



Corporate Services Pvt. Ltd.

SQL



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INTRODUCTION TO DBMS AND INSTALLATION PROCESS

- **Data, Databases, and RDBMS Software**
- **Benefits of SQL Server**
- **Applications, Database Engine Components, and OLTP Databases**
- **BI Tools & Data Science Components**
- **Applications of SQL, Real-world Uses, SQL vs. Microsoft T-SQL (MSSQL)**
- **Instance and Server Names, Features, Collation, Admin Users**
- **Real-world Projects Included, Job Responsibilities, SQL Server Versions and Editions**
- **SQL Server and SSMS Installation, SQL Server Career Paths**
- **SQL Server Requirements: Installing SQL Server 2019 / 2017 / 2014 / 2012**

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BASICS OF SQL AND SSMS TOOL

- **SSMS, Different Connections (Local and Remote)**
- **System Databases, Creating Objects with GUI**
- **Data Insertion, Limits, Storage Capacity**
- **System Files, Commands with Script, Select Statement**
- **Basic Data Scanning and Retrieval**

DATABASE CREATION AND COMMANDS (DDL AND DML)

- **Creating Databases and Tables**
- **Comprehensive Overview of “SELECT”**
- **Data Types in SQL, Select with Simple and Where Conditions**
- **Various Operators: OR, AND, IN, LIKE, NOT LIKE, Wildcards, IS, IS NOT, TOP, DISTINCT, and More**

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EXPORTING AND IMPORTING (DIFFERENT SOURCES) AND SCHEMA MODIFICATIONS

- **Update, Delete, Truncate, Drop
Commands, Removing Schema**
- **Table and Database Management**
- **DDL Commands, Table Creation and
Transfer**
- **GO Statement, Naming Conventions,
Export and Import Wizard**
- **Text Data Types: CHAR and VARCHAR**
- **NVARCHAR, Real-time Applications,
Batches**
- **Based on Real Case Scenarios**

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KEY CONCEPTS

- **Data Integrity**
- **NULL and NOT NULL Properties, Primary Key (PK), Foreign Key (FK), CHECK, and Default Constraints**
- **ER Diagrams**
- **Table Relationships, Identity Property, Auto-increment**
- **Real-world Scenarios: Cascading Referential Integrity Constraint**
- **Identity Column and Retrieving Identity Column Values**

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DATABASE OBJECTS AND BASIC PROCEDURES (CASE 1)

- **Types of Views with Real-world Examples**
- **Executing Views, UDFs, Procedures, Procedures with Parameters**
- **User-defined Procedures and System-defined Procedures (e.g., sp_)**
- **Differences between Procedures**
- **Functions and Views with Performance Comparisons**
- **Benefits of Stored Procedures**

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TYPES OF JOINS AND T-SQL QUERIES (CASE 1)

- **INNER and OUTER Joins with WHERE and ON Clauses**
- **FULL OUTER JOIN with Real-world Examples**
- **MERGE Joins, Differences with Small and Large Tables**
- **CROSS Joins and Advanced Joins**

GROUP BY AND T-SQL QUERIES (CASE 1)

- **GROUP BY Clauses, Aggregate Functions**
- **GROUP BY Queries with WHERE Clause**
- **Difference between WHERE and HAVING Clauses with Real-world Examples**
- **Grand Total, ROLLUP, and CUBE Functions**
- **UNION and UNION ALL, GROUPING Functions**
- **Row Status**

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T-SQL QUERIES (CASE 2)

- **Joining Two and Three Tables**
- **Aliases, WHERE, and ON Conditions**
- **GROUP BY and Sub-Queries, Date and Time Functions**
- **CAST and CONVERT, DATEDIFF Function**
- **String Functions: TRIM, LEFT, RIGHT, REVERSE, and REPLACE**

T-SQL QUERIES (CASE 3)

- **Complex Table Joins in T-SQL; Using Joins with Sub-Queries**
- **Using Joins with Nested Sub-Queries**
- **IIF() and CASE Statements, CASE Studies in Joins**
- **Joins in GROUP BY, ROLLUP, CUBE, Replacing NULLs**
- **IS NULL, COALESCE Functions**
- **MERGE Statement for All Commands like DML**
- **Joins with WHEN MATCHED and NOT MATCHED**
- **DML Operations with MERGE Statement**
- **Row Number Generation in T-SQL**
- **ROW_NUMBER() and RANK() Queries**
- **DENSE_RANK, Sequence Identification, PARTITION**

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STORED PROCEDURES (CASE 2)

- **Table-valued Parameters**
- **IN and OUT Parameters**
- **Dynamic Data with SPs**
- **Variables (@variable)**
- **Common Table Expressions (CTEs)**
- **Replacing @CTE with Self Joins and Sub-Queries**
- **Recursive CTE**

STORED PROCEDURES (CASE 3)

- **Types of Triggers (DML and DDL)**
- **Views and Updatable Views**
- **Using Triggers with Joins**
- **Differences between Procedures and Views**
- **Triggers and Cursors**
- **Types of Cursors**
- **While Loop**
- **Nested Procedures**

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TRANSACTIONS IN T-SQL

- **Types of Transactions (ACID)**
- **BEGIN, COMMIT, and ROLLBACK**

Transactions

- **Explicit and Implicit Transactions**
- **Locking Mechanisms**
- **Blocking and Deadlocking**
- **NO LOCK**

NORMAL FORMS IN T-SQL

- **Normal Forms**
- **BCNF, 1NF, 2NF, 3NF, 4NF**
- **Types of Dependencies (Transitive) in Normalization**
- **Candidate Keys**

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FUNCTIONS (PART 2)

- **Types of Functions**
- **Inline Functions**
- **Multi-dimensional Functions with Real-world Examples**
- **PIVOT Function with Joins**
- **Cascading with DELETE and UPDATE with Real-world Examples**
- **BULK INSERT, JSON Files**
- **XML with Properties: XML Path, AUTO, etc.**
- **Temporary Tables with Real-world Examples**

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INDEXING IN DATABASES

- **Database Architectures**
- **Different File Types (.ldf, .mdf)**
- **Log Files, File Groups, etc.**
- **Types of Indexes: Clustered and Non-clustered**
- **Online Indexes, Unique Indexes**
- **Materialized Views**
- **B-Tree Structure**

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QUERY OPTIMIZATION AND PERFORMANCE TUNING

CASE 1: PARTITION METHODS AND AUDITS

- **Editing Long-running Queries with DMVs and DMFs**
- **Monitoring Tools**
- **Plan Handling and Settings**
- **Using Partitions and Non-partitioned Tables**
- **Compression Methods**

CASE 2: INDEX MANAGEMENT

- **Benefits of Statistics, Creation, Updates, and Management**
- **Fragmentation and Rebuilding Indexes**
- **DMP**
- **Online, Resume Options, and Scanning Process**

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CASE 3: FULL TEXT SEARCH (FTS) AND IN-MEMORY TABLES

- FTS Methods
- Tuning Advisor
- Database Catalog
- ONLINE, PAUSE, RESUME, File Stream, File Groups
- Temporary Tables and System Versioning

CASE 4: LOCKING METHODS AND ISOLATION LEVELS

- Types of Locks
- Shared, Intent, and Schema Locks
- Query Blocking
- Read Committed
- Read Uncommitted
- Repeatable Read
- Deadlock Methods
- Capturing Blocking with Profiler Tools
- Perfmon Tools



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