LEARNING

powerbi

#powerbi

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About

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Chapter 1: Getting started with powerbi

Remarks

The heart of Power BI is a cloud-hosted service for data integration and visualization.

Power BI has a Free Edition with broad functionality, and a Pro Edition, available on a monthly subscription. Power BI is hosted by Microsoft on their "Azure" cloud service.

Power BI is comprised of several tools, web experiences and APIs. Naming of specific components is sometimes confused, so this page attempts to clarify this. These are the main components, with a brief description:

- **Power BI web app**
  - The URL for this is http://app.powerbi.com
  - This is the main user experience for viewing and interacting with published Power BI content - Dashboards, Reports and Datasets.
  - Admin features e.g. security / sharing, scheduled refresh etc are also managed here.
  - Requires an O365 account.
- **Power BI Desktop**
  - Can be downloaded from https://powerbi.microsoft.com/en-us/desktop
  - A (free) Windows app intended for data integration and authoring of visualizations.
  - Includes a **Query Editor** window which leverages the Power Query (Excel Add-In) to provide data integration with a wide range of sources (databases, files, web services etc).
  - Can be used without an account.
- **Power BI Custom Visuals**
  - Old Gallery URL (will be removed): https://app.powerbi.com/visuals
  - New Gallery URL: https://store.office.com/en-us/appshome.aspx?productgroup=PowerBI
- **Power BI JavaScript API**
- **Power BI Embedded API**
- **Power BI REST API**

Changelogs can be found here: PowerBI Service, PowerBI Mobile, PowerBI Desktop - Latest Version, Historic Versions

Versions

"Name"	PowerBI Desktop Version	Date
April 2017 Update	2.45.4704.442	2017-04-01
March 2017 Update	2.44.4675.422	2017-03-01
February 2017 Update	2.43.4647.541	2017-02-01

"Name"	PowerBI Desktop Version	Date
January 2017 Update	2.42.4611.482	2017-01-01
November 2016 Update	2.41.4581.301	2016-11-01
October 2016 Update	2.40.4554.361	2016-10-01
September 2016 Update	2.39.4526.362	2016-09-01
August 2016 Update	2.37.4464.321	2016-08-01
July 2016 Update	2.37.4464.321	2016-07-01
June 2016 Update	2.36.4434.362	2016-06-01
May 2016 Update	2.35.4399.381	2016-05-01
April 2016 Update	2.34.4372.322	2016-04-01
March 2016 Update	2.33.4337.281	2016-03-01
February 2016 Update	2.32.4307.362	2016-02-01
January 2016 Update	2.31.4280.361	2016-01-01
December 2015 Update	2.30.4246.181	2015-12-01
November 2015 Update	2.29.4217.221	2015-11-01
October 2015 Update	2.28.4190.122	2015-10-01
September 2015 Update	2.27.4163.351	2015-09-01
August 2015 Update	2.26.4128.403	2015-08-01
July 2015 Update	2.25.4095.554	2015-07-01
May 2015 Update	2.23.4036.161	2015-05-01
April 2015 Update	2.22.4009.122	2015-04-01
March 2015 Update	2.21.3975.261	2015-03-01
February 2015 Update	2.20.3945.102	2015-02-01

Examples

Installation or Setup

PowerBI reports can be created using PowerBI Desktop application.

Download link: https://powerbi.microsoft.com/en-us/desktop/

Requirements (as of 5 April 2017):

- Windows 7 / Windows Server 2008 R2, or later
- .NET 4.5
- Internet Explorer 9 or later
- Memory (RAM): At least 1 GB available, 1.5 GB or more recommended.
- Display: At least 1440x900 or 1600x900 (16:9) recommended. Lower resolutions such as 1024x768 or 1280x800 are not recommended, as certain controls (such as closing the startup screen) display beyond those resolutions.
- CPU: 1 gigahertz (GHz) or faster x86- or x64-bit processor recommended.

