

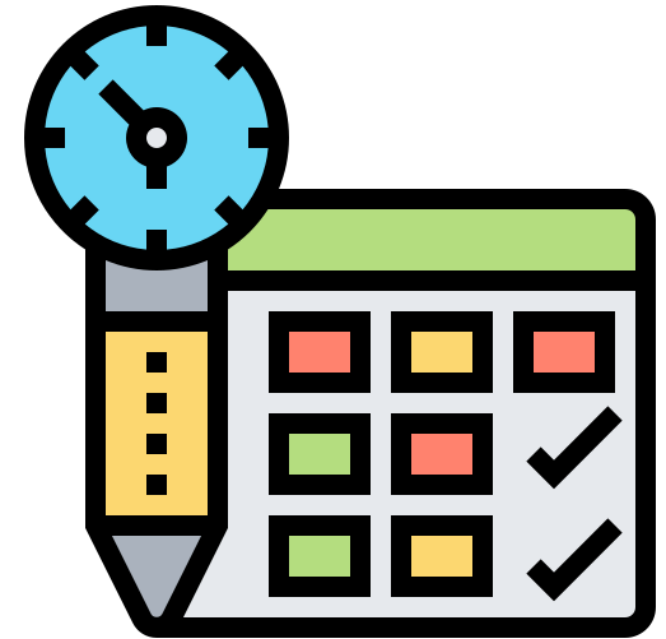


K2's Accessing And Cleaning Your Company's Data With Power Query And Power BI

Discussion & Learning Objectives



- Outline Power Query's noteworthy features and functions and how you can use them for reporting projects
- Demonstrate how to connect Power Query to web resources, spreadsheets, and databases to extract, transform, and load data into your reports
- List the various methods to transform your data using Power Query before importing it into a report
- Demonstrate connecting Power Query and Power BI to a sample data server



Today's Major Topics



- Comprehensive grasp of Excel's Tables and Data Modeling
- Introduction and exploration of Excel Power Query
- Analysis of Power Query's tabs and user experience
- Examination of various Power Query connection options
- Techniques for common Power Query data transformations
- Guidance on connecting to Web, SQL, and ODBC data sources
- Brief look at Advanced Power Query topics



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What Version Of Excel Are You Using?



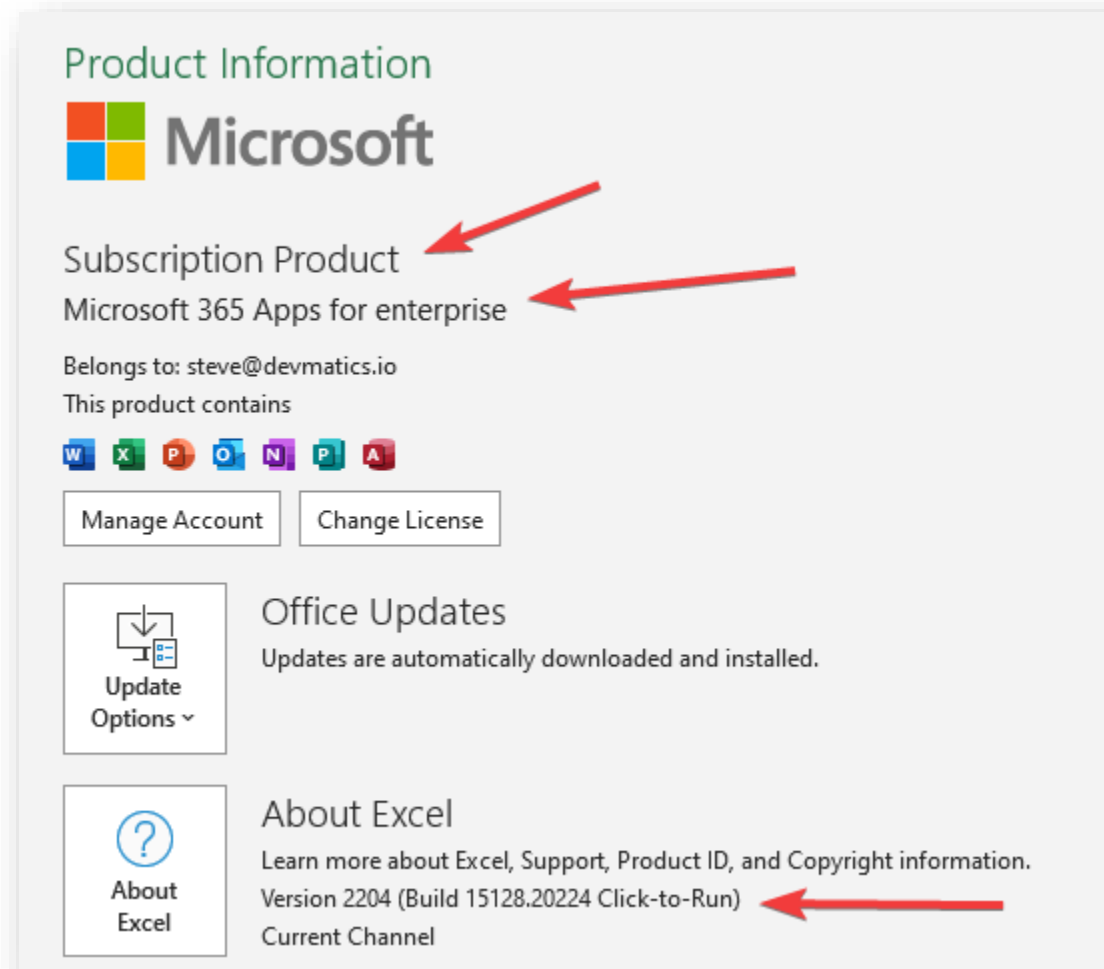
- There are four essential things to know about the Excel version installed on your computer.
- **How did you acquire Microsoft Office?** Did you outright purchase the license (perpetual), or do you have Microsoft/Office 365?
- **What level of Microsoft/Office 365 do you have?** Family, small business, or enterprise
- **What version are you running?** Hopefully 2308+
- **What update channel are you on?** Insiders, current channel, semi-annual, etc.

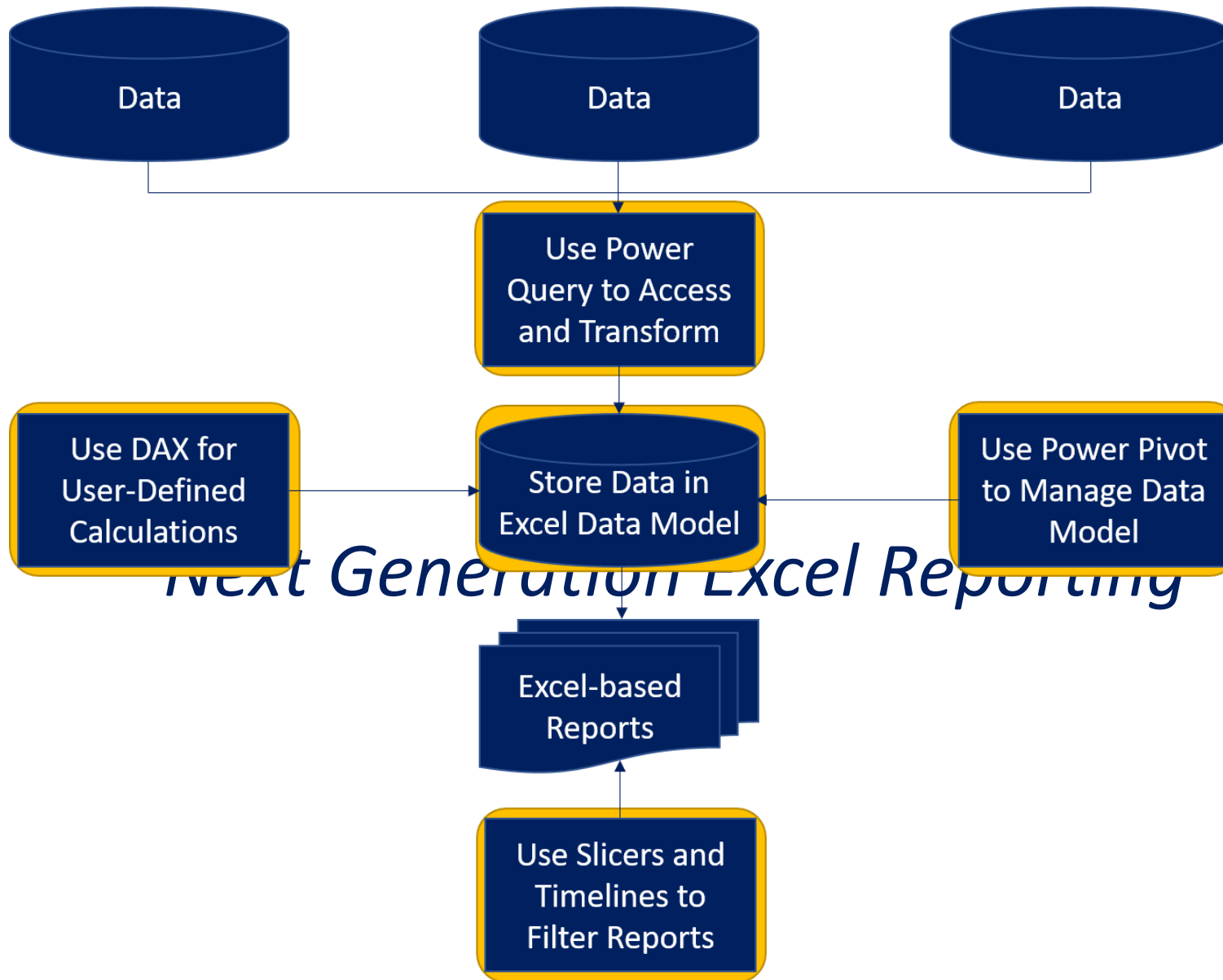


Easily Check Your Office License



- You can check your Office license by looking at the product information screen in the file menu
- Go to File → Account in any Office application





Next Generation Excel Reporting



Unlocking Insights with Tables and Relationships

MASTERING EXCEL'S TABLES & DATA MODELING

Excel Tables: Efficiency Unleashed



- Excel tables act as highly efficient data containers
- They enhance usability, efficiency and streamline Excel functionalities
- Tables serve as a foundation for additional Excel capabilities like Power Query
- They provide an optimized method for data referencing
- Excel tables seamlessly integrate with your existing workflows
- Majority of features explored will utilize tables for maximum efficiency
- Learn more at <https://bit.ly/3NjswbZ>

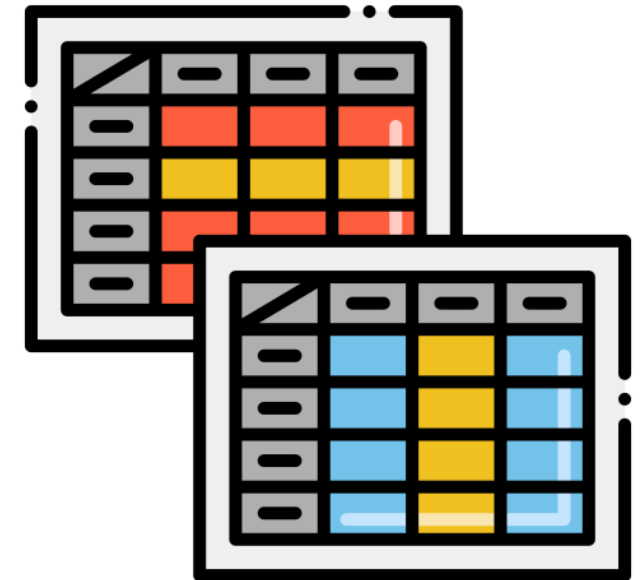


Seven Main Features Of Data Tables



Tables make virtually every operation in Excel better due to the following features:

- Quick and Easy Application of Formatting
- Automatic Resizing of Data Ranges
- Structured Reference Functions
- Easily filter and sort data
- Self-Replicating Functions
- Summary Rows
- Data Modeling





Excel's data transformation and data preparation engine.

POWER QUERY

Excel Power Query



A Better Way to Retrieve Data In Excel

- Power Query enables connecting spreadsheets to dynamic data sources like databases or web content
- It eliminates manual data transfer by fetching data directly from the source
- The retrieval steps are preserved, facilitating future data updates
- Just a simple refresh is needed to update the workbook with new or altered records
- Power Query embodies the concept: write once, refresh repeatedly
- For more knowledge, visit: <https://bit.ly/48qz5Vn>



Why Use Power Query



The Financial Professional's Best Friend

- Power Query transforms raw data into a refined format, enhancing its usability for decision-making
- It enables data from multiple sources to be combined, creating a comprehensive data set for analysis
- Power Query allows for automation of data refresh and transformation tasks, saving time and ensuring data accuracy
- It provides an intuitive, user-friendly interface that makes complex data manipulations accessible to non-technical users
- Power Query's robust filtering options aid in pinpointing specific data, streamlining the analysis process
- The tool facilitates the creation of custom functions, providing flexibility to meet unique business needs



What Can You Do With Power Query?



- Import data from virtually any database, spreadsheet, website, and more directly into Excel
- You can import in a folder spreadsheets in one operation
- You can clean, format, and organize your data from its source before being imported into Excel
- You can create new columns from your data
- You can resort, reorder, change the type (e.g., decimal, text, etc.), or filter your data into any format you might need
- You can pivot or unpivot your data. You can also group your data into custom orders.
- You can split data into separate columns or combine data into a new column
- There are dozens of different data transformation tools for virtually every need!



