

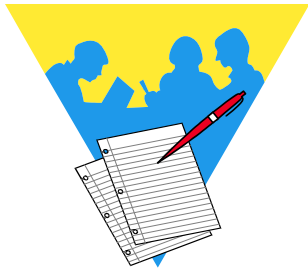


## Lesson 2: Power Query

### Lesson Overview

You will cover the following concepts in this chapter:

- ◆ Introduction to Power Query
- ◆ Get & Transform Data
- ◆ Navigator
- ◆ Power Query Editor
- ◆ Data from Another Workbook
- ◆ Data from a Text File
- ◆ Data from an Access Database
- ◆ Transforming Data
- ◆ Splitting Data
- ◆ Adding a Column
- ◆ Data Types
- ◆ Applied Steps
- ◆ Loading a Query
- ◆ Editing a Query
- ◆ Saving and Running A Query



## Lesson Notes



## Introduction to Power Query

Data coming into *Excel* for analysis is a common occurrence. As illustrated in the last lesson, cleaning up the data within *Excel* is not too difficult a task. *Power Query*, a data connection technology is now the standard tool used to import or gather data into *Excel*. Users of *Excel 2010* and *2013* versions could download and install the *Power Query* add-in while the 2016 version it had been rolled in to the program alongside the legacy data connection and management tools.

The *Power Query* tool offers a streamlined manner to connect to, import, and manage data. You can connect to one or several data sources in order to build complex models to conduct meaningful analysis, combining data sources, merging tables, adding or removing columns. Once a query has been created, it is possible to save and reuse the query. This can save a considerable amount of time when re-running reports in the future.





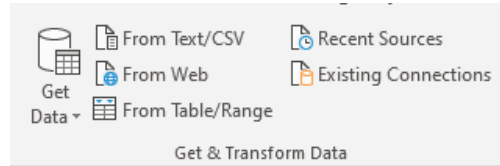
## Get & Transform Data

### Getting Data

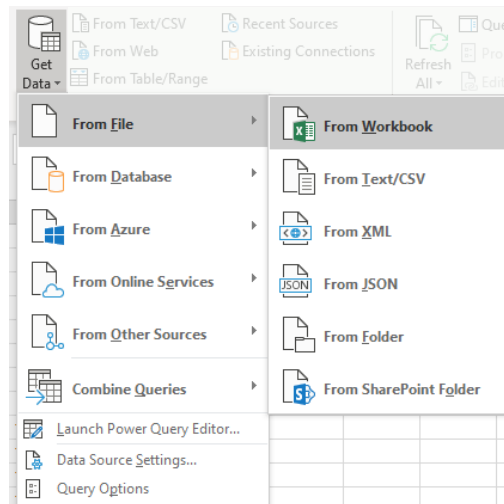
Data can be imported into *Excel* from many different sources by using tools found in the **Get & Transform Data Group** of commands on the **Data Tab**. The data can be imported directly into a workbook as is, and then edited or cleaned-up within *Excel*.

#### Note

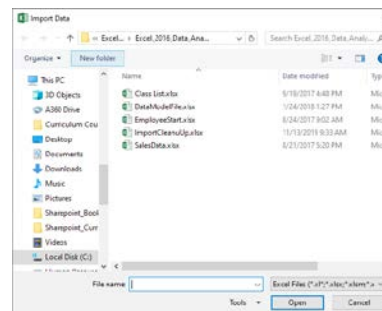
When accessing data from web sites, that data must be in tables in order for *Excel* to access it.



Common types of external data sources have buttons in full view within the **Get & Transform Group**. There are many others available by using the **[Get Data]** drop-down button. This menu of options offers a list of data types with fly-out menus.



Once a choice of data type is made the next step in the process is to locate the data source in the *Import Data* dialog.

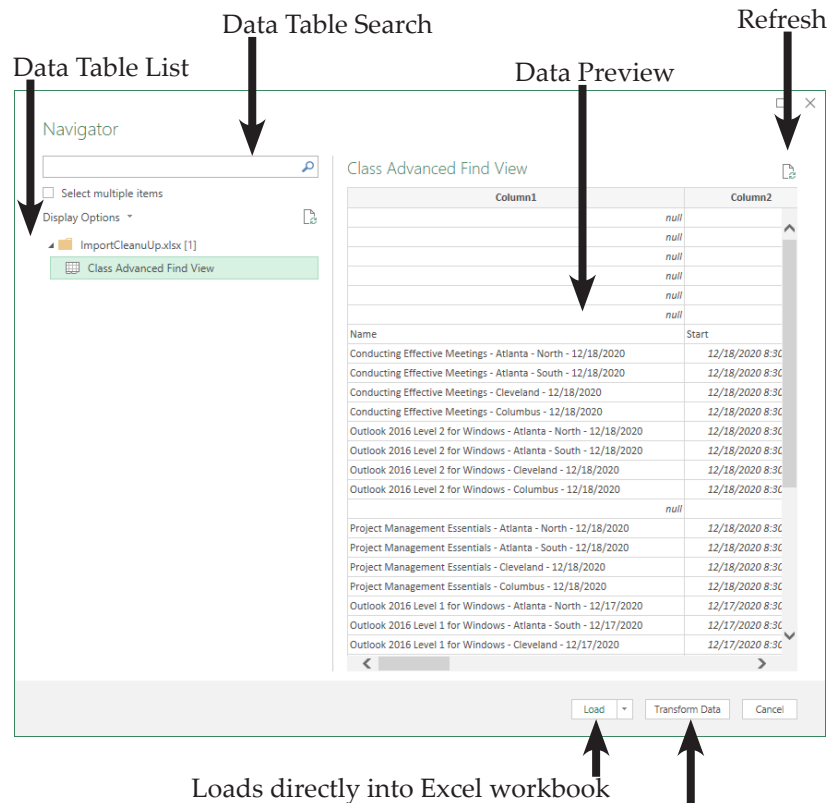


After the data source is located and opened, the *Navigator* dialog opens, which is the next step in the process.



## Navigator

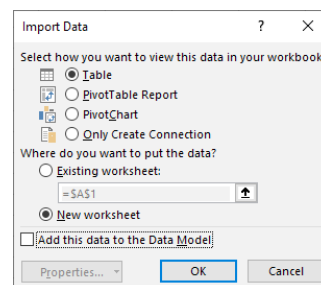
The *Navigator* dialog shows users a list of available tables or data sets on the left and a preview of the data on the right. Choosing a source table, data set, or spreadsheet will change the preview to that of the selected source. If more than a single table from the source is required, checking the *Select multiple items* checkbox allows all selected tables to be imported.



