Power BI Users

- Power Query Various Tips -

Good we are all here again and moving fast toward our gaols.

Today we will cover some Power Query tips to enhance our knowledge of the tools and improve our data import/cleaning workflow as well solve some of the potential compatibility Issues.

Ok let's start and see quickly what we will be exploring today:

- 1) International Data Issues
- 2) Trim
- 3) Replace
- 4) Split Column
- 5) Letters Capitalization
- 6) Group By

1) International Data Issues

In the example we saw two session ago we change the data type of the unpivot month field into "Date"

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3	iten A	Nos	01/03/2020	9							Shee	
4	iten A	Nos	01/04/2020	15							All Properties	
5	iten A	Nos	01/05/2020	18							A ASPLIED STEPS	
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7	Item A	Nes	01/07/2020	38							Source	
8	Item A	Nos	01/05/2020	21							Navigation Chapted Turne	
2	Item A	Nes	01/09/2020	23							Chargeo type	
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11	item 9	Nos	01/02/2020	22							Unpivoted Other Columna	
12	item 9	Nos	01/03/2020	25							Renamed Columns	
13	item 9	Nos	01/04/2020	19							× Changed Type2	
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15	item 9	Nos	01/06/2020	22								
16	Iten 8	Nes	01/07/2020	25								
17	Iten 8	Nes	01/08/2020	22								
18	Iten 8	Nes	01/03/2020	24								
19	Iten C	Nes	01/01/2020	25								
20	Iten C	Nes	01/02/2020	23								
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22	item C	Nos	01/04/2020	21								
23	item C	Nos	01/05/2020	22								
24	item C	Nos	01/06/2020	25								
25	item C	Nos	01/07/2020	22								
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Using the conventional data type from the drop-down menu

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14			6	Item A	Nos		-	Date		16
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16			8	Item A	Nos			Date/Time/	Timezone	21
18			9	Item A	Nos		ð	Duration		23
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21			11	пет в	Nos		×	True/False		22
22			12	Item B	Nos		1			25
23			13	Item B	Nos		E	Binary		19
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20				1496/15.1296			_	0.0000000000000000000000000000000000000	51003	

That's great, however when we are working in an international environment.

In US the date model is conventionally mm.dd.yyy while in Europe it is dd.mm.yyyy and here it is the problem when having a file coming from different source.

In this case Power BI will fail to recognise the date and the 12th July 2020 (07.12.2020 in US format) may be read as 07th December 2020 (12.07.2020) at the best or even found some errors with-out data.

In our past life we used trim, length and some MsExcel function to isolate the day, month and year component of the date and rebuild the date after and the same we could be doing using the M code of Power Query (the language that we will explore in later sessions), but is there an easier solution?

The good news is that Power Query has a really easy way of doing this for you, even if it's not immediately obvious where this functionality is. You don't need to change your Windows locale or split dates into their constituent parts and rearrange them in the correct order, or anything like that.

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6		8	Item A	Nos	(Date/Time/	Timezone	21
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Ohh yes, we can use the "Using Locale" (2).

Power BI Users

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That will open a window "Change Type with Locale", from which we do need to set the "Data Type" (3) and "Locale" (4)

3	×
Change Type with Locale	
Change the data type and select the locale of origin.	
Data Type	
Locale	
· ·	
	OK Cancel

	×
Change Type with Locale	
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Change the data type and select the locale of origin.	
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Change the data type and select the locale of origin.	
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21/26 English prus)	
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With the "Data Type" and "Locale" selection we will be presented with a sample of the format (6)

Data Type			
Date	*		
Locale			
English (Europe)	•		
 Sample input values: 29/03/2016 Tuesday, 29 March 2016 29 March March 2016 	6		

A locale is simply a name for all of the rules for date and number formats and more associated with a particular language and region. So, for example, setting the Date column so that it is interpreted using the English (United States) locale, means that when the data is loaded into Power Query on my machine I see the date 3/2/2015.

×	√ fx	= Table	e.Trans	sformColumnTypes(#"First Row as Header", {{"Date", type date}}, "en-US"]
m.	Date	Sales	*	
1	03/02/201	5 100,002		

What's happened is that the csv file contains the date "2/3/2015", I have told Power Query that the data source uses a US English format date, Power Query has then assumed this date is therefore in MM/DD/YYYY format, loaded the data for me and shown the date in my own locale (which is English (United Kingdom)) in DD/MM/YYYY format as 3/2/2015. The date itself hasn't changed, just the way it is displayed.