Microsoft Power BI

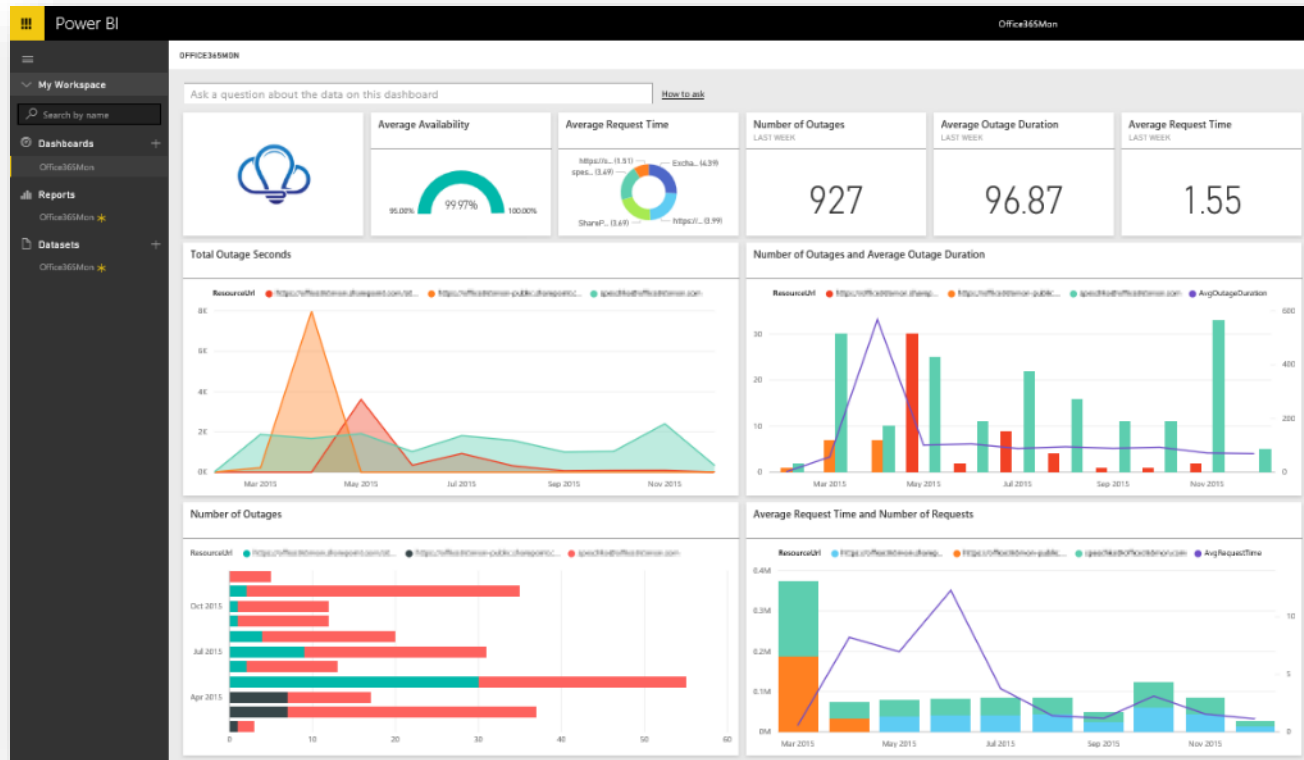


See your company's data in new ways

- Power BI is a dashboard business intelligence reporting tool. You can pull data from excel spreadsheets, cloud services, streaming data, and on-premise databases concurrently.
- Instantly know when your business needs your attention with real-time Power BI dashboards
- Useful for individual or organizational use. Tackle both big and small reporting needs.
- Learn more about how Power BI can turbocharge your organization at <https://powerbi.com>.



Power BI Dashboards



- Native integrations with dozens of services, including marketing, sales, human resources, accounting, etc.
- Easily create beautiful dashboards from your organization's real-time data
- Write once. Refresh many.



What Is The Key Benefit Of Using Power Query In Excel?



It allows manual data transfer from databases.

It only connects spreadsheets to static data sources.

It requires complex coding for data retrieval.

It enables connection to dynamic data sources and automates data fetching.



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From Files, Databases, the Web and More

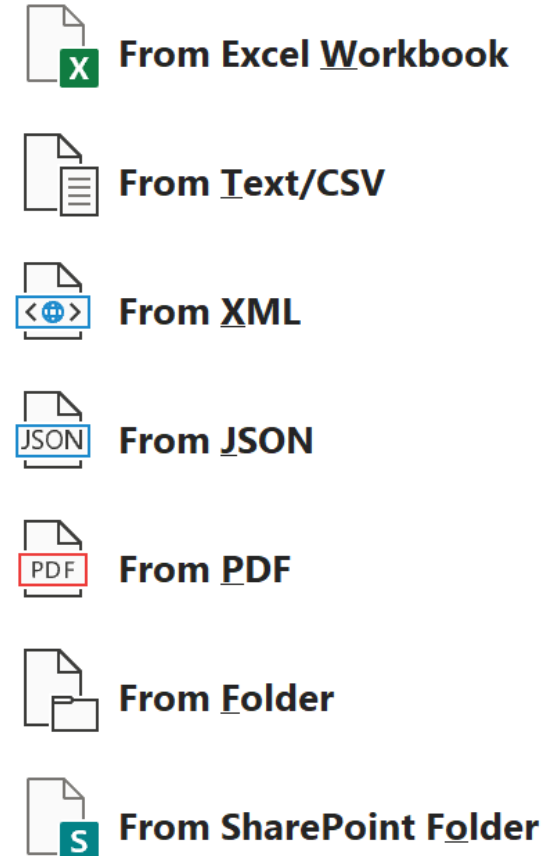
POWER QUERY DATA SOURCES

From File



Data from Static Resources

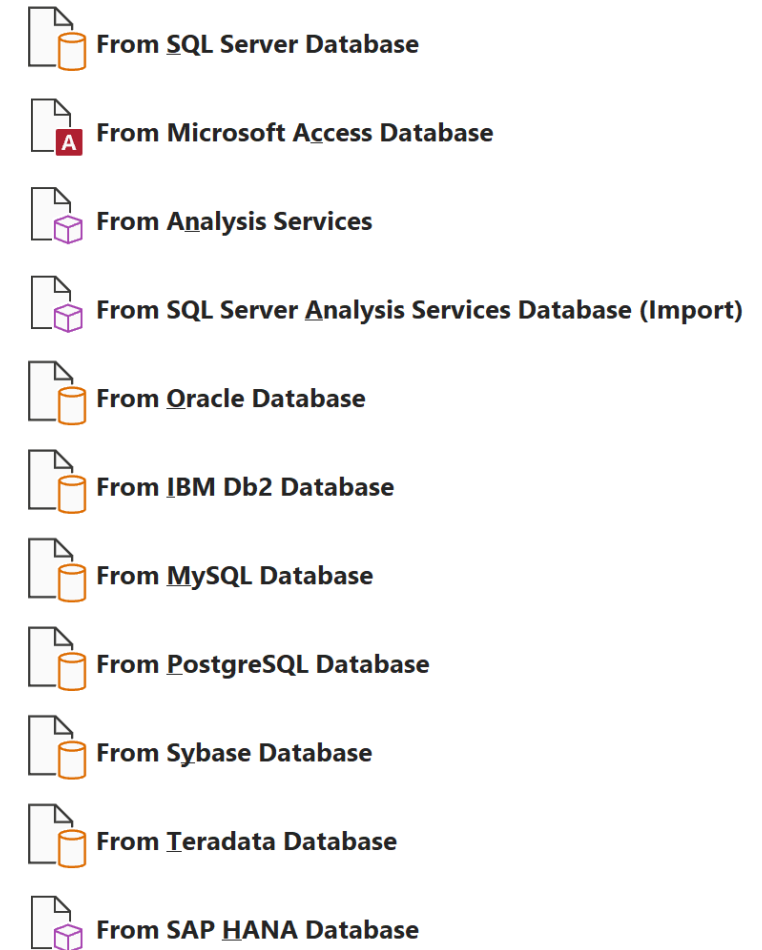
- Power Query allows importing data from Excel files, CSV, XML, JSON, etc.
- It supports combining data from multiple sources like folders or SharePoint
- These stand-alone file sources are not dynamically driven (e.g., not a database)
- You can get data from a PDF or an image, but the quality varies widely



From Database

Leveraging Dynamic Data Sources

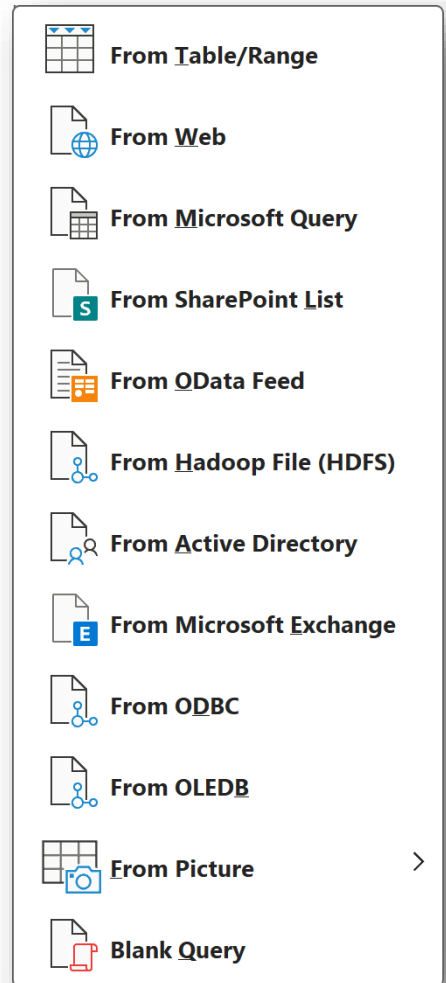
- Power Query supports integration with dynamic data sources like databases
- It is compatible with all standard databases, including SQL, MySQL, Access, and more
- Some databases can be integrated natively without requiring additional setup
- However, certain databases may require the installation of additional drivers for compatibility



From Other Services

Expanding Data Acquisition

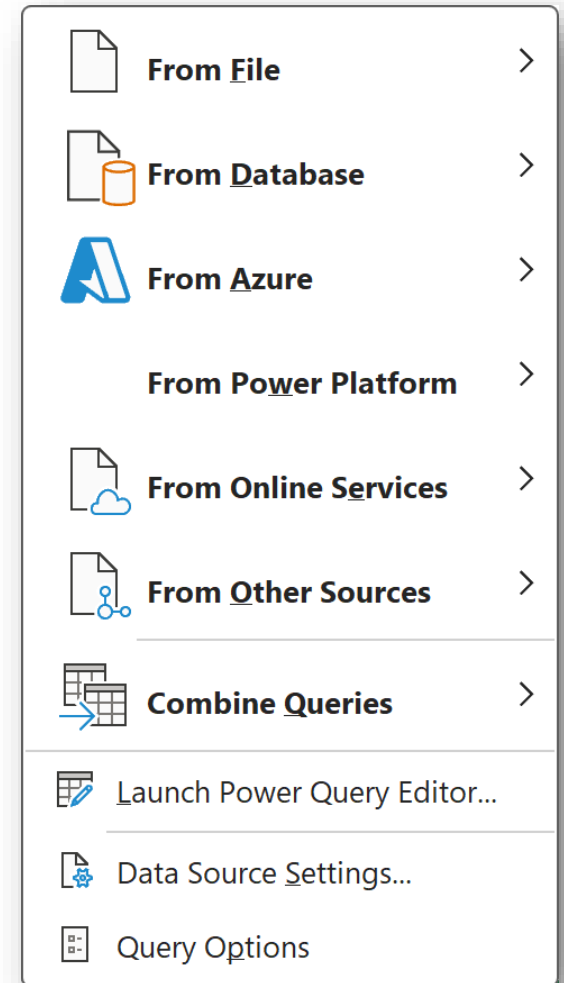
- "From Table/Range" allows data extraction from another table within the same document
- The "From Web" option enables data sourcing directly from the Internet
- "Microsoft Query" is a legacy tool for creating and managing database queries
- "From ODBC" feature employs Open Database Connectivity tools for data extraction
- "From Picture" transforms an image into a usable data source
- "From Exchange & Active Directory" sources data from user and email directories



Combine Queries

Merging and Appending Queries









- Power Query allows users to merge multiple queries into a single output
- Users can append queries, adding data from one query to another
- Merging queries can facilitate the comparison and analysis of different data sets
- Appending queries aids in creating more comprehensive data sets for analysis








From Azure, Power Platform, And Online Services






Azure

-  From Azure SQL Database
-  From Azure Synapse Analytics
-  From Azure HDInsight (HDFS)
-  From Azure Blob Storage
-  From Azure Table Storage
-  From Azure Data Lake Storage Gen1
-  From Azure Data Lake Storage Gen2
-  From Azure Data Explorer

Online Services

-  From SharePoint Online List
-  From Microsoft Exchange Online
-  From Dynamics 365 (online)
-  From Salesforce Objects
-  From Salesforce Reports

