Session 1

رواد مصر الرقمية

وزارة الاتصالات
وتكنولوجيا المعلومات

Module 1

Introduction to Microsoft SQL Server

Module Overview

- The Basic Architecture of SQL Server
- SQL Server Editions and Versions
- Getting Started with SQL Server Management Studio

What is Database?

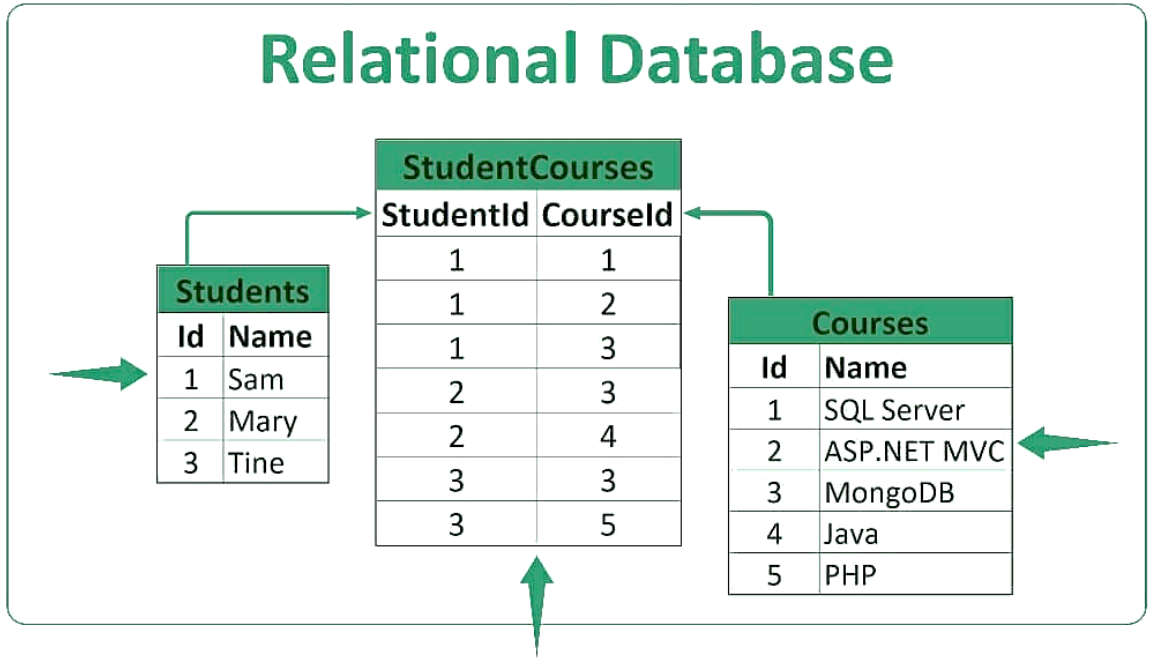
- **Database**: A Collection of Related Data.
- **Database Management System (DBMS)**: A Software that facilitates the creation and maintenance of a computerized database.
- **Database System**: DBMS with the data itself (Software + Database).

Lesson 1: The Basic Architecture of SQL Server

- Relational Databases
- About the Course Sample Database
- Client Server Databases
- Queries

