutions

Design and implement models and embeddings with SQL

- Evaluate AI models for SQL workloads
- Create and manage external models
- Design embedding strategies
- Generate embeddings using built-in SQL AI functions
- Maintain embeddings alignment with source data

Design and implement intelligent search with SQL

- Full-text search
- Vector search
- Hybrid search models
- Vector index strategies
- Similarity metrics
- Reciprocal Rank Fusion (RRF)
- Performance considerations

Design and implement RAG with SQL

- Identify Retrieval-Augmented Generation (RAG) scenarios
- Prepare SQL data as LLM context
- Construct augmented prompts

- Process model responses
- End-to-end RAG implementations in T-SQL