Read Getting started with powerbi online: https://riptutorial.com/powerbi/topic/6912/getting-started-with-powerbi

Chapter 2: Data Management

Examples

Filtering data by dynamic criteria

For example, we need to create two visualisations, "Before" and "After", and use dynamic filter for the date of the split.

- Let's say our query is called `table`.

- Add an additional `date` table with possible dates of the split.

- Add a slicer control with the table added in the previous step.

- Include a measure of this form to the `table`:
  ```
  IsBefore = IF((Max('table'[Date])<Min('Date'[Date])),1,0)
  ```

- Add two visuals, filter first by `IsBefore = 1` and second - by `IsBefore = 0`

Date

- ☐ 01 January 2000
- ☐ 02 January 2000
- ☐ 03 January 2000
- ☐ 04 January 2000
- ☐ 05 January 2000
- ☐ 06 January 2000
- ☐ 07 January 2000
- ☐ 08 January 2000
- ☑ 09 January 2000
- ☐ 10 January 2000
- ☐ 11 January 2000
- ☐ 12 January 2000
- ☐ 13 January 2000
- ☐ 14 January 2000
- ☐ 15 January 2000
- ☐ 16 January 2000
- ☐ 17 January 2000
- ☐ 18 January 2000

Date	Value	IsBefore
01 January 2000	1	1
02 January 2000	2	1
03 January 2000	3	1
04 January 2000	4	1
05 January 2000	3	1
06 January 2000	2	1
07 January 2000	1	1
08 January 2000	2	1
09 January 2000	3	0
10 January 2000	4	0
11 January 2000	3	0
12 January 2000	2	0
13 January 2000	1	0
14 January 2000	2	0
15 January 2000	3	0
16 January 2000	4	0
17 January 2000	3	0
18 January 2000	2	0
Total	**45**	**0**

Date	Value
01 January 2000	1
02 January 2000	2
03 January 2000	3
04 January 2000	4
05 January 2000	3
06 January 2000	2
07 January 2000	1
08 January 2000	2
Total	**18**

Date	Value
09 January 2000	3
10 January 2000	4
11 January 2000	3
12 January 2000	2
13 January 2000	1
14 January 2000	2
15 January 2000	3
16 January 2000	4
17 January 2000	3
18 January 2000	2
Total	**27**

Read Data Management online: https://riptutorial.com/powerbi/topic/6921/data-management

Chapter 3: Edit Queries (data import)

Remarks

This technique can also be used for other data sources e.g. files, web services.

Note that when you do change these settings, you may have to specify Authentication/Credential details for the new source.

Examples

Preventing data source string duplication

By default, when data is imported to the PowerBI Desktop, each table or query stores data source details separately, even if they use the same data source.

This makes it tedious, for example, to change the source database of an entire PowerBI report - which requires changing each query source parameter individually.
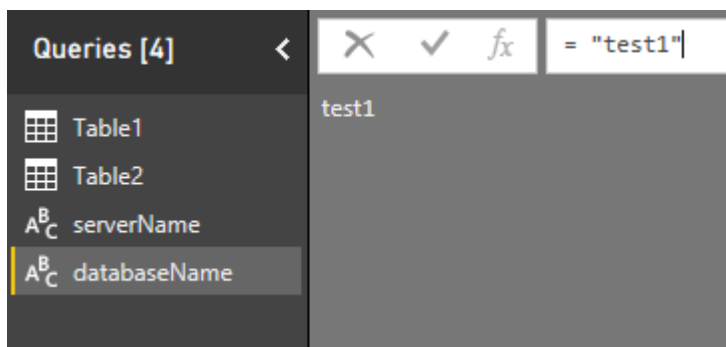
There is a way to simplify this, described here.

---

1. Import your data as you normally would. Example:
   data source type - SQL server,
   server name - `localhost`,
   database - `test1`,
   tables - `table1`, `table2`.

2. In query editor, add two blank queries: "Get Data" -> "Blank Query",
   `serverName` with value = `"localhost"`,
   `databaseName` with value = `"test1"`.