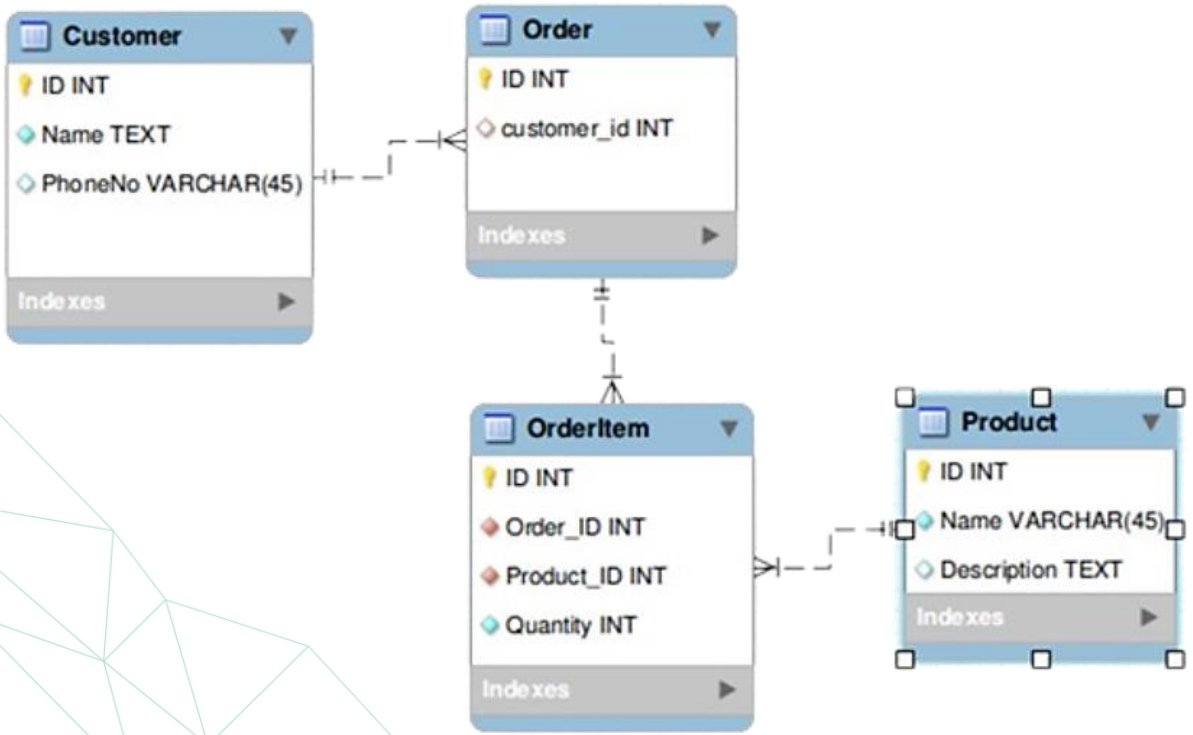
Relational Databases

- SQL Server is a relational database management system
- Databases contain objects and data
- Each database has multiple tables
- Tables are joined together to extract meaningful information



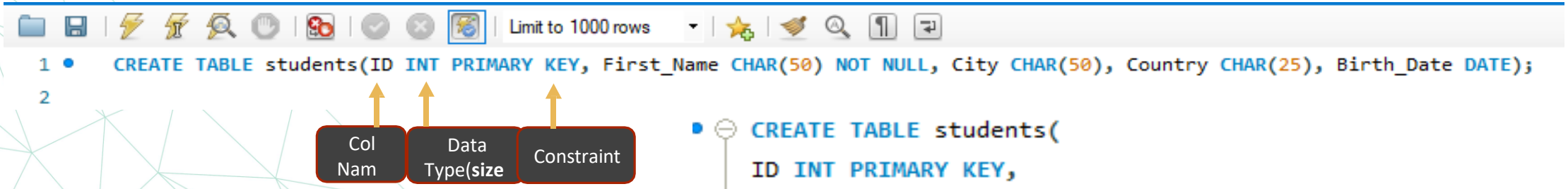
About the Course Sample Database

- TSQL Database



Queries

- T-SQL is a set-based language
- T-SQL is written in scripts with .sql extension
- GO keyword separates batches




```
CREATE TABLE students(
ID INT PRIMARY KEY,
First_Name CHAR(50) NOT NULL,
City CHAR(50),
Country CHAR(25),
Birth_Date DATE);
```

Client Server Databases

- The client software is separate from the server database engine
- Client/Server refers to the separation of functionality—not where the software is actually located
- Client software and server database engine can be on the same machine
- Databases can access data in other databases over a network

Lesson 2: SQL Server Editions and Versions

- SQL Server Versions
- SQL Server Editions

SQL Server Versions

Version	Release Year
2000	2000
7.0	1998
6.5	1996
6.0	1995
4.2.1	1994
4.2	1992
1.1	1991
1.0	1989