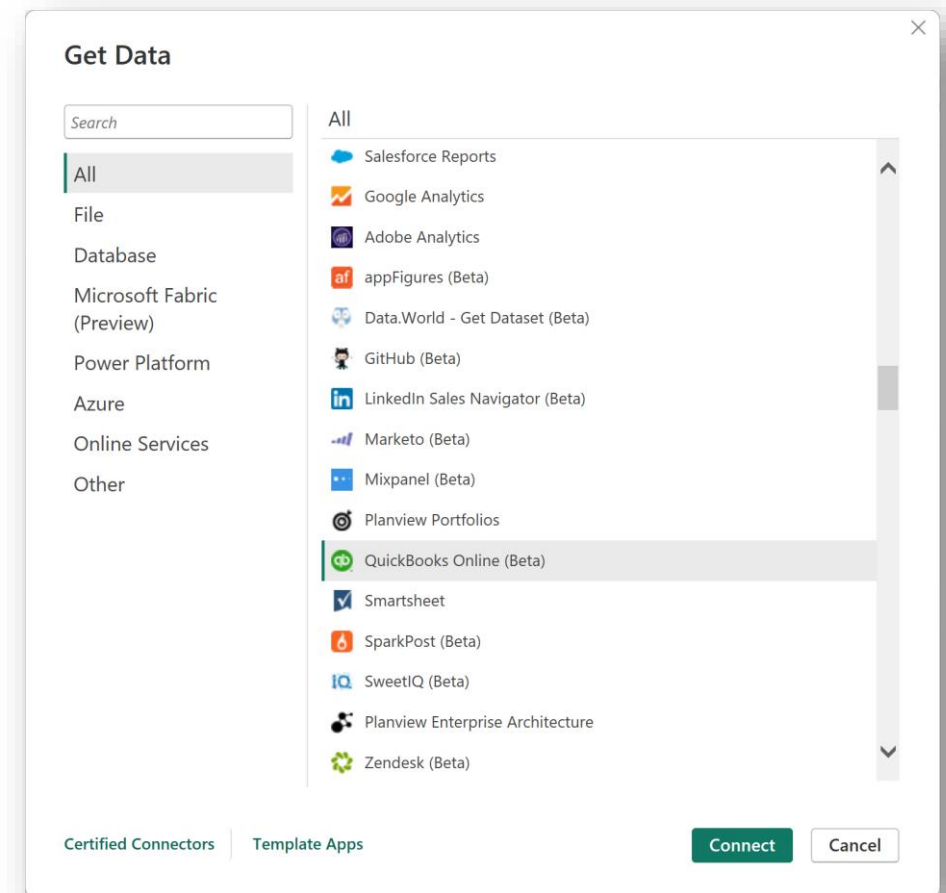
Power Platform

-  From Power BI (Devomatics)
-  From Dataflows
-  From Dataverse

Power BI: Web Connections

Simplifying Data Acquisition

- Power BI facilitates robust 3rd party web connections through Power Query
- It offers seamless integration with business and financial service providers like QBO
- Users only need to supply their username and password for these services
- The system handles authentication, security, and data management on behalf of the user





Navigating the Interface with Confidence

THE POWER QUERY INTERFACE

Functional Areas Of Power Query



1. Ribbon: Enhances navigation through a cohesive interface.
2. Queries Pane: Showcases an inventory of all accessible queries.
3. Current View: The primary workspace providing a default data preview.
4. Query Settings: Offers insight into the selected query's parameters.
5. Status Bar: A real-time update bar for pertinent query details.

The screenshot shows the Power Query - Edit queries window. The interface is divided into several sections:

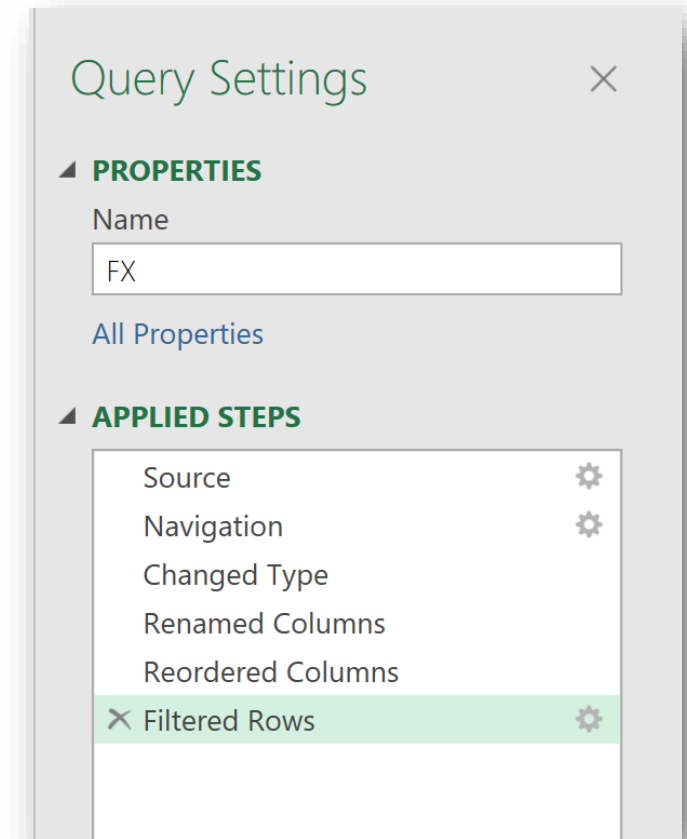
- 1. Ribbon:** Located at the top, it contains tabs for Home, Transform, Add column, View, and Help. The Home tab is active, showing various options like Get data, Enter data, Options, Manage parameters, Refresh, Properties, Advanced editor, Manage, Choose columns, Remove columns, Keep rows, Remove rows, Sort, Split column, Group by, Replace values, Merge queries, Append queries, Combine files, Map to entity, and AI insights.
- 2. Queries Pane:** Located on the left side, it displays a list of queries. The 'Customers' query is selected and highlighted.
- 3. Current View:** The main workspace area showing a data preview table with columns: CustomerID, CompanyName, ContactName, ContactTitle, Address, City, and Region. The data is filtered to show 18 rows.
- 4. Query Settings:** Located on the right side, it provides details about the selected query. The 'Customers' query is selected, and the 'Entity type' is set to 'Custom'. The 'Applied steps' section shows the 'Source' and 'Navigation' steps.
- 5. Status Bar:** Located at the bottom, it displays the status of the query: '1 warning', 'Completed (1.57 s)', 'Columns: 13', and 'Rows: 91'. It also includes 'Cancel' and 'Save & close' buttons.

Power Query: Query Settings Overview

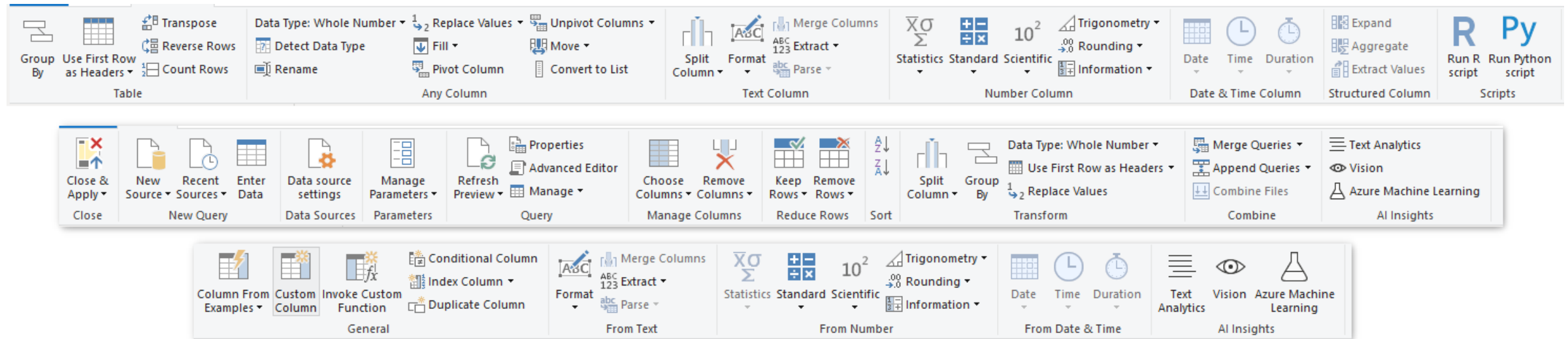


Managing Data Transformations

- The "Name" field in the query settings panel assigns a specific name to the query
- "Applied Steps" displays all the transformations performed on the data
- Every transformation applied is represented as a separate step
- The panel allows for the reordering, editing, or deletion of steps
- Steps build upon each other, making the sequence of steps crucial in data transformation



Power Query Transformations



There are dozens of options to transform and modify your data!

Home Ribbon



- Close and Load
- Query (Refresh, Properties, Advanced Editor, Manage)
- Manage Columns (Choose Columns, Remove Columns)
- Reduced Rows (Keep Rows, Remove Rows)
- Sort
- Transform (Split Column, Group By, Use Headers, Replace Groups)
- Combine (Manage Queries, Append Queries)
- Manage Parameters
- Data Source Settings
- New Query (New Source, Recent Source, Enter Data)



Transform



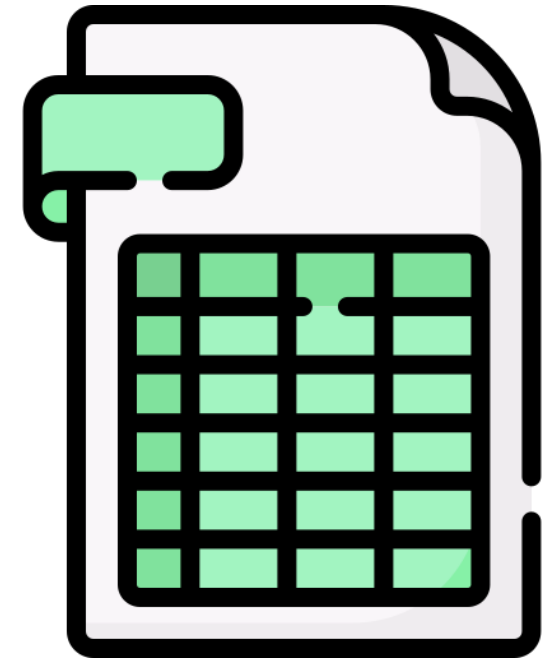
- Table (Group By, Use First as Header, Transpose, Reverse Row, Count Rows)
- Any Columns (Data Types, Rename, Replace Values, Fill, Pivot Columns, Unpivot Columns, Move, Convert to List)
- Text Columns (Split Column, Format, Merge Column, Extract, Parse)
- Number Column (Statistics, Standard, Scientific, Information, etc.)
- Date and Time Column (Date, Time, Duration)
- Structured Column (Expand, Aggregate, Extract, Create Data Type)



Add Columns



- General (Column From Examples, Custom Column, Invoke Custom Function)
- Conditional Column, Index Column, Duplicate Column
- From Text (Format, Merge Columns, Extract, Parse)
- From Number (Statistics, Standard, Scientific, Information, etc.)
- From Date and Time Column (Date, Time, Duration)



View



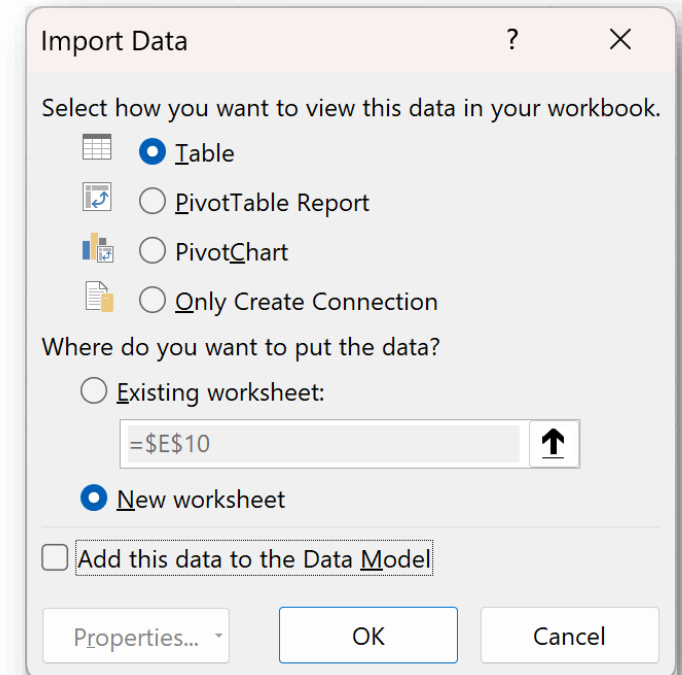
- Layout (Query Settings, Formula Bar)
- Data Preview (Monospaced, Show Whitespace, Column Quality, Column Distribution, Column Profile)
- Go to Column
- Parameters
- Advanced Editor
- Query Dependencies



Power Query: Closing And Loading



- "Close and Load To" allows data transition from Power Query back to Excel
- Data can be returned in the form of an organized table for easy analysis
- It supports the creation of Pivot Tables or Pivot Charts for data visualization
- You can opt for "Connection Only" to store results in memory without visible output
- Alternatively, the data can be directed to a data model for complex analysis purposes





Frequent Use Cases Overview

TRANSFORMATION SCENARIOS IN POWER QUERY

Power Query Transformations



Popular Use Case Insights

- Power Query enables efficient data cleaning by removing unnecessary columns, rows, or erroneous data
- It simplifies data consolidation, pulling from multiple sources and combining into one unified dataset
- With Power Query, you can pivot or unpivot data to better structure it for analysis
- It offers robust date and time transformations, allowing for easy manipulation and formatting of time-series data
- Power Query aids in data normalization, converting disparate data types into a uniform format
- It effectively handles hierarchical data by creating parent-child relationships or flattening structured data



Filtering Capabilities In Power Query



Effective Data Refinement

- Power Query's filtering capabilities help users to isolate specific data subsets for targeted analysis
- To filter data, use the dropdown menu in each column header and select your filter criteria
- The tool offers basic filters like text, number, and date, as well as complex ones like conditional and custom filters
- Power Query also has an advanced filtering option, allowing for complex query-based filtering
- Remember, all filtering actions are reversible and adjustable, providing flexibility in data manipulation

Column And Row Removal



Streamlining Data for Analysis

- Column and row removal in Power Query helps in focusing on relevant data by eliminating unnecessary elements
- To remove columns, right-click on the desired column header and select "Remove"
- Row removal can be performed by filtering data or using the "Remove Rows" option in the Home tab
- Power Query supports removal of duplicate rows, enhancing data integrity and reducing redundancy
- Users can undo column or row removal actions, ensuring data safety
- Strategic removal of columns and rows aids in data normalization and preparation for analysis

