



Power BI Desktop - Deep dive Query Editor

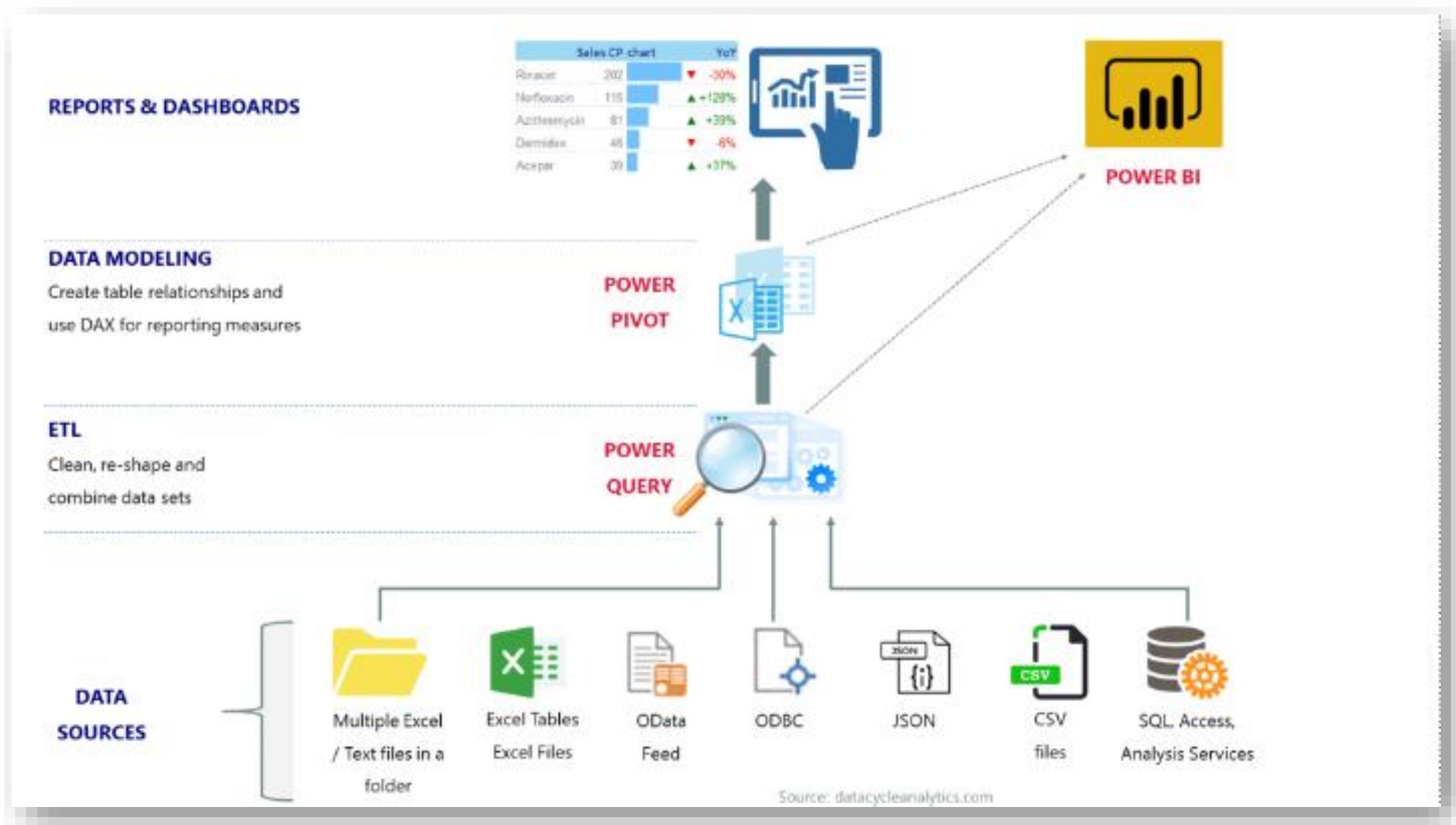
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Overview



1 Working with the Query Editor – Technical Deep dive



Why should you deal with the Query Editor?

Power BI is extremely powerful but there's more to it than just connecting to your data sources and building the visualizations for your reports.

The common scenario is needing to connect to more than one data source to create your reports and needing all of that data to work together.

Unless your requirements and data is extremely simple, 99% of the time you will need to shape and transform your data before creating your reports.

This session will do a deep dive into the Query Editor in Power BI Desktop and demonstrate common reporting scenarios and how to transform the data to get the desired end result.

You will also learn important Query Editor tips and tricks.

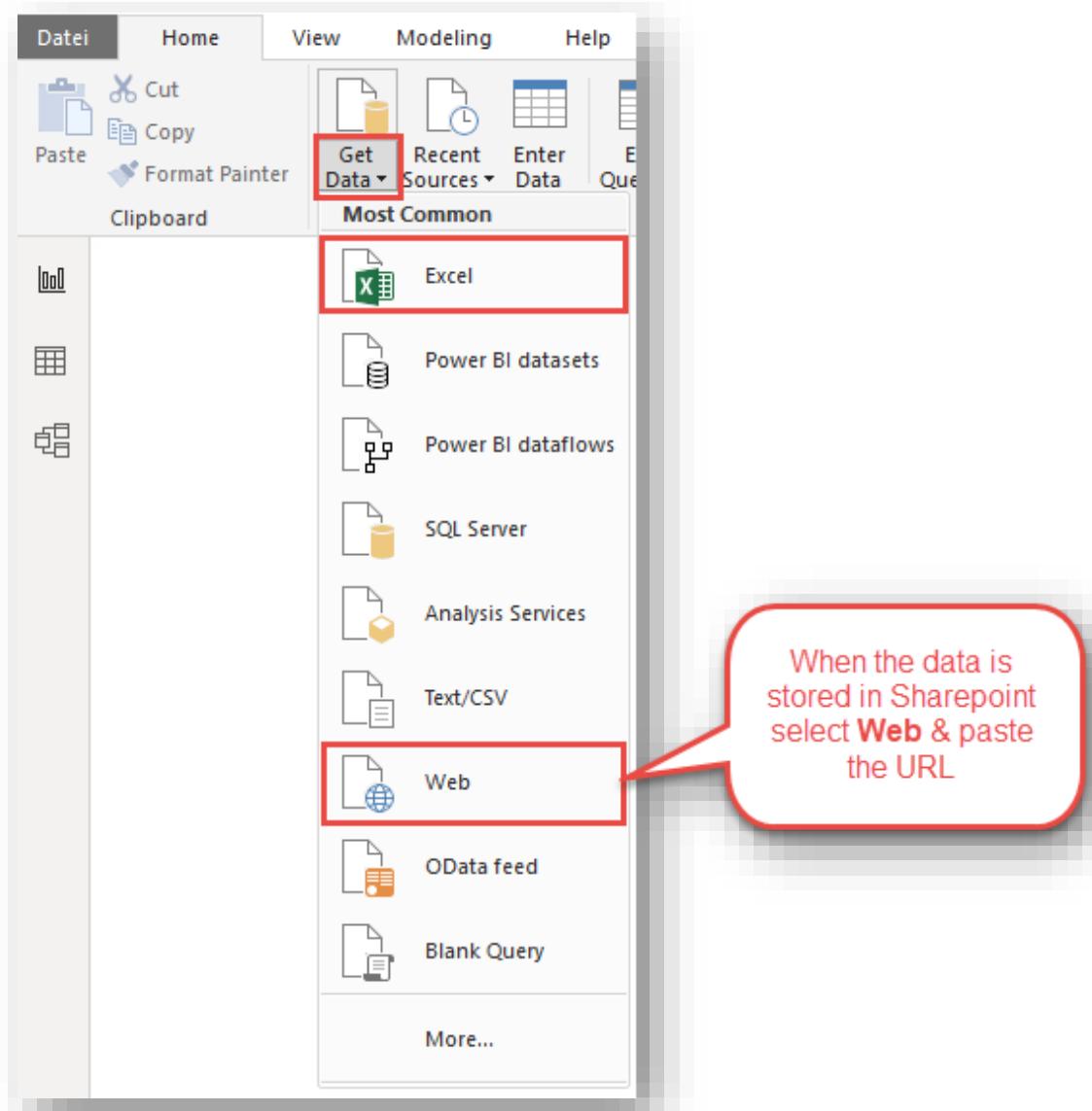
1.1 Basic Principles



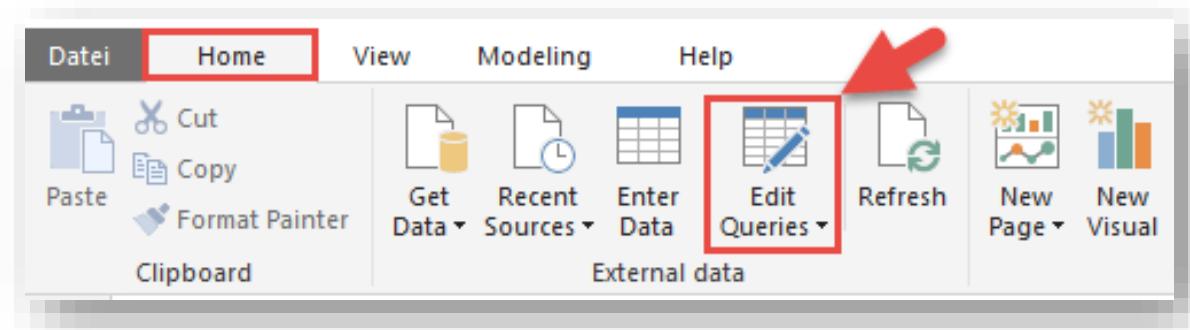
Exercise 1

Get Data

- First step for a new model is getting data. There are many possible file types which Power BI can detect and standardize.
- Most useful connectors are: XLSX / CSV / TXT / PDF
- Unfortunately, **XLS** files are not supported. (please convert to **XLSX!**)
- In order to create a new source, click on the **Get Data** on the top toolbar
- Choose **Excel** ...
- ... & open **Premiums Q4.xlsx**
- Select the table name **Premiums_Q4** & proceed with **Edit**

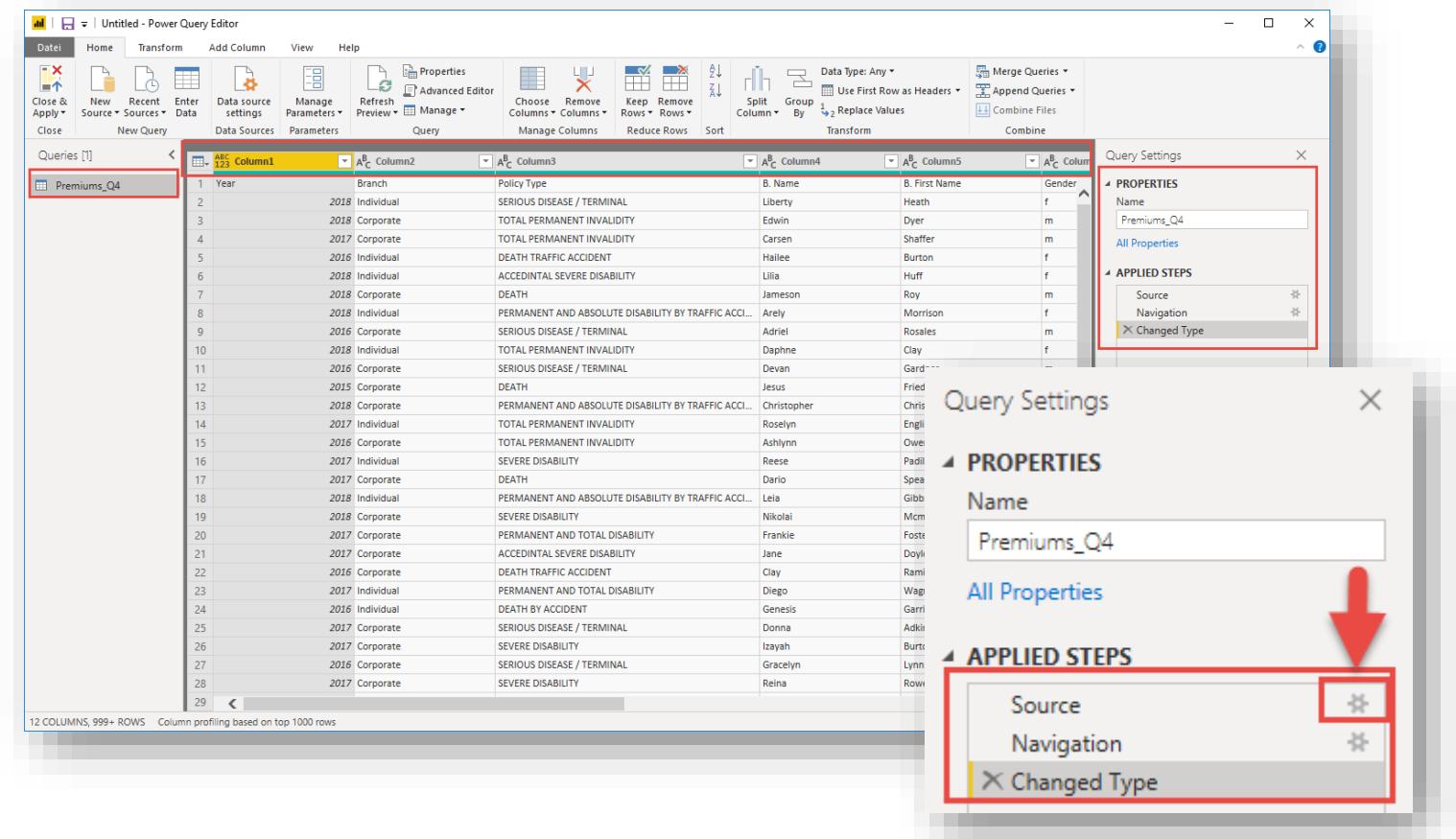


- The **Query Editor** is automatically opened when data is loaded, but it is also possible to access through the toolbar
- The **Query Editor** allows modeling, transforming and enriching data prior to loading it into the file



Query Editor: Applied steps

- Each modification to the file is recorded under the **Applied Steps** pane on the right
- It is possible (but not always recommended) to reorder steps by dragging them
- It is possible to edit each step, by clicking the  icon
- It is possible to see how the data looks in each step just by clicking it

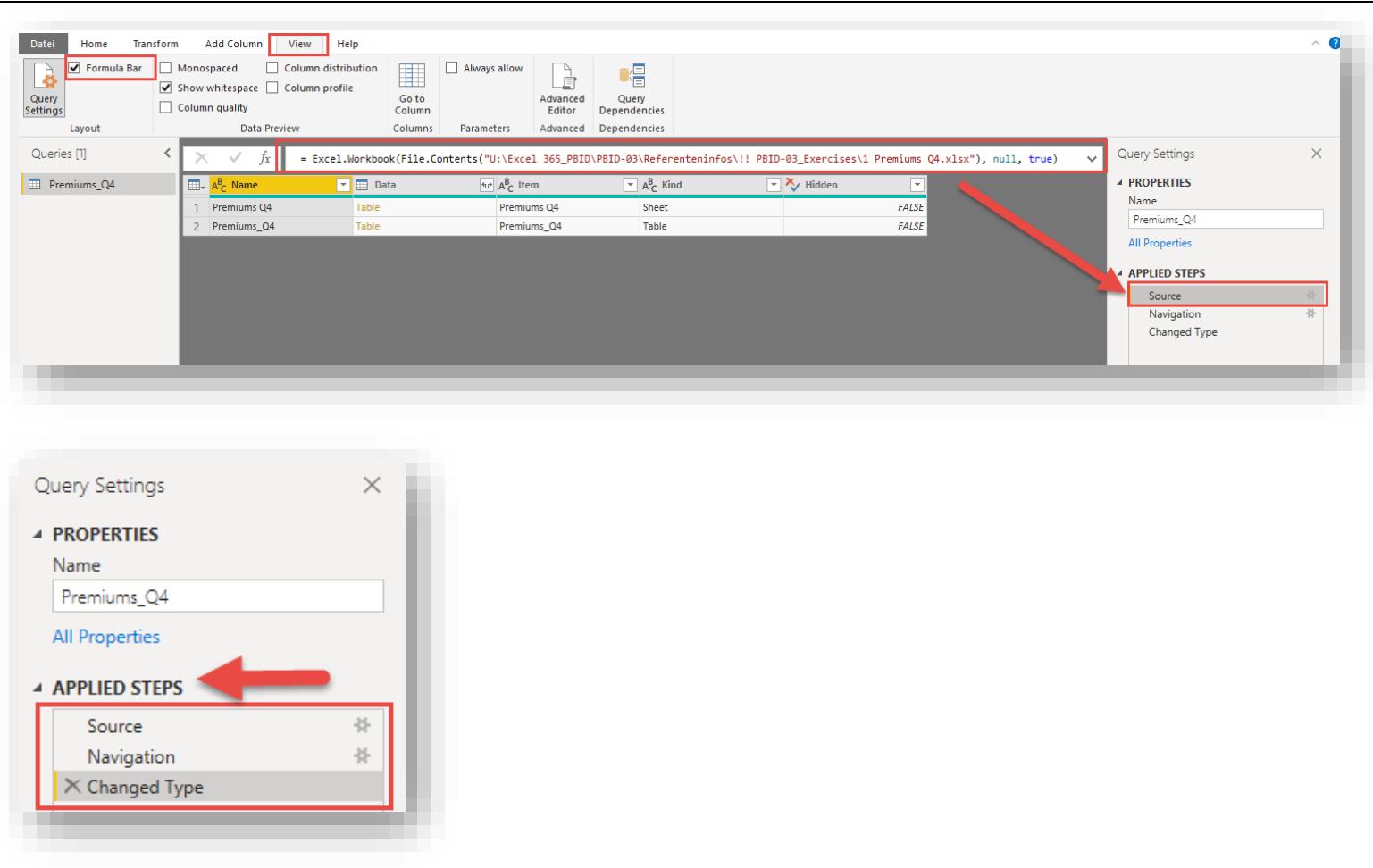


The screenshot shows the Power Query Editor interface. On the left, there is a table of data with columns labeled ABC Column1 through ABC Column5. The first column contains numerical values from 1 to 29. The second column contains categorical labels like 'Year', 'Branch', 'PolicyType', etc. The third column contains specific terms like 'SERIOUS DISEASE / TERMINAL'. The right side of the screen features the 'Applied Steps' pane, which is divided into sections for 'PROPERTIES' and 'APPLIED STEPS'. The 'PROPERTIES' section shows the query is named 'Premiums_Q4'. The 'APPLIED STEPS' section lists three steps: 'Source', 'Navigation', and 'Changed Type'. The 'Changed Type' step is specifically highlighted with a red box and a red arrow pointing to it from the main text.