Version	Release Year
2022	2022
2019	2019
2017	2017
2016	2016
2014	2014
2012	2012
2008 R2	2010
2008	2008
2005	2005

SQL Server Editions

Editions	Description
Enterprise	The premium offering, SQL Server Enterprise edition delivers comprehensive high-end datacenter capabilities with blazing-fast performance, unlimited virtualization [1], and end-to-end business intelligence, enabling high service levels for mission-critical workloads and end-user access to data insights.
Standard	SQL Server Standard edition delivers basic data management and business intelligence database for departments and small organizations to run their applications and supports common development tools for on-premises and cloud, enabling effective database management with minimal IT resources.
Developer	SQL Server Developer edition lets developers build any kind of application on top of SQL Server. It includes all the functionality of Enterprise edition, but is licensed for use as a development and test system, not as a production server. SQL Server Developer is an ideal choice for people who build and test applications.
Express	SQL Server Express edition is the entry-level, free database and is ideal for learning and building desktop and small server data-driven applications. It is the best choice for independent software vendors, developers, and hobbyists building client applications. If you need more advanced database features, SQL Server Express can be seamlessly upgraded to other higher end versions of SQL Server. SQL Server Express LocalDB is a lightweight version of Express edition that has all of its programmability features, runs in user mode and has a fast, zero-configuration installation and a short list of prerequisites.

Lesson 3: Getting Started with SQL Server Management Studio

- Download SQL Sever from here SQL Server Downloads | Microsoft
- Follow this guide to install SQL Server installation guide - SQL Server | Microsoft Learn

Starting SSMS

- Launch SSMS from the Windows Start screen
  - Or type SSMS into the Search Programs and Files box
- Connect to a SQL Server instance
  - Or work disconnected
- Settings available in Tools, Options include:
  - Fonts and colors, line numbering, and word wrap
  - Which windows open when SSMS is launched
- Useful windows include:

-Query Editor - Object Explorer - Solution Explorer

Connecting to SQL Server

- Connecting to SQL Server requires three pieces of information:
  - Instance name
    - Use the form host/instance, except for the default instance
  - Database name
    - A default database can be assigned to a logon
  - Authentication
    - Windows Authentication or SQL Server Authentication
    - Account must be provisioned by a database administrator

Working with Object Explorer

- Object Explorer is a hierarchical, graphical view of SQL Server objects
- Explore objects in the default instance, and additional named instances
- Right-click for context-sensitive menu with frequently used commands
- Create T-SQL scripts of object definitions, and send to the query window, clipboard or a file
- Start a new query window by right-clicking a database
  - Changing the selected object does not change the existing connection

