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U-16/73,74 NEAR CANARA BANK
MAIN ROAD DLF PHASE-III
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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

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

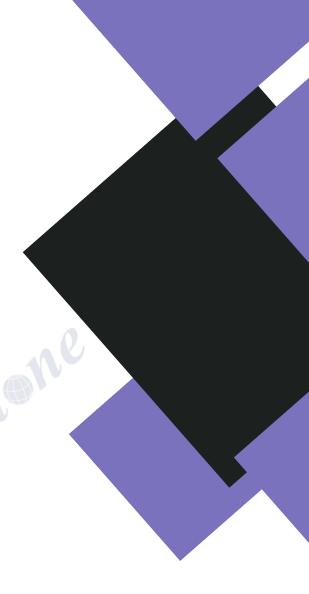
DATABASE CREATION AND COMMANDS (DDL AND DML)

- 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



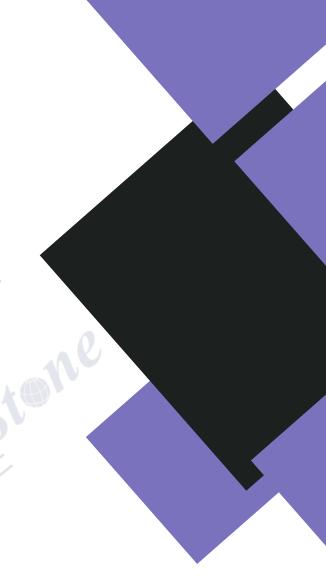
EXPORTING AND IMPORTING (DIFFERENT SOURCES) AND SCHEMA MODIFICATIONS

- 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



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



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

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



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

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)

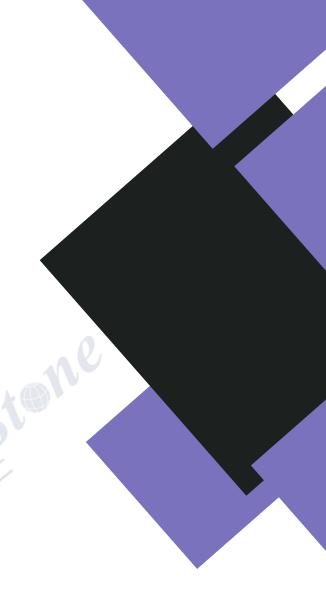
- Types of Triggers (DML and DDL)
- Views and Updatable Views
- Using Triggers with Joins
- Differences between Procedures and Views
- Triggers and Cursors
- Types of Cursors
- While Loop
- Nested Procedures

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



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

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

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 Nonpartitioned 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

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

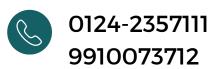
- FTS Methods
- Tuning Advisor
- Database Catalog
- ONLINE, PAUSE, RESUME, File
 Stream, File Groups
- Temporary Tables and System Versioning

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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