## **Microsoft Power Tools for Data Analysis #04:**

# Power Query: Import Multiple Excel Files & Combine (Append) into Proper Data Set

### Notes from Video:

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#### 1. Goal of Video:

1) Import multiple Excel Workbook files with multiple tables, extract Excel Workbook file and sheet tab names as new columns, append all tables into one proper data set, and build PivotTable report that can be refreshed when new files arrive. Here is a summary picture:

_		A	8	C	D	E	F
	1	Date	· Product. ·	Units •	Salos 💌	city/	SalesRep -
Oakland.xlsx	2	12/17/20	16 Majestic Beaut	36	1251	SanFrancisco	Miki
	3	11/15/20	16 Quad	72	3251.52	Seattle	Gigi
🕆 Portland.xlsm	4	12/17/20	17 Majestic Beaut	.84	2942.52	Seattle	Sindy
	5	11/11/20	16 Tri Fly	84	572.88	Tacoma	Pham
🗄 SanFrancisco.xlsm	6	12/11/20	16 Carlota	228	7015.56	Portland	Sioux
	7	12/25/20	16 Carlota	120	3361.2	SanFrancisco	Alden
Seattle.xlsx	8	11/24/20	17 Aussie Round	96	3094.08	Tacoma	Pham
	50895	5/4/20	16 Tri Fly	96	494.4	Seattle	Gigi
Tacoma.xlsx	50696	12/27/20	16 Carlota	204	6387.24	Portland	Sioux
	50897		17 Carlota	60	1722	Seattle	Sindy
	50898	2/6/20	16 Sunshine	204	4388.04	Seattle	Mo
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Sum of Sale	CLEAR AND		γ				
Product	3 SalesRep + 201	16 2012		0-		0	Ŷ
	J Salestep + 200 Alden	013,659 8	7 Geand Total 828,855 1,442,514 11,067 2,172,375	10	roduct	0 E X	9.
Product	3 Salestep + 201 Alden Chin L Fran L	613,659 8 013,659 8 051,368 1,1 275,252 1,1	828,855 1,442,514 121,007 2,172,375 156,412 2,431,645	10	roduct Aspen	0 E X	φ.
Product	3 Salestep + 201 Alden Chin L. Fran L. Gab L.	013,659         8           051,368         1,1           275,252         1,1           150,001         1,2	828,835 1,442,514 121,007 2,172,375 156,412 2,451,545 210,917 2,381,808			° ⊑ ¥	φ.
Product	J Salestop + 201 Alden Chin L Fran L Gab L Gigi L	8         3017           013,659         8           051,368         1,1           275,252         1,1           150,891         1,2           385,368         1,3	828,855 1,442,514 121,007 2,172,375 156,412 2,451,645 210,917 2,341,408 385,752 2,520,900		Aspen	O II X	φ.
Product	3 Salestep + 201       Alden       Chin     1.       Fran     1.       Gab     1.       Gigi     1.       Han	8         3017           613,659         8           051,368         1,1           275,252         1,1           156,891         1,2           135,368         1,3           962,079         9	828,835 1,442,514 121,007 2,172,375 156,412 2,451,645 210,917 2,381,808 335,752 2,520,990 961,728 1,923,807		Aspen Aussie Rou Bellen	O IE X	0
Product	Falestep + 201           Alden           Chin         1.           Fran         1.           Gigi         1.           Han         Miki         1.	3013         3013           013,659         8           0051,368         1,1           275,252         1,1           150,891         1,2           185,168         1,3           962,079         9           086,341         1,1	828,855 1,442,514 121,007 2,172,375 156,412 2,451,645 210,917 2,341,408 385,752 2,520,900	0	Aspen Autsite Rou Bollan Carlota	3	0
Product	Falestep + 201           Alden           Chin           Fran           Gab           Gigi           Han           Miki           Mo	3013         3013           013,659         8           0051,368         1,1           275,252         1,1           150,891         1,2           385,168         1,3           962,079         9           086,341         1,1           005,595         1,0	828,035 1,442,514 121,007 2,172,375 156,412 2,451,645 210,917 2,361,808 385,752 2,520,900 961,728 1,923,807 111,249 2,191,590	0	Aspen Aussie Rou Bellen Carlota Majestic Be	3	Ŷ
Product	J Salestep - 20 Alden Chin L Fran L Gab L Han Miki L Phan Popi L	3017           613,659         8           .051,368         1,1           .275,252         1,1           .150,891         1,2           .385,168         1,3           .962,079         9           .080,341         1,1           .034,595         1,0           .979,516         6           .079,432         1,2	828,355         L.442,514           L21,067         2,172,375           156,472         2,451,645           210,917         2,381,868           335,752         2,520,900           961,726         1,923,807           111,246         2,191,580           071,473         2,196,690           983,446         L,480,900           293,441         L,340,907	0	Aspen Aussie Rou Bellen Carlota Majestic Be Quet	3	0