Loads directly into Excel workbook

Opens data set in Power Query

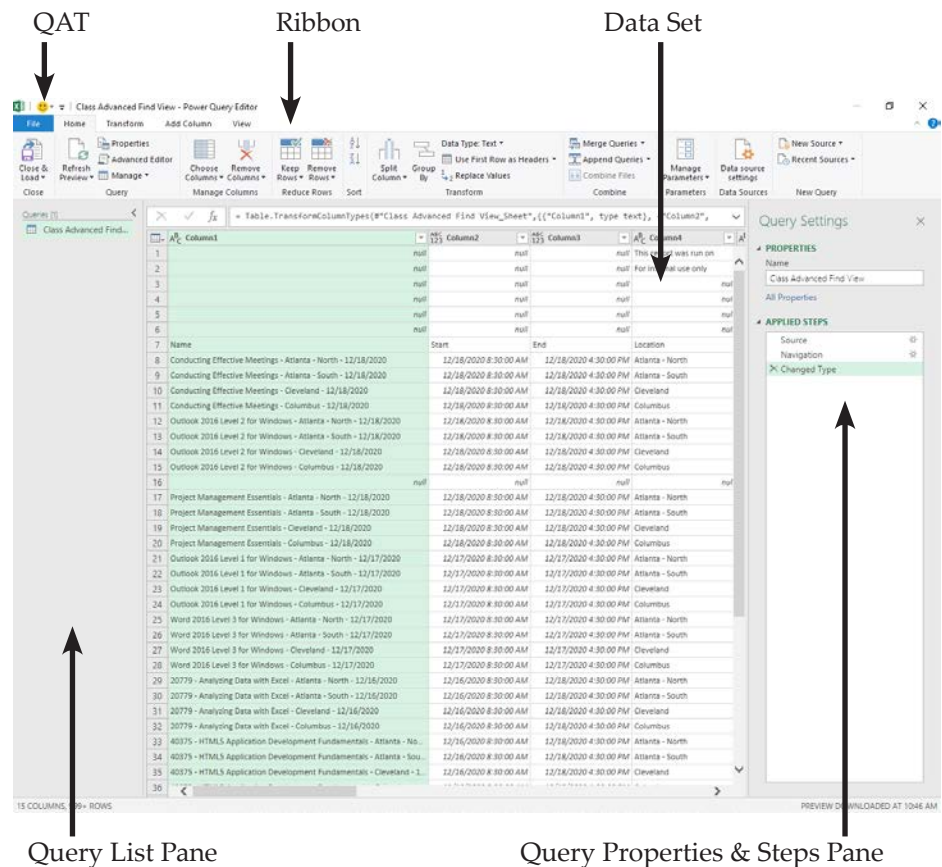
Clicking the **[Load]** button will place the selected data sets into the workbook, beginning in the actively selected cell. Choosing *Load To...* from the drop-down of the **[Load]** button opens an *Import Data* dialog. This dialog allows you to determine how and where the data will be placed into the workbook.



Clicking the **[Transform Data]** button will open the data set in *Power Query*.

## Power Query Editor

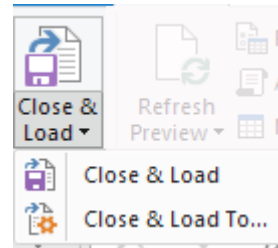
The *Power Query* window is very similar to the *Excel* interface in that, both have a **Quick Access Toolbar** and tabbed ribbon navigation components.



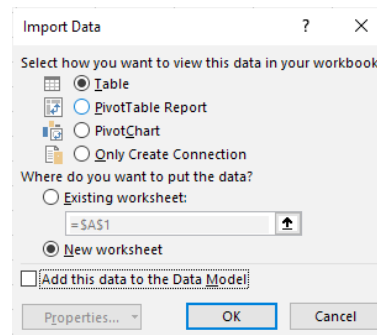
- ❖ **QAT:** (Quick Access Toolbar) users can add common commands to this toolbar for easy access.
- ❖ **Ribbon:** just as in *Excel*, the ribbon is a tabbed set of related tools.
- ❖ **Query List** pane: all imported data sources are displayed here, clicking a query will display the selected data set in the Main view
- ❖ **Data Set View:** this is the main view where data is previewed and modified.
- ❖ **Query Steps** pane: as modifications are made to the data set, those steps are listed in this pane. This can be seen as a history of all actions to prepare the data for importation. Any step in the list can be removed without removing steps made before or after the selected step.

## Power Query Editor, continued

Once all the data modifications are completed; unnecessary row and columns removed, data has been split into more manageable components, and columns of data being combined the data is loaded into an *Excel* workbook by using the **[Close & Load]** button on the *Home Tab*. This button offers the same options and functionality as in the *Navigator* dialog.



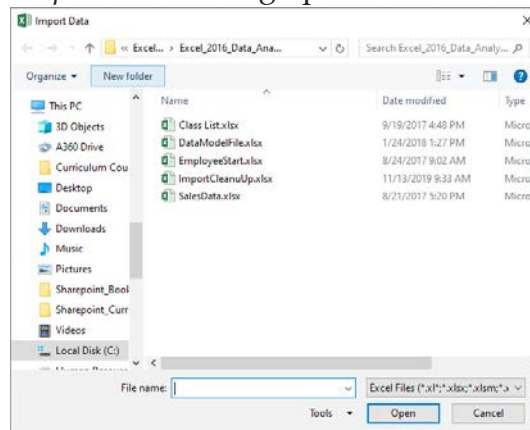
Choosing the *Close & Load To..* option from the button's drop-down will display the *Import Data* dialog .



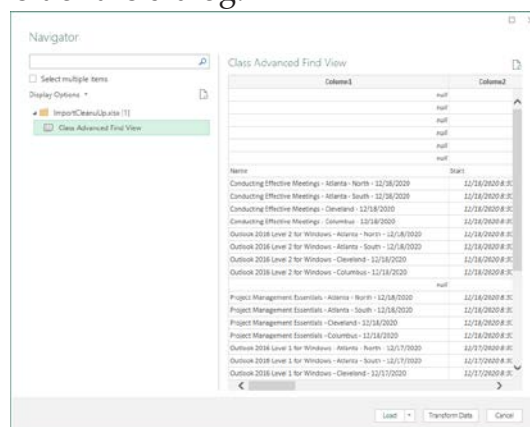
## Data from Another Workbook

Using the Get & Transform tool allows you to connect to data stored in other workbooks. The data can be a simple data set or formatted as a table, either can be brought into and managed in new or existing workbooks.

- ❖ On the **Data Tab**, in the **Get & Transform Group** click the **[Get Data]** button.
- ❖ Choose *From File* in the drop-down and then *From Workbook*.
- ❖ The *Import Data* dialog opens.



- ❖ Navigate to the other workbooks location and click the **[Import]** button.
- ❖ The *Navigator* dialog opens.
- ❖ Choose the spreadsheet or table from the list on the left of the dialog.

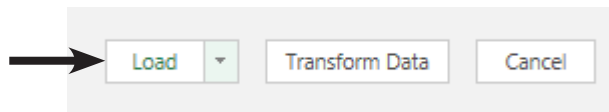


- ❖ If more than one data source is required, check the *Select multiple items* checkbox; and select all sources.

