Sangy Academy

www.sangyacademy.com

Course Title: Introduction to SQL

Duration: 3 Months
Frequency: 2 Sessions/Week
Session Length: 2 Hours
Total Sessions: 24
Total Hours: 48
Target Audience: Beginners in data science, business intelligence, software development, or general data work.

📘 Course Overview

This course introduces learners to SQL (Structured Query Language), the standard language for managing and manipulating relational databases. The course covers querying, filtering, aggregating, joining, and modifying data, and culminates in real-world project scenarios.

🗓️ Course Outline

Month 1 – SQL Fundamentals

Week 1: Introduction to Databases and SQL

- **Session 1:** What is a database? What is SQL?
    - Types of databases (relational vs non-relational)
    - Introduction to RDBMS (MySQL, PostgreSQL, SQLite)
    - Setting up the SQL environment (e.g., SQLiteStudio or pgAdmin)
- **Session 2:** Introduction to Tables & Basic SELECT
    - SELECT statements
    - SELECT DISTINCT
    - Basic filtering using WHERE

Week 2: Filtering and Sorting Data

- **Session 3:** Operators in WHERE clause
    - =, <>, <, >, <=, >=
    - BETWEEN, IN, LIKE, IS NULL

- **Session 4:** Sorting Results and Limiting Output
    - ORDER BY, ASC/DESC
    - LIMIT and OFFSET

Week 3: Data Types and Functions

- **Session 5:** SQL Data Types
    - INTEGER, TEXT, DATE, BOOLEAN, etc.
    - CAST and CONVERT
- **Session 6:** Built-in Functions
    - Numeric functions (ROUND, CEIL, FLOOR)
    - String functions (CONCAT, LENGTH, SUBSTR)
    - Date functions (CURRENT_DATE, DATEADD, DATEDIFF)

Week 4: Aggregation & Grouping

- **Session 7:** Aggregate Functions
    - COUNT, SUM, AVG, MAX, MIN
- **Session 8:** GROUP BY and HAVING
    - GROUP BY use cases
    - Filtering grouped results with HAVING

Month 2 – Intermediate SQL and Joins

Week 5: Working with Multiple Tables

- **Session 9:** Introduction to JOINS
    - Understanding primary and foreign keys
    - INNER JOIN
- **Session 10:** LEFT, RIGHT, and FULL OUTER JOIN
    - JOIN examples and use cases

Week 6: Combining and Nesting Queries

- **Session 11:** UNION and UNION ALL
    - Use cases and syntax

- **Session 12:** Subqueries
    - Scalar subqueries
    - Subqueries in WHERE and FROM

Week 7: Modifying Data

- **Session 13:** INSERT and UPDATE
    - INSERT INTO single and multiple rows
    - UPDATE with conditions
- **Session 14:** DELETE and TRUNCATE
    - DELETE vs TRUNCATE
    - Data integrity and transaction safety

Week 8: Constraints and Keys

- **Session 15:** Table Constraints
    - NOT NULL, UNIQUE, DEFAULT
    - CHECK
- **Session 16:** Primary and Foreign Keys
    - Defining keys in CREATE TABLE
    - Referential integrity

Month 3 – Advanced Queries & Real-World Practice

Week 9: Advanced Querying Techniques

- **Session 17:** CASE and IF statements
    - Conditional logic in SELECT
- **Session 18:** Common Table Expressions (CTEs)
    - WITH clause
    - Recursive queries (introductory)

Week 10: Indexing and Performance

- **Session 19:** Indexes
    - Purpose and types of indexes

    - Performance benefits
- **Session 20:** Query Optimization Tips
    - EXPLAIN / ANALYZE
    - Writing efficient queries

Week 11: Views and Permissions

- **Session 21:** Views
    - Creating and using views
    - Updatable views
- **Session 22:** User Roles and Permissions
    - GRANT, REVOKE
    - Basics of user management

Week 12: Capstone Project & Review

- **Session 23:** Project Brief and Work Time
    - Design schema, load data, write queries
    - Realistic scenario (e.g., sales DB, library system)
- **Session 24:** Presentations and Course Wrap-Up
    - Students demonstrate SQL queries
    - Final Q&A and next steps (e.g., learning joins with Python or BI tools)

🎓 Assessment & Certification

- Quizzes every 2 weeks (short theory and practice)
- Mid-course project (Week 6–7)
- Final project in Week 12
- Certificate of Completion based on attendance and project submission

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