Product	J Salestep - 20 Alden Chin L Faan L Gab L Han Mikk L Mo L Phan Popi L Shella L	3017           613,659         8           0.051,368         1,1           2.75,252         1,1           1.56,891         1,2           3.85,168         1,3           962,079         9           0.080,341         1,1           0.080,541         1,1           0.793,536         6           0.793,536         2           0.038,599         1,0           0.38,599         1,1	828,355         L.442,514           121,067         2,172,375           156,412         2,451,645           120,017         2,341,801           383,732         2,520,909           961,726         1,923,807           111,124         2,195,580           071,473         2,106,067           983,844         L,409,980           991,311         2,707,974           181,797         2,220,796	0	Aspen Aussie Rou Bellen Carlota Majestic Be	3	¢.
Product	J Salestep - 20 Alden Chin L Fran L Gigi J Han Miki L Pham Popi L Shila L Sindy L	3017           013,659         8           051,368         1,1           275,252         1,3           150,891         1,2           385,168         1,3           962,079         9           0080,341         1,1           036,595         1,0           036,595         1,0           0793,5316         6           0794,332         1,2           038,599         1,1           199,107         1,3	828,355         L.442,514           121,067         2.172,375           156,412         2.451,645           120,017         2.341,808           335,752         2.520,900           961,728         1.923,807           111,249         2.191,590           77,471         2.106,007           993,844         1.490,900           291,311         2.370,741           182,797         2.202,936           142,240         2.242,747	0	Aspen Aussie Rou Bellen Carlota Majestic Be Quet	3	¢.
Product	J Salestep - 20 Alden Chin L Fran L Gab L Gab L Han Miki L Phan Popi L Shaila Sindy L Sinux L	3011           013,659         8           0.051,368         1,1           275,352         1,1           150,101         1,2           365,368         1,3           962,079         9           0.08,595         1,0           792,536         6           0779,2536         6           0794,2536         1,0           0.38,599         1,1           0.98,595         1,1           0.98,595         1,2           0.98,595         1,1           0.98,595         1,1           0.98,595         1,1           0.98,595         1,1           0.98,595         1,2	828,355         L.442,514           121,067         2.172,375           156,412         2.451,645           120,017         2.341,808           335,752         2.520,900           961,728         1.923,807           111,249         2.191,590           77,471         2.106,007           993,844         1.490,900           291,311         2.370,741           182,797         2.202,936           142,240         2.242,747	0	Aspen Aussre Rou Bellen Carlota Majestic Be Duet Surshine	3	0
Product	J Salestep - 20 Alden Chin L Fran L Gab L Han Ma L Han Ma L Shalia L Shalia L Shalia L Shalia L	3011           013,659         8           0.051,368         1,1           275,252         1,1           1.050,801         1,2           1.85,168         1,3           962,079         9           0.085,556         1,0           792,516         6           0.079,432         1,2           0.036,559         1,1           1.95,100         1,2           0.036,559         1,0           0.036,559         1,0           0.036,559         1,0           0.046,061         1,2           0.90,068         7	828,355         L.442,514           121,067         2,172,375           156,412         2,431,645           210,917         2,341,608           335,752         2,520,900           0,124         2,191,580           077,473         2,306,067           98,446         L,490,900           291,111         2,370,743           185,797         2,210,784           185,797         2,240,787           2184,840         L,490,900           291,111         2,470,743           184,297         2,210,784           184,240         2,454,747           212,586         2,455,847	0	Aspen Aussre Rou Bellen Carlota Majestic Be Duet Surshine	3	0

- 2. **Main Difficulty When Importing Multiple Excel Files** is that each Excel file may have multiple objects that need to be included or excluded in the query.
  - 1) In last video, when we tried to import multiple text files, we did not have the issue of multiple objects in a single file because each text file contained only one Proper Data Set, as seen in this picture:

Just One Object	7742562 → 1/1/2018 → boomerangs.com + Sumehine → 19 → 0.19+1.01→7040 7742563 → 1/1/2018 → boomerangs.com + Carlota → 3 → 0 → 1.01→804 7742564 → 1/1/2018 → gel-boomerang.comPum.Ply → 6 → 0.105+1.01→726
in Text File	7742565 → 1/1/2018 → Amazon.com→Manu MTA → 2 → 0 → 1 → FRAG 7742566 → 1/1/2018 → boomerangz.com → Yanaki → 2 → 0 → 1.015-8008
	7742567 → 1/1/2018 → amazon.com+Appen48 → 0.43+1.01+COL4 7742568 → 1/1/2018 → amazon.com+Duad+3 → 0 → 0.99+DED4 7742569 → 1/1/2018 → gel=bcomerng.combejmetic Beaut → 24 → 0.3475
2015Sales.txt	→ 1.015+B2E 7742570 → 1/1/2010 → gel-boomerang.comFun fly → 6 → 0.105+1.01+FRAD 7742571 → 1/1/2010 → target.com+Fun fly → 3 → 0 → 1.015+0008 7742572 → 1/1/2018 → boomerangs.com → Carlota → 72 → 0.465+1 → 0009
2016Sales.txt	7742573 → 1/1/2018 → ebay.com → Cuad.+4 → 0 → 1.015+CANE 7742574 → 1/1/2018 → amagon.com→Fun Ply → 3 → 0 → 0.99→VNME
2017Sales.TXT	7742575 → 1/1/2018 → anason.com=Eagl=/2 → 0.1 → 1.0154785 7742576 → 1/1/2018 → boomerangs.com → Cuad+2 → 0 → 1.01+7745 7742577 → 1/1/2018 → boomerangs.com → Created Teaut → 2 → 0 → 0.00
2018Sales.txt	→ CERS 774157E → 1/1/2018 → ebay.com → Fun Fly → 108 → 0.47→1.015-VEMS

2) When we try to import multiple Excel files, each individual Excel file can have one or more objects in an Excel File. For example, in this picture the Excel file named "Oakland.xlsx" contains many objects such as sheets with Proper Data Sets, Excel Tables and Print Ranges, as seen in this picture:

Oakland.xlsx	A         F         C         F           2000         Product         Sectors Reput         2000         1000000           3         110000000         Sectors Reput         2000         1000000           4         120000000         Sectors Reput         2000         10000000           4         12000000         Sectors Reput         2000         1000000           5         12000000         Sectors Reput         40         1000000           6         12000000         Sectors Reput         40         1000000           7         112120000         Sectors Reput         40         1000000           8         12000000         Sectors Reput         40         1000000           10         12000000         Sectors Reput         3000000         Sectors Reput         3000000           10         120000000         Sectors Reput         3000000         10000000         10000000           10         120000000         Sectors 8         12000000         10000000           10         120000000         Sectors 8         12000000         10000000           10         120000000         Sectors 8         12000000         10000000           11	N         B         C         O           Outs         Pendact         Urits Sales           2         10/10/2012 Aussie Round         138         1298.68           3         12/07020 Aussie Round         138         1298.68           3         12/07020 Aussie Round         148         1298.68           3         12/07020 Aussie Round         24         785.12           3         12/02/2016 Aussie Round         324         346.2           3         12/02/2016 Aussie Round         34         3546.2           3         12/02/2017 Aussie Round         34         323.68           3         12/02/2017 Aussie Round         32         3273.76           3         12/02/2017 Aussie Round         32         3273.76           3         12/02/2015 Aussie Round         32         3273.76           3         12/02/2015 Aussie Round         3204.39         3293.34	A         S         C           Indee         Product         Uvits Sale           10/22/2017 fm/Hy         S4         S17.6           20/22/2017 fm/Hy         S4         S17.6           4         LU/23/2015 Mayesic levant         S0         275.26           5         J/S2/2017 Anniel Round         12         375.26           6         L1/23/2015 Anniel Round         12         375.27           11 <l1 2015="" 22="" sunthine<="" td="">         27         S1558 56           6         L2/5/2015 Sunthine         276           7         L1/23/2015 Sunthine         76           8         L2/5/2017 Sateline         96         1353.56           9         7/22/2017 Annie         16         1355.56</l1>
SanFrancisco.xlsm Seattle.xlsx	Constant and a second s	17         13/6/2013 Samplere         44         1086-72           18         12/0/2016 Quark         36         1650-28           19         12/2/2013 Carlots         60         1638.6           19         12/2/2013 Carlots         60         1638.6           19         12/2/2013 Carlots         60         1638.6	11         12/23/2837 mmHy         48         237.46           17         50/67/207 Guad         60         278.3           13         11/27/2077 Auxile         60         278.3           14         12/23/2016 Cambrids         98         255.67           14         12/23/2016 Cambrids         98         255.67           15         12/23/2016 Cambrids         98         255.67           15         12/23/2016 TamPhy         100         753.2           16         12/23/2016 TamPhy         100         753.2
Many Objects in Excel File	Inter         Install         Install <thinstall< th=""> <thinstall< th=""> <thins< td=""><td>No.         No.         No.         No.         No.           1000000000000000000000000000000000000</td><td>17 12/22/2014-Clast 64 3648.12 18 12/17/2016 Aussie Round 108 3642.6 19 W24/2016 Majestie Beaut 17 2435.70</td></thins<></thinstall<></thinstall<>	No.         No.         No.         No.         No.           1000000000000000000000000000000000000	17 12/22/2014-Clast 64 3648.12 18 12/17/2016 Aussie Round 108 3642.6 19 W24/2016 Majestie Beaut 17 2435.70