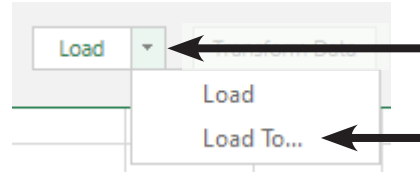


## Data from Another Workbook, continued

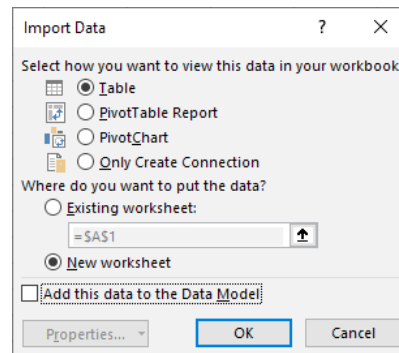
- ◆ Loading the data directly into *Excel* is done by clicking the **[Load]** button. This will place the data in cell A1 of a new worksheet as a table.



- ◆ If you need the data to come in on an existing worksheet or as a PivotTable; click the drop-down arrow of the **[Load]** button and choose *Load To ...*



- ◆ The *Import Data* dialog opens and you are able to set where and how the data will be placed into the workbook.



## Action 2.1 - Importing Data From Another Excel Workbook



### Instructions:

1. Create a blank new workbook.
2. Activate the *Data Tab*.
3. Locate the **Get & Transform Group**.
4. Click the **[Get Data]** button drop-down and choose *From File*, then *From Workbook*.
5. In the *Import Data* dialog, navigate to the data files folder and choose the **Invoices.xlsx** file.
6. Locate the list of available worksheets and tables in the source.
7. Check and uncheck the *Select multiple items* checkbox .
8. Select the *Invoices* from the list of available sources displayed on the left of the window.
9. Click the **[Load]** button.
10. Rename **Sheet2** as **Invoices**.
11. Save the file in the data files folder as **DataImports.xlsx**.

### Results/ Comments:

**[Ctrl + N]**.

This is the first group on the *Data Tab*.

The **[Get Data]** button offers many options for connecting to external data sources. When the choice is made the Import data dialog opens.

The *Navigator* dialog opens.

These are all named tables and worksheets in the file. Another example of will it is good practice to name the worksheets and tables in your files.

When the Checkbox is checked, checkboxes are added in front of each options Checking these will include them in the importation of data. When unchecked you are able to select only one.

The data in that table is displayed in the preview on the right of the window.

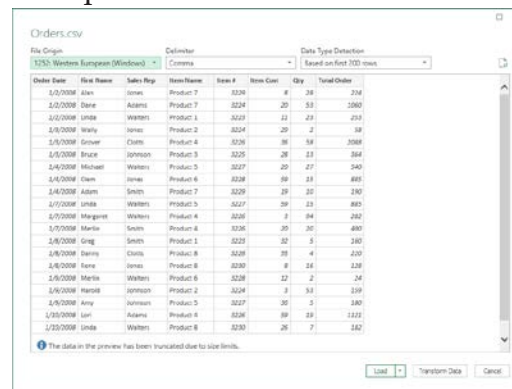
A new worksheet is added to the workbook with the imported data in a formatted table.

Double-click the sheet tab to rename it.

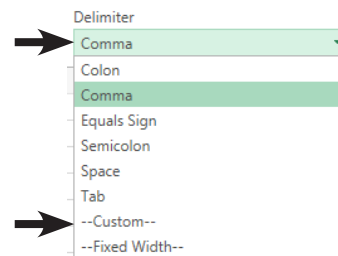
**[F12]**.

## Data from a Text File

Many of us will receive data in the form of CSV or tab delimited text files. The process for getting and importing those types of data will be done in the same manner as importing data from other Excel files. Using the tools in the **Get & Transform Data Group**, you will search for and connect to the source data by clicking the **[From Text/CSV]** button. When importing a text file, the *Navigator* dialog just shows the preview along with a set of fields above the preview.



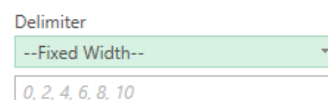
Should the preview show the data breaking in an unexpected manner; use the **Delimiter** field to set the correct delimiter. From the **Delimiter** field drop-down you are able to choose from a list of commonly used delimiters or set your select your own.



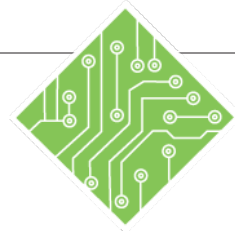
Choosing *Custom* will add a new field below the **Delimiter** field where you are able to type in the delimiter of your choosing.



Choosing *Fixed Width* from the **Delimiter** field will add a new number field below the *delimiter* field. Allowing you to set the number of characters to divide the content by in order to generate columns.



## Action 2.2 - Importing Data From a Text File



### Instructions:

1. **DataImports.xlsx** should still be open.
2. Activate the *Data Tab*.
3. Click the **[From Text/CSV]** button located in the **Get & Transform Group**
4. In the *Import Data* dialog, navigate to the data files folder and open the **CustomerListNorthAmerica.csv** file.
5. Locate the **Delimiter** field.
6. Using the **Delimiter** field drop-down change the delimiter from *Comma* to *Tab*.
7. Change the delimiter back to *Comma*.
8. Click the **[Load]** button drop-down and choose *Load To...*
9. Leave the *Select how you want to view this data in your workbook* choice as *Table*.
10. In the *Where do you want to put the Data?* section, choose the *Existing worksheet* radio button.  
Click into the field below, highlight any existing text and delete it, select cell **A1** on **Sheet1**, click the **[OK]** button.
11. Rename **Sheet1** as **NA Customers**.
12. Save the file and leave it open.

### Results/ Comments:

If not, re-open it.

The *Import Data* dialog opens.

The *Navigator* dialog opens.

As a textually based source file, you are able to set the delimiter if needed.

The preview now shows all the data in a single column. This is because the source is not using tabs to separate the data.

The data is broken into multiple columns again.

A second *Import Data* dialog opens.

This will apply a table format to the data.

This allows you to define where the data is placed.

This is where it will be placed.

The data is placed and formatted as a table. The table does not use the column headers as headers, this will be fixed later.

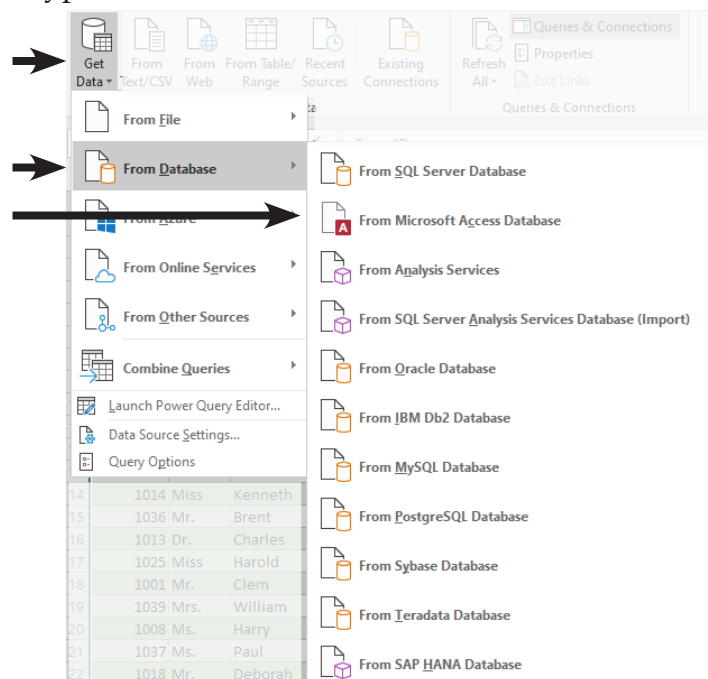
Double-click the sheet tab to rename.

