

SQL Programming

Students Will Learn

- Design normalized table structures for relational databases
- Create databases and tables
- Using primary and foreign keys
- Writing SQL queries
- Using inner and outer joins
- Using set operators (UNION, INTERSECT, EXCEPT)
- Using DML for SELECT, INSERT, UPDATE, DELETE
- Using subqueries
- Using triggers and stored procedures
- Using aggregate functions to return totals and subtotals

Duration

The course consists of about 10 hours of audio/video presentation and about 16 hours of carefully guided hands-on lab exercises.

Price

USD\$500

Course Description

This SQL programming course teaches students relational database fundamentals and SQL programming skills. Topics covered include relational database architecture, database design techniques, and simple and complex query skills. This class is intended for analysts, developers, designers, administrators, and managers new to the SQL programming language. Upon completion, participants will understand SQL functions, join techniques, database objects and constraints, and will be able to write useful SELECT, INSERT, UPDATE and DELETE statements. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency.

Course Overview

Relational Database Fundamentals

- Overview of Relational Database Concepts
- Relational Databases and Relational Database Management Systems
- Data Normalization
- DDL Syntax

Writing Basic SQL Queries

- Displaying Table Structures
- Retrieving Column Data From a Table or View
- Selecting Unique Values
- Filtering Rows Using the WHERE Clause
- Sorting Results Using ORDER BY
- Joining Multiple Tables
- Using Column and Table Aliases

Creating a Database

- Database Development Methodology Overview
- Building a Logical Data Model
 - Identifying Entities and Attributes
 - Isolating Keys
 - Relationships Between Entities
 - Creating Entity-Relationship Diagrams
- Transforming to Physical Design
 - Migrating Entities to Tables
 - Selecting Primary Keys
 - Defining Columns
 - Enforcing Relationships with Foreign Keys
- Constructing the Database Using DDL
 - Creating Tables, Indexes, Constraints and Views
 - Dropping Tables, Indexes, Constraints and Views
 - Modifying Tables, Indexes, Constraints and Views

Manipulating Query Results

- Using Row Functions
 - Character
 - Numeric
 - Date and Time
 - Data Conversion (CAST and CONVERT)
- Using the CASE Function
- Handling Null Values

Advanced Query Techniques

- Inner Joins
- Outer Joins (Left, Right, Full)
- Joining a Table to Itself
- Subqueries
- Tips for Developing Complex SQL Queries
- Using Aggregate Functions
 - AVG
 - COUNT
 - SUM
 - MIN
 - MAX
- Aggregating Results Using GROUP BY
- Restricting Groups with the HAVING Clause
- Creating Temporary Tables

Manipulating Table Data Using SQL's Data Manipulation Language (DML)

- Inserting Data into Tables
- Updating Existing Data
- Deleting Records
- Truncating Tables
- Implementing Data Integrity with Transactions
 - Beginning Explicit Transactions
 - Committing Transactions
 - Rolling Back Transactions

User-Defined Functions

- Definition and Benefits of Use
- CREATE FUNCTION
 - Syntax
 - RETURN Clause and the RETURNS Statement
 - Scalar vs. Table Functions
- Comparison with Stored Procedures
- Returning Scalar Values and Tables
- ALTER and DROP FUNCTION

Stored Procedures

- Definition and Benefits of Use
- CREATE PROCEDURE
 - Syntax
 - Variables and Parameters
- Control of Program Flow
- ALTER and DROP PROCEDURE
- Implementation Differences

Triggers

- Definition and Benefits of Use
- Alternatives (e.g., Constraints)
- CREATE TRIGGER
 - Syntax
 - Trigger Types
- "Inserted" (or "NEW") and "Deleted" (or "OLD") Tables
- Event Handling and Trigger Execution
- ALTER and DROP TRIGGER