Parsing And Splitting: Simplifying Data



- Parsing involves breaking down complex data into more manageable and understandable components
- To parse data, identify the format or structure you want to extract, usually defined by a pattern or rule
- Splitting separates data into distinct sections, often using predefined or custom delimiters such as commas or spaces
- To split data, locate the "Split Column" option, select your delimiter, and choose the positions to split at
- Parsing and splitting are essential techniques for simplifying and structuring data for better readability and analysis

Pivoting And Unpivoting



Reshaping Data for Analysis

- Power Query's pivot functionality allows users to summarize vast datasets based on specific columns for improved legibility
- To pivot data, choose a column to act as the new headers and another one for the corresponding values
- The unpivot feature in Power Query converts column-based data into row-based data, offering a detailed view for analysis
- To unpivot, select the columns to transform, right-click and choose "Unpivot Columns"
- Remember, pivoting and unpivoting actions are reversible in Power Query, providing flexibility in data manipulation

Combine & Merge Data Sources



- Power Query allows users to combine and merge multiple data sources into one for comprehensive analysis
- To merge data, go to the "Home" tab and select "Merge Queries", then set your desired criteria
- Combining data is achieved through the "Append Queries" option in the "Home" tab
- When merging, users must specify a common column between the data sources for correct alignment
- Append operations stack data tables vertically while merge operations combine them horizontally

Folder Data Connection



Simplifying Bulk Data Analysis

- Power Query offers the ability to connect directly to a folder of data for efficient analysis
- To establish a connection, select "Get Data," then "File," and finally "Folder" in the Home tab
- Users must provide the path of the folder they wish to connect to for data extraction
- Power Query then presents a consolidated view of all files within the folder for selection
- This feature helps handle multiple related data files simultaneously, saving time and effort



Building New Columns in Power Query

CREATING COLUMNS IN POWER QUERY

Crafting New Columns



Amplifying Data Analysis Capabilities

- Creating new columns in Power Query enhances data manipulation and analysis capabilities
- The "Add Column" tab in Power Query allows users to create and customize new columns
- Users can generate several types of columns, such as Custom, Date, Conditional, and Index
- Creating new columns can aid in the computation, extraction, or categorization of your data
- The flexibility of Power Query's column creation allows tailoring data to specific analysis requirements
- Once created, these columns can be formatted, moved, renamed, or deleted as per user needs

Column Addition Process



Enhancing Data Customization

- Navigate to the "Add Column" tab in Power Query to begin the process
- The "Add Column" tab presents multiple options for creating different types of columns
- After selecting the column type, input the necessary details or formulas in the dialog box
- Press "OK" and Power Query will add the new column to the rightmost part of your table
- Users can move or rename the new column as per their requirements

Custom Column Types



Customizing Data for Analysis

- Custom columns in Power Query allow user-defined expressions or formulas
- Date columns are used for specific date-related calculations and analyses
- Conditional columns enable users to create new columns based on conditions
- Index columns are sequential numbers added to rows to aid data organization
- Each column type serves specific data analysis needs, increasing the tool's versatility

Custom Columns In Action



Practical Uses and Benefits

- New columns can compute sales totals or averages in business data
- Date columns can help track project timelines or analyze time-series data
- Conditional columns are useful for categorizing data based on certain criteria
- Index columns aid in the orderly organization of large datasets
- Custom columns can facilitate complex calculations tailored to unique user needs
- These practical applications emphasize the versatility and effectiveness of Power Query



Simplifying Online Data Analysis

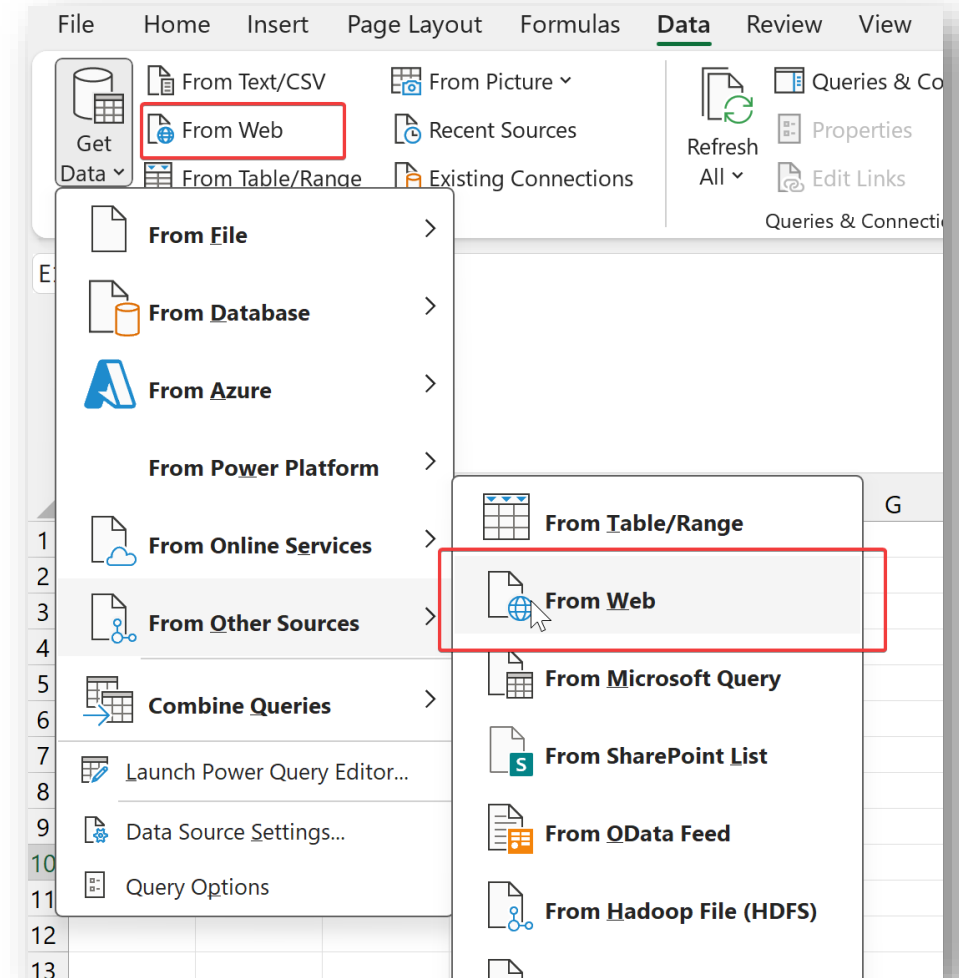
WEB DATA EXTRACTION

Extracting Data From The Web



Navigating Web Data Extraction

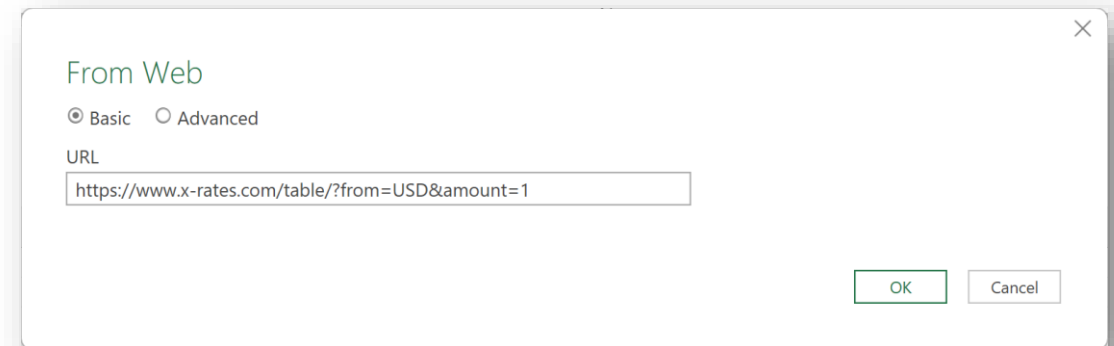
- Power Query proficiently extracts data from websites, APIs, and diverse web data formats
- The web data should ideally be arranged in tables, XML, JSON, or similar structures for best results
- Public data or data needing authentication are both accessible through Power Query
- However, working with two-factor authentication (TFA) could present challenges



Navigate To The Data By URL

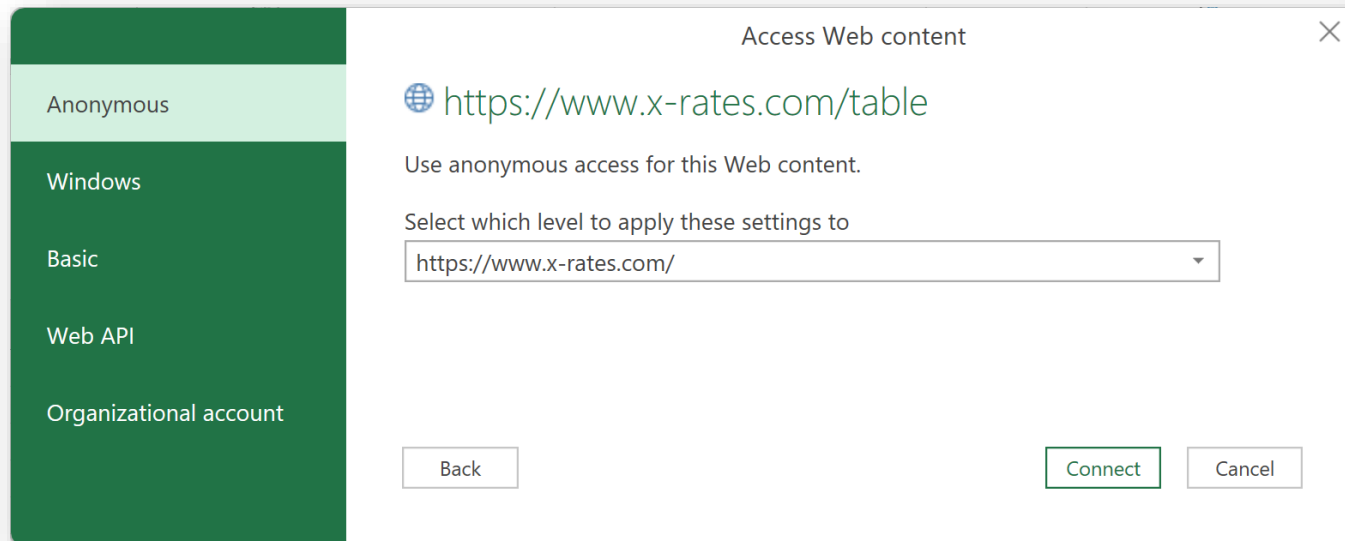


- Users can directly input the URL of the desired web data into Power Query for extraction
- Through Power Query, one can access and manipulate data from the web in real time
- Navigate to the URL, <https://www.x-rates.com/>.



Permissions And Credentials

Authentication to a Website or API



- Power Query allows for connection via diverse access methods
- Anonymous access is suitable for public data retrieval
- The Windows method involves using system-based credentials
- Basic access requires the input of a username and password
- Web API mode allows direct interaction with web services
- An Organizational Account method is ideal for enterprise-level data access

Navigating The Data Structure

Power Query Examining Data



Navigator

☐ Select multiple items

Display Options ▾

https://www.x-rates.com/table/?from=US...

- Document
- Table 1
- US Dollar Exchange Rates Table Convert...

Table View Web View

Table 1
Preview downloaded on Thursday, January 26, 2023

US Dollar ▲	1.00 USD ▲ ▼	inv. 1.00 USD ▲ ▼
Argentine Peso	185.318146	0.005396
Australian Dollar	1.406072	0.711201
Bahraini Dinar	0.376	2.659574
Botswana Pula	12.746259	0.078454
Brazilian Real	5.069944	0.197241
British Pound	0.806104	1.240535
Bruneian Dollar	1.312245	0.762053
Bulgarian Lev	1.796637	0.556596
Canadian Dollar	1.333301	0.750018
Chilean Peso	802.272819	0.001246
Chinese Yuan Renminbi	6.783706	0.147412
Colombian Peso	4527.942815	0.000221
Czech Koruna	21.87861	0.045707
Danish Krone	6.832223	0.146365
Emirati Dirham	3.6725	0.272294
Euro	0.918606	1.088606

Load ▾ Transform Data Cancel

- Power Query proficiently scans URLs, seeking importable content for Excel
- It can highlight multiple data sources linked to a specific URL
- Power Query allows the selection of either a single or multiple data sources
- The "Load" function facilitates data transfer back into Excel
- "Transform Data" directs the data into Power Query for additional alterations



This is the more straightforward method of connecting to data

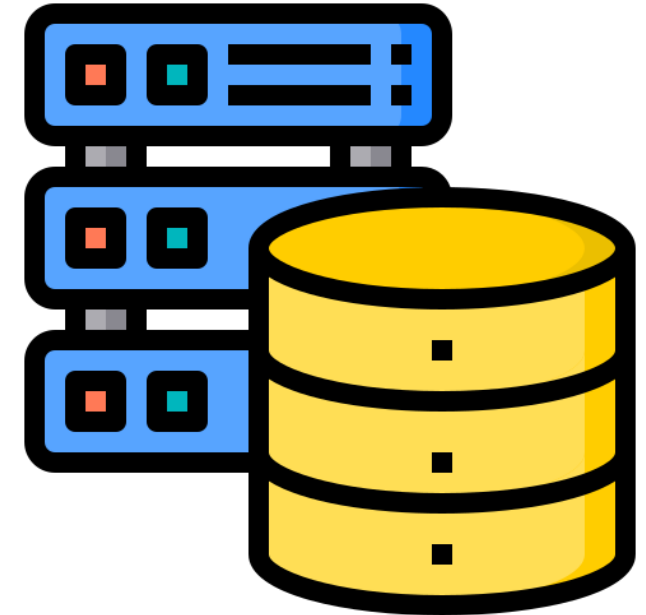
LET'S CONNECT VIA SQL SERVER

Try Accessing Cloud Data Beta!