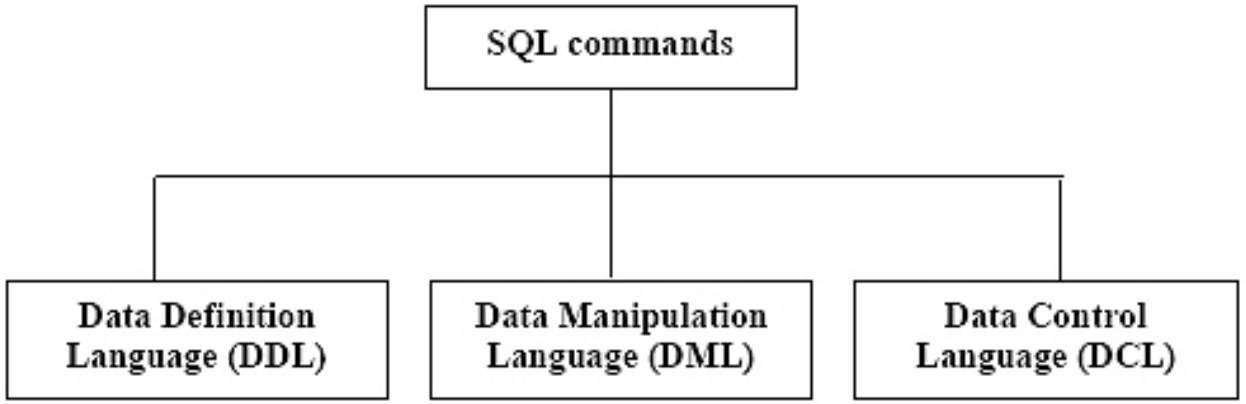
Script Files and Projects

- T-SQL scripts are text files with a .sql extension
- SSMS can open, edit, and execute code in script files
- SSMS allows you to organize script files into:
  - Solutions (*.ssmssln)
  - Projects (*.ssmssqlproj)
- Opening a solution is a convenient way to open all relevant files
- You will use projects on this course

SQL Syntax

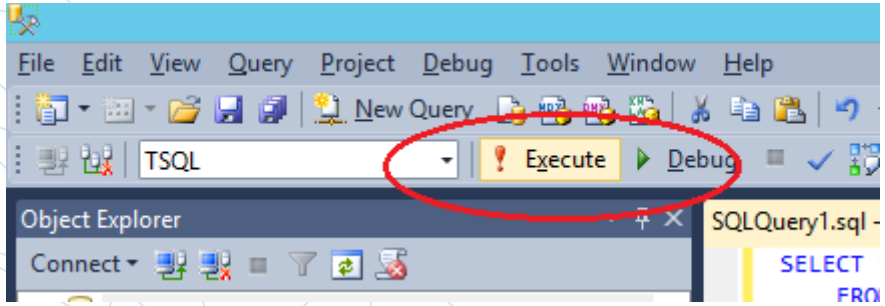
- SQL follows some unique set of rules and guidelines called syntax. Here, we are providing
- all the basic SQL syntax.
- SQL is not case sensitive. Generally SQL keywords are written in uppercases.
- You can perform most of the action in a database with SQL statements.

SQL Commands



Run SQL Commands

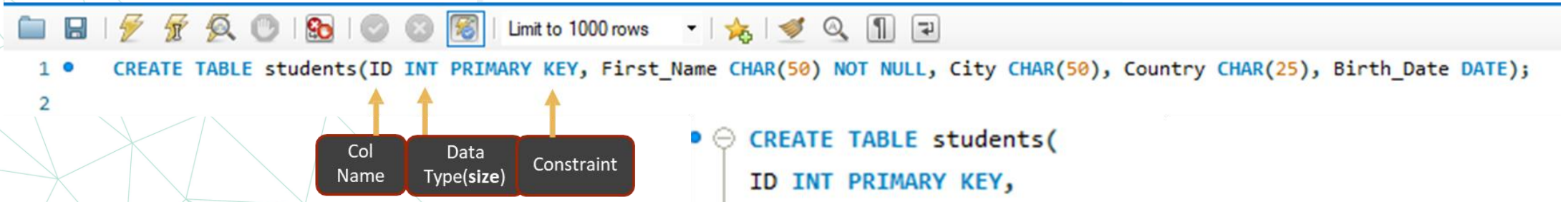
- Open a saved script, or write a new query
- Three ways to execute the query:
  - From the Query menu, select Execute
  - Press F5
  - Click the Execute toolbar button



Data Definition Language (DDL)