- Each step translates into a formula in the language **Power Query** (or **M**), and is visible under the toolbar
- Please note:
Power Query (M) is case-sensitive!

When importing most file types, by default 3 steps are created:

- **Source** – file path / URL to source, type of file (Excel, PDF, CSV etc.)
- **Navigation** – which page or excel sheet?
- **Changed Type** – automatically detects the column data type (date, decimal number, text etc.)



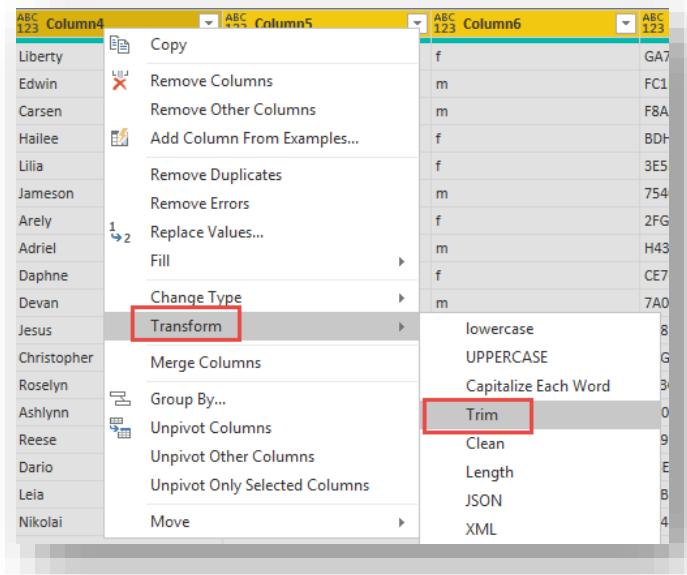
The screenshot shows the Microsoft Power Query Editor interface. At the top, the ribbon has tabs: Datei, Home, Transform, Add Column, View (which is selected and highlighted in red), and Help. Below the ribbon is the 'Query Settings' pane. In the 'View' tab of the settings, the 'Formula Bar' checkbox is checked and highlighted in red. The main area shows a query named 'Premiums_Q4' with two tables: 'Premiums Q4' and 'Premiums_Q4'. The formula bar at the top contains the M code: `= Excel.Workbook(File.Contents("U:\Excel 365_PBID\PBID-03\Referenteninfos\!! PBID-03_Exercises\1 Premiums Q4.xlsx"), null, true)`. To the right of the main area is a 'Query Settings' pane with sections for 'PROPERTIES' (Name: Premiums_Q4) and 'APPLIED STEPS' (Source, Navigation, Changed Type). A red arrow points from the 'Formula Bar' checkbox in the ribbon to the 'Source' step in the 'APPLIED STEPS' section of the 'Query Settings' pane.

Below the main editor window, there is a smaller, semi-transparent window titled 'Query Settings' with its own 'APPLIED STEPS' section. This section also lists 'Source', 'Navigation', and 'Changed Type', with 'Changed Type' being the last item listed. A red arrow points to the 'APPLIED STEPS' section of this smaller window.



Exercise 2

- It is recommended to always **trim text columns** to avoid problems with spaces
- Additionally: when deleting duplicates: convert everything to **lowercase / UPPERCASE** so that there are no problems when deleting duplicates due to the distinction between **UPPERCASE & lowercase**.

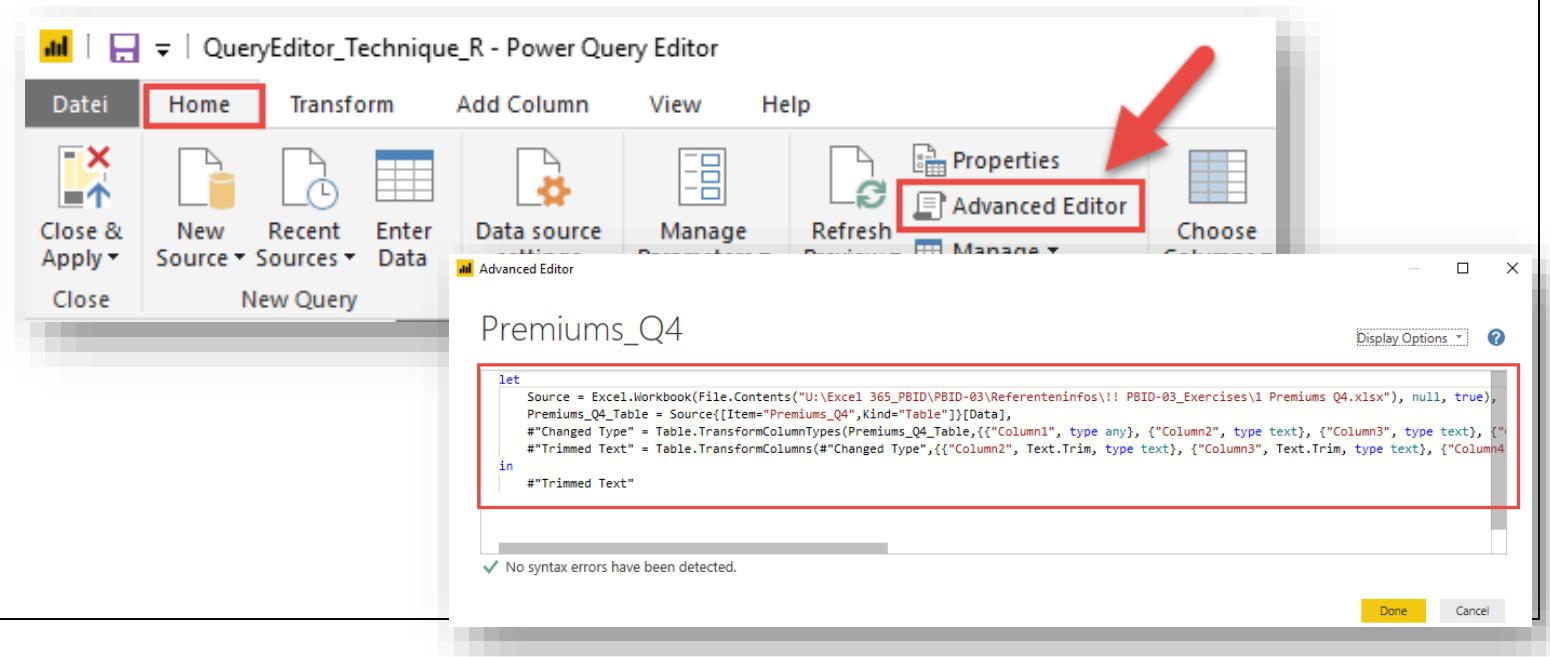


A screenshot of the Power BI context menu for a table column. The 'Transform' option is highlighted with a red box. Its submenu, which includes 'Trim', is also highlighted with a red box.



Exercise 3

- Working with the Advanced Editor
- Each modification adds a step to the *Applied Steps* pane on the right, which translates into a new line of code in the *Advanced Editor*
- Each line of code represents a step



A screenshot of the Power Query Editor. The 'Home' tab is selected. A red arrow points to the 'Advanced Editor' button in the ribbon. Below the ribbon, the 'Premiums_Q4' query is shown with its M code. A red box highlights the M code area.

```

let
    Source = Excel.Workbook(File.Contents("U:\Excel 365_PBID\PBID-03\Referenzeninfos\!! PBID-03_Exercises\1 Premiums Q4.xlsx"), null, true),
    Premiums_Q4_Table = Source{[Item="Premiums_Q4",Kind="Table"]}[Data],
    #"Changed Type" = Table.TransformColumnTypes(Premiums_Q4_Table,{{"Column1", type any}, {"Column2", type text}, {"Column3", type text}, {"Column4", type text}}),
    #"Trimmed Text" = Table.TransformColumns(#"Changed Type",{{"Column2", Text.Trim, type text}, {"Column3", Text.Trim, type text}, {"Column4", Text.Trim, type text}})
in
    #"Trimmed Text"
  
```

No syntax errors have been detected.

- Conceptually, each step contains a version or state of the table
- Each version is saved into a variable: e.g. **Source**, **#"Changed Type"**
- Variables usually are named with quotes and a hashtag, but not always
- Previous versions of the table (which are saved in variables) can be referenced & used in each step

Premiums Q4

```
let
  Source = Excel.Workbook(File.Contents("..\MUCE019334\MUC-Home10$\ny21942\desktop\TrainingExample\Premiums Q4.xlsx"),
    {"Premiums Q4_Sheet" = Source{[Item="Premiums Q4", Kind="Sheet"]}[Data],
     #"Promoted Headers" = Table.PromoteHeaders(#"Premiums Q4_Sheet", [PromoteAllScalars=true]),
     #"Changed Type" = Table.TransformColumnTypes(#"Promoted Headers",{{"Year", Int64.Type}, {"Branch", type text}, {"Policy", type text}})}
in
  #"Changed Type"
```

The final version of table is passed in the “**in**” section

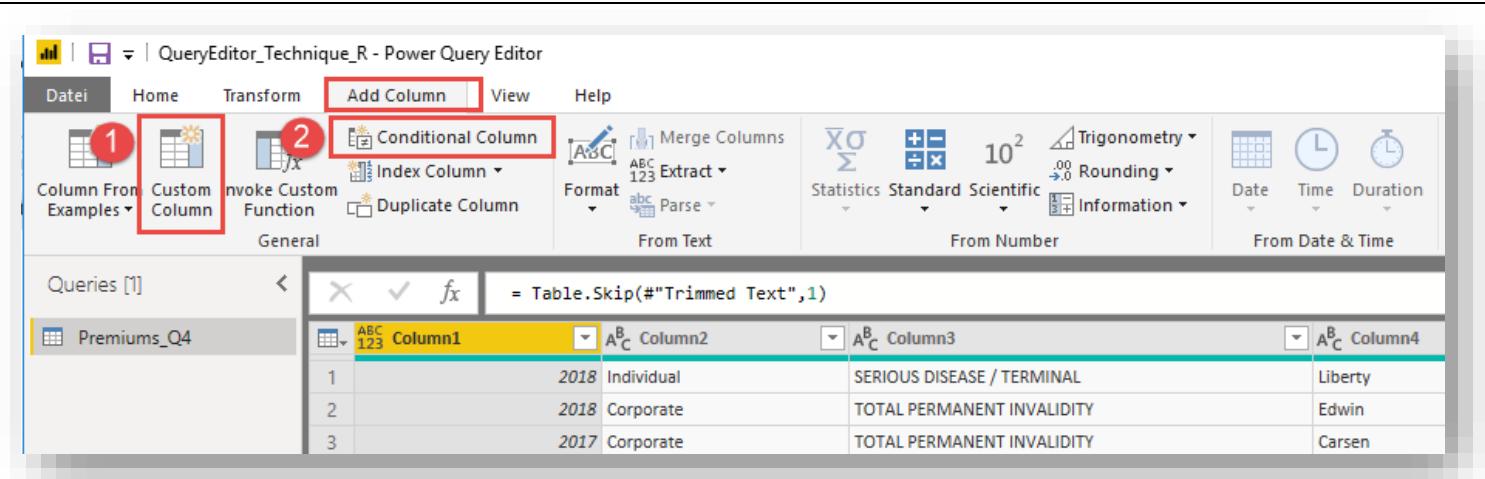
- The name of the variable of the predecessor line has to be repeated in the following line
- Each line is closed with a comma, only the last line in the “**let**”-block has no comma
- The name of the last variable in the “**let**”-block is the name of the step & thus has to be repeated in the “**in**”-block

Premiums Q4

```
let
  Source = Excel.Workbook(File.Contents("..\MUCE019334\MUC-Home10$\ny21942\desktop\TrainingExample\Premiums Q4.xlsx"),
    {"Premiums Q4_Sheet" = Source{[Item="Premiums Q4", Kind="Sheet"]}[Data],
     #"Removed Blank Rows" = Table.SelectRows(#"Premiums Q4_Sheet", each not List.IsEmpty(List.RemoveMatchingItems(Record
     {"Removed Top Rows" = Table.Skip(#"Removed Blank Rows",1),
      #"Added Custom" = Table.AddColumn(#"Removed Top Rows", "SourceFileIdentifier", each "MUC_"& Cedant & File_Name1)
    })
  })
in
  #"Added Custom"
```

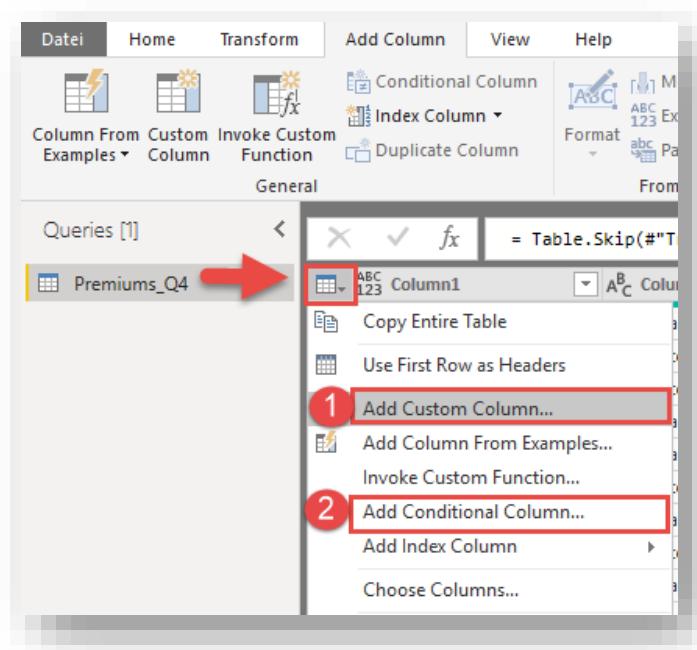
<p>Common functions</p> <ul style="list-style-type: none"> • Remove / Choose Columns – select which columns to include or exclude from the table • Remove Rows – remove top or bottom rows, remove empty rows 	
<p> Exercise 4</p> <p>Delete the first row</p> <ul style="list-style-type: none"> • Titles of the imported files might change • Therefore, you can avoid problems with column titles using the standard titles like <i>Column 1</i>, <i>Column 2</i>, ... • In our example please delete the first row with the original column titles 	

- **1 Custom Column –**
creates a new column with data from an expression
- **2 Conditional Columns –**
creates a new column with data which follow the inserted criteria



The screenshot shows the Power Query Editor interface. The ribbon menu is open, and the 'Add Column' tab is selected. Step 1 points to the 'Custom Column' icon, and step 2 points to the 'Conditional Column' icon. Below the ribbon, a table named 'Premiums_Q4' is displayed with four columns: Column1, Column2, Column3, and Column4. The data in Column1 is 'ABC 123'. The table has three rows:

	Column1	Column2	Column3	Column4
1	ABC 123	2018 Individual	SERIOUS DISEASE / TERMINAL	Liberty
2	ABC 123	2018 Corporate	TOTAL PERMANENT INVALIDITY	Edwin
3	ABC 123	2017 Corporate	TOTAL PERMANENT INVALIDITY	Carsen



The screenshot shows a context menu for the 'Premiums_Q4' query. The menu items are:

- Copy Entire Table
- Use First Row as Headers
- 1 Add Custom Column...**
- 2 Add Conditional Column...**
- Add Index Column
- Choose Columns...