- 3) When we build our query to go and get the data from multiple Excel workbook files, we will have to build the query so that it imports only the objects that contain the data we want.
- 4) Types of objects that we may encounter when we import an Excel Workbook file using Power Query are:
  - i. An Excel Worksheet with all its data
  - ii. An Excel Table
  - iii. A Defined Name
  - iv. A Print Range
  - v. A Table that has had the Filter Feature Used
  - vi. Automatic Defined Name Created when you use the Advanced Filter feature and you use a Criteria Range
  - vii. Automatic Defined Name Created when you use the Advanced Filter feature and you use an Extract Range
- 5) Our Goal is to import only objects that are Sheets and have a SalesRep Sheet Tab Name, as seen in this picture of the "Oakland.xlsx" Workbook File:

Fil	e Home In	sert Page Layout	Formul	as Data	Review Vie	w Develope
A1	- 1817-1890- 30	•] : [	×	/ fx	Date	
Â	A	В	С	D	E	F
1	Date	Product	Units	Sales		
2	11/8/2017	Aussie Round	216	7108.56	5	
3	11/14/2017	Tri Fly	84	551.88	3	
4	12/18/2017	Tri Fly	276	1443.48	3	
5	11/18/2017	Bellen	48	1362.72	1	
6	12/28/2016	Bellen	72	2027.52		
3	Fra	n Gab Popi	Shee	et1   🤅	Ð	
		$\sim$				
						_

#### 3. Import Multiple Excel Files From Folder.

1) For our example these are the files that are sitting in the folder named "004-MSPTDA-ExcelFiles":



2) In the above list of files, we only want files that have an extension that contain ".xls", and because some of the files names have extensions in capital letter and some have lower case letters, we will have to convert them all to lower case letters before importing them.

1

- 3) In Excel to import files from a folder, we can:
  - i. Click on the Data Ribbon Tab.
  - ii. Go to the Get & Transform group.
  - iii. Click on the Get Data dropdown arrow.
  - iv. Point to From File.
  - v. From the sub-menu, click on From Folder option.



- 4) To point Power Query to the folder that contains the files we want to import, we:
  - i. In the Folder dialog box, click the Browse button.
  - ii. In the Browse for Folder dialog box, navigate to the folder named "004-MSPTDA-ExcelFiles", then click on that folder. This is the folder that Power Query is point to in order to find files to import.
  - iii. Click OK in the Browse for Folder dialog box.