DDL Commands

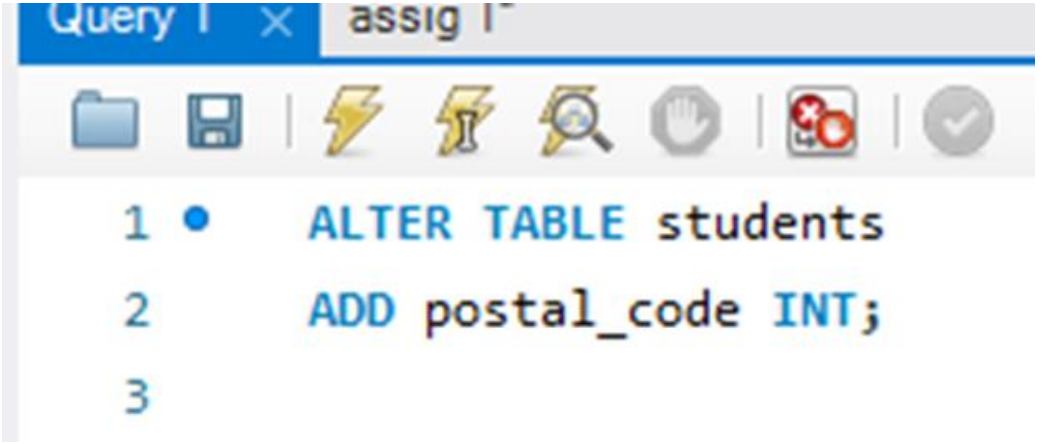
CREATE: It’s used to create Tables Or Database



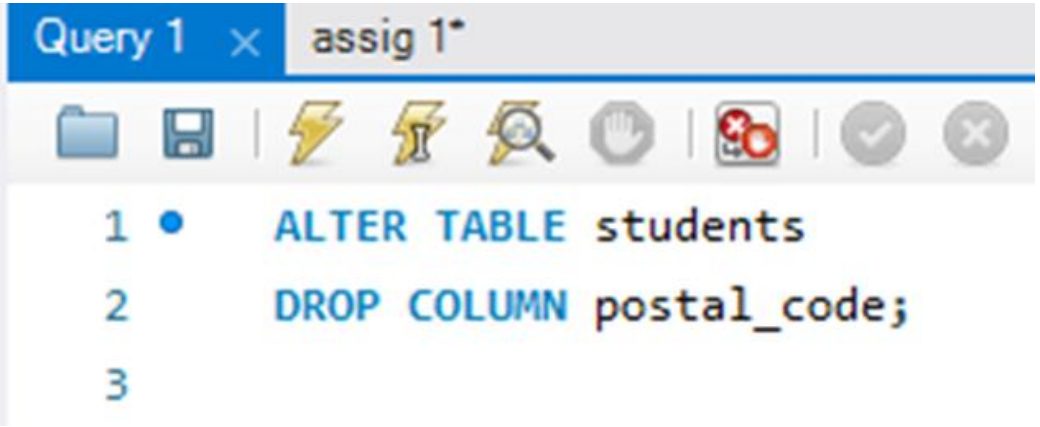

```
CREATE TABLE students(
ID INT PRIMARY KEY,
First_Name CHAR(50) NOT NULL,
City CHAR(50),
Country CHAR(25),
Birth_Date DATE);
```

DDL Commands

ALTER TABLE: It is used to **add**, **delete**, **modify** or **rename** columns in an existing table.



DROP COLUMN: It's used to delete a column in the table.

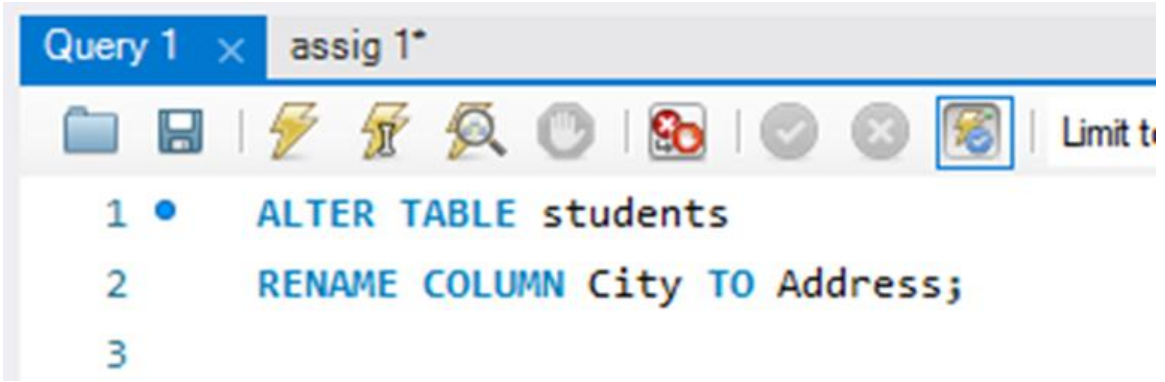


DDL Commands

MODIFY COLUMN: It's used to change the data type of a column.