Access real-world accounting databases

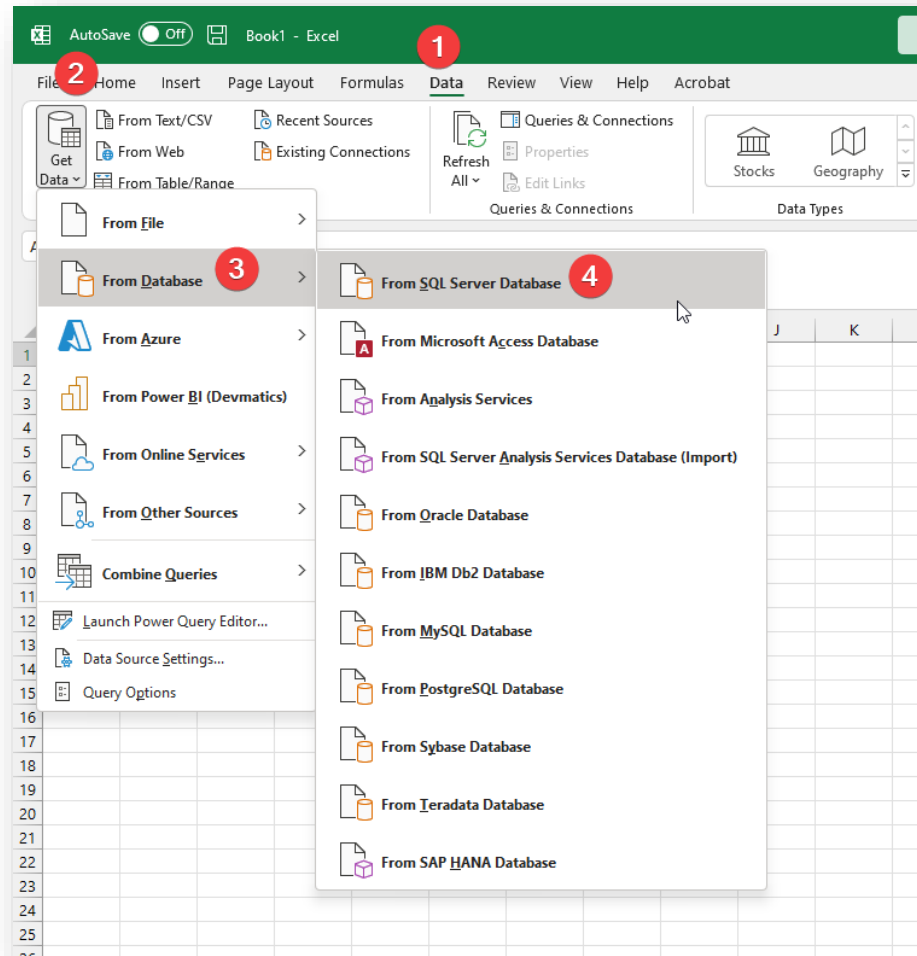
- We have set up a database playground for you to learn how to use Cloud accounting data. You can use this service to learn how to use Power Query in Excel, Power BI, etc.
- You can work with real QuickBooks Desktop and QuickBooks Online data examples
 - URL → learnsql.cpetoday.com
 - UN → `learnsql`
 - PW → `LearnWithUsToday!` (all one-word and case-sensitive)
- This is a new service that might be upgraded from time to time
- Depending on what skill you're looking to learn you can connect either via Microsoft SQL server or via MySQL ODBC
- We'd love to know what you think! Feel free to reach out with questions or comments.



How To Connect To Learn SQL



Learn to work with real cloud databases



- Open up a new blank workbook in Excel
- Go to the Data tab in the ribbon menu
- Click the Get Data button on the far left
- Select From Database
- Select From SQL Server Database

How To Connect To Learn SQL



Provide the server address

SQL Server database

Server ⓘ

learnsql.cpetoday.com

Database (optional)

▸ Advanced options

OK Cancel

- The connection dialog box will ask you for a server address
- Provide learnsql.yoss.io, but don't include the quote marks
- Please note that there is intentionally NOT a protocol (e.g., https) in the address. It isn't needed and will cause an issue if you include it.

How To Connect To Learn SQL

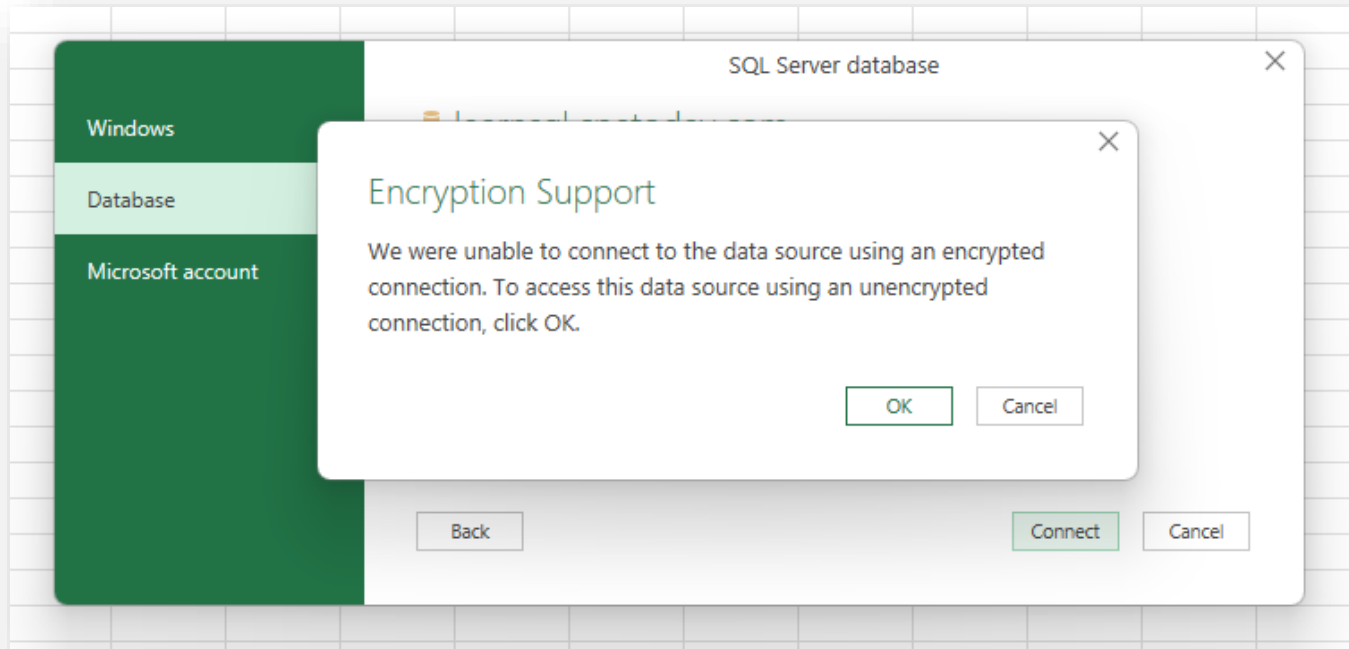
Provide the server credentials



- The next screen will prompt you to connect to the server
- You're going to want to choose the database option. The username is learnsql, and the password is LearnWithUsToday!.
- Again, please don't include the quote marks, which are case-sensitive

How To Connect To Learn SQL

Provide the server credentials

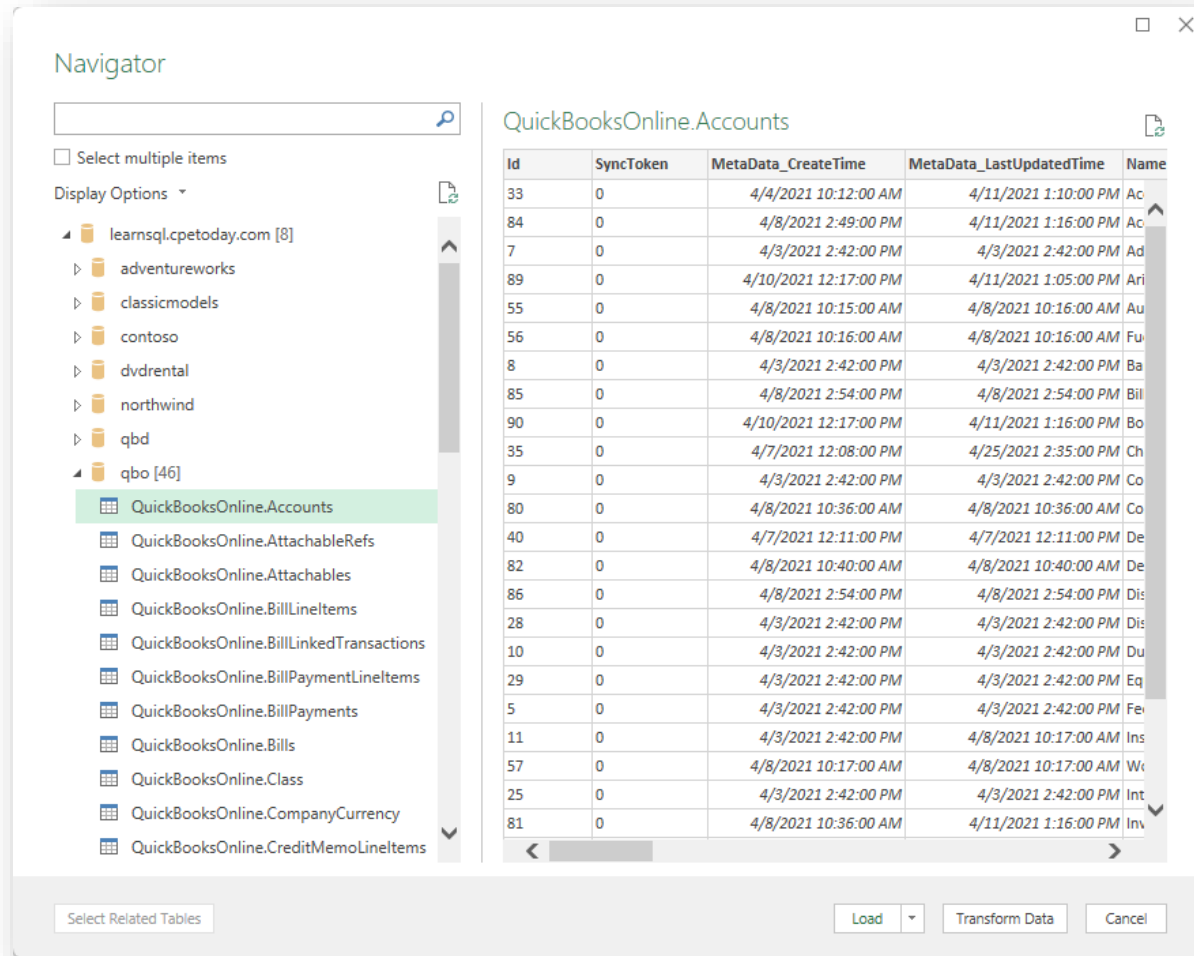


- Excel will warn you that it can't connect over an encrypted connection
- This error message can be ignored, and it isn't critical
- Since there is only sample data on this server, there isn't anything to worry about. Just click okay.

How To Connect To Learn SQL



Provide the server credentials



- The next screen will show you all the databases in the system
- There are several DBs there, including sample data from QBO and QBD
- Once you've selected a DB, you can pick the specific tables you want to work with
- You can either load the data straight into Excel or transform it with Power Query

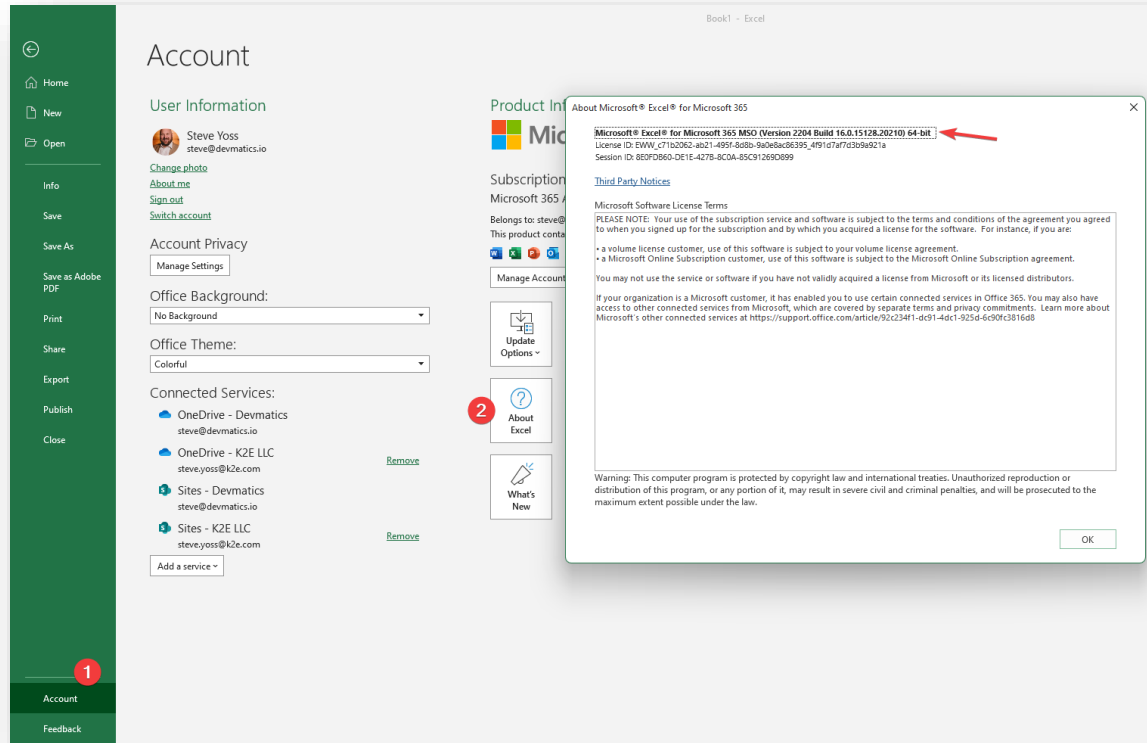


This method is more realistic to how you would connect to your data.