Yeah at the end I used the USA and UK example, as most of the time we have to deal with them.

The same workflow can be used to import number with the dot or comma as decimal separator without messing around the International Settings.

2) Trim

For the next few examples we will be using the data from the table below

LINE ITEMS 💌	REGION 💌	VALUE 💌	CODE 🔄 💌
ABC	North	12	ABC-North
ABC	South	23	ABC-South
ABC	East	18	ABC-East
ABC	Weast	20	ABC-Weast
CDE	North	100	CDE-North
CDE	South	108	CDE-South
CDE	East	97	CDE-East
CDEx	Weast	87	CDE-Weast

We notice that, for any reason the "Line Items" values come with various spaces in front of their values, but we know that regardless of this the line item "ABC" is the same regardless having one or more spaces in front of it.

During our import we do Need to "Trim" the values of the "Line Items" Field.

We right click (1) on the field we do want to trim to open the contextual window, we expand the "Transform" (2) option and click "Trim" (3)



	ABC LIN	E ITEMS 👻	A ^B C REGION	-	1 ² 3 VALUE	-	A ^B _C CODE ▼
1	ABC		North			12	ABC-North
2	ABC		South			23	ABC-South
3	ABC	All the entries	for			18	ABC-East
4	ABC	the Line Item	Field			20	ABC-Weast
5	CDE		North			100	CDE-North
6	CDE		South			108	CDE-South
7	CDE		East			97	CDE-East
8	CDEx		Weast			87	CDE-Weast

3) Replace

Let's use again the same example, but this time after we remove the spaces before the Line Items field we do want to replace the value "CDEx" with "CDE".

LINE ITEMS	REGION	VALUE 💌	CODE
ABC	North	12	ABC-North
ABC	South	23	ABC-South
ABC	East	18	ABC-East
ABC	Weast	20	ABC-Weast
CDE	North	100	CDE-North
CDE	South	108	CDE-South
CDE	East	97	CDE-East
CDEx	Weast	87	CDE-Weast

We right click (1) on the field we do want to trim to open the contextual window, we click on "Replace Values" (2) and a window will pop up.

At this point in "Value to Find" (3) we could choose "x" and the replace in "Replace With" (4) with a no character "" or find "CDEx" and replace with "CDE".



Replace Values	
Replace one value with another in the selected columns	
replace one value war another in the selected columns.	
Value To Find	
x	
Replace With	
4	
Advanced options 5	
Match entire cell contents	
Replace using special characters	
Insert special character *	
	OK Cancel
	UK Califei

	A ^B C LINE ITEMS	A ^B _C REGION	123 VALUE	A ^B _C CODE ▼	
1	ABC	North	12	ABC-North	
2	ABC	South	23	ABC-South	
3	ABC	East	18	ABC-East	
4	ABC	Weast	20	ABC-Weast	
5	CDE	North	100	CDE-North	
6	CDE	South	108	CDE-South	
7	CDE	East	97	CDE-East	
8	CDE	Weast	87	CDE-Weast	

Click "Match entire cell contents" (5) option to replace cells from the entire contents; otherwise, "Replace Values" replaces each Value To Find match.

Last click "Replace Using Special Characters" (6) option to replace using wild characters as below

a design of the second s	
Replace one value with another in the	selected columns.
Value To Find	
#(tab)	
Replace With	
CDD	
Advanced options Match entire cell contents	
Advanced options Match entire cell contents Replace using special characters	7
Advanced options Match entire cell contents ✓ Replace using special characters Insert special character ▼	7
Advanced options Match entire cell contents ✓ Replace using special characters Insert special character Tab	
▲ Advanced options Match antine call contants	OK Care
Advanced options Match antine cell contents Replace using special characters Insert special character ▼ Tab Carriage Return Line Feed	OK Garce

4) Split Column

Let's use the same file and we know we do have all the information in the "Line Items" and "Region" field, but assume we did not, and we do need to use the "Code" field to extract the "Line Item" and "Region".

