

# Performance Tuning and Managing MSSQL Server 2022

## **Module 01: SQL Server Architecture**

Lesson 1: SQL Server Components and SQLOS

Lesson 2: Thread management and Reduced buffer pool I/O promotions

Lab: SQL Server Architecture

## **Module 02: Database Architecture Internal**

Lesson 1: SQLDB Structure

Lesson 2: Data Files

Lesson 3: TempDB and Virtual log file growth

Lab: Database Structures

## **Module 03: Scheduling, and Waits**

Lesson 1: Windows Scheduling vs. SQL Server Scheduling

Lesson 2: Waits and Queues

Lab: Scheduling, and Waits

## **Module 04: Index Internals**

Lesson 1: Indexing and Its types

Lesson 2: Column store Indexes vs Clustered Index

Lesson 3: Index Fragmentation

Lesson 4: Ordered clustered columnstore index and Improved columnstore segment elimination

Lab: Statistics and Indexing

## **Module 05: Statistics and Maintenance**

Lesson1: Statistics and Data Distribution

Lesson2: Auto Create and Update Statistics

Lesson3: Manage Statistics Settings Manually

Lesson4: Resolving outdated and missing Statistics

## **Module 06: SQL Server Memory**

Lesson 1: SQL Server Memory

Lesson 2: In-Memory OLTP Concepts

Lesson3: Memory Optimized Tables and Procedures

Lab: SQL Server In Memory Tables and Procedure

## **Module 07: SQL Server Locking**

Lesson 1: Blocking/Deadlock and Locking Internals

Lesson 2: Concurrency

Lesson 3: Effect of Indexes on locking

Lesson 4: Enhanced spinlock algorithms

Lab: Concurrency and Transactions

## **Module 08: Execution Plan Analysis**

Lesson 1: Query Optimizer

Lesson 2: Estimated vs Actual Execution Plan

Lesson 3: Analyzing Query Execution Plans

Lesson 4: Adaptive Query Processing

## **Module 09: Performance Improvement with Query Store**

Lesson 1: Information Collected by Query Store

Lesson 2: Query Runtime Data and capture Mode

Lesson 3: Controlling Query Store and Query Store Reporting

Lesson 4: Plan Forcing

Lesson 5: Automatic Tuning

## **Module 10: Execution Plan Cache and It's Internal**

Lesson 1: Plan Cache Discussion

Lesson 2: Troubleshooting with Plan Cache

Lesson 3: Execution Plan Caching and Reuse

Lesson 4: Execution Plan Recommendation

## **Module 11: Query Plan Recompilation and Execution**

Lesson 1: Pros and cons of Query Recompilation

Lesson 2: Reason of Recompilation

Lesson 3: Avoid Recompilation

## **Module 12: Query Optimization**

Lesson 1: Optimal Table Joining Order

Lesson 2: Sort operator and Tempdb spill

## **Module 13: Intelligent Query Processing**

Lesson 1: Memory Grant Feedback

Lesson 2: Approximate Count Distinct

Lesson 3: Intelligent Query Processing

Lesson 4: System page latch concurrency enhancements

## **Module 14: Monitoring and Tracing**

Lesson 1: Extended Events core Concepts

Lesson 2: Working with Extended Events

## **Module 15: Automatic Tuning in Azure SQLDB**

Lesson 1: Index Management in Azure SQLDB using Automatic Tuning

Lesson 2: Monitoring Azure SQLDB

## **Module 16: Database Performance Improvement Tips and Tricks**

Lesson 1: Tips to improve SQL Server performance & database design

Lesson 2: Improved virtual log file (VLF) algorithms

Lesson 3: Instant file initialization for transaction log file growth events