Microsoft Power Tools for Data Analysis #20 Power Query Parameter for Folder Path in Excel and Power BI

Notes from Video:

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1) Goal of Video :

- i. Use Variable Folder Path for Query, also known as Parameter Folder Path for Query.
- ii. Because Power Query does not allow a query to point to a second query that contains the Folder Path (we get a Formula.Firewall Error), both in Excel and Power BI, we will have to create a separate query that conations the folder path and lands the list of files, then in a second query we will reference that separate query.

2) Formula.Firewall Error

- i. Formula.Firewall is a defense against accidentally sending data, as part of query folding, to another data source that does not have permission to receive that data, or "unintentionally leaking data between sources".
- ii. If you try to point a query to a second query that contains the Folder Path, this is the error you will see (Error We See In This Video):

Formula.Firewall: Query 'AllFiles' (step 'Source') references other queries or steps, so it may not directly access a data source. Please rebuild this data combination.

- iii. If there are two data sources with different Privacy Settings (like an SQL data source and an Excel data source), you will get this error (This Happens, But We Do Not See In This Video):
 - 1. Error message in older versions of Power Query:



2. Error message in newer versions of Power Query:

Privacy levels	
The privacy level is used to ensure data is combined withou privacy levels may lead to sensitive data being leaked outsi on privacy levels can be found <u>here</u> .	t undesirable data transfer. Incorrect de of a trusted scope. More information
 Ignore Privacy Levels checks for this file. Ignoring Privacy Levels to an unauthorized person. 	els could expose sensitive or confidential data
 Ignore Privacy Levels checks for this file. Ignoring Privacy Levels to an unauthorized person. Current Workbook ① 	els could expose sensitive or confidential data

3) Query Folding(Not in Video)

- i. User creates query in Power Query with Applied Steps.
- ii. If the Applied steps can be sent back to the data source for more efficient processing rather than having the Power Query Engine process the query, Power Query is smart enough to send the code necessary back to the data source for more efficient processing, like with SQL Database or OData data sources.

4) Data Source Privacy Levels(Not in Video)

- i. Privacy Levels for a particular Data Source in Power Query determines if data can be sent to somewhere else, like from an Excel Workbook File to an SQL Database as part of a query that uses both data sources.
- ii. Levels:
 - 1. Public
 - i. Can be sent to any other data source
 - 2. Organizational
 - i. Data can only be sent to other organizational data sources
 - 3. Private
 - i. Data can never be sent to another data source
- iii. Change Privacy Levels:
 - 1. Data Ribbon Tab, Get & Transform group, Get Data, Data Source Settings:
 - i. File, Options and Settings, Data Source Settings, Edit Permissions.
 - 2. Options for Privacy Levels:
 - i. Data Ribbon Tab, Get & Transform group, Get Data, Query Options:
 - Global, Privacy
 - i. "Always ignore Privacy Levels settings" will get rid of Formula. Firewall Error.
 - Microsoft help: "by selecting Ignore the Privacy levels and potentially improve performance but could expose sensitive or confidential data to an unauthorized person.
 - ii. "Combine data according to each file's Privacy Level settings".
 - 1. Microsoft help: "Privacy level settings are used to determine the level of isolation between data sources when combining data."
 - iii. "Always combine data according to your Privacy Level setting each source".
 - 1. Microsoft help: none.

5) Parmenter Query :

- i. Parameter Query = A query that has a variable input
- ii. Parameter synonyms:
 - 1. Parameter
 - 2. Variable
 - 3. Formula Input
 - 4. Argument

6) Situation in Excel for this Video

Exc	cel:
1) We Need to Import Files from Folder, but Folder path will change.	3) We want to tell Power Query where our files are located (Folder Path)
 This PC > Desktop > MSPTDA-20-TextFiles > Start Name Date model FebAccounts.txt JanAccounts.txt MarAccounts.txt 1/15/19 	Folder Folder path CAUSers1/mginin1/Desktop1/MSPTDA-20-TextFiles1/Start Browse OK Cancel
2) We want to use From Folder Option	4) Excel Table in Worksheet contains our Variable or Parameter Folder Path

7) Steps to Create Folder Path Parameter in Excel

- i. Open file named "020-MSPTDA-PQParameterDataSource-Start.xlsx".
- ii. Create a One-Row, One-Column Excel Table in the Excel Worksheet that contains the variable Folder Path, (we will call it an Excel Parameter Table) as seen here:

	Α	В	
1			
2		FolderPathVariable	
3		C:\Users\mgirvin\Desktop\MSPTDA-20-TextFiles\Start]
100			-

iii. Use the "From Table" button in the Get & Transform group in the Data Ribbon Tab to import the Excel Parameter table into the Power Query Editor, as seen here:



- iv. Name the query "FolderParameter".
- v. Delete the "Change Type" step that is automatically created in the Applied Steps list when you import the Excel Parameter Table.