LINE ITEMS 💌	REGION 💌	VALUE 💌	CODE 🛛 💌
ABC	North	12	ABC-North
ABC	South	23	ABC-South
ABC	East	18	ABC-East
ABC	Weast	20	ABC-Weast
CDE	North	100	CDE-North
CDE	South	108	CDE-South
CDE	East	97	CDE-East
CDEx	Weast	87	CDE-Weast

We should first of all Trim the values within the "Code" field, using the workflow that we just saw and then split the field content using the "-" as separator.

We upload the table into Power Query.

.	ABC LINE ITEMS	A ^B _C REGION	٠	123 VALUE	٣	ABC CODE
1	ABC	North			12	ABC-North
2	ABC	South			23	ABC-South
3	ABC	East			18	ABC-East
4	ABC	Weast			20	ABC-Weast
5	CDE	North			100	CDE-North
6	CDE	South			108	CDE-South
7	CDE	East			97	CDE-East
8	CDEX	Weast			87	CDE-Weast

We trim the "CODE" field values as previously shown.

	ABC LINE ITEMS	*	ABC REGION	٣	123 VALUE		A ^B C CODE
1	ABC		North			12	ABC-North
2	ABC		South			23	ABC-South
3	ABC		East			18	ABC-East
4	ABC		Weast			20	ABC-Weast
5	CDE		North			100	CDE-North
6	CDE		South			108	CDE-South
7	CDE		East			97	CDE-East
8	CDEx		Weast			87	CDE-Weast

At this point we are ready to perform the Split, we right click (1) on the field we need to transform, in the context window we choose "Split Column" (2) and the "By Delimiter" (3).

oup By	Use F as He	Home Transform	Data Type: Text • In Data Type: Text • In Detect Data Ty In Rename	file → 2 Replace Valu Appe → Fill → appe → File → appertunction	nes • E	<mark>е</mark> и М Со	npivot Columns • ove • onvert to List	AEC AEC EX 123 EX nat abc Pa	lerge Columns dract • arse •	XO Statistics Standard Sciel Number
 Calizanh 	× 1 2 3 4 5 6 7 8	ABC ABC ABC CDE CDE CDE CDE CDE CDE CDE CDE CDE CD	Fable . TransformCo AR _C REGION North South East Weast Weast	lums (#***) oge 123 valu 22 23 18 20 100 100 108 97 87	A ^R C ABC ABC ABC ABC CDE- CDE- CDE- CDE-	₽ <u>+</u> ₩ ₩	{{"CODE", Text.Trim, type Copy Remove Remove Other Columns Duplicate Column Add Column From Examples. Remove Duplicates Remove Errors Change Type Transform Replace Values	• text}})	
					2	dh z	Split Column Group By Fill Unpivot Columns Unpivot Other Columns Unpivot Only Selected Colum Rename Move Drill Down Add as New Query))))	By Delir By Norm By Posit By Lowe By Upp By Digit By Non-	aniter oer of characters oros ercase to Uppercase ercase to Lowercase to Non-Digit Digit to Digit

At this point a window open with the various parameters to perform our transformation / split:

- 1. Select the character/delimiter that trigger the split, in this case we choose a custom one "-";
- 2. Select when and how to do the split, in this case for each occurrence of the delimiter; and
- 3. How the system will return the split, by column or row, in this case by columns.

plit Column by Delimiter		
Specify the delimiter used to split the text column.		
Select or enter delimiter		
Custom *		
-		
Split at		
C Left-most delimiter		
Right-most delimiter		
Each occurrence of the delimiter		
Advanced options		
Split into		
Columns		
O Rows		
Number of columns to split into		
2		
Quote Character		
Split using special characters		
Insert special character *		
	OK	Cancel

We have now the "CODE" field split into two "CODE.1" and "CODE.2"

×	√ <i>f</i> x = 1	able.SplitColumn	n(#"Trimmed Tex	t", " <mark>CODE</mark> ", Spli	tter.SplitTextBy	Delimiter("-", QuoteStyle.Csv), {"CODE.1", "CODE.2
. ,	A ⁸ _C LINE ITEMS	A ^B _C REGION -	123 VALUE	A ^B C CODE.1	A ^B _C CODE.2 •	
1	ABC	North	12	ABC	North	
2	ABC	South	23	ABC	South	
3	ABC	East	18	ABC	East	
4	ABC	Weast	20	ABC	Weast	
5	CDE	North	100	CDE	North	
6	CDE	South	108	CDE	South	
7	CDE	East	97	CDE	East	
8	CDEx	Weast	87	CDE	Weast	

If wanted we can change their heading.