LET'S CONNECT VIA ODBC

Connect To Learn SQL Via ODBC

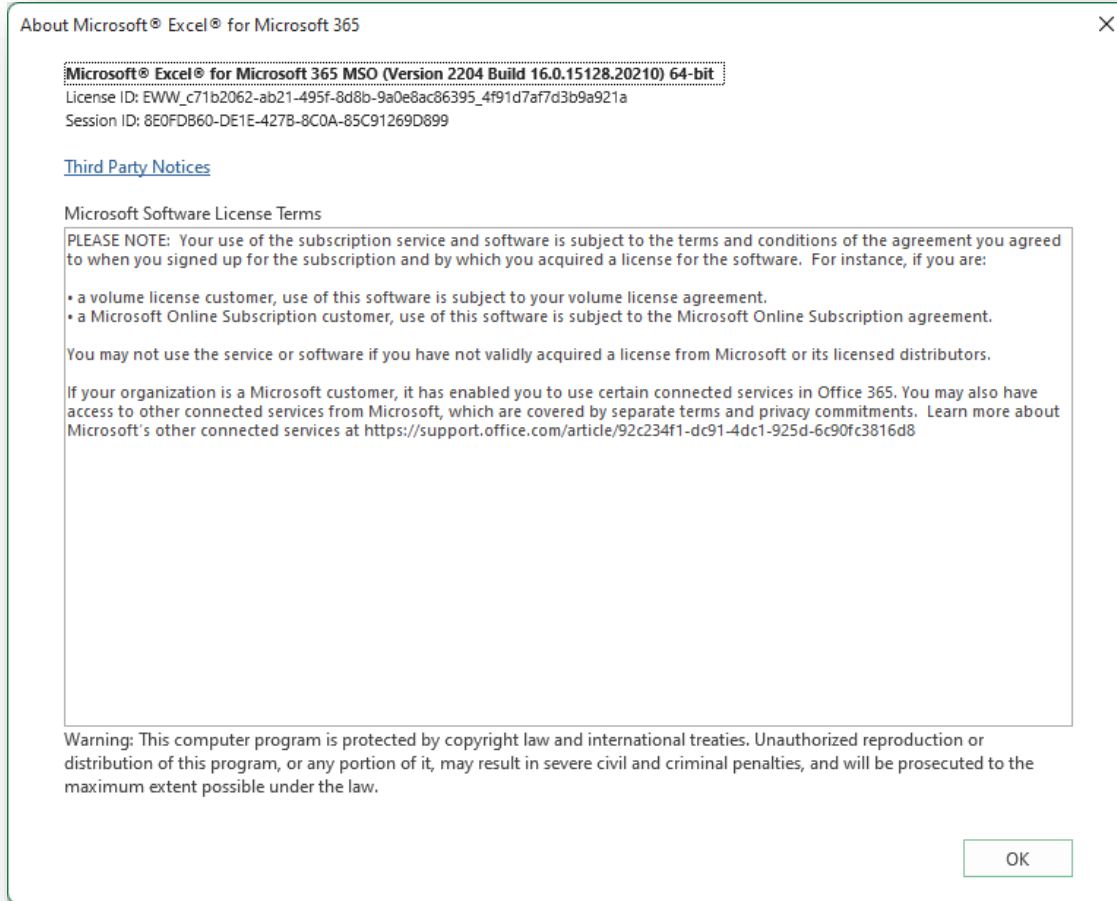
Check your Office or Power BI bit version



- You need to know the bit version of your Office installation, so you download the appropriate driver
- The bit version can either be 32-bit or 64-bit
- In Excel, go to the File option in the ribbon
- Select the Account option at the bottom
- Click the About Excel button in the middle of the screen

Connect To Learn SQL Via ODBC

Check your Office or Power BI bit version



- The 32-bit version is the default option but limits the amount of memory Excel can use. You should use the 64-bit version of Office (or any other application) whenever possible.
- In the dialog box, it will tell you about Excel, specifically if you have the 32-bit or 64-bit version installed

Connect To Learn SQL Via ODBC



Download the data driver from Oracle

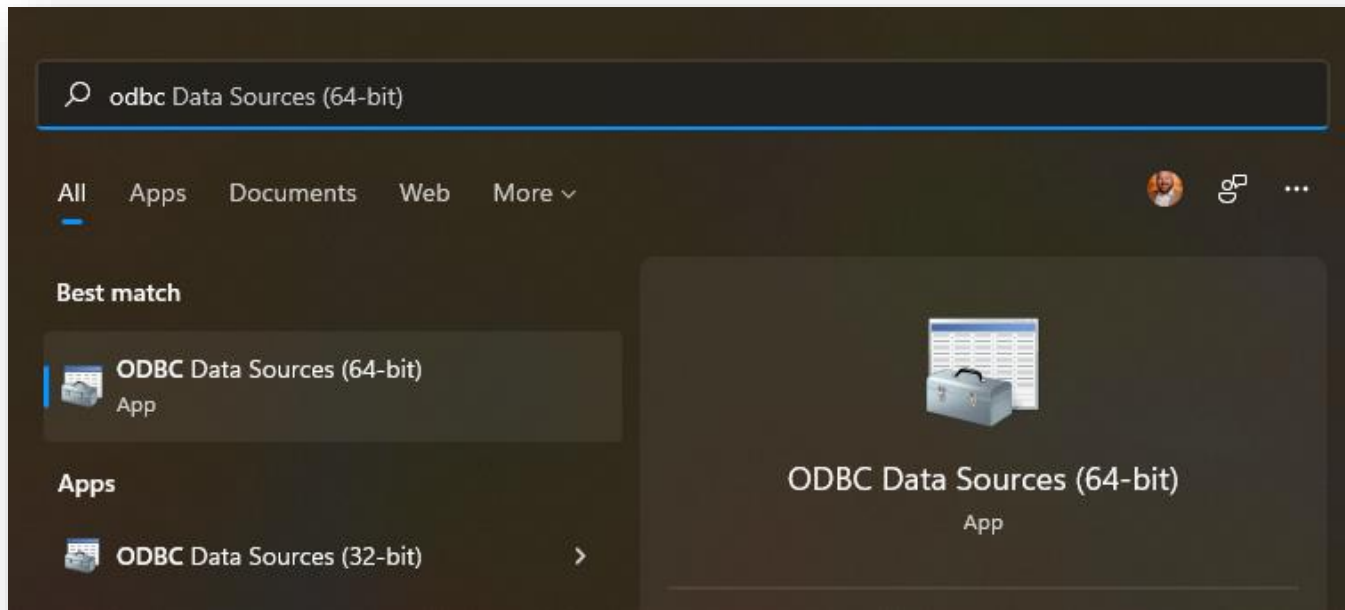
- To connect to Learn SQL via ODBC, you're going to need a specific driver
- The driver allows your computer to speak the same language as the database server
- There are many different types of drivers, but we will use the free MySQL driver provided by Oracle
- Download the appropriate driver for your operating system and bit version (e.g., 32 or 64-bit)
- The bit version **MUST** match your version of Office
- For Windows, choose the MSI installer option, as it will be simpler and easier to configure
- Download the driver from <https://bit.ly/3FYrW0H>

The screenshot shows the Oracle MySQL Connector/ODBC 8.0.29 download page. It features a 'General Availability (GA) Releases' tab and an 'Archives' tab. Under 'Connector/ODBC 8.0.29', there are dropdown menus for 'Select Operating System' (set to 'Microsoft Windows') and 'Select OS Version' (set to 'Windows (x86, 64-bit)'). A 'Looking for previous GA versions?' link is also present. The 'Recommended Download' section highlights the 'MySQL Installer for Windows' with a Windows logo graphic and text stating 'All MySQL Products. For All Windows Platforms. In One Package.' Below this, it specifies 'Windows (x86, 32 & 64-bit), MySQL Installer MSI' with a 'Go to Download Page >' button. The 'Other Downloads' section lists two options: 'MSI Installer' (8.0.29, 21.8M) and 'ZIP Archive' (8.0.29, 22.0M), each with a 'Download' button and MD5 checksum/signature links. A footer note suggests using MD5 checksums and GnuPG signatures for verification.

Download Type	Version	Size	Action
MSI Installer (mysql-connector-odbc-8.0.29-winx64.msi)	8.0.29	21.8M	Download
ZIP Archive (mysql-connector-odbc-noinstall-8.0.29-winx64.zip)	8.0.29	22.0M	Download

Connect To Learn SQL Via ODBC

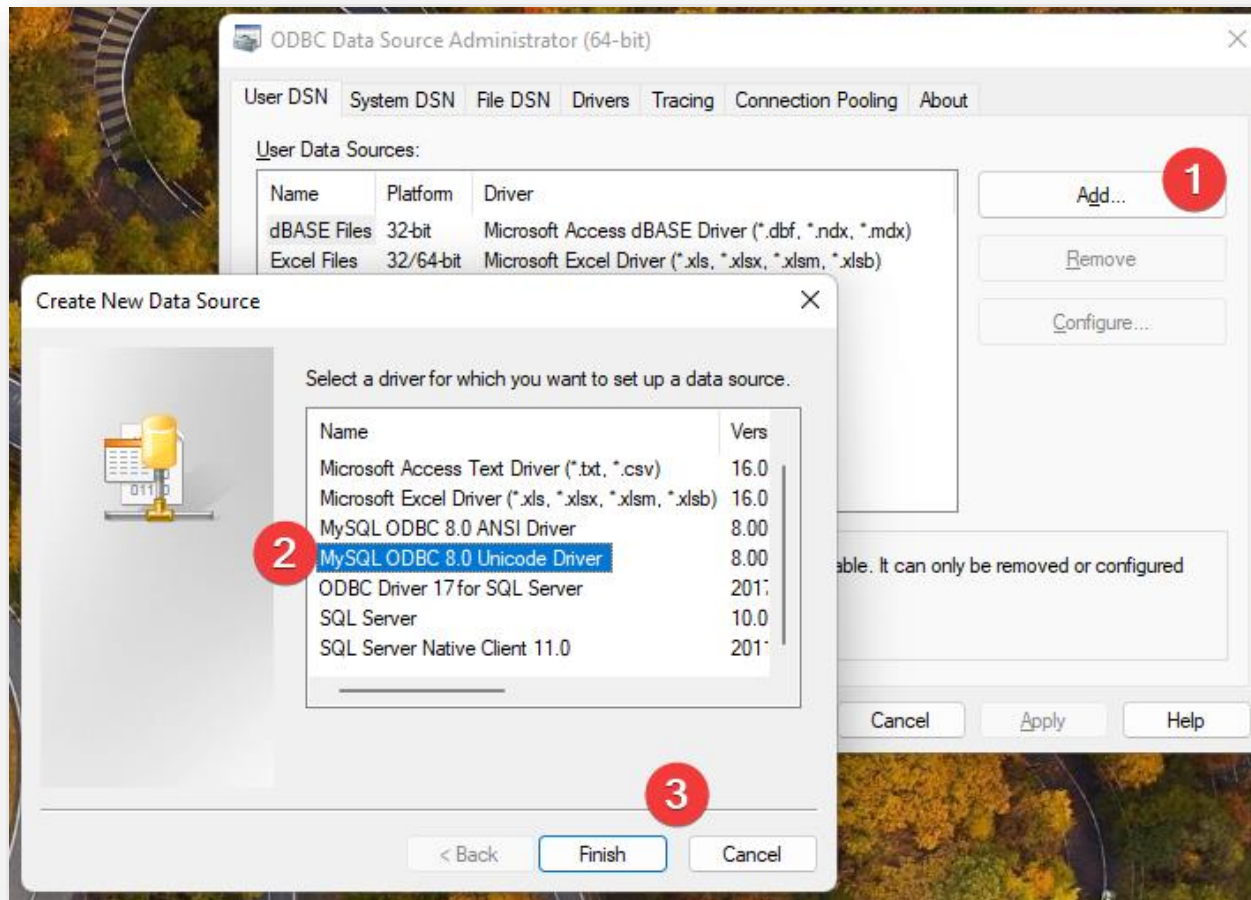
Download and install the MySQL driver



- Once the driver is downloaded, install the driver on your computer, just like any other application
- Once the installation is completed, you can configure the data source on your computer
- From the Windows start menu, type ODBC and launch either the 64-bit or 32-bit version of the utility
- Again, the bit version **MUST** match your version of Office
- If you use the 32-bit utility but the 64-bit version of Office, you will not see the configured ODBC driver

Connect To Learn SQL Via ODBC

Configure a user DSN for ODBC



- In the ODBC data source administrator utility, click the add button on the User DSN tab
- A DSN is a data source name
- This step will configure the Learn SQL service as a global data source for any application
- From the create new data source window, select MySQL ODBC Unicode Driver
- Click Finish

Connect To Learn SQL Via ODBC



Provide the MySQL database credentials

MySQL Connector/ODBC Data Source Configuration

MySQL Connector/ODBC

Connection Parameters

Data Source Name: LearnSQL

Description: Awesome Training Utility from CPE Today!

