SQL Programming

Duration: 21 hours

Prerequisites: None.

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 who need to exploit the power of the SQL programming language. Upon completion, participants will understand SQL functions, join techniques, database objects and constraints, and will be able to write advanced SELECT, INSERT, UPDATE and DELETE statements. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency.

Students Will Learn

- Introduction to Relational Databases and SQL
- Designing Relational Databases
- Creating Databases and Tables
- Working with Records
- JOIN Statements
- Advanced SELECT Statements
- Understanding Subqueries
- SQL Procedural Programming
- Views and Triggers
- Database Security and Transactions

Overview

Relational Database Fundamentals

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

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

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

Manipulating Query Results

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

    - 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

Advanced Query Techniques

- Inner Joins
- Outer Joins (Left, Right, Full)
- Performing Self-Joins
- Subqueries
    - Simple
    - Correlated
- Using the `EXISTS` Operator
- Tips for Developing Complex SQL Queries
- Using Aggregate Functions
    - `AVG`
    - `COUNT`
    - `SUM`
    - `MIN`
    - `MAX`
- Performing Set Operations
    - `UNION`
    - `INTERSECT`
    - `EXCEPT/MINUS`
- 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)

Working with Table Expressions

- Overview of Table Expressions
- Working with Views

- `CREATE TRIGGER`
  - Syntax
  - Trigger Types
- "Inserted" (or "NEW") and "Deleted" (or "OLD") Tables
- Event Handling and Trigger Execution
- `ALTER` and `DROP TRIGGER`
- Using Derived Tables
- Common Table Expressions
- Table-Valued Functions

Related Bootcamps

Track	Duration	Price
SQL Programmer	21 hours	$895
Java Programmer	126 hours	$3,580
Microsoft .NET Developer: C#	161 hours	$4,475
Microsoft .NET Developer: VB.NET	147 hours	$4,475
Python Programmer	49 hours	$1,790

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