Exercise 5

Create a conditional column

- We assume that **Treaty ID** is determined by the **Branch** column
- Please add a ***conditional column*** accordingly
- A ***new step*** will be added, and a ***new line*** of code in the **Advanced Editor**

Cedant Treaty Id	MR Treaty Id
Individual	Treaty 1
Corporate	Treaty 2

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name: **Treaty Identifier**

Column Name	Operator	Value	Output
If: Column2	equals	ABC 123 Individual	Then: ABC 123 Treaty 1
Else If: Column2	equals	ABC 123 Corporate	Then: ABC 123 Treaty 2
Add rule			
Else: ABC 123 null			

OK Cancel

APPLIED STEPS

- Source
- Navigation
- Changed Type
- Trimmed Text
- Removed Top Rows
- Added Conditional Column**

Premiums_Q4

```

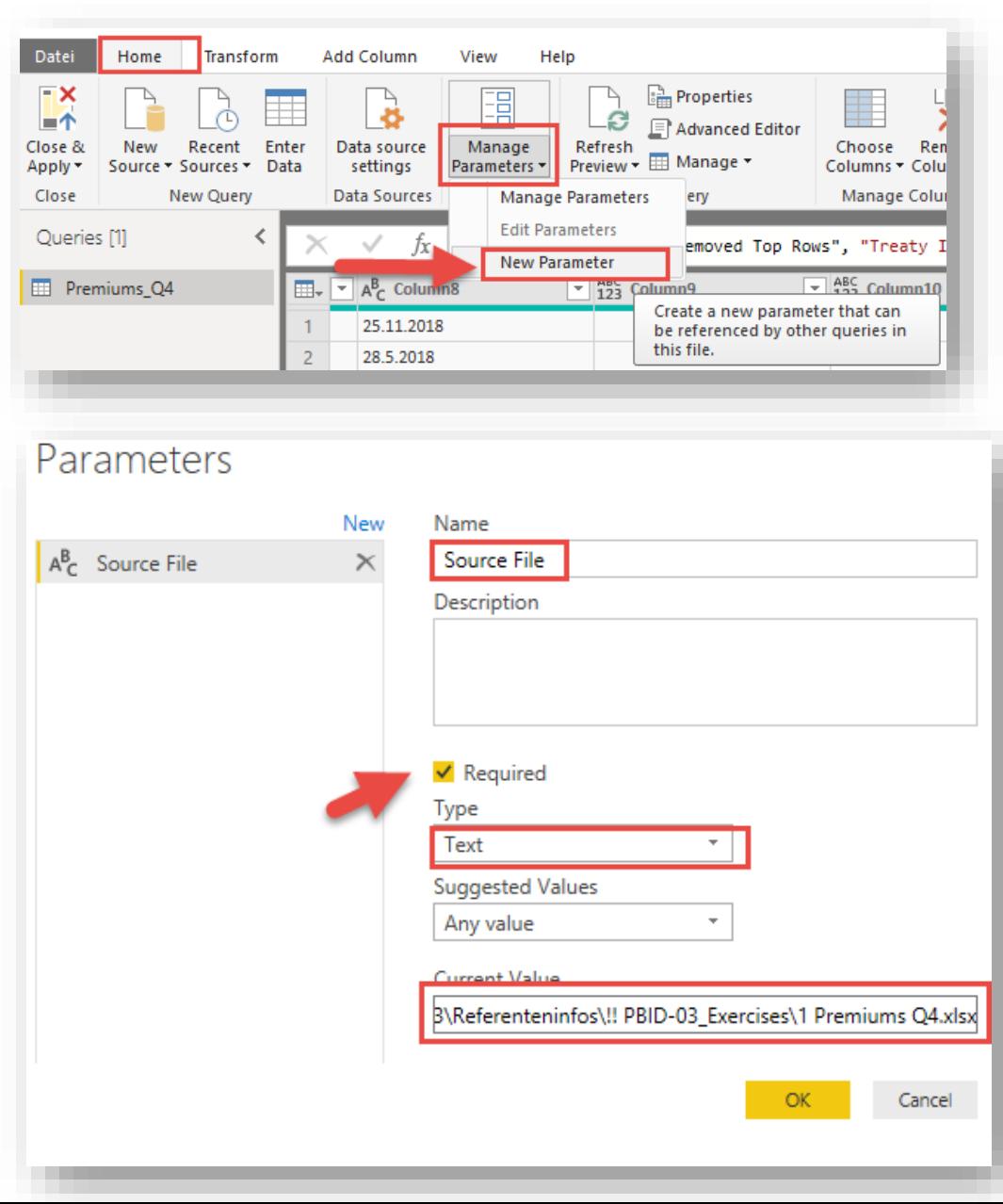
let
    Source = Excel.Workbook(File.Contents("U:\Excel 365_PBID\PBID-03\Referenteninfos\! PBID-03_Exercises\1 Premiums Q4.xlsx"), null, true),
    Premiums_Q4_Table = Source[[Item="Premiums_Q4", Kind="Table"]][Data],
    #"Changed Type" = Table.TransformColumnTypes(Premiums_Q4_Table,{{"Column1", type any}, {"Column2", type text}, {"Column3", type text}, {"Column4", type text}}),
    #"Trimmed Text" = Table.TransformColumns(#"Changed Type",{{"Column2", Text.Trim, type text}, {"Column3", Text.Trim, type text}, {"Column4", Text.Trim, type text}}),
    #"Removed Top Rows" = Table.Skip(#"Trimmed Text",1),
    #"Added Conditional Column" = Table.AddColumn(#"Removed Top Rows", "Treaty Identifier", each if [Column2] = "Individual" then "Treaty 1" else "Treaty 2")
in
    #"Added Conditional Column"
  
```



Exercise 6

Using Parameters

- Each part of the code in the **Advanced Editor** can be replaced with a parameter - for example, changing the source file path, so the same model can use dynamically different files
- A new parameter can be defined under **Manage Parameters**
- Usually **Type** should be **Text**
- The option **Required** is activated by default – it should be deselected for parameters when an information is not always available



The screenshot shows the Power BI Advanced Editor interface. At the top, the ribbon has tabs: Datei, Home (which is selected and highlighted in red), Transform, Add Column, View, and Help. Below the ribbon, there are several icons: Close & Apply, New Source, Recent Sources, Enter Data, Data source settings, Manage Parameters (selected and highlighted in red), Refresh, Preview, Properties, Advanced Editor, Manage, Choose Columns, and Remove Top Rows. A red arrow points from the 'Manage Parameters' button to a sub-menu item 'New Parameter'. Another red box highlights this 'New Parameter' option. A tooltip for 'New Parameter' says: 'Create a new parameter that can be referenced by other queries in this file.'

The main workspace shows a query titled 'Premiums_Q4' with two rows of data:

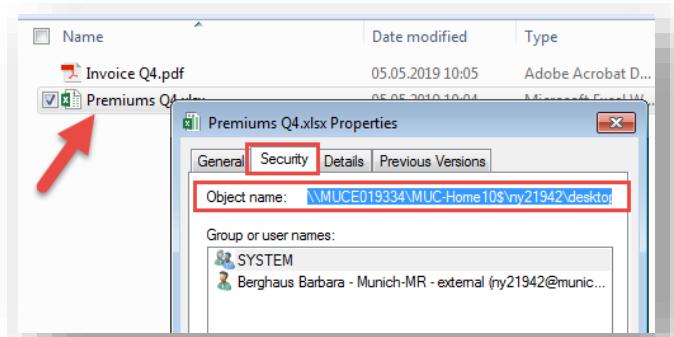
	Column8	Column9	Column10
1	25.11.2018	ABC	Column10
2	28.5.2018	123	Column10

Below the workspace, a 'Parameters' dialog box is open. It shows a 'New' button and a 'Source File' parameter being created. The parameter details are as follows:

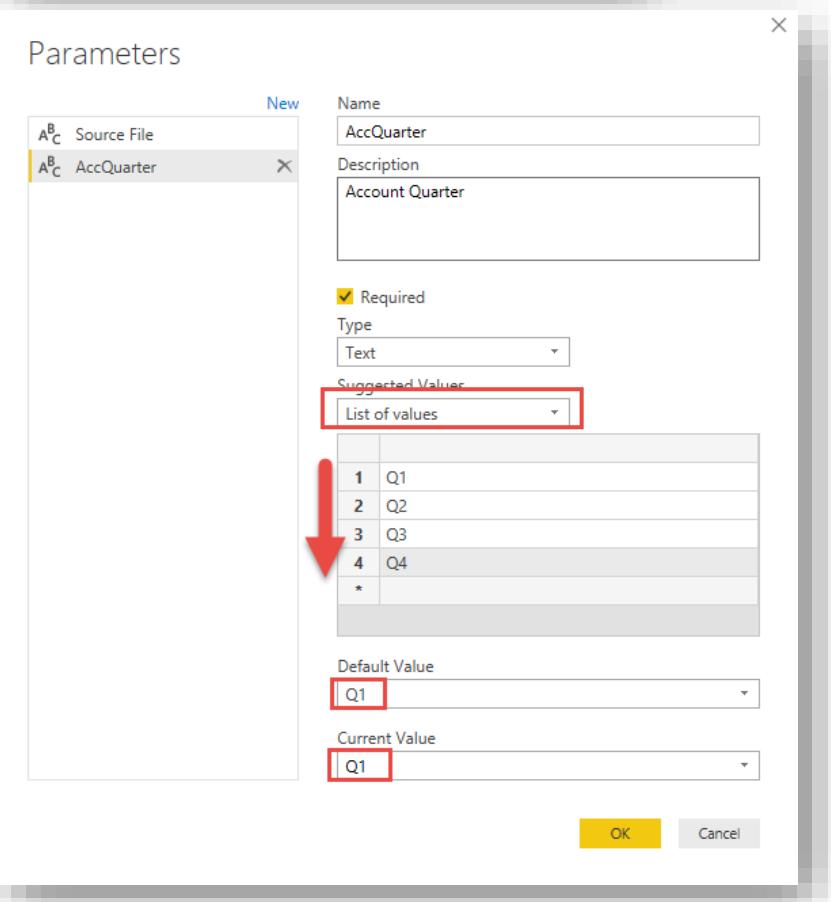
- Name:** Source File (highlighted in red)
- Description:** (empty)
- Required:** Required (highlighted with a red arrow)
- Type:** Text (highlighted in red)
- Suggested Values:** Any value
- Current Value:** B\Referenzeninfos\!! PBID-03_Exercises\1 Premiums Q4.xlsx (highlighted in red)

The file path can be copied:

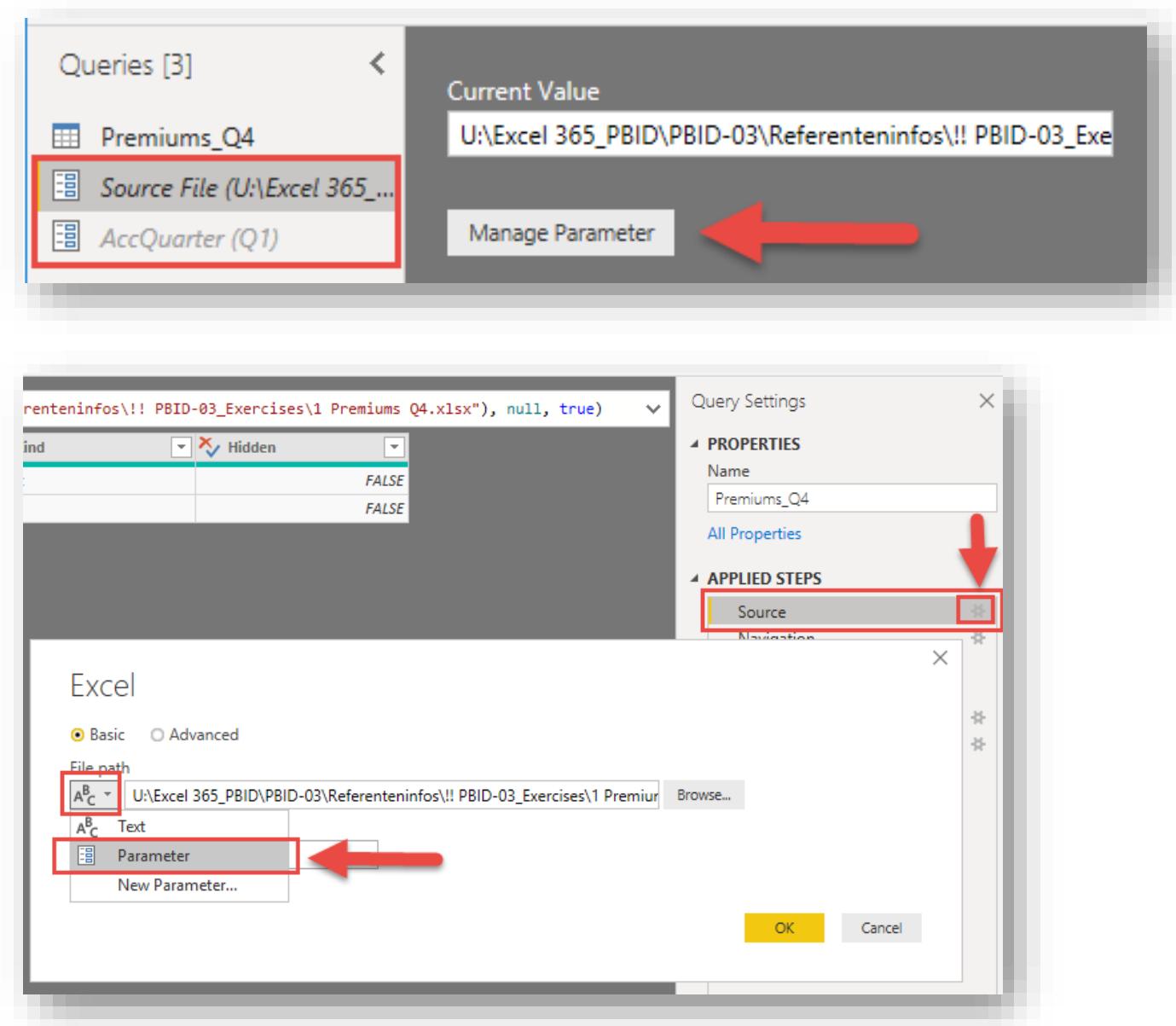
- Rightclick **Premiums Q4.xlsx** & open **Properties**
- Switch to **Security** & copy the file path



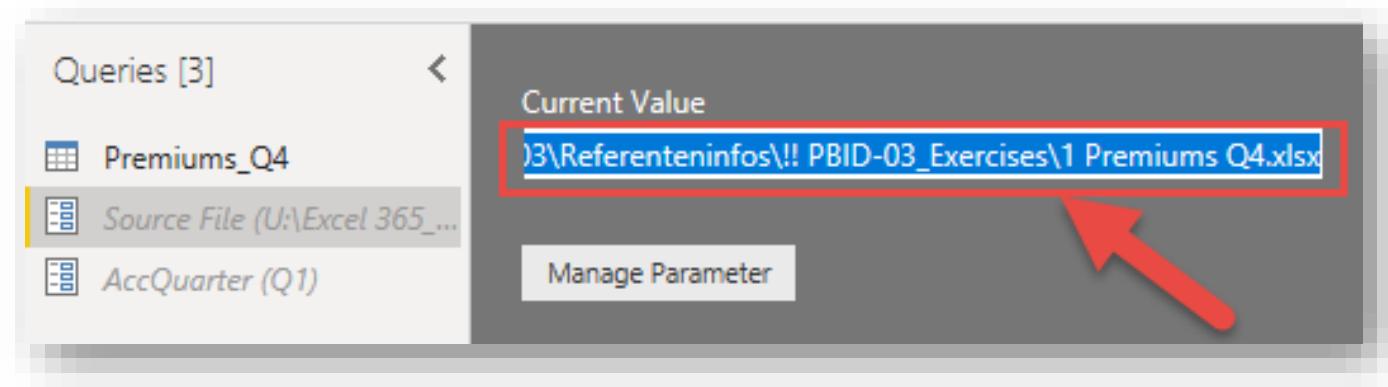
- It is also possible to provide a list of values, when you want to make sure, that the entries from the user are always correct
- For example the entry for the column **Acct Quarter** should always be **Q4** – therefore, the option **List of values** should be choosen here



- Creating a parameter will automatically add it under the queries pane
- Note that Parameters are just like any other query in Power BI Desktop; they can be referenced from other queries, loaded to the Data Model and referenced in DAX expressions, etc.
- By default though, Parameters are not loaded to the Data Model
- To incorporate the parameter in the query, click on the cogwheel in the step Source