☒ TCP/IP Server: learnsql.cpetoday.com Port: 3306

☐ Named Pipe:

User: cpetoday

Password:

Database: [v]

Test

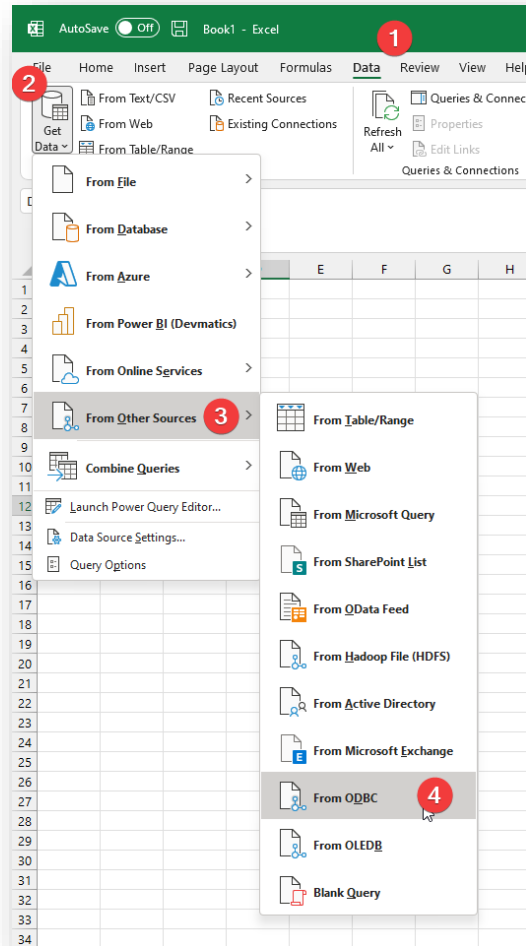
Details >> OK Cancel Help

- Data Source Name → LearnSQL
(Keep it short, simple, and one word with no spaces)
- Description → Optional
- TCP/IP Server → learnsql.yoss.io
(Please note that there is intentionally NOT a protocol (e.g., https) in the address. It isn't needed and will cause an issue if you include it.)
- Port → 3306
- User → learnsql
- Password → LearnWithUsToday!
- You can click the test button to check the connection and ensure it works

Connect To Learn SQL Via ODBC



Access the ODBC connection in Excel

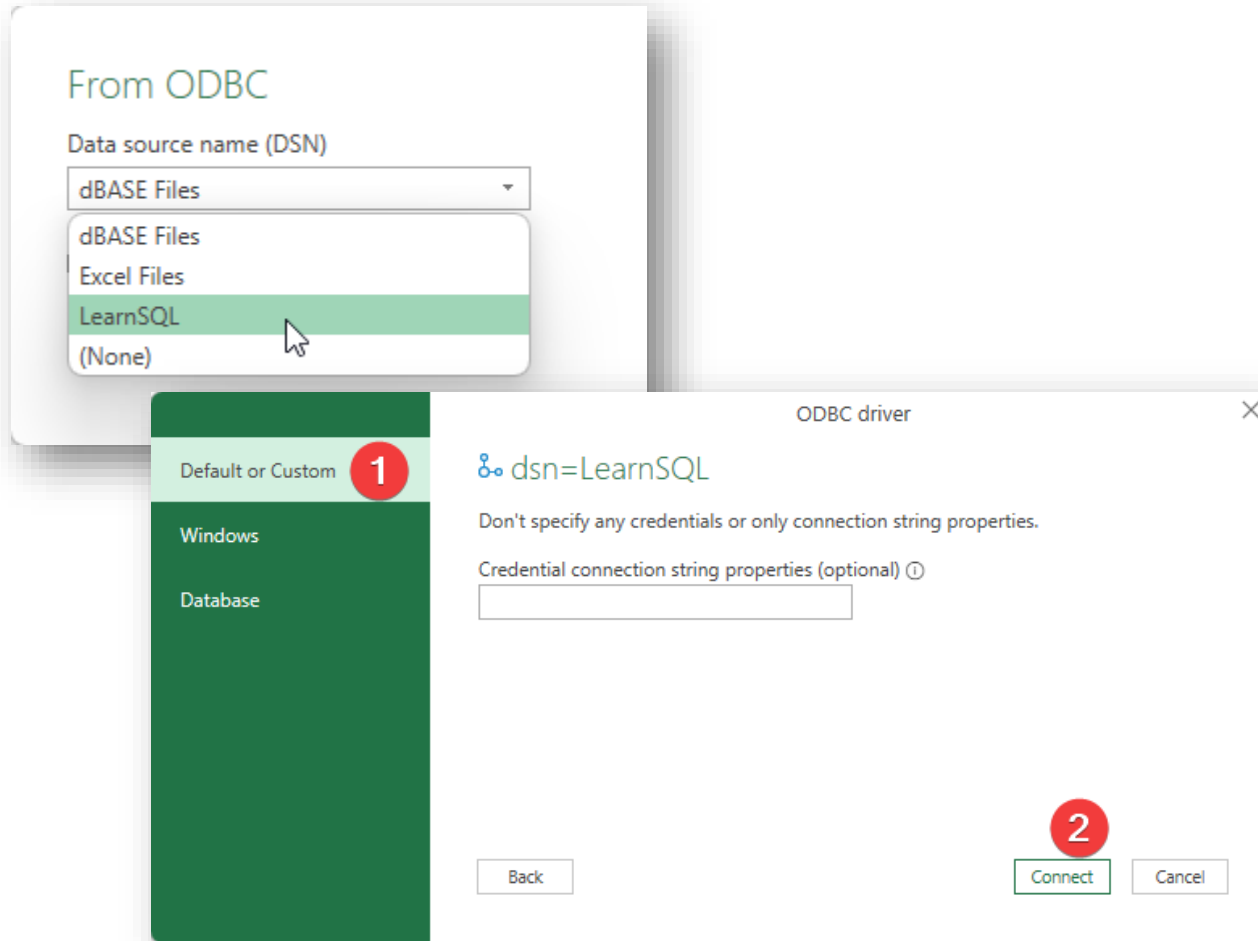


- Open up a new blank workbook in Excel
- Go to the Data tab in the ribbon menu
- Click the Get Data button on the far left
- Click the From Other Sources
- Click From ODBC

Connect To Learn SQL Via ODBC



Access the ODBC connection in Excel

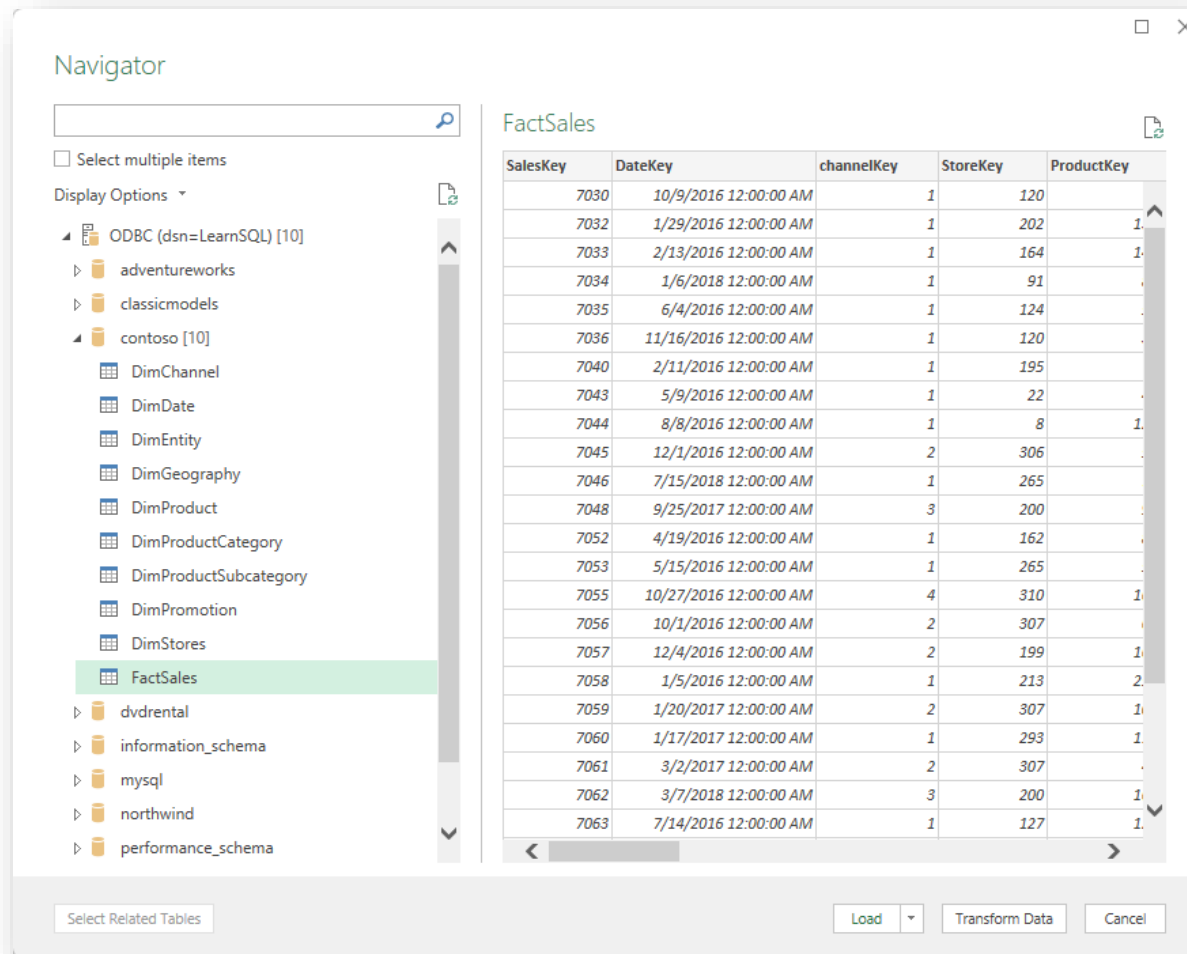


- From the ODBC connection menu, choose your recently configured connection (e.g., LearnSQL)
- In the authentication screen, choose the Default or Custom option
- You don't need to provide any additional authentication information as you provided it when you configured the ODBC connection
- Click Connect to establish a connection to the database server

Connect To Learn SQL Via ODBC



Provide the server credentials

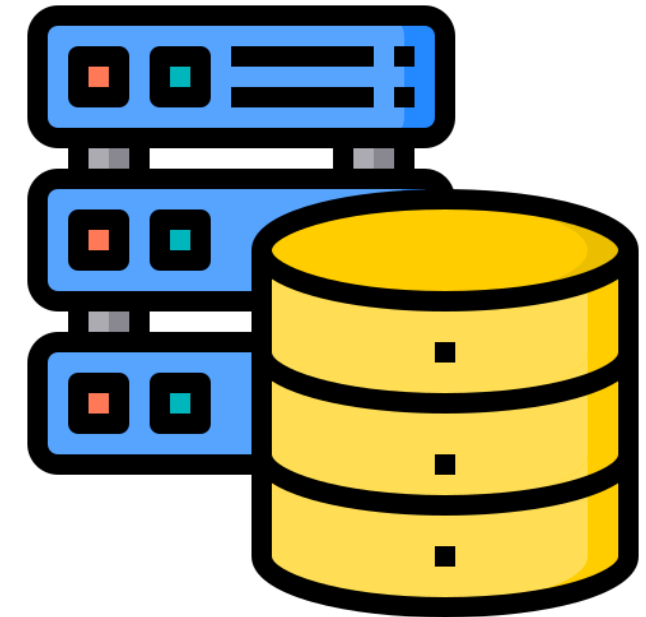


- The next screen will show you all the databases in the system
- There are several DBs with tons of sample data
- Once you've selected a DB, you can pick the specific tables you would like to work with
- You can load the data into Excel or transform it with Power Query

CData: Bridging Data Access

Connector Solutions Simplified

- CData is instrumental when native data access is lacking in your application; it serves as a vital helper tool.
- It offers connectors to a wide array of commonly used business and accounting applications, ensuring easy data accessibility
- These connectors open gates to potentially inaccessible data, strengthening your data management
- Connectors to a wide range of accounting, ERP, CRM, and other applications
- Learn more at <https://www.cdata.com/>



QODBC: A QuickBooks Interface



Simplifying Data Access

- QODBC is a forward-thinking tool aiding ODBC connections to QuickBooks for smooth data extraction
- It serves as a link between QuickBooks and ODBC-supporting applications, enabling data queries sans coding
- QODBC offers a bidirectional connection, permitting data pull and push to and from QuickBooks
- With its platform versatility, QODBC works efficiently with Excel, Access, Crystal Reports, and other ODBC-compliant software
- It accommodates all key QuickBooks versions, such as Pro, Premier, Enterprise, along with global editions





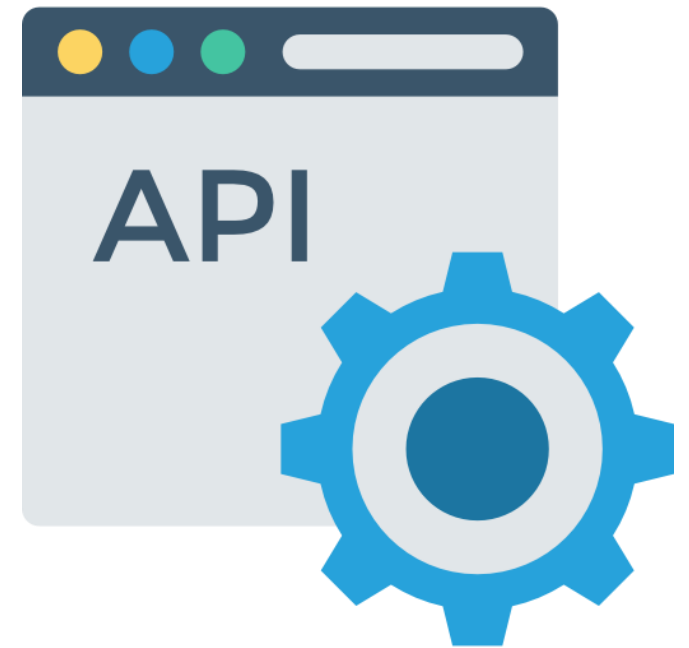
This method is often used to connect to Cloud data and applications

LET'S CONNECT VIA API

What Is An API? Why Do I Need It?