3. For each table on the "Queries" pane on the left, select "Source" in "Query Settings" on the right, then substitute server and database names with parameters created in the step 2.

---
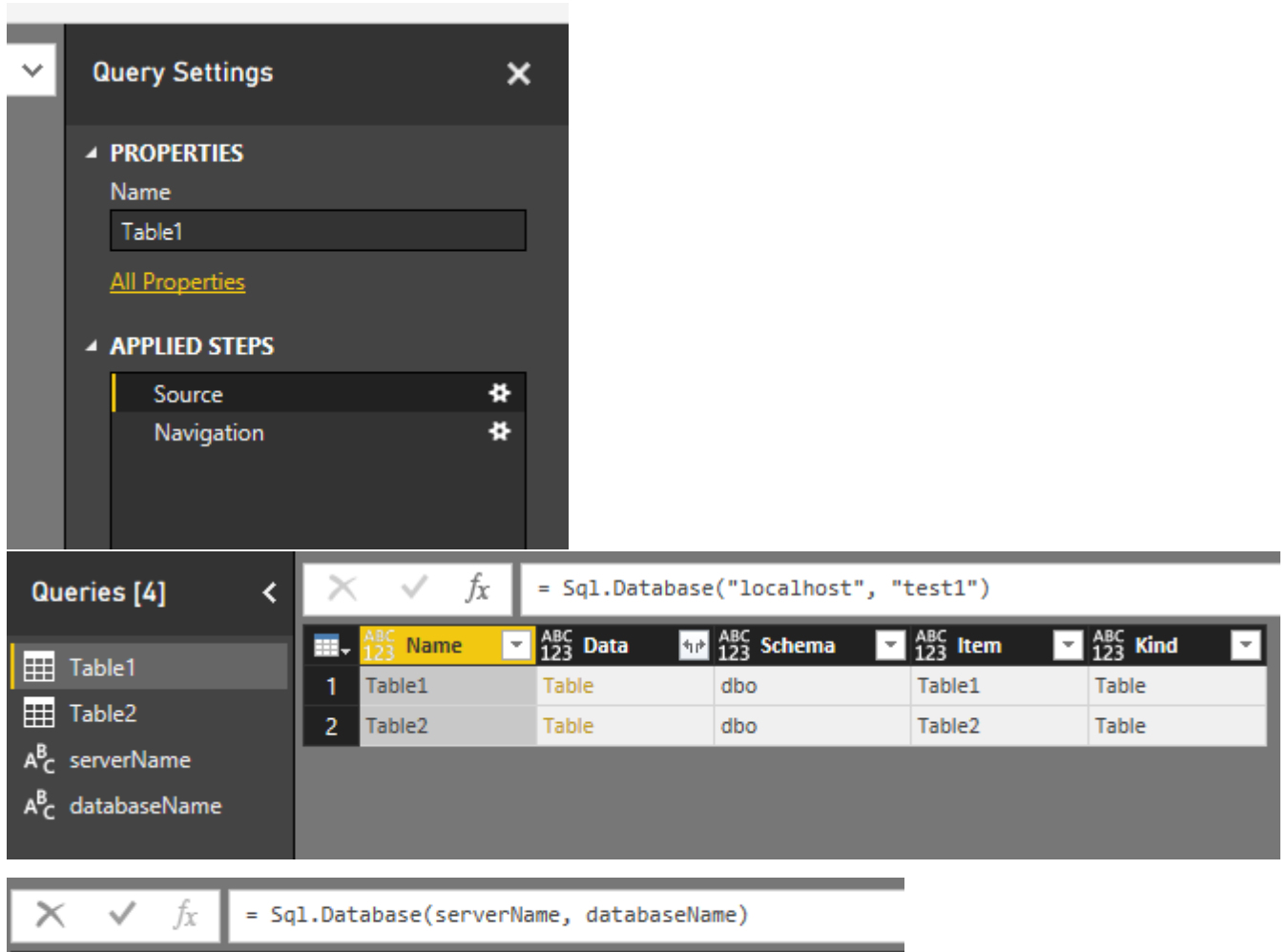
4. Now when you need to update your connection string, change `serverName` or `databaseName` and refresh data.

