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# Microsoft Excel 2016 Business Analytics & Power BI Quick Reference Guide - Windows Version (4-page Cheat Sheet Of Instructions, Tips & Shortcuts - Laminated Guide)

**Excel 2016 Business Analytics and Power BI**

For details on creating and using PivotTables see Excel's Excel 2016 Tables, PowerTables, Sorting, Filtering & Inquire Quick Reference guide.

### Gathering Data

**Excel's Data Model**

Excel's Data Model is an internal data storehouse and analysis engine that accommodates a wide variety of data types from multiple internal or external sources. Data can be imported into the Data Model as in the case of large data sets including Excel files, but connections can be made to the data. It is used to derive relationships between data tables and to create data analysis formulas using a special set of functions. (See Data Functions.)

If the Data Model has not been enabled choose DATA, MANAGE DATA MODEL then [CLICK] ENABLE on the subsequent dialog.

### Adding External Data to the Data Model

1. Choose DATA, NEW QUERY.
2. Select an appropriate data source:
  - FROM FILE - Select any of WORKBOOK, CSV/TEXT and XML FROM FOLDER imports an entire folder of similar file types. When new files of the same type are added to the folder a single IMPORT of the analysis will automatically incorporate the new data. (See Adding a Folder of Files to the Data Model.)
  - FROM DATABASE - Includes most enterprise database systems plus Microsoft Access. Choosing SELECT MULTIPLE ITEMS in the Importer dialog allows multiple tables to be imported.
  - FROM Azure - For getting data from enterprise level services hosted on Microsoft Azure cloud platform.
  - FROM OTHER SOURCES - Combines various web and in-house data sources from Microsoft and other services. This can include Wikipedia pages, mapped data links, corporate databases and analytics APIs.
3. In the Navigator dialog [CLICK] EDIT to access the Query Editor. In the Query Editor transform the data (see Transforming Data).
4. Choose HOME, then [CLICK] CLOSE & LOAD TO...
5. [CLICK] ADD THIS DATA TO THE DATA MODEL, make appropriate display choices then [CLICK] LOAD.

Note that selecting CLOSE & LOAD in step 4 instead of CLOSE & LOAD TO will load the data into a new sheet not the Data Model.

### Importing Data Directly

Alternatively, data can be imported directly.

1. [CLICK] any non-table cell then on the DATA tab choose a source from the GET EXTERNAL DATA ribbon group.
2. Make appropriate choices on the most several dialog software dialogs for different sources.
3. From the IMPORT DATA dialog:
  - A. Select ADD THIS DATA TO THE DATA MODEL (if not available use Adding Ranges to the Data Model).
  - B. For a smaller dataset select TABLE FROM SELECT HOW YOU WANT TO VIEW THIS DATA IN YOUR WORKBOOK, select WITH AN EXISTING as required from WHERE (if you want to PUT THIS DATA) Otherwise choose ONLY CREATES CONNECTION to only import it into the Data Model.
  - C. If the REQUIRES SUMMER ANALYSIS step does not fit, make sure to select IMPORT RELATIONSHIPS BETWEEN TABLES.
4. [CLICK] OK.
5. If the SELECT TABLES dialog appears, select TABLE SELECTION OF MULTIPLE TABLES to simultaneously import multiple tables.

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### Adding Ranges to the Data Model

A range of data must be in the form of a Table to be added to the Data Model.

1. [CLICK] in a data range or table.
2. Choose DATA, then FROM TABLE and complete the CREATE TABLE dialog if necessary.
3. Transform the data in the Query Editor (see Transforming Data).
4. Choose HOME, then [CLICK] CLOSE & LOAD TO, then make sure to [CLICK] ADD THIS DATA TO THE DATA MODEL.
5. Make appropriate display choices then [CLICK] LOAD. To load an existing Table directly into the Data Model [CLICK] inside the Table then choose POWER PIVOT, ADD TO DATA MODEL.

### Adding a Folder of Files to the Data Model

1. Choose DATA, NEW QUERY.
2. Select FROM FILE then FROM FOLDER.
3. [CLICK] BROWSE then navigate to the folder containing files.
4. [CLICK] OK twice.
5. In the Query Editor remove all columns except CONTENT (see Using the Query Editor to Transform).
6. To display data:
  - Step 1: [CLICK] the Data Expansion icon.
  - Excel files will add a custom column then expand it:
    - A. Choose ADD COLUMNS, ADD CUSTOM COLUMN.
    - B. Create a NEW COLUMN NAME to describe the imported data, e.g. "Top Quarter Sales".
    - C. Enter the following formula after the "x" sign (substitution is critical: Excel Workbook Errors) = SUM(DETECTED).
    - D. Make sure NO SYNTAX ERRORS HAVE BEEN DETECTED.
    - E. [CLICK] OK.
    - F. [CLICK] the Data Expansion icon of the new custom column.
    - G. Make sure only the NAME (sheet name) and DATA (data column) are selected. [CLICK] OK.
    - H. [CLICK] the Data Expansion icon of the new Data column.
    - I. Make sure all columns are selected. [CLICK] OK.
  - 7. Process the data as usual (see Transforming Data).
  - 8. Choose HOME, then [CLICK] CLOSE & LOAD TO, then make sure to [CLICK] ADD THIS DATA TO THE DATA MODEL.
  - 9. Make appropriate display choices then [CLICK] LOAD.

### Edit Existing Connections

1. Choose DATA, MANAGE DATA MODEL.
2. Choose REMOVE, GET EXTERNAL DATA, EXISTING CONNECTIONS. Select a connection then EDIT or DELETE it.