- vi. Using the formula bar, Modify the M Code for the "Source" step in the Applied Steps List, as see below:
 - 1. As discussed in the video and in MSPTDA Video #9, there are two different Two-Way Lookups in this formula:
 - i. Two-Way Lookup to get Excel Table from Excel Worksheet:

Excel.CurrentWorkbook(){[Name="ExcelTableFolderParameter"]}

ii. Two-Way Lookup to get Folder Path from first row of imported Excel Table:

[Content]{0}[FolderPathVariable]

2. The Folder. Files Power Query function takes a Folder Path and retrieves all the files in the specified folder.

×	✓ <i>f</i> _x	= Folder.Files(E	xcel.CurrentWork	book(){[Name="ExcelTab	o <mark>le</mark> Folde	rParameter"]}	[Cont	tent]{0}[FolderP	PathVariable])	
	E Content	++ A ^B _C Name	▼ A ^B _C Extension	Date accessed	- 5	Date modified		Date created	Attributes	4114
1	Binary	JanAccounts.txt	.txt	4/26/19 4:10:5	4 PM	11/3/18 10:51:4	12 AM	4/25/19 9:20:	59 AM Record	

vii. Close & Load the "FolderParameter" query as a Connection Only.

viii. The "FolderParameter" has successfully imported the files in the folder without getting a Formula. Firewall Error. Because this query is not referring to another query with the folder path, we do not get the error.

- ix. Open the Power Query window back up. One way to do this is by right-clicking the "FolderParameter" query in the Queries & Connections Pane.
- x. On the left-side of the Power Query Editor, in the Queries Pane, right-click the "FolderParameter" query and point to Reference, as seen here:

File	Home	Transform Ad	d Column
Close & Load • Close	Refresh Preview •	Properties Advanced Editor Manage Query	Choose Columns + C Manage Co
Queries [l] IdaeDaraenu	< × .	✓ <i>f</i> _X =
		Copy Paste Delete Rename Duplicate	

- i. Name the query "FolderParameter".
- ii. Click Combine button at top of Content Column to Append all Text File Data Sets.

File	▼	Power Query orm Add	Editor Column	View					Combine Button
Close & Load ▼ Close	Refresh Preview • Mana Query	erties nced Editor age 🕶	Choose Columns - Manage	Remove Columns •	Keep Rows •	Reprove Rows •	A↓ Z↓ Sort	Split Columr	
Queries [Fol	2] <	× ✓ □+ □ Cc 1 Binary	f _x	= Folder Pa	rameter e 💽	A ^B C Ex	tension	-	

iii. In the next step, make sure the Delimiter is Tab, then click OK.

					\times
Combine Files					
Specify the settings for each file. Lea	rn more				
Example File:					
First file	¢*				
File Origin	Delimiter		Data Type Detection		
1252: Western European (Windows)	* Tab	*	Based on first 200 rows	•	13
Account Name	Expense Group	Amount			 1
Professional Fee- Mr. B	Legal and professional Charges	5562.459788			

iv. The Final Table in the Power Query Editor and all the Queries (on the left) and Applied Steps (on the right), are seen here:

I U ↓ ↓ AllTextFiles - File Home Transformation	Powe rm	r Query Editor Add Column Vie	w			- C X
Close & Refresh Close & Query	rties nced f ge 🕶	ditor Choose Rer Columns - Colu Manage Colu	move mms • Reduce Rows Reduce Rows Rows • Rows • Ro	Data Type: Text Toup By 1, 2 Replace Values Transform	Combine • Manage Parameters • Parameters	Data sources Data Sources Data Sources Data Sources Data Sources
Queries [6]	>	√ f _X = Ta	ble.TransformColumnTypes(#"Expanded `	Table Column1",{{"Source.Name"	, type text}, 🗸 🗸	Ouerv Settings X
Transform File f	m.	A ^B _c Source.Name	AB ₂ Account Name	AB _c Expense Group	1.2 Amount	
A Sample Quer	1	JanAccounts.txt	Professional Fee- Mr. B	Legal and professional Charges	5562.459788	PROPERTIES
Sample File	2	JanAccounts.txt	Rent - Branch Office 1	Rentals	9492.639328	Name
Sample File	3	JanAccounts.txt	Travel - Director	Traveling Expenses	15000	AllTextFiles
Transform Sa	4	JanAccounts.txt	Elec Expenses - Branch Office 2	Power and Fuel Expenses	17838.96471	All Properties
fx Transform Fil	5	JanAccounts.txt	Elec Expenses - Branch Office 1	Power and Fuel Expenses	25818.79137	
A Other Queries [2]	6	JanAccounts.txt	Travel - Local	Traveling Expenses	26316.33627	A APPLIED STEPS
	7	JanAccounts.txt	Elec Expenses - Head Office	Power and Fuel Expenses	26482.71906	Source
FolderParame	8	JanAccounts.txt	Elec Expenses - Petrol and Diesel expenses	Power and Fuel Expenses	35456	Filtered Hidden Files1
AllTextFiles	9	JanAccounts.txt	Rent - Head Office	Rentals	35930.3024	Invoke Custom Function1
	10	JanAccounts.txt	Professional Fee- Mr. C	Legal and professional Charges	49463.95913	Renamed Columns1
	11	JanAccounts.txt	Sales - Branch Office 1	Sales	51180.96398	Removed Other Columns 1 SP
	12	JanAccounts.txt	Professional Fee- Mr. A	Legal and professional Charges	80234.25807	Expanded Table Column 1
	13	JanAccounts.txt	Travel - Sales Team	Traveling Expenses	81713.48797	X changed type
	14	JanAccounts.txt	Rent - Branch Office 2	Rentals	85212.42125	
	15	JanAccounts.txt	Travel - Foreign	Traveling Expenses	88462.92647	
	16	JanAccounts.txt	Sales - Branch Office 2	Sales	406428.0342	
	17	JanAccounts.txt	Sales - Head Office	Sales	768500.2395	

- v. Close & Load the query to the Excel Worksheet.
- vi. Import Data dialog box should look like this:



vii. Final query output should look like this:

- 4	A	В	C D	E	F	G	H
1				Source.Name	Account Name	Expense Group	Amount
2		FolderPathVariable		JanAccounts.txt	Professional Fee- Mr. B	Legal and professional Charge:	5562.459788
3		C:\Users\mgirvin\Desktop\MSPTDA-20-TextFiles\Start		JanAccounts.txt	Rent - Branch Office 1	Rentals	9492.639328
4				JanAccounts.txt	Travel - Director	Traveling Expenses	15000
5				JanAccounts.txt	Elec Expenses - Branch Office 2	Power and Fuel Expenses	17838.96471
6		Changed Folder Path:		JanAccounts.txt	Elec Expenses - Branch Office 1	Power and Fuel Expenses	25818.79137
7		C:\Users\mgirvin\Desktop\NewLocationsFoprMSPTDA-20	_TextFiles\MSPTDA-20-Tex	tFiles\S JanAccounts.txt	Travel - Local	Traveling Expenses	26316.33627
8		C:\Users\mgirvin\Desktop\MSPTDA-20-TextFiles\Start		JanAccounts.txt	Elec Expenses - Head Office	Power and Fuel Expenses	26482.71906
9		C:\Users\FamilyUse\Desktop\MSPTDA-20-TextFiles\Start		JanAccounts.txt	Elec Expenses - Petrol and Diesel expense	es Power and Fuel Expenses	35456
10				JanAccounts.txt	Rent - Head Office	Rentals	35930.3024
11				JanAccounts.txt	Professional Fee- Mr. C	Legal and professional Charge:	49463.95913
12				JanAccounts.txt	Sales - Branch Office 1	Sales	51180.96398
13				JanAccounts.txt	Professional Fee- Mr. A	Legal and professional Charges	80234.25807
14				JanAccounts.txt	Travel - Sales Team	Traveling Expenses	81713.48797
15				JanAccounts.txt	Rent - Branch Office 2	Rentals	85212.42125
16				JanAccounts.txt	Travel - Foreign	Traveling Expenses	88462.92647
17				JanAccounts.txt	Sales - Branch Office 2	Sales	406428.0342
18				JanAccounts.txt	Sales - Head Office	Sales	768500.2395
19							
20							
21							
22							

viii. When you change the parameter and use the keyboard to Refresh All in the Excel Workbook, it can look like this:

