

# 55232: Writing Analytical Queries for Business Intelligence

## Course Details

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### Course Outline

#### 1. Introduction to TSQL for Business Intelligence

- Two Approaches to SQL Programming
- TSQL Data Retrieval in an Analytics / Business Intelligence Environment
- The Database Engine
- SQL Server Management Studio and the CarDeal Sample Database
- Identifying Variables in Tables
- SQL is a Declarative Language
- Introduction to the SELECT Query
- **Lab 1: Introduction to TSQL for Business Intelligence**
- Create a database diagram
- Create and execute basic SELECT queries

#### 2. Turning Table Columns into Variables for Analysis: SELECT List Expressions, WHERE, and ORDER BY

- Turning Columns into Variables for Analysis
- Column Expressions, Data Types, and Built-in Functions
- Column aliases
- Data type conversions
- Built-in Scalar Functions
- Table Aliases
- The WHERE clause
- ORDER BY
- **Lab 1: Write queries using:**
- Column and table aliases
- DISTINCT
- WHERE
- ORDER BY
- Built-in functions
- Explicit and implicit data type conversion

### 3. Combining Columns from Multiple Tables into a Single Dataset: The JOIN Operators

- Primary Keys, Foreign Keys, and Joins
- Understanding Joins, Part 1: CROSS JOIN and the Full Cartesian Product
- Understanding Joins, Part 2: The INNER JOIN
- Understanding Joins, Part 3: The OUTER JOINS
- Understanding Joins, Part 4: Joining more than two tables
- Understanding Joins, Part 5: Combining INNER and OUTER JOINS
- Combining JOIN Operations with WHERE and ORDER BY
- **Lab 1: Write SELECT queries using:**
  - Inner join
  - Left, right, and full join
  - Joins of more than two tables
  - Join operators, in addition to WHERE and ORDER BY

### 4. Creating an Appropriate Aggregation Level Using GROUP BY

- Identifying required aggregation level and granularity
- Aggregate Functions
- GROUP BY
- HAVING
- Order of operations in SELECT queries
- **Lab 1: Write queries using:**
  - Aggregate functions
  - Aggregate function with HAVING
  - Aggregate function with GROUP BY and HAVING
  - Aggregate function with GROUP BY, HAVING, WHERE, and ORDER BY

### 5. Subqueries, Derived Tables and Common Table Expressions

- Non-correlated and correlated subqueries
- Derived tables
- Common table expressions
- **Lab 1: Write queries using:**
  - Non-correlated subqueries
  - Correlated subqueries
  - Derived tables
  - Common table expressions

- Subqueries, derived tables, and common table expressions in combination with other topics covered in previous modules

## 6. Encapsulating Data Retrieval Logic

- Views
- Table-valued functions
- Stored procedures
- Creating objects for read-access users
- Creating database accounts for analytical client tools
- **Lab 1: Encapsulating Data Retrieval Logic**
- Create a SQL login
- Create a database user and assign required permissions
- Create a database schema for views, functions, and stored procs
- Create a view
- Create a table-values function
- Create a stored procedure
- Allow a user with read-only access to use views, table-valued functions, and store procedures

## 7. Getting Your Dataset to the Client

- Connecting to SQL Server and Submitting Queries from Client Tools
- Connecting and running SELECT queries from:
  - Excel
  - PowerBI
  - RStudio
- Exporting datasets to files using
  - Results pane from SSMS
  - The bcp utility
  - The Import/Export Wizard
- **Lab 1: Getting Your Dataset to the Client**
- Retrieving the results of a view in Excel
- Running an ad-hoc SELECT query from Excel
- Running an ad-hoc query from PowerBI
- Running an ad-hoc query from RStudio
- Using the Import/Export wizard to write the results of a query to a text file