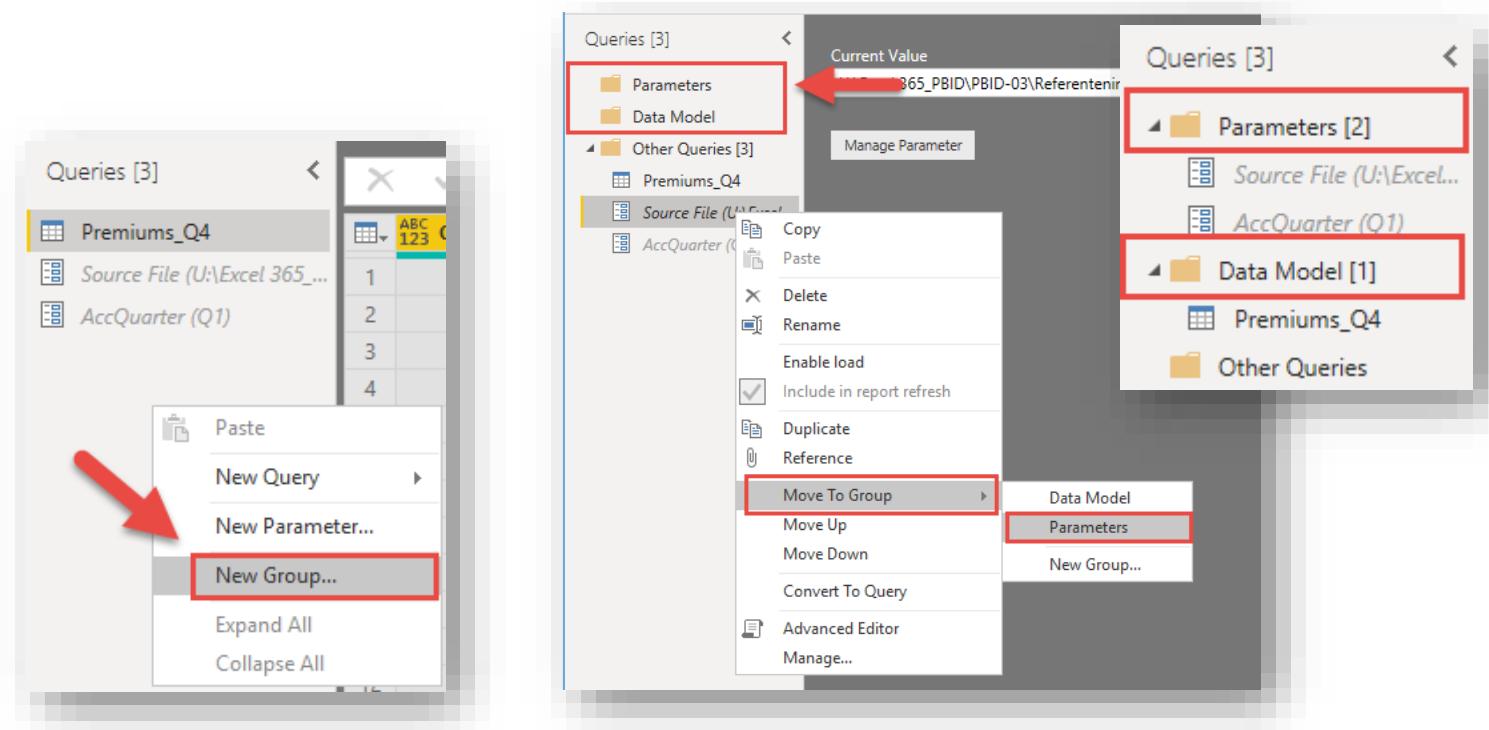


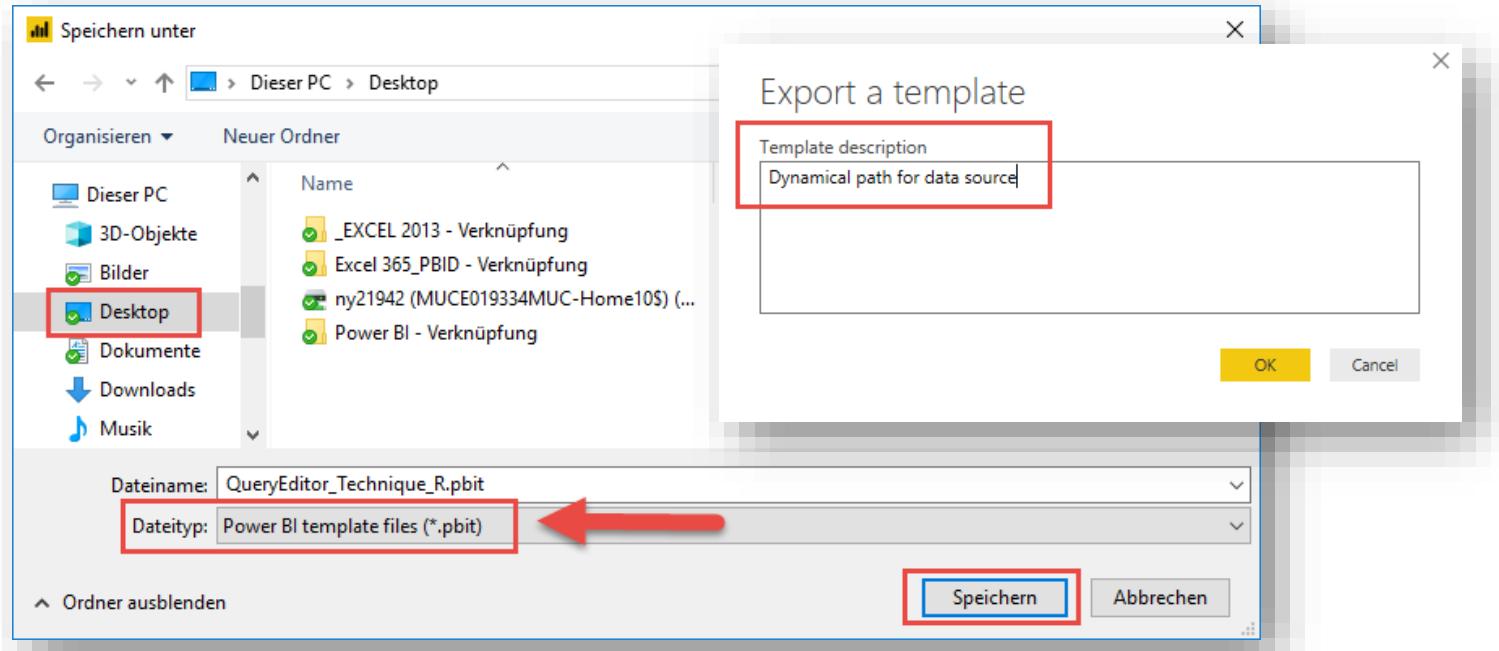
- When using a new source file, instead of editing the code, just change the parameter value
- or use a template (see next exercise)



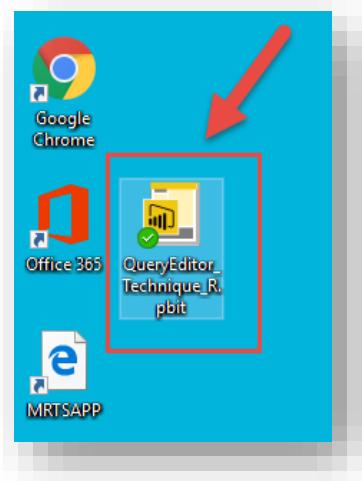
Organize the entries

- With **Groups** you can organize your queries and parameters
- Save the **PBIX**-file



Using templates	<ul style="list-style-type: none">A Power BI Report Template contains the definition of the Report (pages, visuals, etc.), Data Model definition (schema, relationships, measures, etc.) and Queries definition (collection of queries, including Query Parameters, etc.)In other words, a Power BI Report template includes pretty much everything that a Report file includes, with the exception of the data itselfWhen a user tries to instantiate a template, either via double-click on the PBIT file, or by using the File / Import / Power BI Template path, a new Power BI Desktop file will be created, containing the actual data based on current user's credentials for data sources, etc.
 Exercise 7	

- Close the PBIX-File & open the **Template**



- A parameter dialog is shown where the user can enter the new path for the data source & other information ...
- Then a **new PBIX-file** with the selected data source is opened
- All **Applied steps** from the **Query Editor** are then processed on this new data



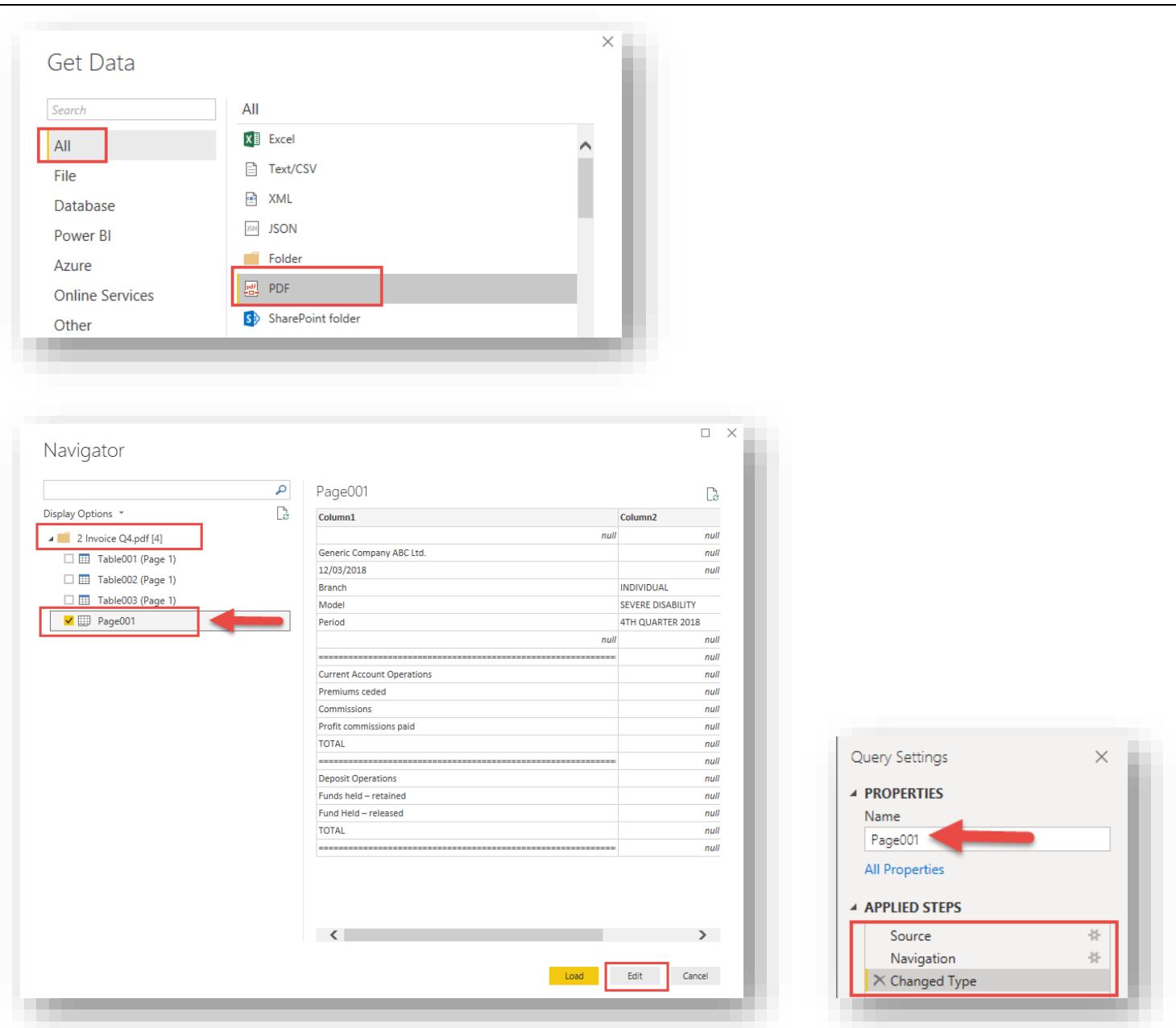
2 Example – Data Preparation from PDF

<ul style="list-style-type: none"> Example data <p>The starting point</p> <ul style="list-style-type: none"> You receive new quarterly figures from your cedant The data arrive as XLSX-files & as PDF-files The XLSX file is already shaped & transformed to the needed format Now open the PDF file <p>The task</p> <ol style="list-style-type: none"> The data from both files have to be appended – therefore, the PDF file has to be shaped accordingly With a template it should be possible to enter a file path & other basic information for the PDF file 	<p>2 Invoice Q4.pdf 2 CEDANT_2018_Q4.pbix</p> <p>Shaped XLSX-File</p> <table border="1"> <thead> <tr> <th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th><th>I</th><th>J</th><th>K</th></tr> </thead> <tbody> <tr> <td>1 SourceFileIdentifier</td><td>TreatyIdentifier</td><td>AULIdentifier</td><td>Entry Code</td><td>Amount</td><td>Acct Text</td><td>Acct Year</td><td>Acct Quarter</td><td>UY</td><td>OY</td><td>Currency</td></tr> <tr> <td>2 MUC_COMPANY_ABC_PREMIUMS</td><td>Individual</td><td>SERIOUS DISEASE</td><td>10199</td><td>178.91</td><td>LH_2018Q4_C</td><td>2018 Q4</td><td></td><td></td><td></td><td>2018 EUR</td></tr> <tr> <td>3 MUC_COMPANY_ABC_PREMIUMS</td><td>Individual</td><td>SERIOUS DISEASE</td><td>10099</td><td>35.78</td><td>LH_2018Q4_C</td><td>2018 Q4</td><td></td><td></td><td></td><td>2018 EUR</td></tr> <tr> <td>4 MUC_COMPANY_ABC_PREMIUMS</td><td>Corporate</td><td>TOTAL PERI</td><td></td><td></td><td></td><td>C</td><td>2018 Q4</td><td></td><td></td><td>2018 EUR</td></tr> <tr> <td>5 MUC_COMPANY_ABC_PREMIUMS</td><td>Corporate</td><td>TOTAL PERI</td><td></td><td></td><td></td><td>C</td><td>2018 Q4</td><td></td><td></td><td>2018 EUR</td></tr> <tr> <td>6 MUC_COMPANY_ABC_PREMIUMS</td><td>Corporate</td><td>TOTAL PERI</td><td></td><td></td><td></td><td>C</td><td>2018 Q4</td><td></td><td></td><td>2017 EUR</td></tr> <tr> <td>7 MUC_COMPANY_ABC_PREMIUMS</td><td>Corporate</td><td>TOTAL PERMANENT</td><td>10099</td><td>204.45</td><td>LH_2018Q4_C</td><td>2018 Q4</td><td></td><td></td><td></td><td>2017 EUR</td></tr> <tr> <td>8 MUC_COMPANY_ABC_PREMIUMS</td><td>Individual</td><td>DEATH TRAFFIC AC</td><td>10199</td><td>100.57</td><td>LH_2018Q4_C</td><td>2018 Q4</td><td></td><td></td><td></td><td>2016 EUR</td></tr> </tbody> </table> <p>PDF-File</p> <p>Generic Company ABC Ltd. 12/03/2018</p> <p>Branch INDIVIDUAL Model SEVERE DISABILITY Period 4TH QUARTER 2018</p> <table border="1"> <thead> <tr> <th></th><th>DEBIT</th><th>CREDIT</th></tr> </thead> <tbody> <tr> <td colspan="3"><hr/></td></tr> <tr> <td colspan="3"><u>Current Account Operations</u></td></tr> <tr> <td>Premiums ceded</td><td></td><td>15.984,36</td></tr> <tr> <td>Commissions</td><td>590,03</td><td>0,00</td></tr> <tr> <td>Profit commissions paid</td><td>1.485,90</td><td>0,00</td></tr> <tr> <td>TOTAL</td><td>2.075,93</td><td>15.984,36</td></tr> <tr> <td colspan="3"><hr/></td></tr> <tr> <td colspan="3"><u>Deposit Operations</u></td></tr> <tr> <td>Funds held – retained</td><td></td><td>6.497,84</td></tr> <tr> <td>Fund Held – released</td><td></td><td>9.371,38</td></tr> <tr> <td>TOTAL</td><td>0,00</td><td>2.873,54</td></tr> <tr> <td colspan="3"><hr/></td></tr> </tbody> </table>	A	B	C	D	E	F	G	H	I	J	K	1 SourceFileIdentifier	TreatyIdentifier	AULIdentifier	Entry Code	Amount	Acct Text	Acct Year	Acct Quarter	UY	OY	Currency	2 MUC_COMPANY_ABC_PREMIUMS	Individual	SERIOUS DISEASE	10199	178.91	LH_2018Q4_C	2018 Q4				2018 EUR	3 MUC_COMPANY_ABC_PREMIUMS	Individual	SERIOUS DISEASE	10099	35.78	LH_2018Q4_C	2018 Q4				2018 EUR	4 MUC_COMPANY_ABC_PREMIUMS	Corporate	TOTAL PERI				C	2018 Q4			2018 EUR	5 MUC_COMPANY_ABC_PREMIUMS	Corporate	TOTAL PERI				C	2018 Q4			2018 EUR	6 MUC_COMPANY_ABC_PREMIUMS	Corporate	TOTAL PERI				C	2018 Q4			2017 EUR	7 MUC_COMPANY_ABC_PREMIUMS	Corporate	TOTAL PERMANENT	10099	204.45	LH_2018Q4_C	2018 Q4				2017 EUR	8 MUC_COMPANY_ABC_PREMIUMS	Individual	DEATH TRAFFIC AC	10199	100.57	LH_2018Q4_C	2018 Q4				2016 EUR		DEBIT	CREDIT	<hr/>			<u>Current Account Operations</u>			Premiums ceded		15.984,36	Commissions	590,03	0,00	Profit commissions paid	1.485,90	0,00	TOTAL	2.075,93	15.984,36	<hr/>			<u>Deposit Operations</u>			Funds held – retained		6.497,84	Fund Held – released		9.371,38	TOTAL	0,00	2.873,54	<hr/>		
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Premiums ceded		15.984,36																																																																																																																																									
Commissions	590,03	0,00																																																																																																																																									
Profit commissions paid	1.485,90	0,00																																																																																																																																									
TOTAL	2.075,93	15.984,36																																																																																																																																									
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<u>Deposit Operations</u>																																																																																																																																											
Funds held – retained		6.497,84																																																																																																																																									
Fund Held – released		9.371,38																																																																																																																																									
TOTAL	0,00	2.873,54																																																																																																																																									
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Exercise 1

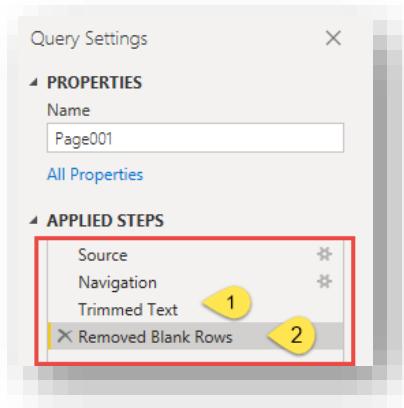
- Open **2 CEDANT_2018_Q4.pbix**
- The data of the XLSX file is already imported
- Import **2 Invoice Q4.pdf** with the **PDF connector**
- Similar to importing .XLSX files, it is required to select a page to import
- The PDF connector auto-detects tables within the page itself
- It is not recommended using tables, rather selecting an entire page



The screenshot illustrates the process of importing a PDF file into Power BI:

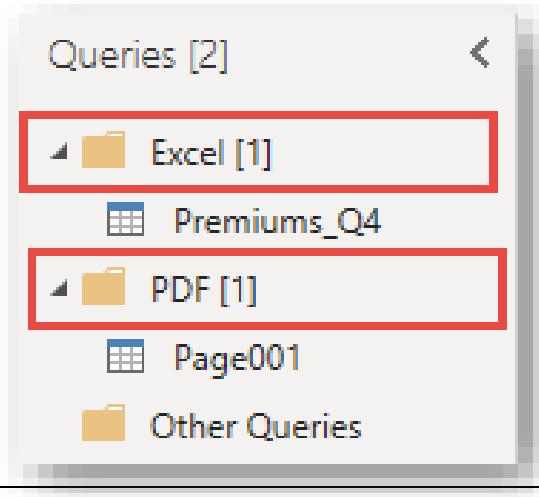
- Get Data pane:** Shows the "All" category selected. The "PDF" option is highlighted with a red box.
- Navigator pane:** Shows the imported file "2 Invoice Q4.pdf [4]" expanded. The first table "Page001" is selected and highlighted with a red box. A red arrow points from the "Page001" selection in the Navigator to the "Page001" name in the Query Settings pane.
- Query Settings pane:** Displays the "Page001" query settings. The "Name" field is set to "Page001". The "APPLIED STEPS" section shows a step named "Changed Type" which has been applied to the source and navigation.