A	В	С	D	E	F	G	н	1
1				Source.Name	Account Name	Expense Group	Amount 🔀	
2	FolderPathVariable			FebAccounts.txt	Professional Fee- Mr. B	Legal and professional Charges	24586.2	
3	C:\Users\mgirvin\Desktop\NewLocationsFoprMSPTDA-20	_TextFiles\MSPT	DA-20-TextFiles\S	FebAccounts.txt	Rent - Branch Office 1	Rentals	11226.53	
4				FebAccounts.txt	Travel - Director	Traveling Expenses	14622.14	
5				FebAccounts.txt	Elec Expenses - Branch Office 2	Power and Fuel Expenses	14424.87	
6	Changed Folder Path:			FebAccounts.txt	Elec Expenses - Branch Office 1	Power and Fuel Expenses	16492.73	
7	C:\Users\mgirvin\Desktop\NewLocationsFoprMSPTDA-20	_TextFiles\MSPT	DA-20-TextFiles\S	FebAccounts.txt	Travel - Local	Traveling Expenses	15308.31	
8	C:\Users\mgirvin\Desktop\MSPTDA-20-TextFiles\Start			FebAccounts.txt	Elec Expenses - Head Office	Power and Fuel Expenses	12558.96	
9	C:\Users\FamilyUse\Desktop\MSPTDA-20-TextFiles\Star	t		FebAccounts.txt	Elec Expenses - Petrol and Diesel expenses	Power and Fuel Expenses	10802.43	
10				FebAccounts.txt	Rent - Head Office	Rentals	24619.04	
11				FebAccounts.txt	Professional Fee- Mr. C	Legal and professional Charges	48759	
12				FebAccounts.txt	Sales - Branch Office 1	Sales	18019.45	
13				FebAccounts.txt	Professional Fee- Mr. A	Legal and professional Charges	25113.99	
14				FebAccounts.txt	Travel - Sales Team	Traveling Expenses	11549.3	
15				FebAccounts.txt	Rent - Branch Office 2	Rentals	22907.84	
16				FebAccounts.txt	Travel - Foreign	Traveling Expenses	23402.71	
17				FebAccounts.txt	Sales - Branch Office 2	Sales	10203.74	
18				FebAccounts.txt	Sales - Head Office	Sales	21961.17	
19				FebAccounts.txt	Admin - Salary	Admin	18024.31	
20				FebAccounts.txt	Admin - Office	Admin	12633.17	
21				JanAccounts.txt	Professional Fee- Mr. B	Legal and professional Charges	5562.459788	
22				JanAccounts.txt	Rent - Branch Office 1	Rentals	9492.639328	
23				JanAccounts.txt	Travel - Director	Traveling Expenses	15000	
24				JanAccounts.txt	Elec Expenses - Branch Office 2	Power and Fuel Expenses	17838.96471	
25				JanAccounts.txt	Elec Expenses - Branch Office 1	Power and Fuel Expenses	25818.79137	
26				JanAccounts.txt	Travel - Local	Traveling Expenses	26316.33627	
27				JanAccounts.txt	Elec Expenses - Head Office	Power and Fuel Expenses	26482.71906	
28				JanAccounts.txt	Elec Expenses - Petrol and Diesel expenses	Power and Fuel Expenses	35456	
29				JanAccounts.txt	Rent - Head Office	Rentals	35930.3024	
80				JanAccounts.txt	Professional Fee- Mr. C	Legal and professional Charges	49463.95913	
81				JanAccounts.txt	Sales - Branch Office 1	Sales	51180.96398	
32				JanAccounts.txt	Professional Fee- Mr. A	Legal and professional Charges	80234.25807	

8) Situation in Power BI Desktop for this Video

This PC > Desktop >	MSPTDA-20-TextFiles > Start	Folder
Name	^ Date mo	Folder path Image: The second secon
FebAccounts.txt	1/15/19	X
JanAccounts.txt	11/3/18	
MarAccounts.txt	1/15/19	OK Cancel
2) We v	want to use From Folder Option	4) Variable of Parameter Folder Path created with Parameter Fea
AU		X
Get Data		Parameters
	All	New Name
		A*C DataSourcePathParameter DataSourcePathParameter Description
All	L Excel	DataSourcePathParameter
File	Text/CSV	
	XML XML	a Partial
Database	ISONI	Туре
Database Power Bl	E- 130N	
Database Power Bl Azure	Folder	Text *

9) Steps to Create Folder Path Parameter in Power BI

- i. Open the file named "020-MSPTDA-PQParameterDataSource-Start.xlsx".
- ii. In the Power BI Desktop window, in the Home Ribbon Tab, in the External data group, click the Edit Query drop-down, then click on Edit Queries, as seen here:

aal 🔒	5 🥏 후 020-1	MSPTDA-P	QParame	terDataS	ource-	Start -	- Power Bl	Desktop	ŝ		
File	Home	View	Modeling	H	elp						
Paste	 K Cut Copy ✓ Format Painter 	Get Data ▼	Recent Sources +	Enter Data	Ed	it ies ▼	Refresh	New Page •	New Visual	Ask A Question	Buttor
	Clipboard		E	xternal o	K ist	Edit	Queries			Inse	rt
ūJ						Data Edit	a source se Parameter	ttings s			

iii. In the Power Query window, in the Home Ribbon Tab, in the Parameter group, click the Manage Parameter drop-down, then click on New Parameter, as seen here:



iv. Create your Parameter, then click OK, as seen here:

2 13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	New	Name
A ^B C FolderPathAddress	×	FolderPathAddress
		Description
		✓ Required
		Text
		Suggested Values
		Any value
		Current Value
		C:\Users\mgirvin\Desktop\MSPTDA-20-TextFiles\Start

- v. In the Power Query Editor window:
 - 1. in the Home Ribbon Tab, in the Get external data group, click the New Source drop-down, then click on More.
 - 2. Then in the "Get Data" dialog box, click the "From Folder" option.
 - 3. Then click the Connect button, as seen here:

H 🔒		Get Dat	×
ΞX		Search	All
=		All	K Excel
Close & Apply •	New Recent Enter Source • Sources • Data	File	Text/CSV
Close	Most Common	C Database	M XML
	Excel	Power BI	JSON JSON
Queries		Azure	Folder 2
Folde	SQL Server	P Online Se	ervices 📴 PDF
		Other	SharePoint folder
	Analysis Services		SQL Server database
			ACcess database
	Text/CSV		🤪 SQL Server Analysis Services database
			Oracle database
	Web		🥫 IBM Db2 database
			🥫 IBM Informix database (Beta)
	OData feed		IBM Netezza
			MySQL database
	Blank Query		PostgreSQL database
	More	1 <u>Certified Conr</u>	anectors 3 Connect Cancel

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vi. In the Folder Path text box, use the drop-down to select "Parameter", as seen here:

older path		
B _C -	Browse	
N ^B C Text		
B Parameter		
New Parameter		

vii. This is what the Folder dialog box looks like before you click OK:

lder	path		
+	FolderPathAddress	*	
	L		

viii. The Appended Proper Data Set, a list of the queries (on the left) and the Applied Steps (on the right), can be seen here:

📶 拱 🗧 020-MSPTDA-PQParameterDataSc	rce-Start - Power Query Editor	- 🗆 X
File Home Transform Add Colum	View Help	^ (
Close New Query Data Sour	Image Parameters + Preview - Manage - Strates Query Image Columns + Columns Image Parameters + Remove Remove Rows + Remove Rows + Remove Rows + Remove Rows + Rows	Ieaders Headers Header
Queries [6]	$ \frac{f_x}{m_{e}} = Table.TransformColumnTypes(#"Expanded Table Column1", {{"Source.Name", type text}, ~ v} $	QUERY SETTINGS $ imes$
	Image: Accounts but Professional Fee- Mr. B Legal and professional Charges Image: Accounts but Image:	PROPERTIES Name AITextFiles AII Properties APPLIED STEPS Source Filtered Hidden Files1 Renamed Columns1 Removed Other Columns1 Expanded Table Column1 Changed Type
4 COLUMNS, 17 ROWS Column profiling based on t	p 1000 rows	PREVIEW DOWNLOADED AT 5:08 PM

ix. Use the Close & Apply button to load the Proper Data Set to the Power BI Desktop Data Model, as seen here:



x. To change the Folder Path Parameter, in the Home Ribbon Tab, in the External data group, click the Edit Query drop-down, then click on Edit Parameters, as seen here:

ul E	5 🔿 🖛 020)-MSPTDA-PO	QParamete	erDataSo	ource-	Start	- Power Bl	Desktop	E .			
File	Home	Modeling	Help									
Paste	Cut	Get Data • S	Recent Sources +	Enter Data	Ed	it ies ▼	Refresh	New Page *	New Visual	Ask A Question	Buttons	Text b Image
	Clipboard		Ex	ternal d		Edit	Queries			Inse	rt	
	XV				3	Dat	a source se	ttings				
, mm				_		Edi	Parameter	s	-			
	Source.Name	A	ccount Nan	ne		Edit	Variables			Amou	nt 💌	
E	JanAccounts.txt	Professional I	Fee- Mr. B						View an	d modify t	he curren	t values
	JanAccounts.txt	Rent - Branch	Office 1				Rentals		for para	meters in t	his file.	1000 (000 C
₽₽	JanAccounts.txt	Travel - Direc	tor				Traveling E	xpenses			1 <mark>5000</mark>	

xi. Change the Parameter, then click OK

FolderPathAddress		
ationsFoprMSPTDA-20_TextFiles\MSF	PTDA-20-TextFiles\Start	
Sample File Parameter1		
	Carlas -	
Sample File	(*)	
Sample File		