**[Ctrl +S]**.

## Data from an Access Database

Gathering data from an *Access Database* follows similar lines as within importing *Excel* or text content. Sometimes we want to bring in a table from a database but not know what other tables are related; the *Navigator* dialog allows you to **Select multiple items**. When the **Select multiple items** checkbox is checked and a table is selected, the **[Select Related Tables]** button becomes active. Clicking this button will select all related tables in the database at once; alleviating the need to know and understand the entire database structure.

To connect to the access database use the **[Get Data]** button drop-down and choose *From Microsoft Access Database* from the list of database types.

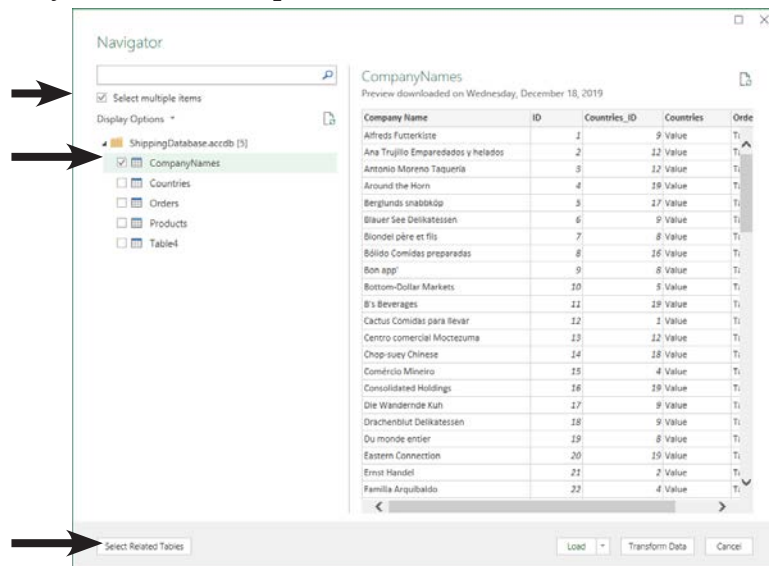


- ◆ Should your database type not be listed, contact the manufacturer of your database to see if they have and can send you the required drivers to connect to *Excel*.

In the *Import Data* dialog, navigate to and select the desired database then click the **[Open]** button.

## Data from an Access Database, continued

The *Navigator* dialog opens, in the left of the dialog is the list of tables in the database. You will notice that the **[Select Related Tables]** button is greyed out and inactive. In order to make it active; you must first check the *Select multiple items* checkbox, then select a table from the list. Then the **[Select Related Tables]** button is active. Clicking the button will allow the *Navigator* to follow all the primary to foreign key threads to include all necessary data in the import..



### Action 2.3 - Importing Data From a Database



#### Instructions:

1. **DataImports.xlsx** should still be open.
2. Activate the *Data Tab*.
3. Click the **[Get Data]** button drop-down and choose *From Database*, then *From Microsoft Access Database*.
4. In the *Import Data* dialog, navigate to the data files folder and choose the **ShippingDatabase.accdb**.
5. Select *CompanyNames* from the list of tables.
6. Check the *Select multiple items* checkbox.
7. Check the *CompanyNames* checkbox.
8. Click the **[Select related Tables]** button.
9. Uncheck the checkboxes for *CompanyNames* and *Countries*.
10. Click the **[Select related Tables]** button again.
11. Uncheck the *Select multiple items* checkbox.
12. Select the *Orders* table and click the **[Load]** button.
13. Rename **Sheet3** as **Orders**.
14. Save the file and leave it open.

#### Results/ Comments:

If not, re-open it.

The *Import Data* dialog opens.

The *Navigator* dialog opens.

The table is displayed in the preview area.

The preview is removed and checkboxes are added to each table in the list.

The preview is re-displayed.

Since the *Countries* and *Orders* tables have a relation with *CompanyNames* table they are added to the selection.

The table are now deselected.

Any tables related to the *Orders* table are now also selected.

All selections are cleared and the checkboxes are removed.

The data is loaded onto a new worksheet as a formatted table.

Double-click the sheet tab to rename.

**[Ctrl +S]**.

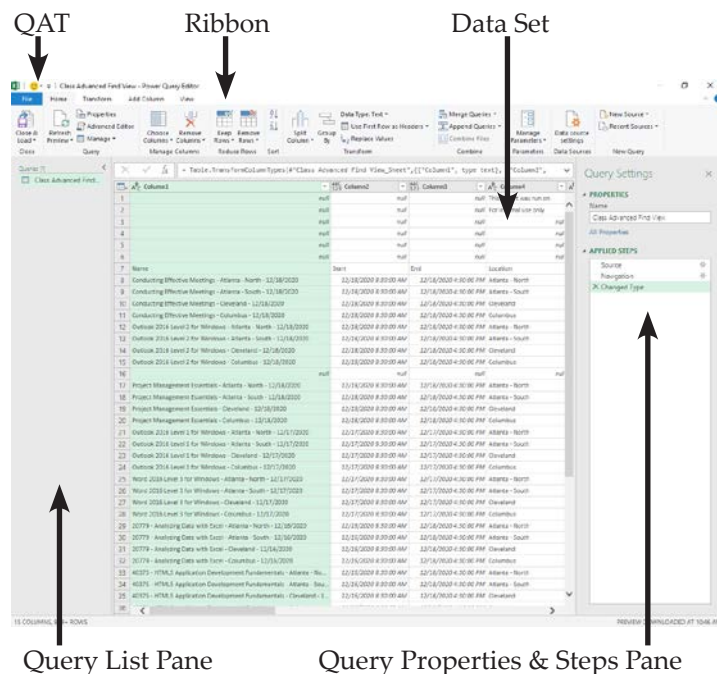
## Transforming Data

Raw data is not often configured in the best and most useful manner; requiring users to spend time removing unnecessary data and splitting data into smaller more manageable pieces. This quickly becomes very time consuming when updated data is required every week or two. With the Transform tools available in Power Query you can take care of most of those changes before bringing the data into *Excel*. Once the connection has been established along with a process to transform the raw data into useful data developed, the query can be saved and rerun as new data is comes in.

### Opening Power Query

This begins with importing data into *Excel*, but instead of simply loading the data set, choosing the **[Transform]** button in the *Navigator* dialog.

- ❖ On the **Data Tab**, use the appropriate **Get Data** option.
- ❖ In the *Import Data* dialog, navigate to and open the source data.
- ❖ In the *Navigator* dialog, choose the required data sources.
- ❖ Click the **[Transform]** button to open the raw data in *Power Query*.
- ❖ *Power Query* opens.