- **Delete step** Changed Type
- **Trim text columns**
- **Remove blank rows**

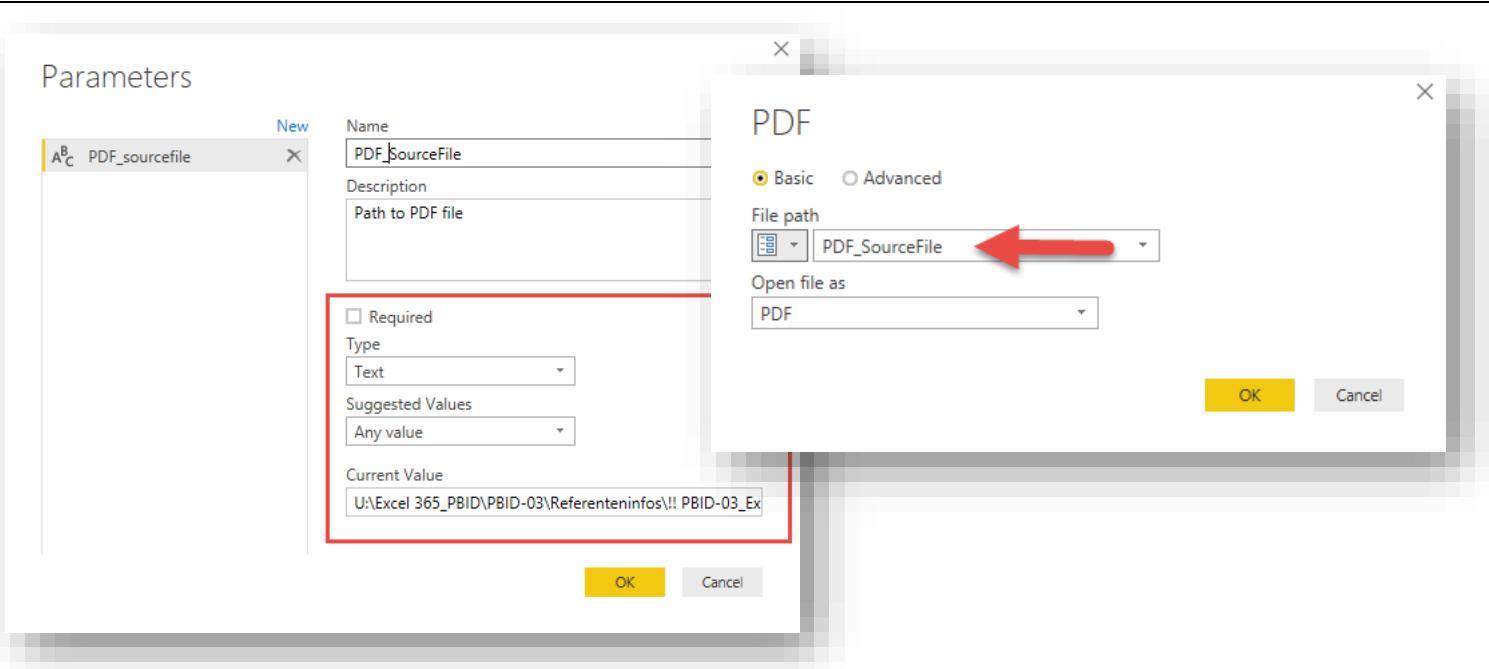


Organizing queries & parameters

- As there are two different files in the model, you should create **Groups** for each file & parameters
- Right click on the **Queries left pane / New Group**
- Create the following groups
 - ...
- ... & move the queries (& later the parameters) as shown in the screenshot

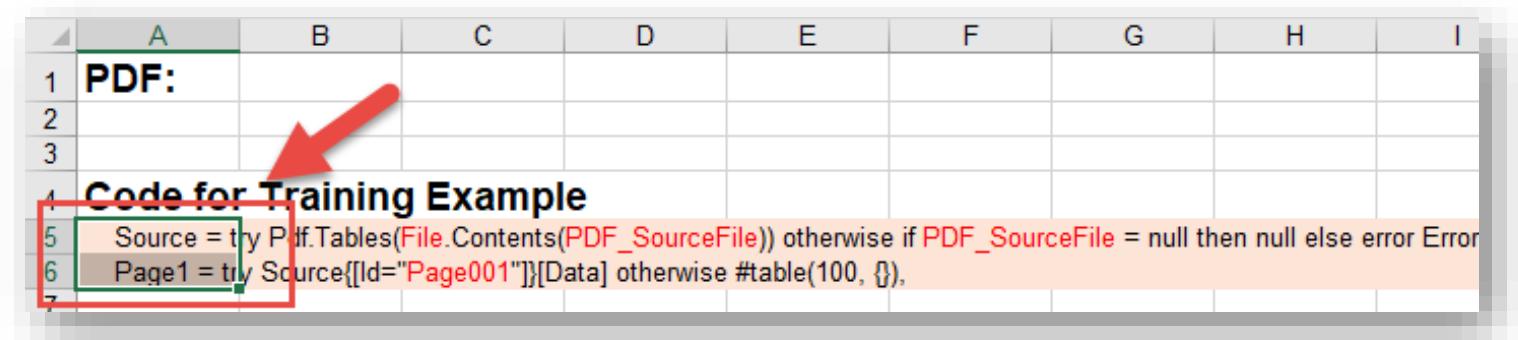


- Create a parameter for the source file: **PDF_SourceFile**
- The option **Required** is not selected!
- Connect the parameter to query **Page001**



Flexible Parameter Code for source data

- Open the Excel file **Flexible Parameter_Code for PBI.xlsx**
- Highlight the first two cells of code as shown in the screenshot
- Copy the necessary code
- The name of the **parameter** (**PDF_SourceFile** used for the data source) is already inserted here



A	B	C	D	E	F	G	H	I
1	PDF:							
2								
3								
4	Code for Training Example							
5	Source = try Pdf.Tables(File.Contents(PDF_SourceFile)) otherwise if PDF_SourceFile = null then null else error Error							
6	Page1 = try Source{[Id="Page001"]}[Data] otherwise #table(100, {}).							
7								

- Open the **Advanced Editor** & highlight the code as shown

Page001

```

let
    Source = Pdf.Tables(File.Contents(PDF_SourceFile)),
    Page1 = Source{[Id="Page001"]}[Data],
    #"Trimmed Text" = Table.TransformColumns(Page1, {"Column2", Text.Trim, type text}, {"Column3", Text.Trim, type text}, {"Column4", Text.Trim, type text}),
    #"Removed Blank Rows" = Table.SelectRows(#"Trimmed Text", each not List.IsEmpty(List.RemoveMatchingItems(Record.FieldValues(_), {"", null})))
in
    #"Removed Blank Rows"
  
```

- Replace the two code lines with the new code for the lines **Source** & **Page1**
- Close the **Advanced Editor** – the query result should be shown as before
- If you now enter e. g. a wrong file path or leave the parameter empty these cases are handled by the changed code

Page001

```

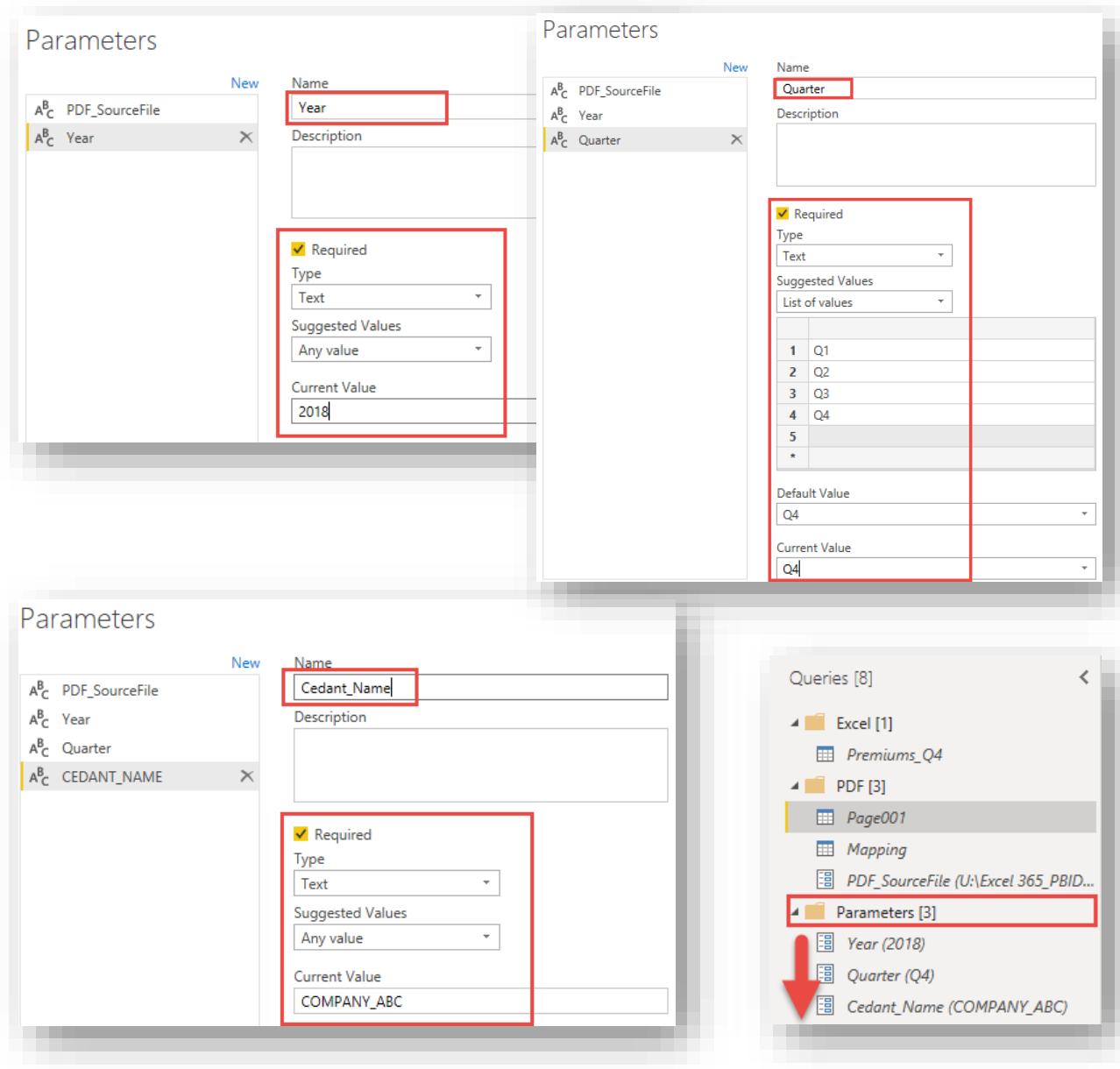
let
    Source = try Pdf.Tables(File.Contents(PDF_SourceFile)) otherwise if PDF_SourceFile = null then null else error Error.Record("Invalid input"),
    Page1 = try Source{[Id="Page001"]}[Data] otherwise #table(100, {}),
    #"Trimmed Text" = Table.TransformColumns(Page1, {"Column2", Text.Trim, type text}, {"Column3", Text.Trim, type text}, {"Column4", Text.Trim, type text}),
    #"Removed Blank Rows" = Table.SelectRows(#"Trimmed Text", each not List.IsEmpty(List.RemoveMatchingItems(Record.FieldValues(_), {"", null})))
in
    #"Removed Blank Rows"
  
```



Exercise 2

More parameters are needed

- Year
- Quarter
- Cedant_Name
- Move them to a new group
Parameters



The image shows three separate Power BI parameter configuration windows and a 'Queries' list pane.

- Top Left:** A 'Parameters' window showing a parameter named 'Year'. It is set to 'Required', 'Text' type, and has a current value of '2018'. A red box highlights the 'Required' checkbox, the 'Type' dropdown, and the 'Current Value' input field.
- Top Right:** A 'Parameters' window showing a parameter named 'Quarter'. It is set to 'Required', 'Text' type, and has a current value of 'Q4'. It includes a 'Suggested Values' list with options 1 (Q1), 2 (Q2), 3 (Q3), 4 (Q4), and 5. A red box highlights the 'Required' checkbox, the 'Type' dropdown, the 'Suggested Values' list, and the 'Current Value' input field.
- Bottom Left:** A 'Parameters' window showing a parameter named 'Cedant_Name'. It is set to 'Required', 'Text' type, and has a current value of 'COMPANY_ABC'. A red box highlights the 'Required' checkbox, the 'Type' dropdown, the 'Suggested Values' list, and the 'Current Value' input field.
- Bottom Right:** A 'Queries [8]' list pane. It shows a hierarchy of data sources and parameters. A red box highlights the 'Parameters [3]' folder, and a red arrow points to the 'Cedant_Name (COMPANY_ABC)' entry under it.

2.1 Creating the table structure

TreatyIdentifier [¤]	A ^B _C Column1	A ^B _C Column2	A ^B _C Column3
Treaty Identifier as originally listed in invoice [¤]	1	null	null
Individual [¤]	2 Generic Company ABC Ltd.		null
	3 12/03/2018		null
	4 Branch		INDIVIDUAL
	5 Model		SEVERE DISABILITY
	6 Period		4TH QUARTER 2018
	7	null	DEBIT
	8 =====		null
	9 Current Account Operations		null
	10 Premiums ceded		null
	11 Commissions		590,03
	12 Profit commissions paid		1.485,90
	13 TOTAL		2.075,93
	14 =====		null
	15 Deposit Operations		null
	16 Funds held – retained		6.497,84
	17 Fund Held – released		
	18 TOTAL		0,00
	19 =====		null

• TreatyIdentifier (Branch) & AUIdentifier (Model) are created from columns 1 & 2



Exercise 3

- Create a conditional column
- Tip:
In this case it is safer to use
“contains” than “equals”

Add Conditional Column

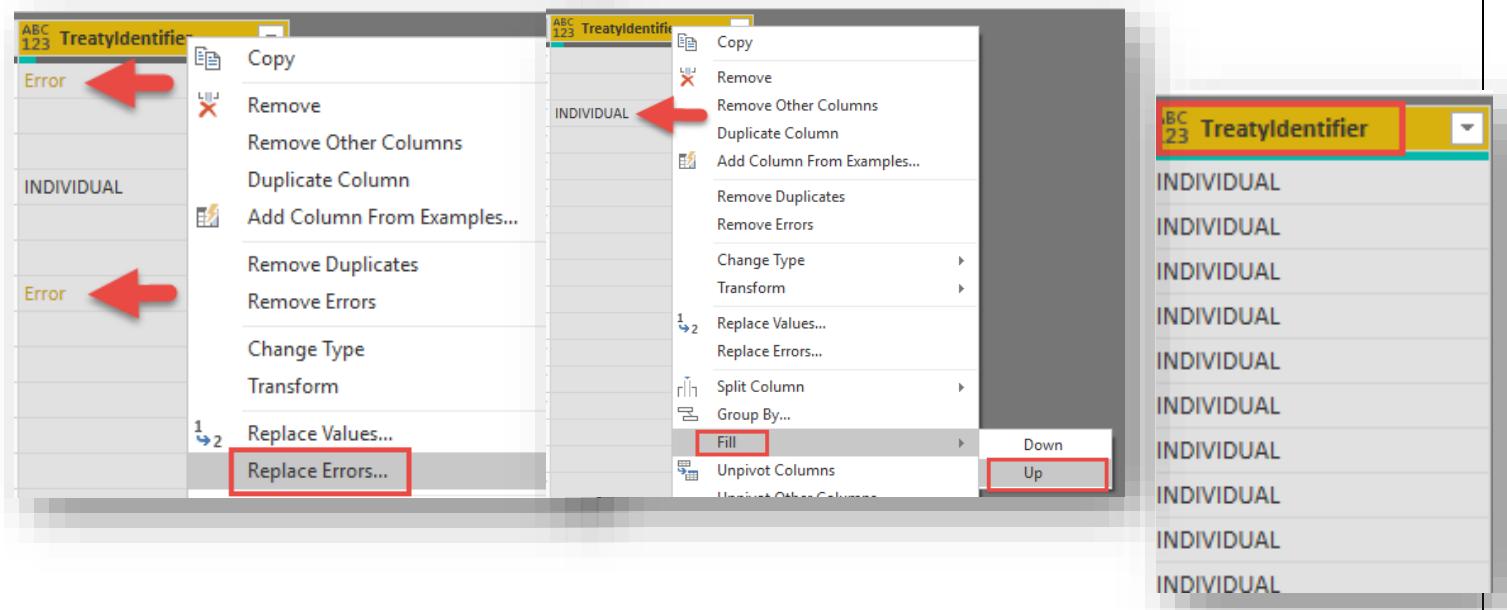
Add a conditional column that is computed from the other columns or values.