Read Edit Queries (data import) online: https://riptutorial.com/powerbi/topic/6919/edit-queries--data-import-

Chapter 4: Power Query (M) and DAX - What's the difference?

Introduction

M and DAX are two building blocks of Power BI. They both are functional languages but they differ considerably and are used for very different purposes.

This page shows code samples for both languages and explains their purpose.

Remarks

M and DAX are two building blocks of Power BI. They both are functional languages but they differ considerably and are used for very different purposes.

M is used in Power Query (a.k.a. Get & Transform in Excel 2016) and the query tool for Power BI Desktop. Its functions and syntax are very different from Excel worksheet functions. M is a mashup query language used to query a multitude of data sources. It contains commands to transform data and can return the results of the query and transformations to either an Excel table or the Excel or Power BI data model.

More information about M can be found in this MSDN area: Introduction to Power Query (informally known as "M") Formula Language

DAX stands for Data Analysis eXpressions. DAX is the formula language used in Power Pivot and Power BI Desktop. DAX uses functions to work on data that is stored in tables. Some DAX functions are identical to Excel worksheet functions, but DAX has many more functions to summarize, slice and dice complex data scenarios.

There are many tutorials and learning resources for DAX. The Introduction to DAX is a good place to start.

In essence: First you use Power Query (M) to query data sources, clean and load data. Then you use DAX to analyze the data in Power Pivot. Finally, you build pivot tables (Excel) or data visualisations with Power BI.

Power Query and DAX resources can also be found on lots of blogs (e.g. Power BI Team Blog) and in the "Desktop" section of the Power BI Community site.

Examples

Power Query (M) sample

```
let
```

```
    Source = Folder.Files("\\jsds1.live\dfs\Userprofiles\ixh500\UPM_Profile\desktop\PQ Desktop
Demos\Set 2"),
    #"Lowercased Text" = Table.TransformColumns(Source,{{"Extension", Text.Lower}}),
    #"Filtered Rows" = Table.SelectRows(#"Lowercased Text", each ([Extension] = ".csv")),
    #"Combined Binaries" = Binary.Combine(#"Filtered Rows"[Content]),
    #"Imported CSV" = Csv.Document(#"Combined Binaries",[Delimiter=",", Columns=4,
Encoding=1252, QuoteStyle=QuoteStyle.None]),
    #"Promoted Headers" = Table.PromoteHeaders(#"Imported CSV"),
    #"Changed Type" = Table.TransformColumnTypes(#"Promoted Headers",{{"TranDate", type date},
{"Account", Int64.Type}, {"Dept", Int64.Type}, {"Sum of Amount", type number}})
in
    #"Changed Type"
```

(Opens all files in a folder, filters on CSV files, opens and combines all CSV files and sets column data types. Note that none of that code was manually typed, but generated by clicking icons in the Power Query Editor.)

DAX example formula

Previous Quarter Sales:=CALCULATE(FactSales[Sales], PREVIOUSQUARTER(DimDate[DateKey]))

(Calculates the total sales for the previous quarter, based on the Sales column in the FactSales table and the DateKey in the DimDate table, depending on the filters applied in a PivotTable or PivotChart)

Read Power Query (M) and DAX - What's the difference? online:
https://riptutorial.com/powerbi/topic/6980/power-query--m--and-dax---what-s-the-difference-

Credits

S. No	Chapters	Contributors
1	Getting started with powerbi	Community, Mike Honey, user5226582
2	Data Management	user5226582
3	Edit Queries (data import)	bitnine, Mike Honey, user5226582
4	Power Query (M) and DAX - What's the difference?	teylyn