

SQL Querying Fundamentals



Days: 2

Prerequisites: Basic end-user computer skills and some familiarity with database terminology and structure are required.

Audience: Students should have basic computer skills, SQL skills, and be familiar with concepts related to database structure and terminology.

Description: Many organizations use databases to store their most critical information: the information that manages their day-to-day operations. After the data is stored in databases, however, it is useless unless you can retrieve it for further business analysis. One example of a database management system is Microsoft SQL Server 2012. The language you use to retrieve information from SQL Server 2012 databases is the Structured Query Language (SQL).

The first day of this course will teach you to use SQL as a tool to retrieve the information you need from databases.

On the second day of this course, you will learn how to identify and use advanced querying techniques. In addition, you might find that you need to perform tasks such as modifying the structure of a table; inserting, updating, or deleting data; and indexing tables to optimize query performance. You will learn how to complete these tasks and more.

In today's competitive environment, information is one of the most important factors in determining the success of an organization. If you are able to manage and retrieve information efficiently, you can streamline the organization's processes and give it a competitive edge. As the organization grows, you will need to handle large amounts of data. Under such circumstances, you might need to query multiple tables simultaneously and with increasing frequency. You must step up the speed of generating query output to cope with the increasing demands of data storage, management, and retrieval.

Course Objectives: In this course, you will compose SQL queries to retrieve desired information from a database, work with advanced queries to manipulate and index tables, and create transactions so that you can choose to save or cancel the data entry process. You will:

- Connect to the SQL Server database and execute a simple query.
- Include a search condition in a simple query.
- Use various functions to perform calculations on data.
- Organize the data obtained from a query before it is displayed on-screen.
- Retrieve data from multiple tables.
- Export the results of a query. Use subqueries to generate query output.
- Manipulate table data by inserting and updating records in a table and deleting records from a table.
- Manipulate the table structure.
- Create views, manipulate data through views, modify the view structure, and drop views.
- Create indexes on table columns and drop inefficient indexes.
- Mark the beginning of a transaction, roll back a transaction, and commit a transaction.

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OUTLINE:

LESSON 1: EXECUTING A SIMPLE QUERY

- Topic A: **Connect to the SQL Database**
- Topic B: **Query a Database**
- Topic C: **Save a Query**
- Topic D: **Modify and Execute a Saved Query**

LESSON 2: PERFORMING A CONDITIONAL SEARCH

- Topic A: **Search Using One or More Conditions**
- Topic B: **Search for a Range of Values and NULL Values**
- Topic C: **Search Data Based on Patterns**

LESSON 3: WORKING WITH FUNCTIONS

- **Topic A:** Perform Date Calculations
- **Topic B:** Calculate Data Using Aggregate Functions
- **Topic C:** Manipulate String Values

LESSON 4: ORGANIZING DATA

- Topic A: **Sort Data**
- Topic B: **Rank Data**
- Topic C: **Group Data**
- Topic D: **Filter Grouped Data**
- Topic E: **Summarize Grouped Data**
- Topic F: **Use PIVOT and UNPIVOT Operators**

LESSON 5: RETRIEVING DATA FROM MULTIPLE TABLES

- **Topic A:** Combine the Results of Two Queries
- **Topic B:** Compare the Results of Two Queries
- **Topic C:** Retrieve Data by Joining Tables

LESSON 6: EXPORTING QUERY RESULTS

- Topic A: **Generate a Text File**
- Topic B: **Generate an XML File**

LESSON 7: USING SUBQUERIES TO PERFORM ADVANCED QUERYING

- **Topic A:** Search Based on Unknown Values
- **Topic B:** Compare a Value with Unknown Values
- **Topic C:** Search Based on the Existence of Records
- **Topic D:** Generate Output Using Correlated Subqueries
- **Topic E:** Filter Grouped Data Within Subqueries
- **Topic F:** Perform Multiple-Level Subqueries

LESSON 8: MANIPULATING TABLE DATA

- **Topic A:** Insert Data
- **Topic B:** Modify and Delete Data

LESSON 9: MANIPULATING THE TABLE STRUCTURE

- Topic A: **Create a Table**
- Topic B: **Create a Table with Constraints**
- Topic C: **Modify a Table's Structure**
- Topic D: **Back Up Tables**
- Topic E: **Delete Tables**

LESSON 10: WORKING WITH VIEWS

- **Topic A:** Create a View
- **Topic B:** Manipulate Data in Views
- **Topic C:** Create Aliases
- **Topic D:** Modify and Delete Views

LESSON 11: INDEXING DATA

- Topic A: **Create Indexes**
- Topic B: **Drop Indexes**

LESSON 12: MANAGING TRANSACTIONS

- Topic A: **Create Transactions**
- Topic B: **Commit Transactions**

APPENDIX A: THE FULLERACKERMAN DATABASE