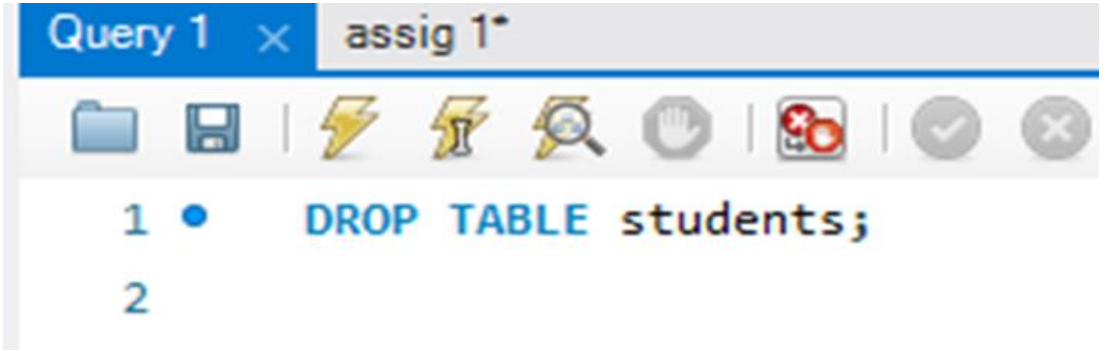
```
ALTER TABLE students
MODIFY COLUMN Country varchar(20);
```

RENAME COLUMN: It's used to RENAME an existing COLUMN in a database.

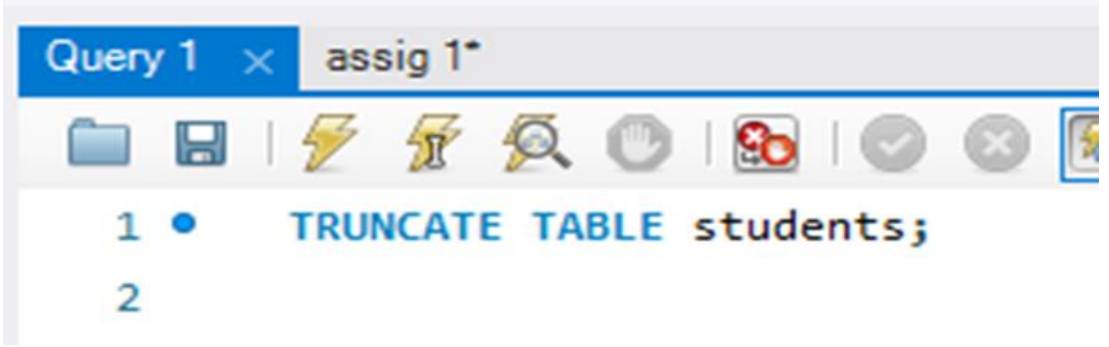


DDL Commands

DROP TABLE: used to delete an existing table in a database.



TRUNCATE TABLE: used to delete the data inside a table, but not the table itself.



Hands-on Practice

- Create DB for e-commerce platform with these tables:
  - Customer table that contain (id, name, email, phone)
  - Order table that contain (id, customer_id)
  - Order_details that contain (id, order_id, product_id, quantity)
  - Product table that contain (id, name, description)

Demonstration: Introducing Microsoft SQL Server

In this demonstration you will see how to:

- Use SSMS to connect to an on-premises instance of SQL Server
- Explore databases and other objects
- Work with T-SQL scripts

Using SQL Server Technical Documentation

- Product documentation for SQL Server is online in Microsoft Docs
- Help is also available from:
  - SSMS query window (context-sensitive when you highlight a keyword)
  - SSMS Help menu
  - Windows Start menu

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Module Review and Takeaways

- Review Question(s)