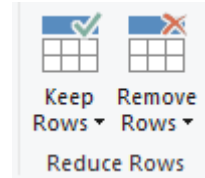


## Transforming Data, continued

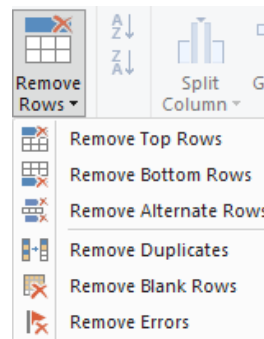
### Removing Rows and Columns

#### Row Removal

- On the *Home Tab* you will find the **Reduce Rows** Group.



- Click the **[Remove Rows]** button, a menu of option is displayed. There is no need to select the rows before using this tool.



- Choose *Remove Top Rows* from the menu.



- The *Remove Top Rows* dialog opens.
- Enter the number of rows to be remove from the top of the data set and click the **[OK]** button.

#### Column Removal

- When removing columns, select the columns to be removed or kept.
  - use the Shift key for continuous selection
  - use the Ctrl key for noncontinuous selection

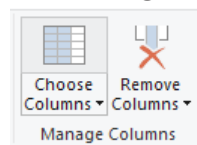
#### Note

Using the **[Keep Rows]** button works just as the **[Remove Rows]**.

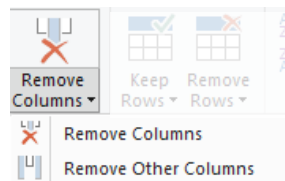


## Transforming Data, continued

- Once the columns have been selected, got to the **Home Tab** and locate the **Manage Columns Group**.



- Click the **[Remove Columns]** button drop-down.

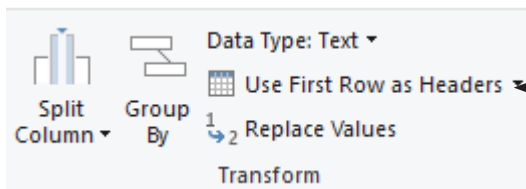


- Choose the appropriate option to either remove or keep the selected columns.

### Making Top Row the Headers

After any unwanted rows have been removed from the top, the top row may contain the actual column headers.

- On the *Home Tab*, locate the **Transform Group**.
- Click the **[Use First Row as Headers]** button.



- Notice the column headers of A,B,C.. have been replaced with your data.

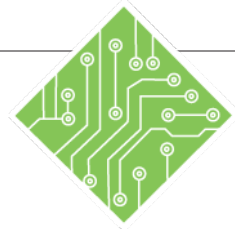
### Removing Duplicates and Blank Rows

One important task is checking for and removing duplicate records from the data set. Using the **[Remove Rows]** button drop-down, you will find the ability to remove duplicates.

- On the *Home Tab*, click the **[Remove Rows]** button drop-down and choose *Remove Duplicates*.
- Click the **[Remove Rows]** button again and choose *Remove Blank Rows* from the menu.



## Action 2.4 - Transforming Data in Power Query



### Instructions:

1. **DataImports.xlsx** should still be open.
2. Activate the *Data Tab*.
3. Click the **[From Text/CSV]** button located in the **Get & Transform Group**
4. In the *Import Data* dialog, navigate to the data files folder and choose the **EmployeeList.txt** file.
5. Click the **[Transform]** button.
6. Examine the *Power Query Editor* interface.
7. Click the arrow at the top of the *Queries* pane to expand the pane. Use the arrow again to collapse the pane.
8. On the *Home Tab*, locate and click the **[Remove Rows]** button. Choose *Remove Top Rows* from the menu.
9. Enter **4** in the **Number of rows** field and click the **[OK]** button.
10. On the *Home Tab*, locate and click the **[Remove Rows]** button. Choose *Remove Blank Rows* from the menu.
11. On the *Home Tab*, locate and click the **[Remove Rows]** button. Choose *Remove Duplicate Rows* from the menu.

### Results/ Comments:

If not, re-open it.

The *Import Data* dialog opens.

The *Navigator* dialog opens.

The data is opened in the *Power Query Editor* window.

Locate the **QAT**, click through the tabs in the ribbon, note the left *Queries* pane is collapsed, and the *Query Settings* pane is expanded on the right.

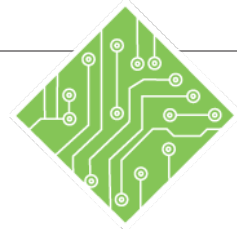
The *Queries* pane is on the left of the data view. When expanded, it shows and gives access to all queries in the current workbook.

The *Remove Top Rows* dialog opens.

The top four rows are removed from the data.

Any blank rows are removed from the data.

Any duplicate rows are removed from the data.



**Instructions:**

12. On the *Home Tab*, locate and click the **[Use First Row as Headers]** button in the **Transform Group**.
13. Select the **Name** header cell, right-click on it and choose *Rename* from the menu.
14. Rename the column as **F\_Name**.
15. Rename the **Name\_1** header as **L\_Name**.
16. Scroll to right to locate and select the **Age, Vision, Dental, and Health** columns.
17. On the *Home Tab*, locate and click the **[Remove Columns]** button in the **Manage Columns Group**.
18. Leave the file as is.

**Results/ Comments:**

The default names of Column A, Column B, etc... are replaced with the values in the first row of the data.

A **[Rename]** button can also be found on the *Transform Tab* in the **Any Column Group**.

Use either the button or right-click method to rename the header.

Select the first column then hold the Ctrl key as you select the others.

The columns are removed from the data. If you wanted to keep only these columns, use the **[Remove Columns]** button drop-down and choose *Remove Other Columns*.

Do not exit the *Power Query Editor*.



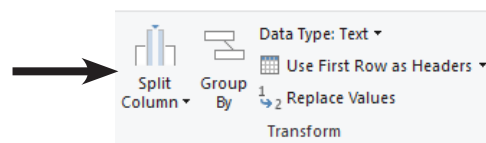
## Splitting Data

One aspect of the Rules of Normalization is that data should be broken down into the smallest logical components. As an example consider an address; to be normalized it should have a column(field) for street, city, state, and zip to truly be used effectively.

Data may not be normalized when you first receive it, so it may be necessary to re-organize the data in a more useful manner. This can also be done within the Power Query environment.

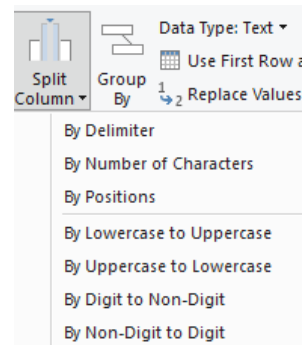
### Splitting Data

- ◆ Select the column which needs broken into smaller



component parts.

- ◆ On the *Home Tab* locate the **[Split Column]** button in the **Transform Group**.
- ◆ Clicking the button opens the menu of options for splitting the column.