	ABC LINE ITEMS	٠	A ^B _C REGION	123 VALUE	A ⁸ _C ITEM ▼	A ^B _C REGION2 ~
1	ABC		North	12	ABC	North
2	ABC		South	23	ABC	South
3	ABC		East	18	ABC	East
4	ABC		Weast	20	ABC	Weast
5	CDE		North	100	CDE	North
6	CDE		South	108	CDE	South
7	CDE		East	97	CDE	East
8	CDEx		Weast	87	CDE	Weast

5) Letters Capitalization

Using the same source data file, in case the "REGION.2" field created in the previous tip is not consistently formatted, in terms of letter capitalization, we could perform a further transformation:

- 1. Right click on the field we do want to transform;
- 2. On the sensitive menu click "Transform"; and
- 3. Select "UPPERCASE".

	A ^B C LINE ITEMS	A ^B _C REGION =	123 VALUE	ABC ITED	A ⁸ C REC	1	CODY		
1	ABC	North	12	ABC	North		-		
2	ABC	South	23	ABC	South	×	Remove		
3	ABC	East	18	ABC	East		Remove Other Columns		
4	ABC	Weast	20	ABC	Weast	-	Duplicate Column		
5	CDE	North	100	CDE	North	83	Add Column From Examples		
6	CDE	South	108	CDE	South		Remove Duplicates		
7	CDE	East	97	CDE	East		Remove Errors		
8	CDEx	Weast	87	CDE	1	<u>}_</u>	Change Type		
							Replace Values Replace Errors Split Column Group By Fill Unpivot Columns Unpivot Other Columns	3	Capitalize Each Word Trim Clean Length JSON XML
						—]	Unpivot Only Selected Columns Rename Move	×.	
							Add as New Query		

All the records associated with the "REGION2" field are not capitalised.

×	√ fx =	 Table.TransformCo 	lumns(#"Renamed	i Columns",{{" <mark>F</mark>	REGION2", Text.Up	<pre>per, type text}})</pre>
	A ^B C LINE ITEMS		1 ² 3 VALUE	A ^B _C ITEM ▼	A ^B C REGION2	
1	ABC	North	12	ABC	NORTH	
2	ABC	South	23	ABC	SOUTH	
3	ABC	East	18	ABC	EAST	
4	ABC	Weast	20	ABC	WEAST	
5	CDE	North	100	CDE	NORTH	
6	CDE	South	108	CDE	SOUTH	
7	CDE	East	97	CDE	EAST	
8	CDEx	Weast	87	CDE	WEAST	

Similarly we could perform the following text transformations (that are self explanatory):

- lowercase;
- UPPERCASE; and
- Capitalise Each Word.

1	Сору		
	Remove Remove Other Columns Duplicate Column		
	Remove Duplicates Remove Errors		
	Change Type		
	Transform		lowercase
2	Replace Values Replace Errors		UPPERCASE Capitalize Each Word
1	Split Column Group By		Clean Length
1	Fill Unpivot Columns	2	JSON XML
	Unpivot Other Columns Unpivot Only Selected Columns		
	Rename		
	Drill Down	3	
	Add as New Query		

6) Group By

Using the same source data file, we will import the data already Grouped.

You will be asking the reason of this, as we could perform this in Power BI or Power Pivot, and you are right, however think of working with millions of records.

Is always good practice to understand the minimum level of drill down that is required on our data and upload the essential data (memory utilisation optimisation that lead to system good performance and reaction time).

LINE ITEMS 💌	REGION 💌	VALUE 💌	CODE 🛛 💌
ABC	North	12	ABC-North
ABC	South	23	ABC-South
ABC	East	18	ABC-East
ABC	Weast	20	ABC-Weast
CDE	North	100	CDE-North
CDE	South	108	CDE-South
CDE	East	97	CDE-East
CDEx	Weast	87	CDE-Weast

- 1. Right click on the field we do want to group by; and
- 2. On the sensitive menu click "Group By...".

