Technical Guftgu

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SQL + NoSQL

SQL Course Curriculum –

Introduction - This course covers the fundamentals of **SQL and NoSQL** databases, their differences, and use cases. Learn how **SQL** manages structured data with relational databases and how **NoSQL** handles flexible, scalable data storage. Gain hands-on experience with querying, indexing, and transactions.

Module 1: Introduction to DBMS

I.   1.File Management system and its drawbacks
II.   2.DBMS & data Models - Physical | Logical Models

Module 2: Introduction to SQL

I.   1 Various types of databases
II.   2 Introduction to Structured Query Language
III. 3 Distinction between client-server and file-server databases
IV.   4 Understanding SQL Server Management Studio
V.   5 Authentication Modes - -

Module 3: Database Normalization and Entity Relationship Model

I.   1 Entity-Relationship Model
II.   2 Entity and Entity Set
III. 3 Attributes and types of Attributes
IV.   4 Relationship Sets
V.   5 Degree of Relationship
VI.   6 Mapping Cardinalities, One-to-One, One-to-Many, Many-to-one, Many-to-many
VII. 7 Symbols Used in E-R Notation

Module 4: Introduction to TSQL

-Types Of TSQL Commands

- **Data Definition Language (DDL)**

  1.Database

  I.   Creating Database
  II.   Altering Database
  III. Deleting Database

IV. Backup and Restore Of Database

V. Attach and Detach of Database

2.Table

I. Creating Table

II. Altering Table

III. Deleting Table

3.Data Types In TSQL

4.Constraints

I. Not Null, Unique, Default and Check constraints

II. Primary Key and Referential Integrity or foreign key constraints

- **Data Manipulation Language (DML)**
  1. Insert
  I. Identity
  II. Creating A Table From Another Table
  III. Inserting Rows From One Table To Another
  IV. Update

  2.Computed Columns

  3.Delete & Truncate

- **Data Query Language (DQL)**
  1. Select
  2. Where clause |
  3. Order By Clause
  4. Distinct Keyword
  5. Isnull() function
  6. Column aliases
  7. Comparison Operations - =,>,<,<=,>=,<>
  8. Logical Operators -AND,OR,Between,in,Not in
  9. Like, Null, Not Null
  10. Group By and Having Clauses
  11. Top n Clause

Module 5: Working with Built In Functions

I. Numeric/Aggregate Functions

II. Character Functions

III. Conversion Functions

IV. Date Functions

V. Advance Functions

VI. Over(partition by …) Clause

VII. Ranking Functions(Window functions)

VIII.Common Table Expressions (CTE)

Module 6: Set Operators

    I.   Union
    II. Intersect
    III. Except

Module 7: Working with SQL: Join, and Variables

    I.   Inner Join / Equi Join
    II.   Self Join
    III. Outer Join - Left Outer Join | Right Outer Join |Full Outer Join
    IV. Cross Join
    V.   Data retrieval from tables
    VI. Temporary table creation
    VII. Variables & Table variables

Module 8: Working with Subqueries

    I.   Understanding SQL subqueries, their rules
    II.   Statements and operators with which subqueries can be used
    III. Using the set clause to modify subqueries
    IV. Understanding different types of subqueries, such as where, select, insert, update, delete, etc.
    V.   Methods to create and view subqueries

Module 9: SQL Views and Stored Procedures

    I.   Learning SQL views
    II.   Methods of creating, using, altering, renaming, dropping, and modifying views
    III. Understanding stored procedures and their key benefits
    IV. Working with stored procedures
    V.   Error handling

Module 10: Deep Dive into User-defined Functions

    I.   User-defined functions
    II.   Types of UDFs, such as scalar
    III. Inline table value
    IV. Multi-statement table
    V.   Triggers, and when to execute triggers?

Module 11: SQL Optimization and Performance

    I.   Records grouping, advantages, searching, sorting, modifying data
    II.   Clustered indexes creation
    III. Use of indexes to cover queries
    IV. Index guidelines

Module 12: Transaction Management & Database Concurrency

    I.   Applying transactions
    II.   Begin | Commit | Rollback | Save Transaction
    III. Using the transaction behavior to identify DML statements

IV. Learning about implicit and explicit transactions
V. Understanding concurrency and locking behavior
VI. Using memory-optimized tables

Module 13: TSQL Programming

I. Drawbacks Of TSQL that leads to TSQL Programming
II. Introduction To TSQL Programming
III. Control statements In TSQL Programming
IV. Conditional Control Statements
V. If
VI. Case
VII. Looping Control Statements
VIII. While