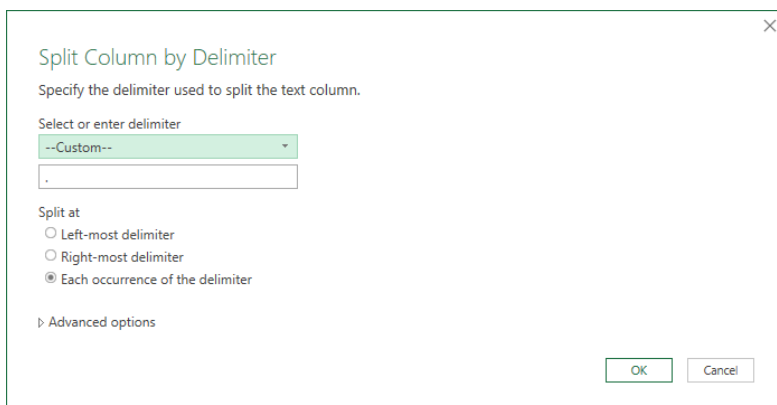
- ◆ Choosing any of the top three options opens a dialog, where you are able to set the specific parameters to split the data.
- ◆ The others will do as their names suggest.






## Splitting Data, continued

- ◆ Choosing the *By Delimiter* option opens the *Split Column by Delimiter* dialog.



The dialog box is titled "Split Column by Delimiter" and includes a close button (X) in the top right corner. Below the title, it says "Specify the delimiter used to split the text column." There is a section labeled "Select or enter delimiter" with a dropdown menu currently showing "--Custom--" and a text box below it containing a single period ".". Below this, the "Split at" section has three radio buttons: "Left-most delimiter", "Right-most delimiter", and "Each occurrence of the delimiter", with the third option being selected. At the bottom left, there is a collapsed arrow icon next to the text "Advanced options". At the bottom right, there are "OK" and "Cancel" buttons.

- ◆ In this dialog, you are able to choose from a list of common delimiters from the **Select or enter delimiter** field.
- ◆ Choosing *Custom* from the list adds a field where you type the character to use as a delimiter. Consider using an @ to split the user name from the domain name in a list of email addresses.
- ◆ Below the delimiter selector area are radio buttons offering choices on how the delimiter will be applied.
- ◆ The *Advanced Options* arrow will expand the dialog.



This section shows the expanded "Advanced options" from the previous dialog. It starts with a collapsed arrow icon next to the text "Advanced options". Below this, the "Split into" section has two radio buttons: "Columns" (which is selected) and "Rows". Below that, the "Number of columns to split into" section has a text box containing the number "2". The "Quote Character" section has a dropdown menu showing a double quote character ". Below this, there is a checkbox labeled "Split using special characters" which is currently unchecked. To its right is a text box labeled "Insert special character" with a dropdown arrow. At the bottom right, there are "OK" and "Cancel" buttons.

- ◆ Once all the parameters have been set, click the [OK] button to apply the split.



## Action 2.5 - Split Column



### Instructions:

1. Select the *Address* column.
2. On the *Home Tab*, locate and click the **[Split Column]** button in the **Transform Group**.
3. Choose the *By Digit to Non-Digit* option from the drop-down list.
4. Select the **Address.1** heading and rename it **Address\_Number**.
5. Select the **Address.2** heading and rename it **Street\_Name**.
6. Select the *Date* column.
7. On the *Home Tab*, locate and click the **[Split Column]** button in the **Transform Group**.
8. Choose the *By Delimiter* option from the drop-down list.
9. From the **Select or enter delimiter** field drop-down choose *Custom* (if necessary), in the new *Delimiter* field type in a */* , in the **Split at** section, choose *Each occurrence of the delimiter* radio button (if necessary), and click the **[OK]** button.
10. Select the **Date.1** heading and rename it **DOB\_Month**.

### Results/ Comments:

The *Power Query Editor* should still be open. If not, repeat the previous exercise.

A drop-down menu is displayed allowing you to choose how the column will be split.

The leading number of the addresses are separated from the text and there are now two columns to represent the address data.

Use either of the renaming methods from the previous exercise.

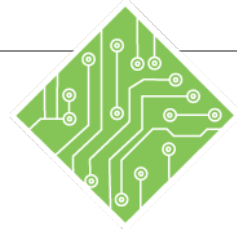
The list of options are displayed.

The *Split Column by Delimiter* dialog opens.

Often when choosing *By Delimiter*, the data is analyzed and the correct delimiter is put in place.

The data is now broken into three separate columns.

Try double-clicking the header in order to rename it.



**Instructions:**

11. Select the **Date.2** heading and rename it **DOB\_Day**.
12. Select the **Date.3** heading and rename it **DOB\_Year**.
13. Leave the file as is.

**Results/ Comments:**

Do not exit the *Power Query Editor*.



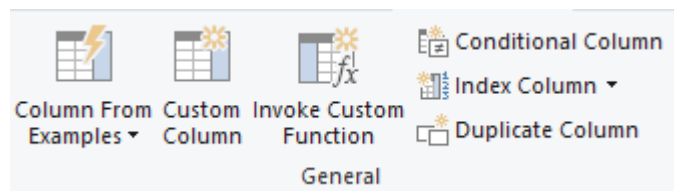
## Adding a Column

At times, the raw data may be segmented to be used effectively. It may be necessary to create new columns by combining existing columns or even creating calculated columns.

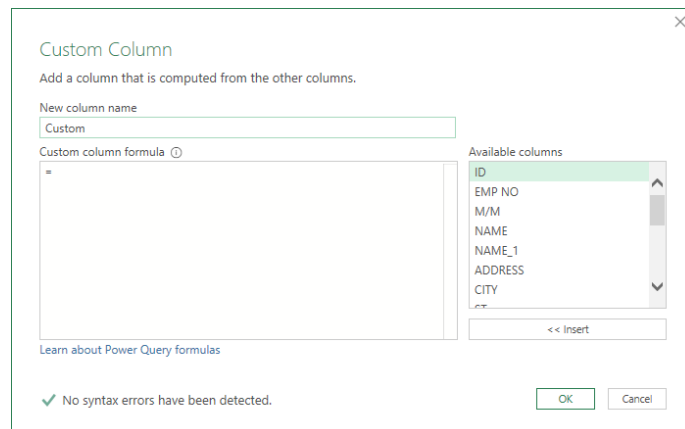
### Create a Combined Column

This example will be a joining of the first and last names columns to create a full name column.

- ◆ Activate the **Add Column Tab**.
- ◆ Click on the **[Custom Column]** button in the **General Group**.



- ◆ The *Custom Column* dialog opens.



- ◆ Name the column by typing into the **New column name** field.
- ◆ In the **Custom column formula** field, set your cursor after the equal sign.
- ◆ In the **Available columns** list select the *first Name* column and click the **[Insert]** button.
- ◆ Then type in: **&" "&**. This will add the blank space after the first name and allow you to add the next column. The **&** acts as an add function.

#### Note

Quotation marks are used to string together any values that are not part of an existing field. This is similar to concatenating but uses a symbol instead of a function.