### Transforming Data

Shaping and transforming data is a crucial intermediary step between gathering and analyzing Data should be free of duplication, inconsistent spellings and inappropriate types. Unnecessary columns and rows should be eliminated. Tables of data should be merged or relationships created between them. These transformations are best performed in the Query Editor where they can be recorded and saved. When the source data changes a simple refresh will apply the transformations ensuring analyses or visualizations will be accurately updated.

### Opening the Query Editor

1. Choose DATA, SHOW QUERIES to display existing queries on the WORKBOOK QUERIES pane.
2. [Right Click] a query and choose EDIT.

### Using the Query Editor to Transform

1. Change the query table in the PROPERTIES section of the Query Settings pane so it can be easily selected out of a list of similar queries. The name must be less than 60 characters without leading or trailing whitespace, double quotes (") or periods. Because the renaming can cause problems if done after data has been analyzed.
2. If your table has headers and those are not automatically being recognized, choose TRANSFORM, USE FIRST ROW AS HEADERS.
3. Remove any row containing an ERROR warning. [CLICK] the data pane top information menu and choose REMOVE ERRORS.
  - Alternatively you can leave these rows but replace the ERROR. Select all columns then choose TRANSFORM, REPLACE ERRORS. Enter a replacement VALUE then [CLICK] OK.
4. Remove extra row duplicates.
  - [CLICK] the data pane top left context menu and choose REMOVE DUPLICATES. Note the reduced row count at the bottom.
5. Remove unnecessary columns. Select columns to retain with [CLICK] - (Ear-Click). [Right Click] the heading of one of the selected columns, then choose REMOVE OTHER COLUMNS.
  - Do not keep columns containing a single duplicated value as it is not useful for analysis (eg. "Location" columns with "City" in every row).
  - [Right Click] each column's heading, select CHANGE TYPE and change the Data Type if necessary. Be especially vigilant for left-aligned numbers as they do not have a numeric type.
6. [Right Click] a column heading and select RENAME to create a more appropriate heading.

### Using the Query Editor to Filter

1. [CLICK] the heading drop-down arrow of any column.
2. [CLICK] FILTER, if available, to display all unique records.
3. [CLICK] SELECT ALL to display all records then [CLICK] only those rows you want to import.
4. Always uncheck BLANK if it is used.
5. [CLICK] OK.

### Suggested Data Transformations

Select columns of a single Data Type then perform the following transformations.

#### For Text Columns

Choose TRANSFORM, REMOVE text then:

- Remove leading and trailing spaces [CLICK] TRIM.
- Remove non-printable characters. [CLICK] CLEAN.

#### For Numeric Columns

Choose TRANSFORM then:

- Change the type. [CLICK] DATA TYPE and select something more appropriate.
- Remove nulls. [CLICK] REPLACE VALUES, enter the word NONE in VALUE TO FIND and a zero in REPLACE WITH then [CLICK] OK.
- Round numbers. [CLICK] ROUNDING, ROUND, enter the number of DECIMAL PLACES to round to and [CLICK] OK.

#### For Date columns

Choose TRANSFORM, DATE when there is an appropriate type.

Example of using Filtering to Clean Up a Column of Unique Identifiers.

1. [CLICK] the heading drop-down arrow of the column with most unique records, usually a lot of 6's.
2. [CLICK] LOAD MORE, if available, to display all unique records.
3. Deleted entries that do not belong, e.g., column headings do not belong in a list of IDs.
4. Uncheck BLANK. [CLICK] OK.

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## Synopsis

For power users who want to bring big data onto the desktop this four page laminated quick reference provides guidance on powerful Excel 2016 and Power BI data analytic features.

Step-by-step instructions are given for many data gathering, transforming, analyzing and visualizing features such as the Data Model, Query Editor and Power View. DAX functions are highlighted and Power BI Desktop is introduced. Written with Beezix's trademark focus on clarity, accuracy, and the user's perspective, this guide will be a valuable resource to improve your proficiency in using Excel 2016. This guide is suitable as a training handout, or simply an easy to use reference guide. The following topics are covered: Gathering Data: Excel's Data Model; Adding External Data to the Data Model; Adding Ranges to the Data Model; Adding a Folder of Files to the Data Model; Edit Existing Connections. Transforming Data: Opening the Query Editor; Using the Query Editor to Transform; Using the Query Editor to Filter; Suggested Data Transformations; Working with Query Actions; Using the Query Editor to Merge; Using the Query Editor to Unpivot Columns; Using the Query Editor to Append; Using the Query Editor to Split Text Into Columns; Closing the Query Editor; Add Table Data to the Data Model; Defining Relationships Across Multiple Tables; Managing Relationships Within the Data Model. Analyzing Data:

## Book Information

Pamphlet: 4 pages

Publisher: Beezix Inc (February 24, 2016)

Language: English

ISBN-10: 1939791987

ISBN-13: 978-1939791986

Product Dimensions: 11 x 8.5 x 0.2 inches

Shipping Weight: 0.8 ounces (View shipping rates and policies)

Average Customer Review: 4.0 out of 5 stars [See all reviews](#) (1 customer review)

Best Sellers Rank: #716,579 in Books (See Top 100 in Books) #240 in [Books > Computers & Technology > Databases & Big Data > Data Warehousing](#) #329 in [Books > Computers & Technology > Software > Microsoft > Microsoft Excel](#) #353 in [Books > Computers & Technology > Databases & Big Data > Data Modeling & Design](#)

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