Module 14: Advanced Topics

I. Correlated Subquery, Rank, CTE, Cursors, Exception Handling, Schema

Module 15: Practice Session

1. Creating Transact-SQL queries
2. Querying multiple tables using joins
3. Implementing functions and aggregating data
4. Modifying data
5. Determining the results of DDL statements on supplied tables and data
6. Constructing DML statements using the output statement
7. Querying data using subqueries and APPLY
8. Querying data using table expressions
9. Grouping and pivoting data using queries
10. Querying temporal data and non-relational data
11. Constructing recursive table expressions to meet business requirements
12. Using windowing functions to group
13. Rank the results of a query
14. Creating database programmability objects by using T-SQL
15. Implementing error handling and transactions
16. Implementing transaction control in conjunction with error handling in stored procedures
17. Implementing data types and NULL
18. Designing and implementing relational database schema
19. Designing and implementing indexes
20. Learning to compare between indexed and included columns
21. Implementing clustered index
22. Designing and deploying views
23. Explaining foreign key constraints
24. Usage of Data Manipulation Language (DML)
25. Designing the components of stored procedures
26. Implementing input and output parameters
27. Executing control logic in stored procedures
28. Designing trigger logic, DDL triggers, etc.
29. Identifying missing indexes

30.   SQL server performance monitoring

NoSQL MongoDB Course Curriculum –

Module 1: Introduction to Databases

    I.   Relational vs. Non-Relational Databases
    II. Limitations of Relational Databases
    III. Why NoSQL? Characteristics and Use Cases

Module 2: Overview of NoSQL Database Types

    I.   Key-Value Stores (e.g., Redis)
    II. Document Stores (e.g., MongoDB)
    III. Column-Family Stores (e.g., Cassandra)
    IV. Graph Databases (e.g., Neo4j)

Module 3: NoSQL Basics

    I.   ACID vs. BASE Models
    II. CAP Theorem and Distributed Systems
    III. Scalability: Vertical vs. Horizontal Scaling

Module 4: Hands-On Practice

    I.   Setting up a NoSQL database (e.g., MongoDB or Redis)
    II. Performing basic CRUD operations

Module 5: Introduction

    I.   What is MongoDB?
    II. Installing & Setting Up MongoDB
    III. Shell vs Drivers

Module 6: CRUD Operations

    I.   Understanding Databases & Collections
    II. JSON vs BSON
    III. Create, Read, Update, Delete (CRUD)
    IV. Querying & Modifying Data

Module 7: Schemas & Relations

    I.   Structuring Documents
    II. Data Types & Limits
    III. One-to-One, One-to-Many, Many-to-Many Relations
    IV. Schema Validation

Module 8: MongoDB Tools & Shell

    I.   MongoDB Shell Commands
    II. Configuring MongoDB Server

III.   MongoDB Compass Overview

Module 9: Advanced CRUD & Indexing

   I.   Inserting, Updating & Deleting Data Efficiently
   II.   Indexing for Performance

Module 10: Aggregation Framework

   I.   Using Aggregation Pipelines
   II.   Advanced Querying Techniques

Module 11: Transactions & Security

   I.   ACID Transactions
   II.   Authentication & Role-Based Access Control (RBAC)
   III.   Data Encryption

Module 12: Deployment & Performance Optimization

   I.   MongoDB in Production
   II.   Monitoring & Performance Tuning
   III.   Backup & Restore Strategies

Module 13: MongoDB Atlas & Cloud Integration

   I.   Deploying a Database in MongoDB Atlas
   II.   Cloud-Based Features & Management

Module 14: Working with MongoDB Drivers

   I.   Connecting via Python, Node.js, Java
   II.   Using MongoDB Drivers in Applications

Module 15: Sharding & Replication

   I.   Setting Up Replica Sets
   II.   Configuring a Sharded Cluster

Module 16: Real-World Applications

   I.   E-commerce Database
   II.   Analytics Dashboard
   III.   IoT Data Management

KEY HIGHLIGHTS OF THIS TRAINING PROGRAM:
- ✓ *Entire training programme is in Hindi Language for Better understanding.*
- ✓ *Special focus on Non technical and Fresher candidates.*
- ✓ *Resume Preparation for Fresher's and Experienced Both.*
- ✓ *Provides Recording of each live session which you can access from anywhere anytime for One year.*
- ✓ *Interview Cracking tips during live sessions.*
- ✓ *Provide complete notes and e-books for preparation.*

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