## Adding a Column, continued

- ◆ Then select the *last name* column from the list of **Available columns** and click the **[Insert]** button.
- ◆ Click the **[OK]** button to add the column.
- ◆ The new column will be added to the far right of the column, click the header and drag it into position.

### Create a Calculated Column

- ◆ Activate the **Add Column Tab**.
- ◆ Click on the **[Custom Column]** button in the **General Group**.
- ◆ The *Custom Column* dialog opens.
- ◆ Name the new column in the **New column name** field.
- ◆ Set the cursor into the **Custom column formula** field.
- ◆ Select the first column of data to be used in the formula from the **Available fields** list, and click the **[Insert]** button. (Double-clicking the choice in the **Available fields** list will also insert it.)
- ◆ Add a mathematical operator. (+, -, \*, /)
- ◆ Select the second column of data to be used in the formula and click the **[Insert]** button, or add a specific value.
- ◆ Click the **[OK]** button when done.

If there are any errors in the syntax of your formula, you will be notified and the **[OK]** button will also not be active.





### Instructions:

1. The Power Query Editor should still be open.
2. Activate the *Add Column Tab*.
3. Locate and click the **[Custom Column]** button in the **General Group**.
4. In the **New column name** field enter the name: **Full Name**.
5. Set the cursor into the **Custom column formula** field beside the equal sign, choose the *F\_Name* column in the **Available columns** field and click the **[Insert]** button, type in **&" "&**, choose the *L\_Name* column in the **Available columns** field and click the **[Insert]** button, then click the **[OK]** button.
6. Click the Column header and drag it into position after the **L\_Name** column.
7. Click the **[Custom Column]** button again.
8. In the **New column name** field enter the name: **YearlySalary**.
9. Set the cursor into the **Custom column formula** field, beside the equal sign, choose the *WEEKLY PAY* column in the **Available columns** field and click the **[Insert]** button, type in **\*52**, then click the **[OK]** button.
10. Click the Column header and drag it into position after the **Weekly Pay** column.

### Results/ Comments:

The *Power Query Editor* should still be open. If not, repeat the previous exercise.

This should be the second button on the tab. The *Custom Column* dialog opens.

This will be the column name.

This will add the values in the *F\_Name* column, to a blank space, and the values in the *L\_Name* column together to combine these fields.

Double-clicking the column name in the **Available columns** list will also insert the column into the formula.

New columns are added to the far right of the columns.

The column is now in the correct position.

The *Custom Column* dialog opens.

This will be the column name.

This will multiply the values in the *WEEKLY PAY* column by 52. If there is an error in your formula, you will see a warning and the **[OK]** button is inactive.

The column is now the correction position.

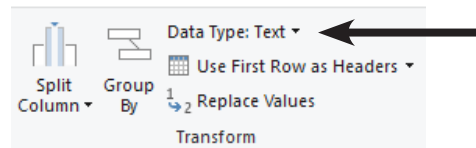


## Data Types

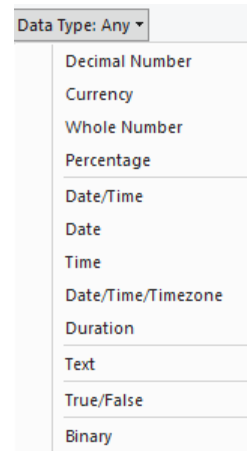
As data is brought into the *Power Query Editor* it is analyzed and data type is applied to each column. Data will fall into one of three data types: text, dates, or numbers. Within each of these data types are formatting variations: date, date and time, whole number, currency, percentages. When the format is applied within *Power Query*, the data is simply being defined not visually formatted. Formatting will be done in *Excel* after the data is imported.

### Applying Data Types

- ◆ Select the column of data to be typed.
- ◆ On the *Home Tab*, locate the **[Data Type]** button drop-down,



- ◆ Choose the appropriate data type.



- ◆ Each column header cell displays an icon to represent the data type.

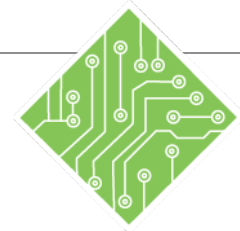
## Applied Steps

As changes are made to the raw data, each step in the process is recorded and displayed in the *Applied Steps* pane. When a data modification does not return an expected or desired result, that step can easily be removed from within the *Applied Steps* pane.

### Using the applied Steps Pane.

- ◆ Select the step in the *Applied steps* pane.
- ◆ Click the **[X]** button to delete the step.
- ◆ Step can be deleted from any point within the list.





### Instructions:

1. Select the *YearlySalary* column
2. On the **Home Tab**, locate the **[Data Type]** button in the **Transform Group**.
3. Click the button drop-down and choose *Currency* from the menu.
4. Select the *SSN* column.
5. Click the **[Data Type]** button drop-down and choose *Whole Number* from the menu.
6. Look at the *Query Settings* pane and locate the list of applied steps in the transformation.
7. Select the *Added Custom 1* step.
8. Select the last step and click the **X** to the left of the step.
9. Re-select the *YearlySalary* column and apply the correct data type.
10. Leave the file as is.

### Results/ Comments:

Notice the header of the column has a text/number icon to the left of the name.

Currently the data type is set to *Any*.

The icon to the left of the column header is now a dollar sign.

This column is currently set as text.

The column now displays an error for the entire column. This is because the *SSN* uses dashes as separators, which numbers can't have.

Any step listed after are not in play in the data. This allows you to easily find the last step which was correct.

That step is removed from the list and undone from the data. Unfortunately it also removed the data type change from the *YearlySalary* column.

Apply the *Currency* data type.

Do not exit the *Power Query Editor*.

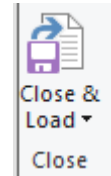


## Loading a Query

Once the data has been transformed and it is ready to be brought into Excel, you can choose how the data will be placed into the workbook.

### Close & Load

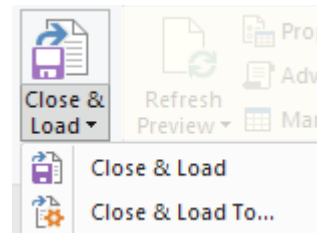
- ◆ On the *Home Tab*.
- ◆ Click the [Close & Load] button.



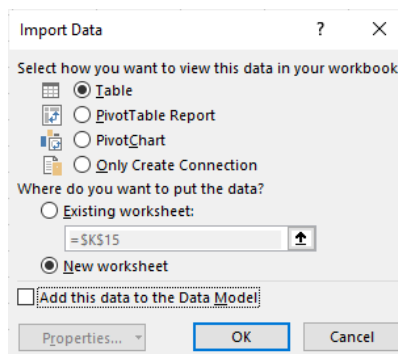
- ◆ The data is placed on a new worksheet as a table.

### Close & Load To...

- ◆ On the *Home Tab*.
- ◆ Click the [Close & Load] button drop-down.



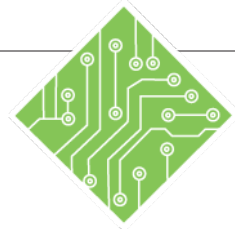
- ◆ From the menu, choose Close & Load To...
- ◆ The Import Data dialog opens.
- ◆ Choose what form the imported data will take and where the data is to be loaded.