New column name

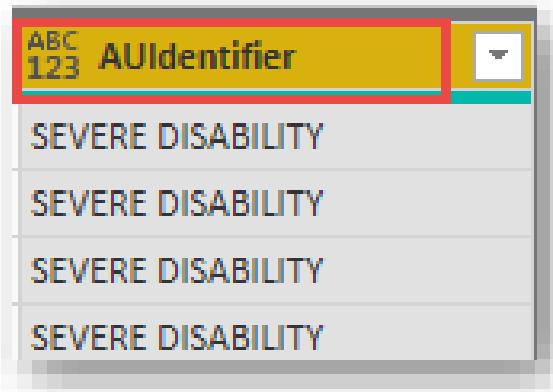
- Right click / **Replace errors** with **Null**
- Right click / **FillUp / Down**

Result



The screenshot shows a data grid with a context menu open over the 'TreatyIdentifier' column. The menu includes options like Copy, Remove, Remove Other Columns, Duplicate Column, Add Column From Examples..., Remove Duplicates, Remove Errors, Change Type, Transform, Replace Values..., Replace Errors..., Split Column, Group By..., Fill, Unpivot Columns, and Unpivot Other Columns. The 'Replace Errors...' option is highlighted with a red box and a red arrow pointing to it. The 'Fill' option is also highlighted with a red box and a red arrow pointing to it. The 'TreatyIdentifier' column header is also highlighted with a red box.

- In the same way create AUIdentifier



Amount			
Amount as originally listed in invoice or calculated percentage			
99,9			

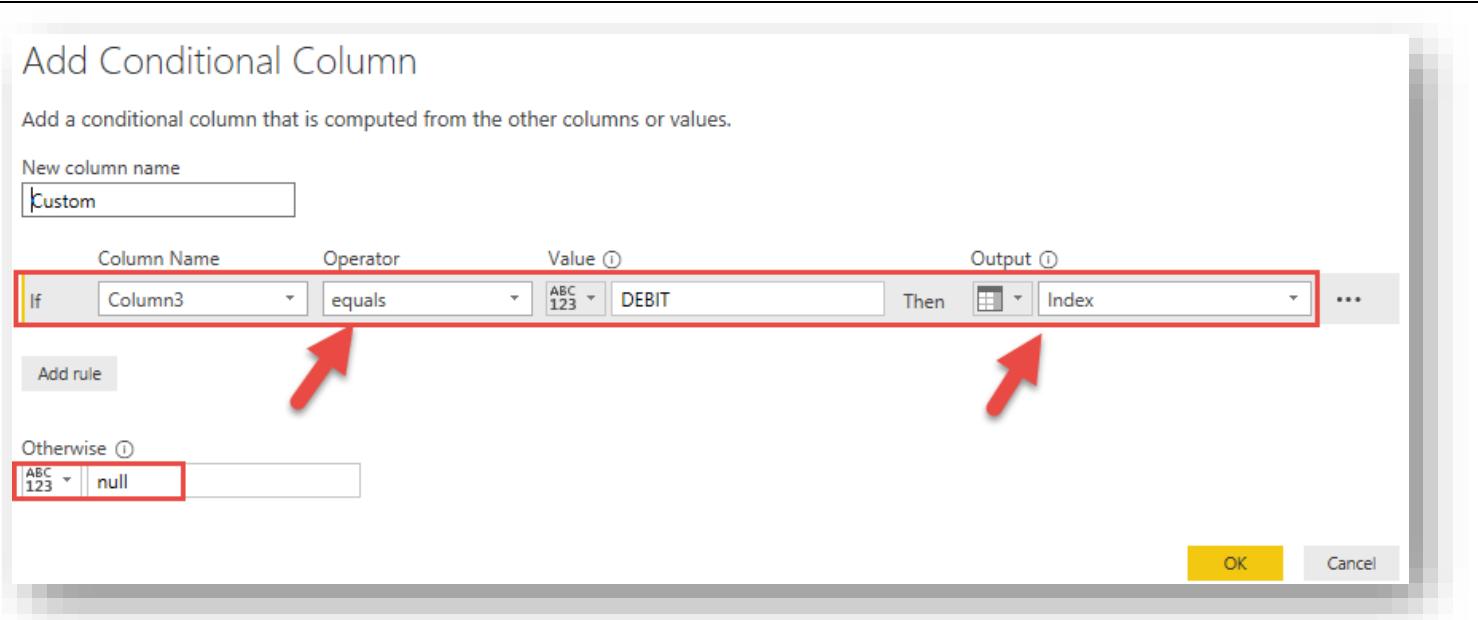
Exercise 4

- In order to prepare the query to create the **Entry Code & Amount**, there are several steps to perform
- First thing is to define the range of the table which contains the headers & the values
- Therefore, the next step is to **dynamically remove top rows**.
- In this case the headers of the actual table are in row **7** (**Credit** and **Debit**)
- To retrieve that number dynamically you need to create an **Index column**

ABC Column1	ABC Column2	ABC Column3	ABC Column4
Copy Entire Table	null	null [image]	null
Use First Row as Headers	null	null	null
Add Custom Column...	null	null	null
Add Column From Examples...	INDIVIDUAL	null	null
Invoke Custom Function...	SEVERE DISABILITY	null	null
Add Conditional Column...	4TH QUARTER 2018	null	null
Add Index Column	DEBIT	CREDIT	
From 0	null	null	null
From 1	null	null	null
Choose Columns...	null	15.984,36	
Keep Top Rows...	590,03	0,00	
12 Profit commissions paid	1.485,90	0,00	
13 TOTAL	2.075,93	15.984,36	
14 =====	null	null	null
15 Deposit Operations	null	null	null
16 Funds held – retained	6.497,84		
17 Fund Held – released		null 9.371,38	
18 TOTAL	0,00	2.873,54	
19 =====	null	null	null

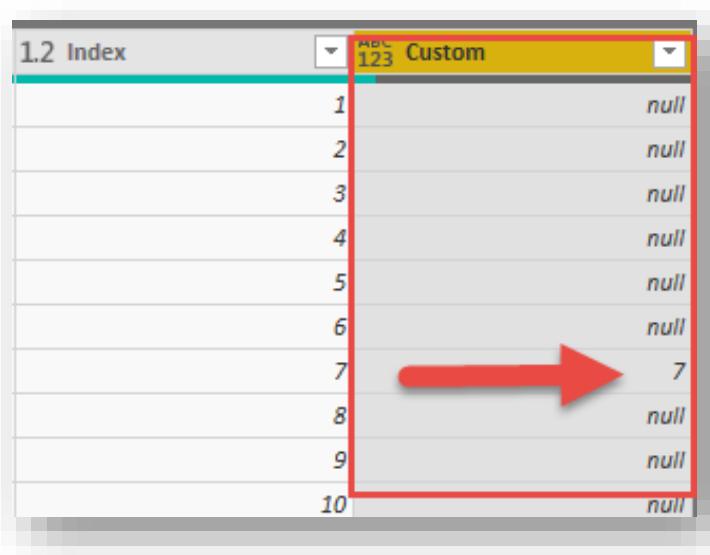
ABC Identifier	1.2 Index
SEVERE DISABILITY	1
SEVERE DISABILITY	2
SEVERE DISABILITY	3
SEVERE DISABILITY	4
SEVERE DISABILITY	5
SEVERE DISABILITY	6
SEVERE DISABILITY	7

- With a conditional column you can then retrieve the number of the row, where the table starts



- In order to determine which is the top row (in case the header name exists more than once), a variable is needed to store the minimum value

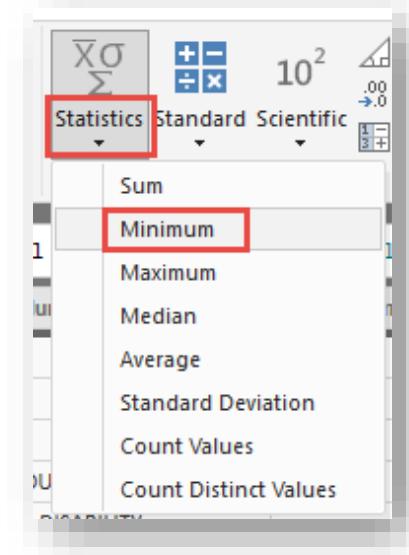
1.2 Index	ABC 123 Custom
1	null
2	null
3	null
4	null
5	null
6	null
7	7
8	null
9	null
10	null



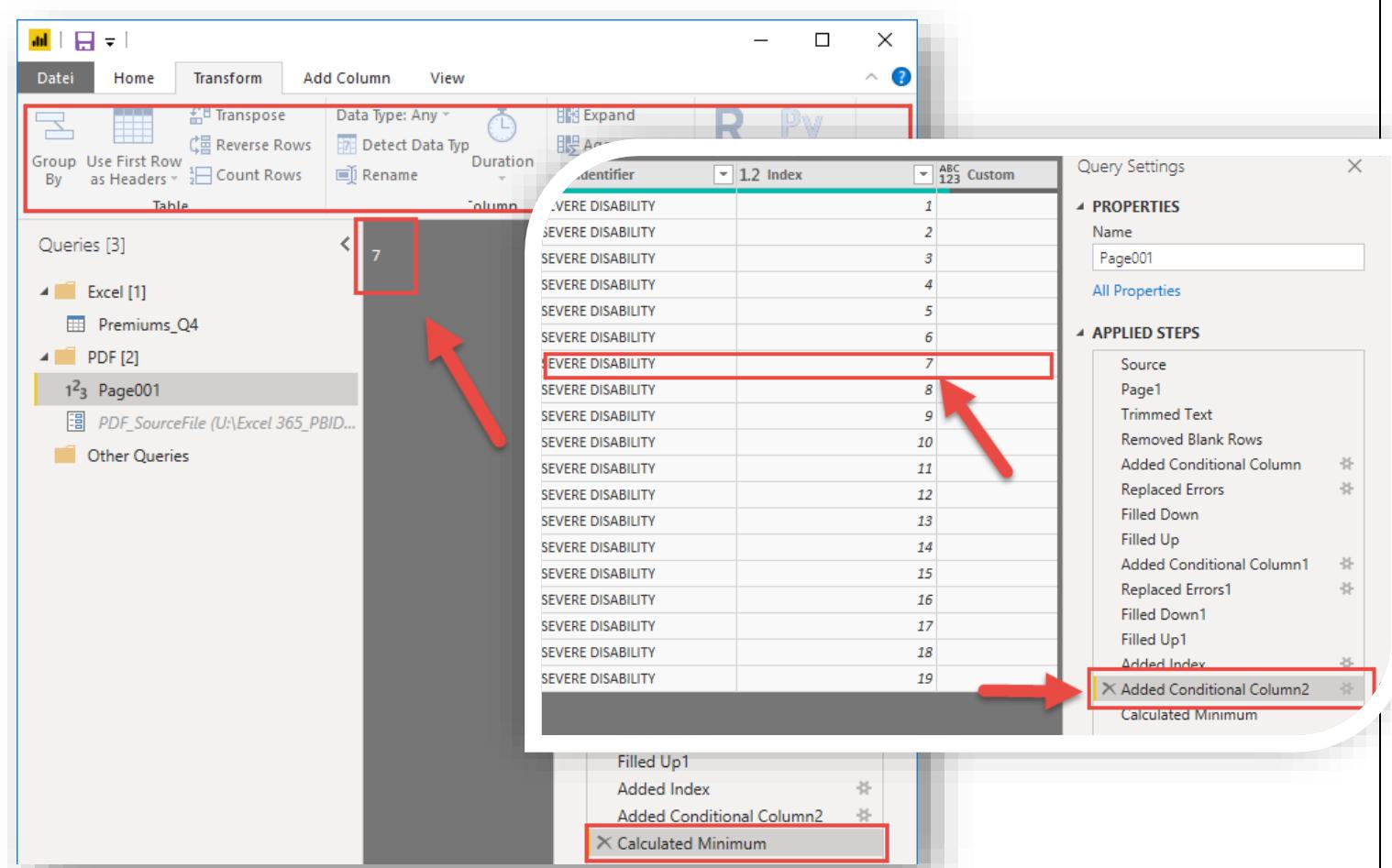
→

Statistics Standard Scientific

Sum Minimum Maximum Median Average Standard Deviation Count Values Count Distinct Values



- As you cannot work with further commands here, you have to move up one step
- On the step above you add the step deleting the **first 7 rows** – as from here the table with the figures for **Amount** starts



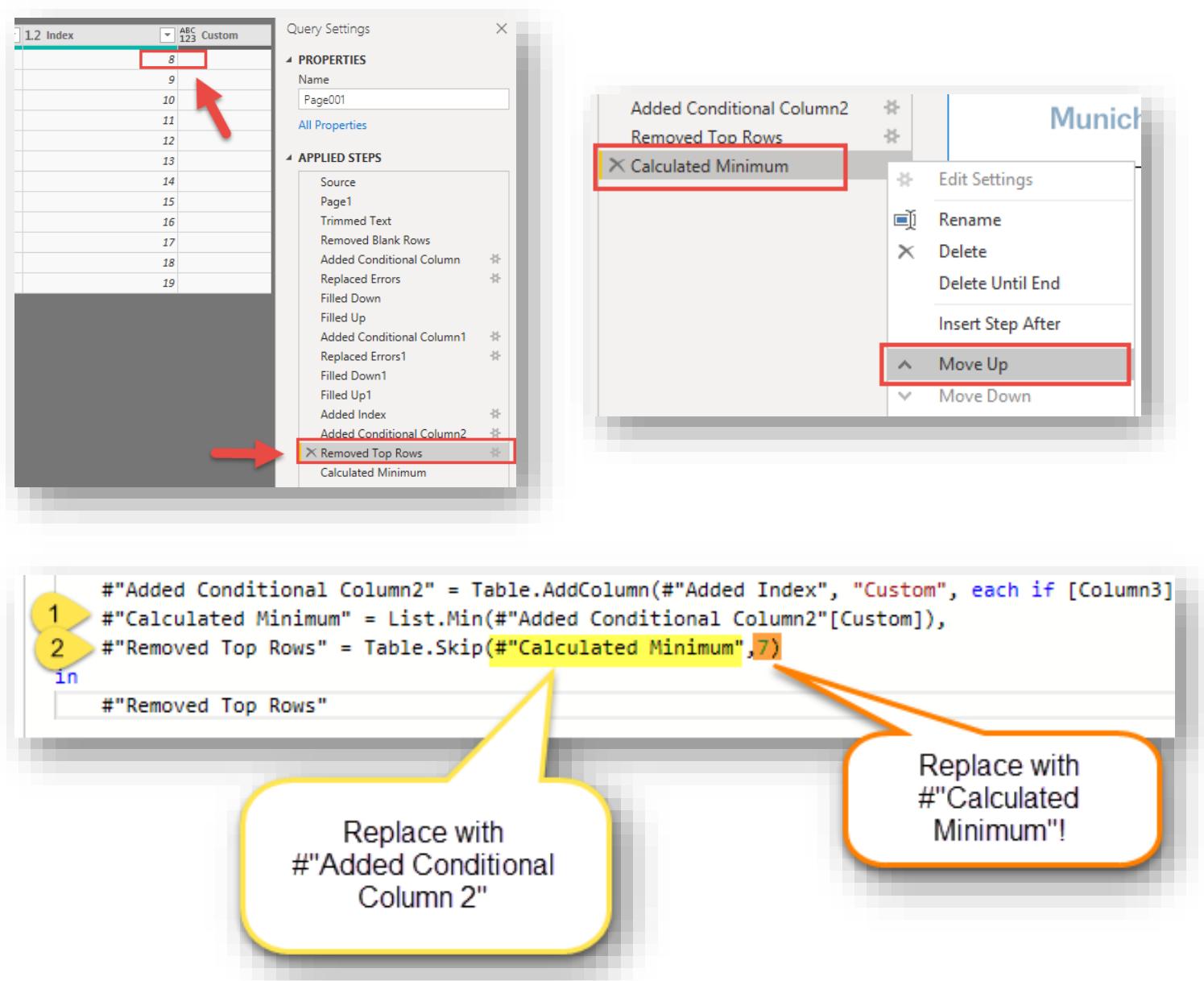
The screenshot shows the Power BI Transform Data Editor interface. The ribbon at the top has 'Transform' selected. The main area displays a table with 19 rows, all labeled 'SEVERE DISABILITY'. A red box highlights the 'Table' button in the toolbar. Red arrows point to the row number '7' in the left pane and to the row '7' in the table preview. The 'APPLIED STEPS' pane on the right lists several steps, with 'Added Conditional Column2' and 'Calculated Minimum' highlighted by a red box.

