Module 1: Introduction to Databases & SQL

- What is a Database?

- Types of Databases: Relational vs. Non-relational

- Introduction to SQL (Structured Query Language)

- DBMS vs RDBMS

- Popular RDBMS: MySQL, PostgreSQL, SQL Server, Oracle, SQLite

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Module 2: Basic SQL Queries

- Creating a Database

- CREATE TABLE and data types

- INSERT INTO – inserting data

- SELECT – retrieving data

- WHERE clause

- ORDER BY, LIMIT

- DISTINCT

Module 3: SQL Functions

- Aggregate Functions: COUNT, SUM, AVG, MIN, MAX

- String Functions: UPPER, LOWER, LENGTH, SUBSTRING

- Date Functions

- Mathematical Functions

Module 4: Filtering and Sorting

- Operators: =, !=, <, >, <=, >=

- Logical Operators: AND, OR, NOT

- IN, BETWEEN, LIKE, IS NULL

Module 5: Joins and Relationships

- Understanding Keys: Primary Key, Foreign Key

- Types of Joins:

  - INNER JOIN

- o LEFT JOIN / RIGHT JOIN

- o FULL OUTER JOIN

- o SELF JOIN

- Relationships: One-to-One, One-to-Many, Many-to-Many

Module 6: Subqueries and Nested Queries

- Correlated, and Nested Subqueries

- IN, EXISTS, ANY, ALL with subqueries

Module 7: Data Modification

- UPDATE – modifying existing data

- DELETE – removing data

- TRUNCATE vs DELETE

Module 8: Table Management & Constraints

- Altering Tables: ALTER TABLE

- Dropping Tables

- Constraints: NOT NULL, UNIQUE, CHECK, DEFAULT