- ◆ Click the [OK] button to complete the importation.



## Action 2.8 - Loading the Transformed Data



### Instructions:

1. On the **Home Tab**, locate the [**Close & Load**] button.
2. Clicking the drop-down of this button will allow you to choose *Close & Load* or *Close & Load To...*
3. Choose *Close & Load* if using the drop-down or simply click the top half of the button.
4. Save the file and leave it open.

### Results/ Comments:

This is the first button on the *Home Tab*.

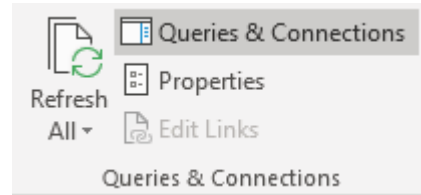
These function the exact same way the Load and Load To... work in the Navigator dialog.

The data is loaded as a Table to a new worksheet.

**[Ctrl + S].**

## Editing a Query

When the data has been imported into Excel, you will work with it as any other data. As the workbook now has data connected to an outside source the *Queries & Connections* pane is displayed to the right of the interface. Should this pane be in the way, it can be closed. To bring the *Queries & Connections* pane back into view, click the **[Queries & Connections]** button in the **Queries & Connections Group** on the *Data Tab*.



The *Queries & Connections* pane lists any and all external sources the current workbook is using. Hovering over an existing connection will bring up a preview of the sources data along with connections details and options.

 This block contains two screenshots. The left screenshot shows a data table titled 'Table1' with 5 columns: Emp. ID, M/M, First Name, Last Name, and Address. The data includes 10 rows of employee information. Below the table, it shows 'Columns [5]', 'Last refreshed Monday', 'Load status: Loaded to worksheet', and 'Data Sources [1]' with a file path. The right screenshot shows the 'Queries & Connections' task pane. It lists four queries: Table1 (40 rows loaded), Table2 (40 rows loaded), NewHires (65 rows loaded), and EmployeeList (64 rows loaded). The 'EmployeeList' query is highlighted in green. At the bottom of the pane, there are buttons for 'VIEW IN WORKSHEET', 'EDIT', and 'DELETE'.
 

Emp. ID	M/M	First Name	Last Name	Address
1033	Ms.	Dale	Antel	932 Mesquite Ave.
1035	Mr.	Margaret	Applegate	53 Elm St.
1031	Ms.	Merlin	Barford	1226 Northern Rd.
1032	Mrs.	Bruce	Bargdill	1484 Mesquite Rd.
1010	Dr.	Teresa	Belmont	1401 Bacillus Rd.
1029	Ms.	Edmond	Clotts	1263 Coral Ave.
1034	Ms.	Robert	Clotts	862 Main Rd.
1030	Mr.	Robert	Cloud	1135 Bacillus St.
1004	Miss	Pixie	Davis	73 Elm Rd.

Clicking the **[Edit]** at the bottom of the preview pane will take the data back into the *Power Query Editor*. All applied steps are still listed in the *Applied Steps* pane and you are able to continued transforming the data as needed. When finished editing, click the **[Close & Load]** button as before.

To refresh data can be done on either the *Data* or *Query Tabs*.

- ❖ On the *Query Tab* the **[Refresh]** button is in the **Load Group**.
- ❖ On the *Data Tab* the **[Refresh]** button is in the **Queries & Connections Group**.



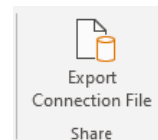
## Saving and Running A Query

Once the query has been created, you may want or need to save it to use again in other files.

The *Query Tools Query Tab* is a contextual tab, if you are working inside the imported data, the tab is available, if not in the data set the tab is not displayed on the ribbon.

### Export Connection File

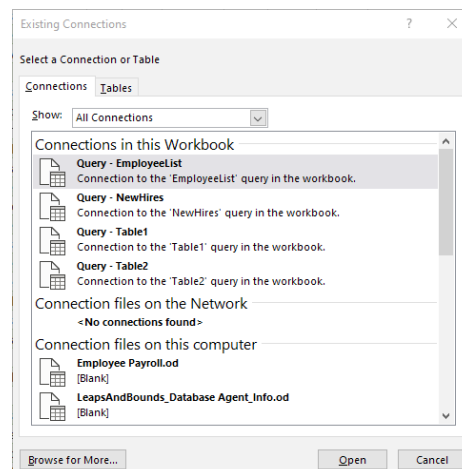
- ◆ Select any cell within the imported data set.
- ◆ Activate the *Query Tab*.
- ◆ Click the **[Export Connection File]** button.



- ◆ The *File Save* dialog opens.
- ◆ Name the file.
- ◆ Do not change the location where this is being saved.

### Running a Query

- ◆ On the *Data Tab*, click the **[Existing Connections]** button in the **Get & Transform Data Group**.
- ◆ The *Existing Connections* dialog opens, allowing you to search for the saved queries.
- ◆ If your query is not in the list, click the **[Browse for More...]** button.





#### Instructions:

1. The **DataImports.xlsx** file should still be open.
2. The *Queries & Connections* pane should be open, if not go to the **Data Tab** and click the **[Queries & Connections]** button.
3. Hover over the *EmployeeList* connection.
4. Click away from the *Queries and Connections* pane.
5. Activate the *Queries Tab*.
6. Click the **[Refresh]** button in the **Load Group**.
7. On the *Query Tab*, locate and click the **[Export Connection File]** button.
8. Give it a meaningful name and click the **[Save]** button.
9. Save and close the file.

#### Results/ Comments:

If not, re-open it.

When data has been imported into a workbook, this pane should be active. This pane shows all imported data connections.

A preview panel opens, showing some details about the connection, and connection tools.

The preview disappears.

The data is refreshed. If you hover over the *EmployeeList* connection again the **Last Refreshed** detail will show when you ran the refresh command. The **Data Tab** also has a **[Refresh]** button available.

This is the last button on the tab. Clicking it opens a *File Save* dialog.

Do not change the location of where it is being saved. This makes finding it later easier.

**[Ctrl + S]** and **[Ctrl + W]**.



**Instructions:**

1. Create a new blank workbook.
2. On the *Data Tab*, click the **[Existing Connections]** button in the **Get & Transform Group**.
3. Select the query you just saved and click the **[Open]** button.
4. Leave the settings as they are in the *Import Data* dialog and click the **[OK]** button.
5. Close the file without saving.

**Results/ Comments:**

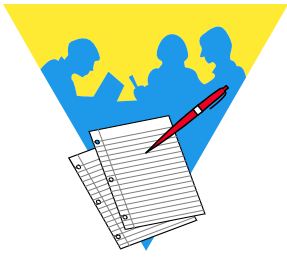
**[Ctrl + N].**

The *Existing Connections* dialog opens.

The *Import Data* dialog opens.

The data is imported as a table to a new worksheet.

**[Ctrl + W].**



## Tips and Notes