- An API (Application Programming Interface) is a set of protocols, routines, and tools for building software and applications
- It provides a way for different software systems to communicate with each other and exchange data
- APIs are often used to CRUD with the data in your database
- It is the safest, fastest, and easiest way to work with data



What Is CRUD To A API/Database?



- CRUD stands for Create, Read, Update, and Delete. It's a set of operations performed on data in a database or any other storage system.
 - **Create.** The create operation is used to insert new data into the database. It adds a new record to the table.
 - **Read.** The read operation retrieves data from the database. It fetches the data from the table.
 - **Update.** The update operation is used to modify existing data in the database. It changes the data in the table.
 - **Delete.** The delete operation removes data from the database. It deletes the data from the table.



Why Are APIs Awesome To Use



- **Integrating with other systems.** If you want to integrate your system with other systems, such as an e-commerce platform, a payment gateway, or a social media platform, you can use their APIs to exchange data and perform various operations.
- **Automating tasks.** APIs allow you to automate tasks and perform them programmatically, reducing the need for manual intervention.
- **Enhancing user experience.** By using APIs, you can enhance the user experience by providing a more seamless and integrated experience, for example, by integrating maps, weather, or other data into your application.
- **Monetizing your data.** If you have valuable data, you can use APIs to monetize it by allowing other companies or developers to access it and build new products and services around it.
- **Building new applications and services.** APIs are essential for creating new applications and services, allowing you to leverage existing functionality and data and build new products more quickly and cost-effectively.

What Is A REST API?



Representational State Transfer – API

- **REST:** A Simple and Effective Way to Share Data
- **Interoperability between Computer Systems:** REST makes it easy for two different systems to exchange data without having to know much about each other.
- **The Internet's Lingua Franca:** With REST, you can easily integrate with other organization applications, providing internet interoperability.
- **Effortless Data Transfer:** Support for REST means you can easily import and export data from your system.

Postman



A fantastic tool to work with APIs

- Postman is an API development and testing tool that allows developers to send HTTP requests and view responses easily
- It provides a user-friendly interface that simplifies the process of crafting and sending API requests, making it easier to test and debug API interactions
- Postman supports various request methods such as GET, POST, PUT, DELETE, and others and allows you to save and reuse collections of requests for later use
- It provides a range of features for working with APIs, including environment variables, pre-request scripts, test scripts, and more, making it a comprehensive tool for API development and testing
- Free for personal use and \$12/user/month for team access
- Learn more at <https://www.postman.com/>



POSTMAN

Connect To An API Today!



- Check out <https://learnsql.cpetoday.com/api/> for an overview of the Learn SQL API and connect to sample order and product data
 - <https://learnsql.cpetoday.com/api/Order>
 - <https://learnsql.cpetoday.com/api/OrderItem>
 - <https://learnsql.cpetoday.com/api/Customer>
 - <https://learnsql.cpetoday.com/api/ProductCategory>
 - <https://learnsql.cpetoday.com/api/Product>
- This is a real REST API and will give you real-world experience working with cloud JSON data



Diving Deeper into Advanced Power Query Topics

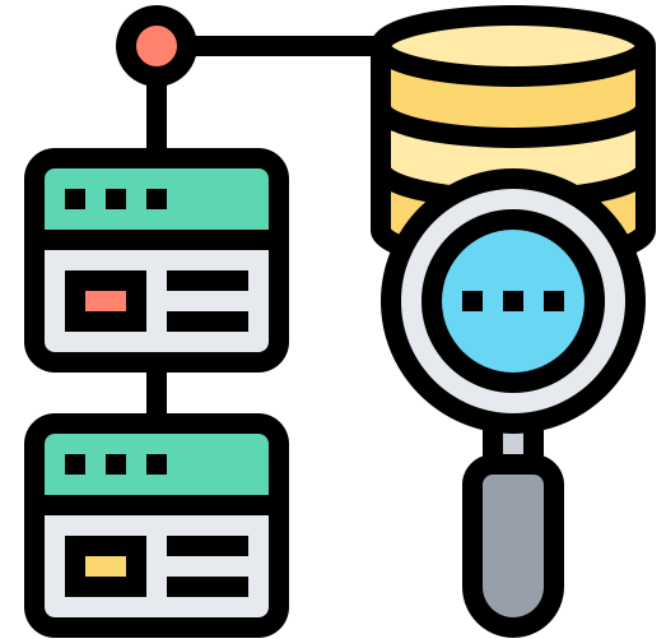
ADVANCED POWER QUERY TOPICS

Power Query: Advanced Insights



Moving Beyond the Basics

- Understanding the role of parameters in Power Query
- Getting familiar with Advanced Editors and M Language
- Creating and using custom functions effectively
- Forming custom data types for better organization
- Integrating Power Pivot for data analysis



Navigating Advanced Editor



Mastering M Language

- Advanced Editor in Power Query helps craft and refine M Language code
- M Language offers a case-sensitive, functional data scripting language
- Features of M Language include data shaping, transformation, and combination capabilities
- Utilizing Advanced Editor allows for creating, viewing, and modifying M Language scripts.
- Learn more about M at <https://bit.ly/3ZyQffK>



Navigating Advanced Editor



- The Advanced Editor presents the M code for a Power Query
- You can add, edit, or delete code to achieve specific outcomes
- Each row within the Advanced Editor signifies a distinct query step

Parameters In Power Query



Amplifying Data Efficiency

- Excel Workbooks enable the creation of parameters passed to Power Query
- Parameters like dates, customer IDs, or GL Account Numbers are applicable
- Using parameters in Power Query enables specific record lookups
- Parameters aid in filtering records before importing data into Excel, limiting data scope
- The use of parameters enhances work productivity by enabling multi-purpose functionality
- Learn more at <https://bit.ly/3PsXcub>



Custom Functions In Power Query



- Custom functions in Power Query facilitate repetitive data transformation tasks
- Use custom functions to apply complex transformations across multiple queries
- Debugging custom functions often involves isolating the function and test running it
- For efficiency, convert often-used steps into custom functions for easy reuse
- Keep a repository of your custom functions for future reference and use
- Learn more at <https://bit.ly/3PQfaYZ>



Creating Custom Data Types



- Excel's Power Query allows the creation of custom data types from any supported data source
- The process involves importing data with Power Query, shaping it, and loading it into a worksheet
- Custom data types can be viewed in an Excel table, displayed as a card, or used in formulas
- Creating a custom data type involves selecting relevant columns and defining the data type name and display column
- The newly created custom data type collapses initially selected columns into one for easier data manipulation

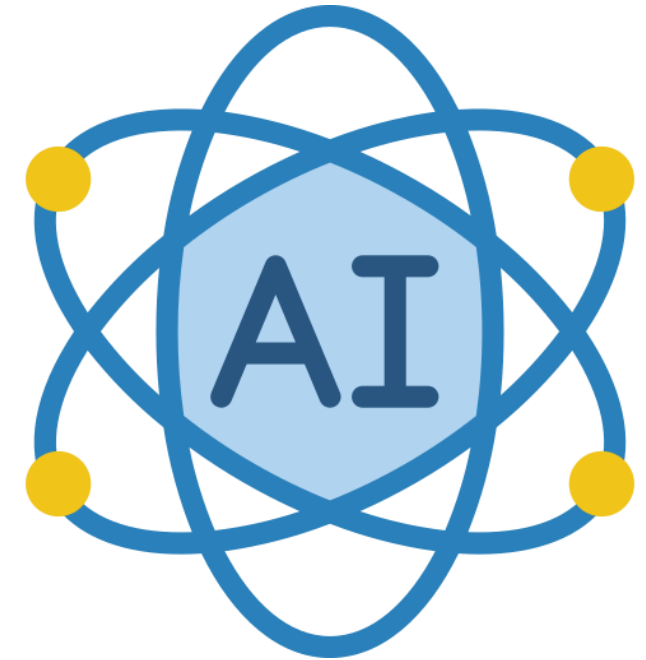


AI Insight Tools



Machine Learning in Power Query

- AI Insights in Power BI provides access to pre-trained machine learning models, enhancing data preparation
- Functions for Text Analytics and Vision are available from Azure Cognitive Services, enriching your data in Power Query
- AI Insights can be accessed directly from the Home and Add Column tabs in Power Query Editor
- Power BI's AI Insights supports Sentiment Analysis, Key Phrase Extraction, Language Detection, and Image Tagging
- Power BI Premium is required for Text Analytics or Vision features, supporting extensive nodes and memory customization
- AI Insights is compatible with Excel for Microsoft 365, Excel 2019, Excel 2016, and Excel 2013



Power Pivot: A Deep Dive

Excel's Data Modeling Tool

- Power Pivot empowers users to create data models, form relationships, and perform calculations
- It allows for extensive data handling, intricate relationships, and diverse calculations in a high-performance Excel environment
- Capable manage large data volumes from various sources within a single Excel document
- Power Pivot operates directly within Excel as an in-memory SQL Server Analysis Services engine
- It's accessible on Excel for Microsoft 365, Excel 2019, Excel 2016, and Excel 2013
- For more insights, visit: <https://bit.ly/3O31rMc>



Power Pivot for Excel - Book1

File **Home** **Design** **Advanced**

Paste

Paste Append

Paste Replace

Copy

Clipboard

From Database

From Data Service

From Other Sources

Get External Data

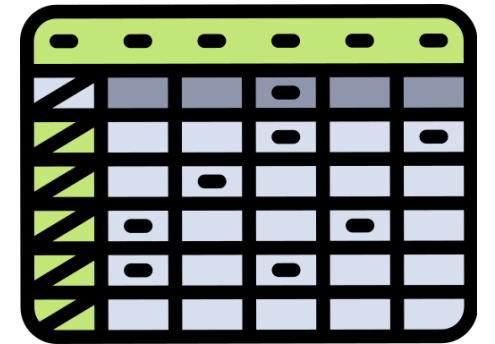
	[Order ID]	fx	
	Order Date	Sales Rep	Customer N...
1	1/7/2014	Anne Hellung-Lar...	Company F
2	1/12/2014	Robert Zare	Company J
3	1/15/2014	Jan Kotas	Company AA
4	1/20/2014	Mariya Sergienko	Company D

Excel's Data Modeling Magic



Structuring for Success

- Data modeling in Excel involves organizing data in a structured format
- It allows for the creation of relationships between different data sets
- Data modeling enables effective management and analysis of large volumes of data
- It enhances the functionality of Pivot Tables and Pivot Charts
- Excel's data modeling facilitates advanced data analysis and forecasting
- It ultimately drives efficient decision-making by providing a clear view of data

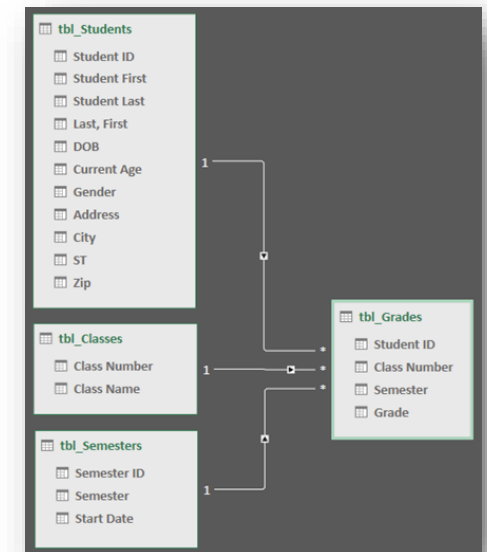


Excel Data Model



A Database Right Inside Your Excel

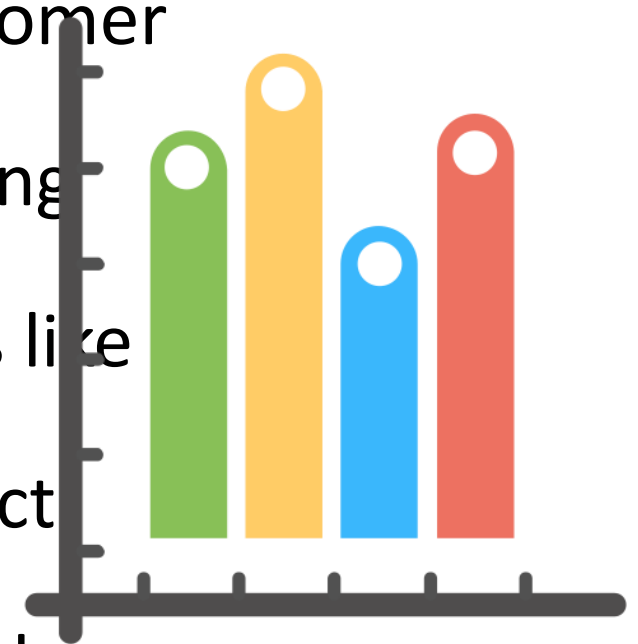
- Excel's Data Model integrates data from various tables
- It builds a relational data source within an Excel workbook
- This Model underpins PivotTables and Pivot Charts
- It's visualized as a collection of tables in a Field List
- The Data Model enables the creation of Pivot Tables from multiple worksheets
- It's crucial for leveraging Power Pivot and generating dynamic reports
- Learn more at <https://bit.ly/3OwKPxK>



Data Models: Practical Applications



- Data models facilitate sales forecasting by integrating historical and market data
- They can help identify trends and patterns in customer behavior
- Data models assist in budget planning by combining various financial data
- They are utilized for performing complex analyses like regression or correlation
- Data models enable tracking and visualizing project progress over time
- They can help streamline supply chain operations by integrating inventory, sales, and delivery data



Today We Discussed



- Comprehensive grasp of Excel's Tables and Data Modeling
- Introduction and exploration of Excel Power Query
- Analysis of Power Query's tabs and user experience
- Examination of various Power Query connection options
- Techniques for common Power Query data transformations
- Guidance on connecting to Web, SQL, and ODBC data sources
- Brief look at Advanced Power Query topics