Identifier	1.2 Index
SEVERE DISABILITY	1
SEVERE DISABILITY	2
SEVERE DISABILITY	3
SEVERE DISABILITY	4
SEVERE DISABILITY	5
SEVERE DISABILITY	6
SEVERE DISABILITY	7
SEVERE DISABILITY	8
SEVERE DISABILITY	9
SEVERE DISABILITY	10
SEVERE DISABILITY	11
SEVERE DISABILITY	12
SEVERE DISABILITY	13
SEVERE DISABILITY	14
SEVERE DISABILITY	15
SEVERE DISABILITY	16
SEVERE DISABILITY	17
SEVERE DISABILITY	18
SEVERE DISABILITY	19

APPLIED STEPS

- Source
- Page1
- Trimmed Text
- Removed Blank Rows
- Added Conditional Column
- Replaced Errors
- Filled Down
- Filled Up
- Added Conditional Column1
- Replaced Errors1
- Filled Down1
- Filled Up1
- Added Conditional Column2**
- Calculated Minimum**

- You receive a table which starts with Index-number **8**
- Then: to keep the number of deleted rows dynamic, move up step “Calculated Minimum”



The screenshot shows the Power Query Editor interface. On the left, there's a preview of a table with rows indexed from 8 to 19. A red arrow points to the index number 8. On the right, the 'APPLIED STEPS' pane lists several steps: 'Source', 'Page1', 'Trimmed Text', 'Removed Blank Rows', 'Added Conditional Column', 'Replaced Errors', 'Filled Down', 'Filled Up', 'Added Conditional Column1', 'Replaced Errors1', 'Filled Down1', 'Filled Up1', 'Added Index', 'Added Conditional Column2', 'Removed Top Rows', and 'Calculated Minimum'. A red box highlights the 'Removed Top Rows' and 'Calculated Minimum' steps. A context menu is open over the 'Calculated Minimum' step, with 'Move Up' highlighted in red. Below the editor, the 'Advanced Editor' window shows the M code:

```

1 #"Added Conditional Column2" = Table.AddColumn(#"Added Index", "Custom", each if [Column3]
2 #"Calculated Minimum" = List.Min(#"Added Conditional Column2"[Custom]),
in
#"Removed Top Rows"
  
```

A yellow callout bubble points to the line '#"Calculated Minimum" = List.Min(#"Added Conditional Column2"[Custom]),' with the text 'Replace with #"Added Conditional Column 2"'. An orange callout bubble points to the line '#"Removed Top Rows"' with the text 'Replace with #"Calculated Minimum"!'

Result

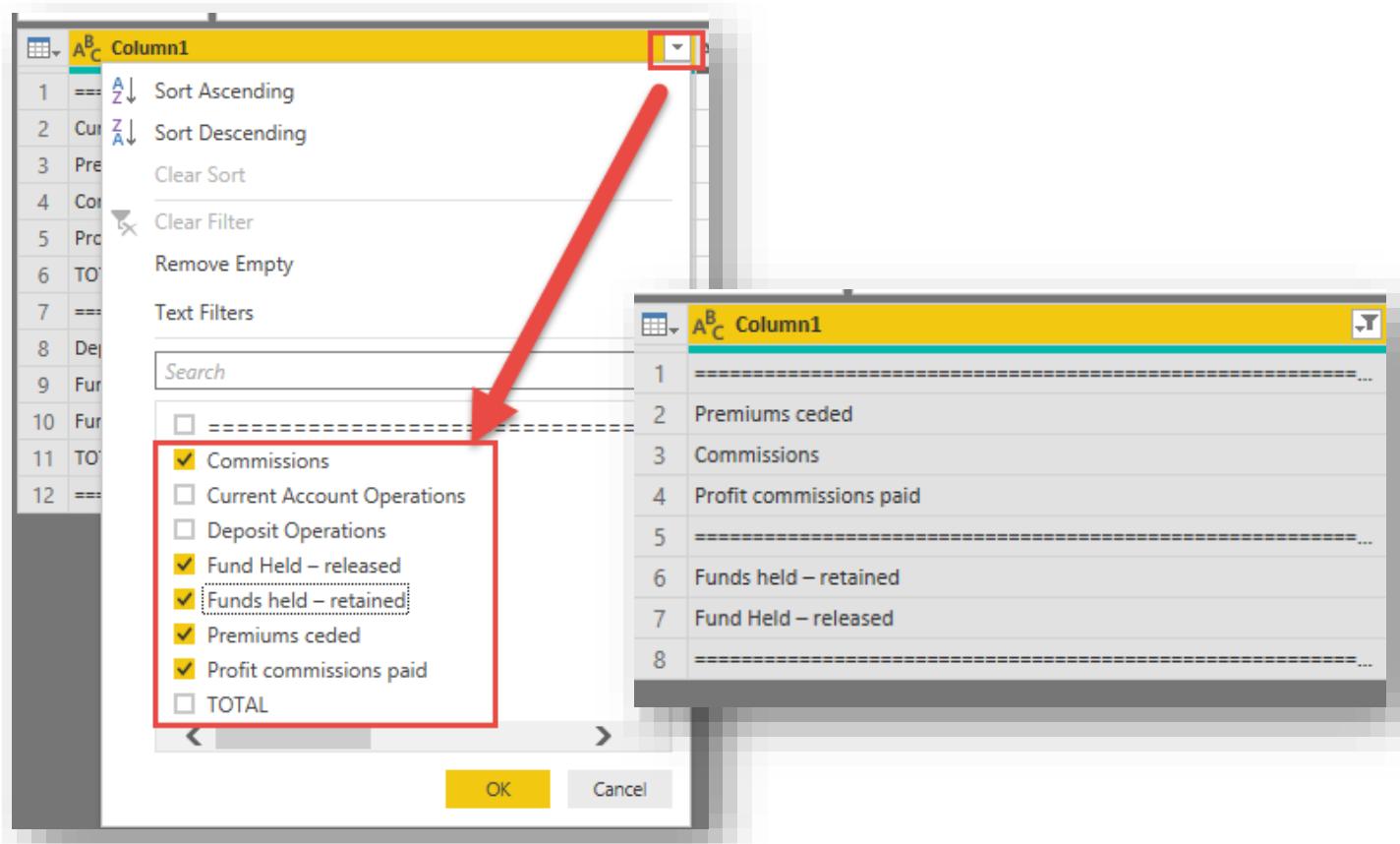
- The query should work as before

```

#"Added Index" = Table.AddIndexColumn(#"Filled Up1", "Index", 1, 1),
#"Added Conditional Column2" = Table.AddColumn(#"Added Index", "Custom", each if [Column3] = "DEBIT" then [Index] else null),
#"Calculated Minimum" = List.Min(#"Added Conditional Column2"[Custom]),
#"Removed Top Rows" = Table.Skip(#"Added Conditional Column2", #"Calculated Minimum") ←
in
#"Removed Top Rows"

```

- Filter the **Column1** to exclude nulls, totals and sub-headers



- Now you have to create the column **Entry Code**

Entry Code

Calculated in model (FSRI-Entry-Code)

12345

Column1	Entry Code
Premiums ceded	10099
Commissions	20099
Profit commissions paid	20299
Profit commissions paid	20499
Funds held – retained	40099
Fund Held – released	40199

 **Exercise 5**

- Considering the following mapping of entry codes, create a mapping table
- You can copy that table from the Excel file **Flexible Parameter_Code for PBI.xlsx / Sheet Mapping**
- Name the table **Mapping**

Create Table

Column1	Entry Code
1 Premiums ceded	10099
2 Commissions	20099
3 Profit commissi...	20299
4 Profit commissi...	20499
5 Funds held – re...	40099
6 Fund Held – rel...	40199
*	

Name:

Queries [4]

- Excel [1]
- Premiums_Q4
- PDF [3]
- Page001
- PDF_SourceFile (U:\Excel\65_PBI...
- Mapping**
- Other Queries

Column1	Entry Code
1 Premiums ceded	10099
2 Commissions	20099
3 Profit commissions paid	20299
4 Profit commissions paid	20499
5 Funds held – retained	40099
6 Fund Held – released	40199

- Create a **Conditional Column**: here you can define which **Entry code** belongs to which text

Add Conditional Column

Add a conditional column that is computed from the other columns or values.

New column name: Custom.1

Column Name	Operator	Value	Output
If	equals	ABC 123 Premium ceded	Then ABC 123 10099
Else If	equals	ABC 123 Commissions	Then ABC 123 20099
Else If	equals	ABC 123 Profit commissions paid	Then ABC 123 20299 / 20499
Else If	equals	ABC 123 Funds held – retained	Then ABC 123 40099
Else If	equals	ABC 123 Fund Held – released	Then ABC 123 40199

Add rule

Otherwise: ABC 123 null

Split Column by Delimiter

Specify the delimiter used to split the text column.

Select or enter delimiter: --Custom-- /

Split at:

- Left-most delimiter
- Right-most delimiter
- Each occurrence of the delimiter

Advanced options:

Split into:

- Columns
- Rows

Quote Character: "

Split using special characters: Insert special character

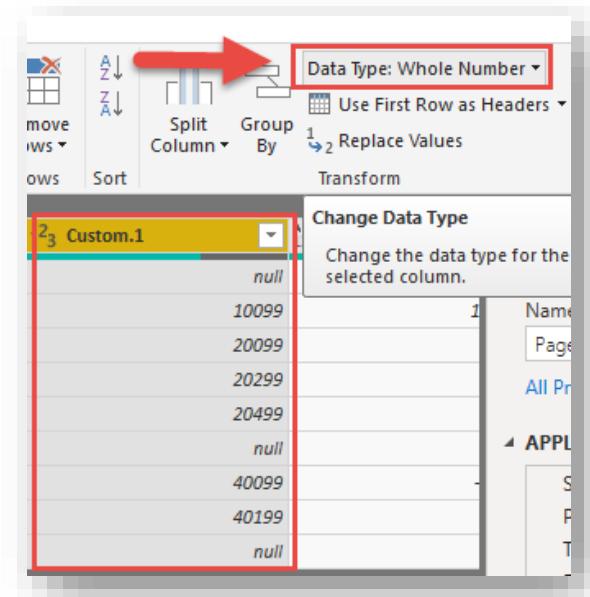
OK Cancel

When you split rows, the rows are doubled in this case

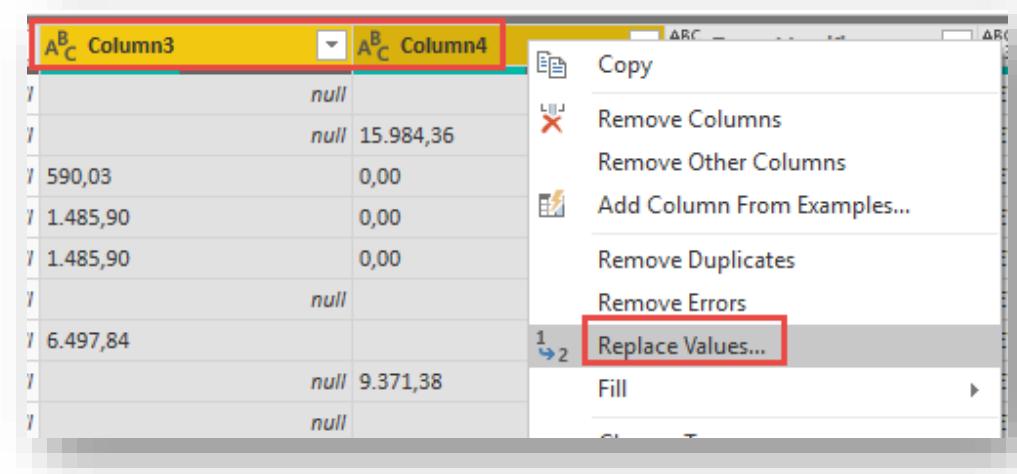
ABC Custom.1

20099	20299	20499
-------	-------	-------

- As a last step switch the data type to **Whole number**



- In order to create the **amount** column, the debit should be deducted from credit
- Nulls are not deductible, thus all **nulls** should be replaced with **0**
- Highlight **column3 & 4**, then replace **null** to **0**
- Make sure column type is **decimal**



- If numbers are written with a comma as a decimal (8,6 and not 8.6), use convert with **Using locale ...** (in A / APAC)

Change Type with Locale

Change the data type and select the locale of origin.

Data Type: Decimal Number
Locale: German (Germany)

Sample input values:

Column3	Column4
2.100,50	0
-1,50	0
590,03	15984,36
1485,9	0
1485,9	0
0	0
6497,84	9371,38
0	0
0	0

- After preparing the columns for amount, create a new **Custom Column** where you calculate a temporary amount

Custom Column

Add a column that is computed from the other columns.

New column name

Amount_TEMP

Custom column formula (i)

= [Column4]-[Column3]

[Learn about Power BI Desktop formulas](#)

✓ No syntax errors have been detected.

ABC	123	Custom.2
		0
		15984,36
		-590,03
		-1485,9
		-1485,9
		0
		-6497,84
		9371,38
		0

OK

Cancel

- Some amounts are wrong, because they should be multiplied by **-1**
- You can use the **Mapping table** to correct the calculations

There are 2 solutions:

Conditional column – in case there are not many values to check, it is possible to manually create a column with the formula:

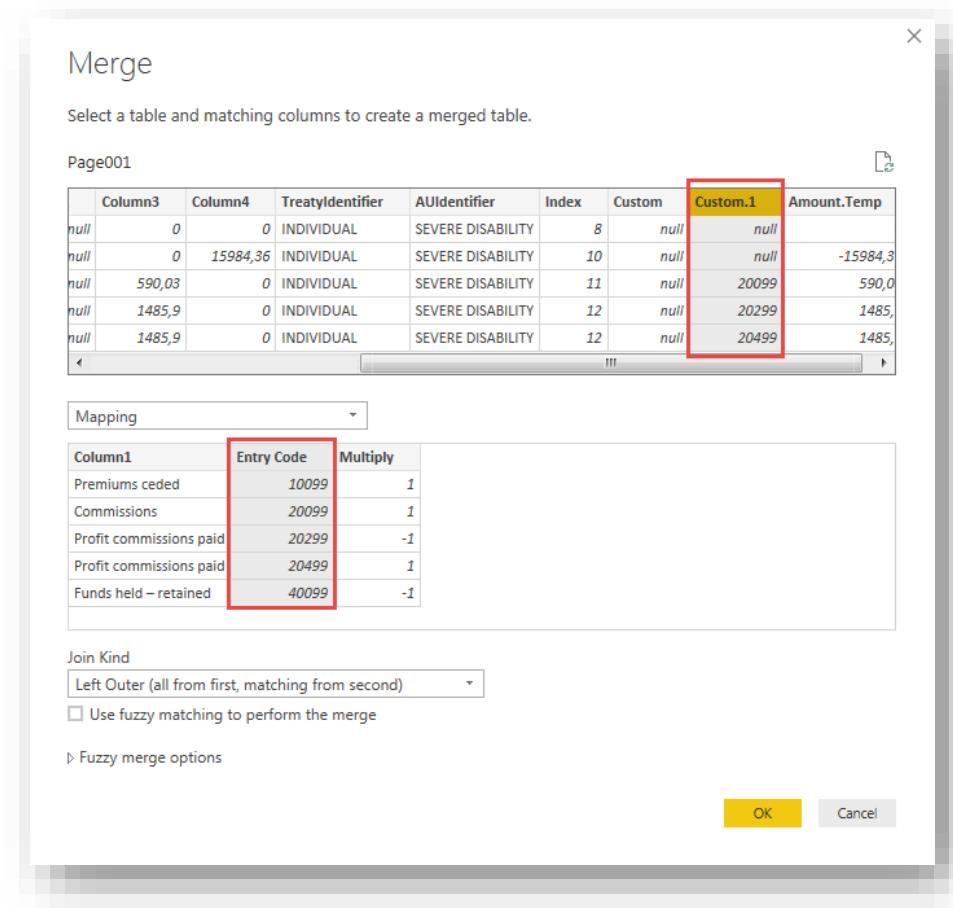
When [Entry Code] = 100 then [amount]*-1 else [amount]

Import Lookup – if there are many complicated conditions, a lookup table offers an easy solution which automatically updates the values

