SQL COURSE - 1.5 MONTHS

MODULE 1: INTRODUCTION TO DATA BASE SQL

- ✓ What is a database?
- ✓ Types of databases (Relational vs Non-Relational)
- ✓ Overview of RDBMS (MySQL, PostgreSQL, SQL Server, Oracle)
- ✓ What is SQL? History and importance
- ✓ Installing and setting up a database server (MySQL / PostgreSQL)
- ✓ SQL syntax rules

MODULE 2: BASIC SQL COMMANDS

- ✓ Creating and selecting a database
- ✓ Creating tables (CREATE TABLE)
- ✓ Data types in SQL
- ✓ Inserting data (INSERT INTO)
- ✓ Viewing data (SELECT)
- ✓ Updating data (UPDATE)
- ✓ Deleting data (DELETE)
- ✓ Truncating a table (TRUNCATE)

MODULE 3: FILTERING AND SORTING DATA

- ✓ WHERE clause
- ✓ Comparison operators (=, <>, <, >, BETWEEN, IN, LIKE)
- ✓ Logical operators (AND, OR, NOT)
- ✓ Sorting with ORDER BY
- ✓ Limiting results with LIMIT / TOP

MODULE 4: SQL FUNCTIONS

- ✓ Aggregate functions (COUNT(), SUM(), AVG(), MIN(), MAX())
- ✓ String functions (CONCAT(), SUBSTRING(), LENGTH(), REPLACE())
- ✓ Date and time functions (NOW(), CURDATE(), DATE_ADD(), DATEDIFF())
- ✓ Mathematical functions (ROUND(), CEIL(), FLOOR())

MODULE 5: GROUPING DATA

- ✓ GROUP BY clause
- ✓ Using HAVING with aggregate functions
- ✓ Grouping and filtering together

MODULE 6: JOINS IN SQL

- ✓ Introduction to relationships in databases
- ✓ INNER JOIN
- ✓ LEFT JOIN / LEFT OUTER JOIN
- ✓ RIGHT JOIN / RIGHT OUTER JOIN
- ✓ FULL JOIN / FULL OUTER JOIN
- ✓ CROSS JOIN
- ✓ Self-joins

MODULE 7: SUBQUERIES

- ✓ Single-row subqueries
- ✓ Multi-row subqueries
- ✓ Correlated subqueries
- ✓ Using subqueries in SELECT, FROM, and WHERE clauses

MODULE 8: DATA MODIFICATION S CONSTRAINTS

- ✓ Adding, modifying, and deleting columns (ALTER TABLE)
- ✓ Dropping tables and databases (DROP)
- ✓ Primary key and foreign key constraints
- ✓ Unique, NOT NULL, CHECK, and DEFAULT constraints

MODULE 9: VIEWS, INDEXES TRANSACTIONS

- ✓ Creating and managing views
- ✓ Indexing for performance improvement
- ✓ Creating and dropping indexes
- ✓ Transactions (BEGIN, COMMIT, ROLLBACK)
- ✓ Understanding ACID properties

MODULE 10: ADVANCED SQL TOPICS

- ✓ Common Table Expressions (CTEs)
- ✓ Window functions (ROW_NUMBER(), RANK(), DENSE_RANK(), LEAD(), LAG())
- ✓ Pivot and unpivot tables
- ✓ Stored procedures and functions
- ✓ Triggers
- ✓ Query optimization basics

MODULE 11: PROJECT WORK S PRACTICE

- ✓ Mini-project ideas:
  - ➢ Library database management
  - ➢ E-commerce order and inventory tracking
  - ➢ School student record system
  - ➢ Sales reporting dashboard using SQL queries
- ✓ Debugging and query optimization

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