□.,	A ^B C LINE ITEMS	A ^B _C REGION	+ 123 VA	ABC IT	EBA	▼ A ^B REGION2 ▼	
1	ABC	North	12	ABC	-0	Сору	
2	ABC	South	23	ABC	×	Remove	
3	ABC	East	18	ABC		Remove Other Columns	
4	ABC	Weast	20	ABC		Duplicate Column	
5	CDE	North	100	CDE	-	Add Column From Examples	
б	CDE	South	108	CDE		Remove Duplicates	
7	CDE	East	97	CDE		Remove Errors	
8	CDEx	Weast	87	CDE		Change Type	÷
						Transform	×
					1	Replace Values	
						Replace Errors	
			1	2	dh	Split Column	
				-	B	Group By	
						Fill	
					5	Unpivot Columns	
						Unpivot Other Columns	
						Unpivot Only Selected Columns	
					-I	Rename	
						Move	
						Drill Down	
						Add as New Overv	

The context window will open and we will:

- 1. Click for the "Advanced" grouping option;
- 2. Select the filed we do want group by;
- 3. Add additional field to group by;
- 4. Insert the grouping aggregation calculation; and
- 5. Add further grouping aggregation calculations as necessary.

Specify the columns to g	1 by and one or more output	uts.		
Basic Advanced	—			
iroup by	2			
ITEM	*			
Add grouping				
vew column name	Operation		Column	-4
lew column name Count	Operation Count Rows	*	Column	-4
iew column name Count Add aggregation	Operation Count Rows	*	Column	-4
Vew column name Count Add aggregation	Operation Count Rows	٣	Column	 4

In this case we decide to group by "ITEM" field and for each group count the number of entries, number that will be saved into the new created "Count" field.

X	√ fx	= Table.Group(#"U	percased T <mark>ext"</mark> ,	{"ITEM"}, {{"Count", eac	h Table.RowCount(_),	type number
	A ⁸ _C ITEM ▼	1.2 Count 💌				
1	ABC	4				
2	CDE	- 4				

Now we do want to calculate the sum of "Value" grouped by "REGION", so we will:

- 1. Group by "REGION";
- 2. Select the "Sum" aggregation function; and
- 3. Sum to be performed on the "Value" field.

Group By				
Specify the columns to gro	oup by and one or more output	its.		
O Basic Advanced				
Group by				
REGION	*			
Add grouping	Operation	2	Column	
	Sum		LINE ITEMS	
Count				
Count	Sum			

specify the columns to group t	by and one or more out	puts.		
O Basic Advanced				
Group by				
REGION +				
How grouping				
New column name	Operation	3	Column	_
New column name	Operation Sum	3	Column VALUE	• •••
New column name Count Add aggregation	Operation Sum	3	Column VALUE LINE ITEMS REGION	× 1.1
New column name Count Add aggregation	Operation Sum	3	Column VALUE LINE ITEMS REGION VALUE	×

And here it is our grouped result.

<	√ ƒx	= Table.Group(#"U	<pre>ppercased Text", {"REGION"}, {{"Count", each List.Sum([VALUE]), type</pre>
	A ^B _C REGION	1.2 Count 💌	
1	North	112	
2	South	131	
3	East	115	
4	Weast	107	

Similarly if we wold group by "ITEM" and then "REGION" field, and return the count of entries for the combination of ITEM – REGION grouping along side the relevant sum of the "VALUE" field.

Group By				
Specify the columns to gro	oup by and one or more outp	uts.		
Basic Advanced				
Group by				
ITEM	*			
REGION	*			
Add grouping				
Add grouping				
Mean column pares	Operation		Column	
New column name	Operation		Column	
Count	Count Rows			· · ·
Sum	Sum	•	VALUE	-
Add aggregation				

Good progress done with this session.

In these sessions I do no spend a lot of effort in explaining every single functionality, I rather prefer give you a solid basis from which you can start fly by yourself.

You will need to practice the topics presented in these sessions, and if want further enhance your knowledge with Mr Google. Yes Mr Google always knows everything as once a colleague of mine told me.

Soon we will complete the sessions on Power Query and move to the real magic of Power BI and Power Pivot the DAX language.