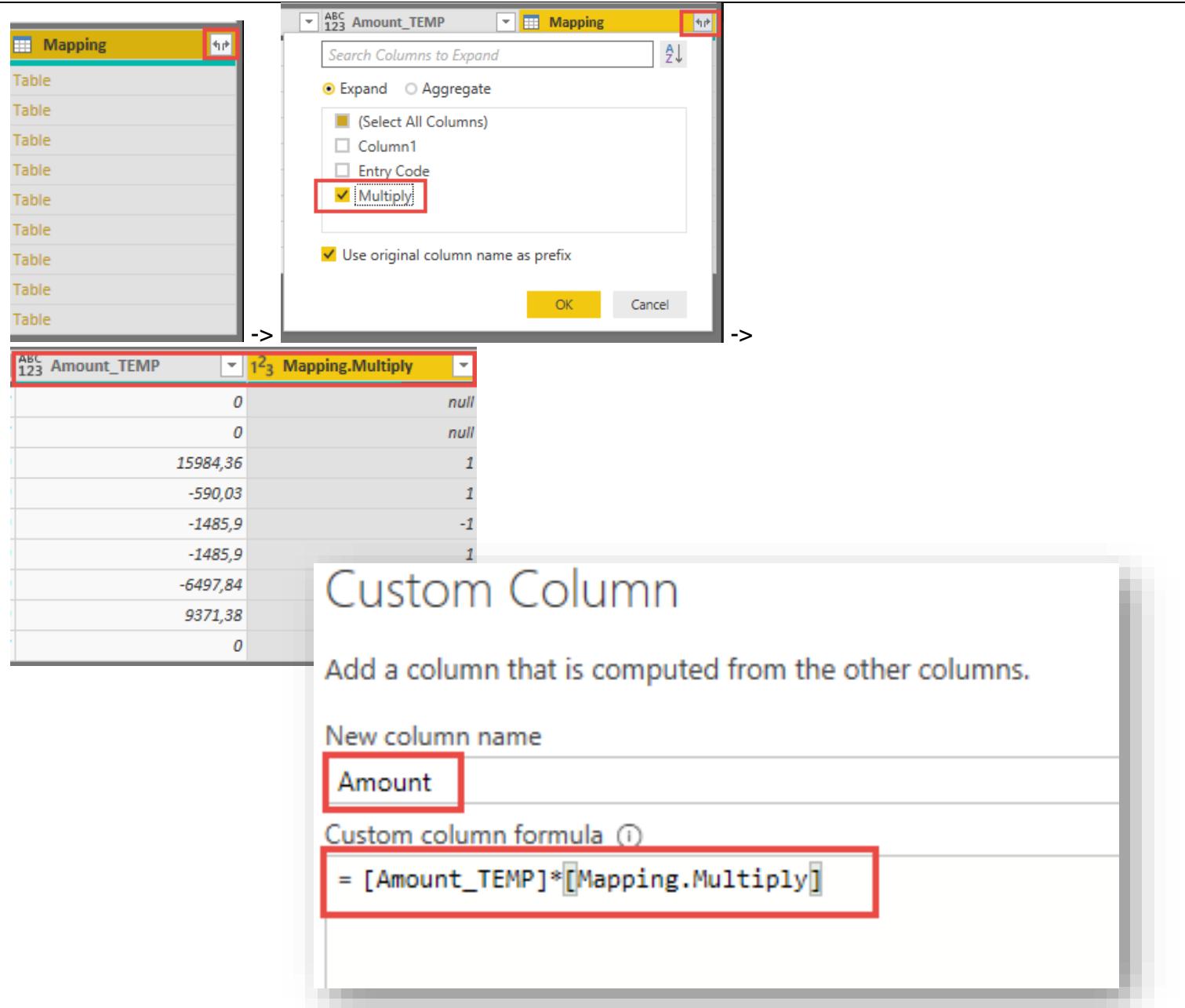
Column1	Entry Code	Multiply
Premiums ceded	10099	1
Commissions	20099	1
Profit commissions paid	20299	-1
Profit commissions paid	20499	1
Funds held – retained	40099	-1
Fund Held – released	40199	1

Merge tables

- In the original query, select the merge queries option - this function works like the VLOOKUP function in Excel
- Select the mapping table and chose in both tables which column should be merged on



- A new column has been added and it contains only the value "Table".
- In order to import the value, select the **expand icon**, and select which columns should be imported
- Create a **Custom Column** that multiplies both columns now



The screenshot illustrates the process of creating a custom column in a data mapping tool. It consists of three main panels:

- Left Panel:** A list of tables labeled "Table" followed by a red box around the "Mapping" tab.
- Middle Panel:** A "Mapping" dialog box with a red box around the "Expand" radio button. It lists several options: "(Select All Columns)", "Column1", "Entry Code", and "Multiply" (which is checked). A checkbox for "Use original column name as prefix" is also present. Buttons for "OK" and "Cancel" are at the bottom.
- Right Panel:** A table view showing data from "Amount_TEMP" and "Mapping.Multiply". The "Mapping.Multiply" column contains values like null, 1, -1, and 1. Below this is a "Custom Column" configuration window with the following fields:
 - New column name:** "Amount" (highlighted with a red box).
 - Custom column formula:** "= [Amount_TEMP]*[Mapping.Multiply]" (highlighted with a red box).

The overall flow is indicated by arrows: from the left panel to the middle dialog, and from the middle dialog to the right panel.

Amount_TEMP	Mapping.Multiply
0	null
0	null
15984,36	1
-590,03	1
-1485,9	-1
-1485,9	1
-6497,84	
9371,38	
0	

Custom Column

Add a column that is computed from the other columns.

New column name
Amount

Custom column formula (i)
= [Amount_TEMP]*[Mapping.Multiply]

- Result

ABC 123	Amount
	null
	-15984,36
	null
	590,03
	-1485,9
	1485,9
	-6497,84
	-9371,38
	null

After data is prepared, complete the model by adding necessary columns as in the Excel file

2.2 Creating the necessary columns

 **Exercise 6**

SourceFileIdentifier

[Country Code]_[Cedant Name]_[File Name]
ESP_MRE_PREMIUM

Custom Column

Add a column that is computed from the other columns.

New column name: SourceFileIdentifier

Custom column formula: = "MUC_COMPANY_ABC_PDF"

Available columns: Column1, Column2, Column3, Column4, TreatyIdentifier, AUIdentifier, Index

Learn about Power BI Desktop formulas

✓ No syntax errors have been detected.

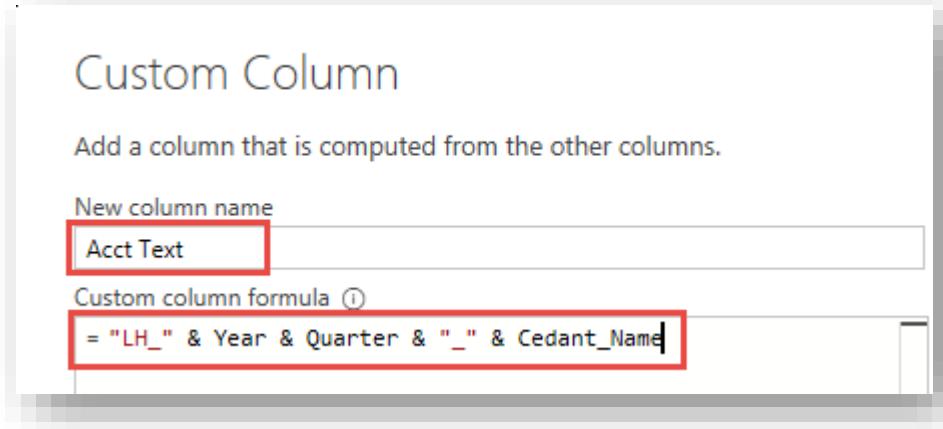
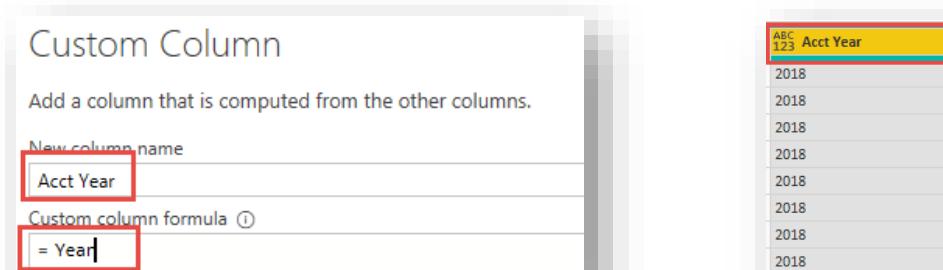
OK Cancel

ABC
123 SourceFileIdentifier ▾

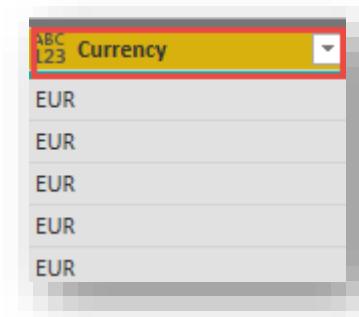
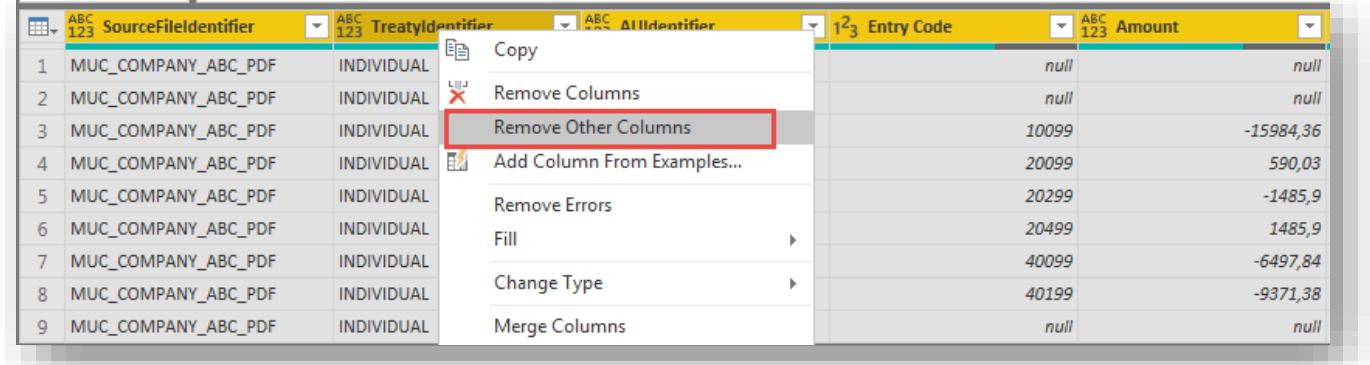
MUC_COMPANY_ABC_PDF
MUC_COMPANY_ABC_PDF
MUC_COMPANY_ABC_PDF
MUC_COMPANY_ABC_PDF
MUC_COMPANY_ABC_PDF
MUC_COMPANY_ABC_PDF
MUC_COMPANY_ABC_PDF

->

TreatyIdentifier^{xx} Treaty-Identifier-as-originally-listed-in-invoice ^{xx} Individual ^{xx}	ABC 123 TreatyIdentifier  ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL ↳ INDIVIDUAL	- already created
AUIdentifier^{xx} AU-Identifier-as-originally-listed-in-invoice ^{xx} Individual ^{xx}	ABC 123 AUIdentifier  SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY SEVERE DISABILITY	- already created
Entry^oCode^{xx} Calculated-in-model-(FSRI-Entry-Code) ^{xx} 12345 ^{xx}	123 Custom.1  null null null 20099 20299 20499 40099 40199 null	123 Entry Code  null null null 20099 20299 20499 40099 40199 null

Amount Amount-as-originally-listed-in-invoice-or-calculated-percentage: 99,9	<table border="1"> <thead> <tr> <th>ABC 123 Amount</th></tr> </thead> <tbody> <tr><td>null</td></tr> <tr><td>null</td></tr> <tr><td>15984,36</td></tr> <tr><td>-590,03</td></tr> <tr><td>1485,9</td></tr> <tr><td>-1485,9</td></tr> <tr><td>6497,84</td></tr> <tr><td>9371,38</td></tr> <tr><td>null</td></tr> </tbody> </table> <p>- already created</p>	ABC 123 Amount	null	null	15984,36	-590,03	1485,9	-1485,9	6497,84	9371,38	null
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Acct Text LH_[Year&Quarter] _[Cendant Name] LH_2018Q4_MRE	<h3>Custom Column</h3> <p>Add a column that is computed from the other columns.</p> <p>New column name <input type="text" value="Acct Text"/></p> <p>Custom column formula ⓘ <input "_"="" &="" cedant_name "="" lh_"="" quarter="" type="text" value="= " year=""/></p> 										
Acct-Year Client- Accounting- Year: 2018	<h3>Custom Column</h3> <p>Add a column that is computed from the other columns.</p> <p>New column name <input type="text" value="Acct Year"/></p> <p>Custom column formula ⓘ <input type="text" value="= Year "/></p> 										

Acct-Quarter^{xx} Client- Accounting- Quarter ^{xx} Q4 ^{xx}	<h3>Custom Column</h3> <p>Add a column that is computed from the other columns.</p> <p>New column name <input type="text" value="Acct Quarter"/></p> <p>Custom column formula ⓘ <input type="text" value="= Quarter"/></p>	<table border="1"> <thead> <tr> <th>ABC</th> <th>123</th> <th>Acct Quarter</th> </tr> </thead> <tbody> <tr><td>Q4</td><td></td><td></td></tr> <tr><td>Q4</td><td></td><td></td></tr> <tr><td>Q4</td><td></td><td></td></tr> <tr><td>Q4</td><td></td><td></td></tr> <tr><td>Q4</td><td></td><td></td></tr> <tr><td>Q4</td><td></td><td></td></tr> </tbody> </table>	ABC	123	Acct Quarter	Q4			Q4														
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UY^{xx} UY-as-in- original-file ^{xx}	<h3>Custom Column</h3> <p>Add a column that is computed from the other columns.</p> <p>New column name <input type="text" value="UY"/></p> <p>Custom column formula ⓘ <input type="text" value="= null"/></p>	<table border="1"> <thead> <tr> <th>ABC</th> <th>123</th> <th>UY</th> </tr> </thead> <tbody> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> </tbody> </table>	ABC	123	UY			null															
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OY^{xx} OY-as-in- original-file ^{xx} 2017 ^{xx}	<h3>Custom Column</h3> <p>Add a column that is computed from the other columns.</p> <p>New column name <input type="text" value="OY"/></p> <p>Custom column formula ⓘ <input type="text" value="= Null"/></p>	<table border="1"> <thead> <tr> <th>ABC</th> <th>123</th> <th>OY</th> </tr> </thead> <tbody> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> <tr><td></td><td></td><td>null</td></tr> </tbody> </table>	ABC	123	OY			null															
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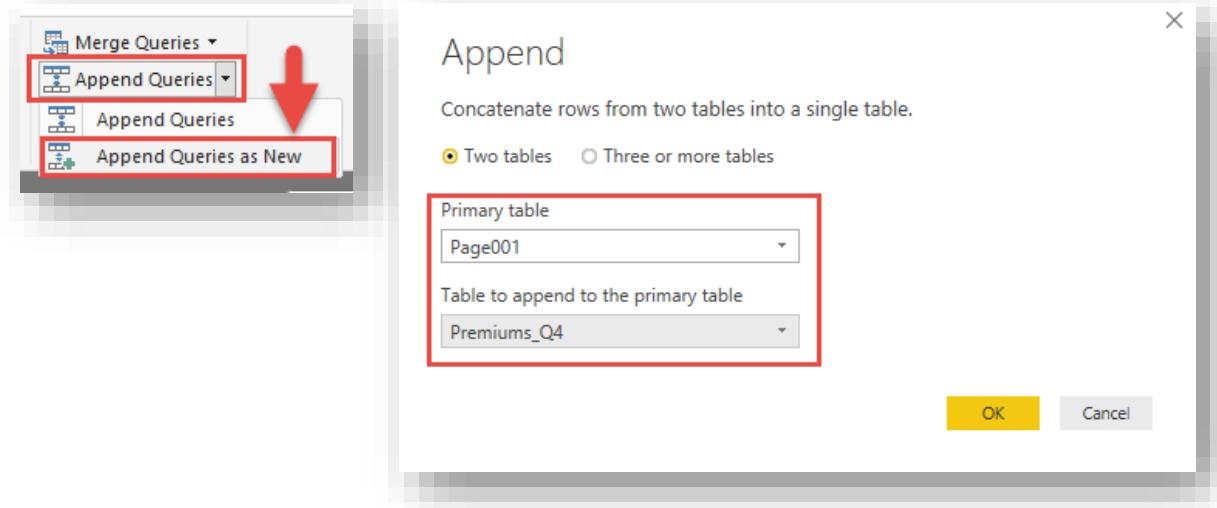
	<h3>Custom Column</h3> <p>Add a column that is computed from the other columns.</p> <p>New column name Currency</p> <p>Custom column formula ⓘ = "EUR"</p>	
->		
<ul style="list-style-type: none"> • Reorder Columns • Highlight all columns you want to keep – then rightclick & choose Remove other columns • Check & correct the data type of each column – avoid the data type Any! 		

2.3 Appending Queries & Testing Template



Exercise 7

- **Append** the 2 queries now
- Rename the new query:
Premiums_all 2018 Q4

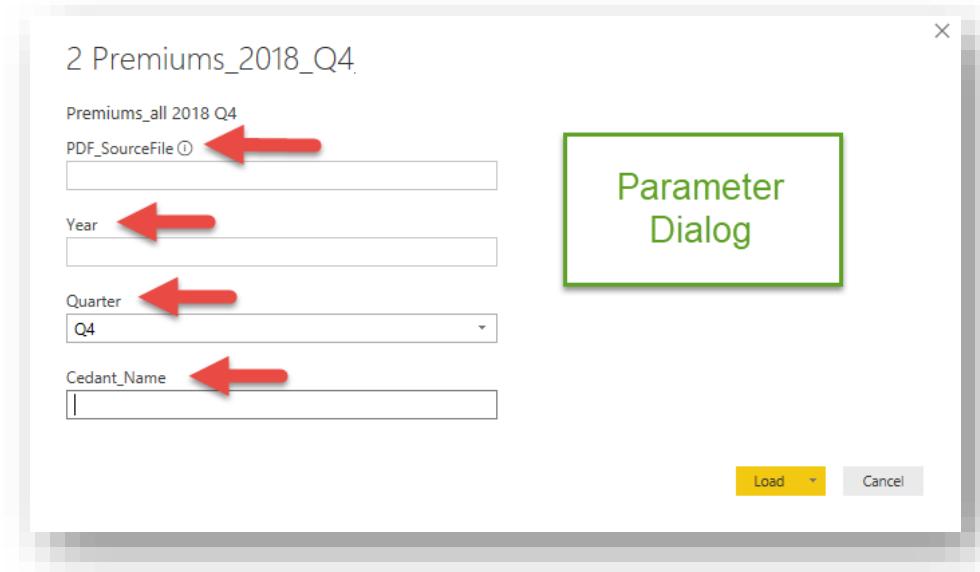


Change the setting *Enable Load*

- Only the new query should be loaded to the data model
- Save with ***Close & Apply***
- Save the **PBIX** file

Test the Template

- Save the PBIX-file as a **template**
- Copy the PDF file to the desktop
- Open the template & test the parameter dialog with the new path for the PDF file



Stay tuned ...