Folder path		Brokse- 1
	Browse For Folder	
	Desktop  Signature  Signature	

5) The Folder dialog box now contains the folder path that Power Query will use when we later need to refresh our query. If the folder path ever changes, we are allowed to come back and edit this folder path. To point Power Query to this folder path, click the OK button. This picture shows the Folder dialog box:

6) **Click Transform Data!!** In the next step click the Transform Data button to open the query in the Power Query Editor, as seen here:

Content	Name	Extension	Date accessed	Date modified	Date created	Attributes	Folder Path	
finary	Cotland.cov	CTV	7/2/2018 2:21:31 PM	7/2/2018 1:19:44 PHJ	7/2/2018 1:21:11 PM	Record	C:\UseriyngHym\Deskto	Click the
Binary	Oakland ist	.txt	7/2/2018 1:21:11 PM	7/2/2018 1:20:01 PM	2/2/2018 1.21:11 PM	Record	C.\Users\mgirvin\Deskta	
Binary.	Calitand ator	ates	2/2/2018 2:11:53 PM	7/2/2018 2:12:53 PM	7/2/2018 1:21:11 PM	Record	C \U/sani/mgirvin\Deckto	Transform
binary	Portland alsm	alumi	7/2/2018 1:21:12 PM	7/2/2018 1-20-08 PM	7/2/2018 1 21 11 PM	Antord	C \Usars\mgirvin\Deskto	
finary.	Prices.accdb	acculty	7/2/2018 1:22:11 PM	3/2/2018 2:20:34 PM	3/2/2018 1:21:11 PM	Record	C\Users\mgirvin\Deskto	Data button,
Binary .	SanFranciacu XLSM	ALSM	7/2/2018 1:22:11 PM	7/2/2018 1:20:39 PM	7/2/2018 1:22:11 PM	Record	C.\Ukers\mgtrvin\Deskto	
Binary	Seattie.stus	site	7/2/2018 1:21:11 PM	7/2/2018 1:20 AK PM	7/2/2018 1:21:11 PM	Record	C\U/uert/yngirvin\Deskto	not the
Binary.	Tacuma XLSK	30,58	7/2/2018 1:21:11 PM	7/2/2018 1:30:52 PM	2/2/2018 1-22:11 PM	Becord.	C:\Users'yegizyin\Deckto	
								Combine or
								Load buttons.
-			144					Load Duttons.
•			.01					

7) In the Power Query Editor, we can see the file name column is the second column and that there the subsequent columns are attributes about the file. The first column is named Content and is the column that contains the file. The first step for any query is always to give the Query a smart name. As seen here, we named it "AllExcelSheetDataIntoOneTable":

الشنا	8	Hame	Transform	Add Column	View							
Chine inad	*	Autom .	C Propertie	Editor Durent Caluters	Remove Free	r Review Land * Review Contame	, to be to the total	Chen Bran - Ou Post Bours Meadon - Report Values	Approved Quarters	Manage Persenters	Data source settings	De New Source + De Rocent Sources +
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5	1	Beary		Oshand ov	429	7/2/2016 1.21115	PM 3/4/	2018 1-19-44 Mil 3/2/20	IN 2.21 11 PM Necord	1	PROPERTES	
	12	Bingry		Oskiand.txt	:0/1	7/2/2018 1.21:11	PM 1/1		A CONTRACTOR OF		Name	
	1	In Binary		Cultiend size	labor.	7/2/2018 2:13:55	PM 7/2				AlExceSheet0	atsintoOneTable
		Sinary.		Portland alum	ALTER	7/2/2016 1.21.13	M 2/2	Always na	ime the		All Properties	
	11.4				#0089	3/2/2018 1:22:11	PM 8/2					
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	11							query sr	nartiy		Source	*/) 

- 8) **Change Query Options for Data Types**. Before we start transforming the data using Power Query, we can turn off the default option to automatically change the Data Type for columns with unstructured data (not obvious what sort of data type the column contains, or the data source does not specify a Data Type) by:
  - i. Clicking the File Menu Dropdown Arrow.
  - ii. Click on Options and settings.
  - iii. Click on Query Options.



- 9) Then in the Query Options dialog box:
  - i. On the Left, click Data Load.
  - ii. Uncheck the check box for "Automatically detect column types and headers for unstructured sources".

SLOBAL	Type Detection
Data Load	Automatically detect column types and headers for unstructured
Power Query Editor	sources
Security	Relationships
Privacy	$\overline{\mathscr{D}}$ Create relationships between tables when adding to the Data Model
Account	for the first time 🔘
Diagnostics	Update relationships when refreshing queries loaded to the     Data Model
URRENT WORKBOOK	Background Data
Data Lood	Allow data preview to download in the background
Regional Settings	
Privacy	Ciante

10) In the Content column, if you click to the right of the word Binary in the third row, you can see the "Oakland.xlsx" in the bottom of the query, as seen here:



- 11) Because Power Query is case sensitive, and we have some extensions listed with capital letters and some with lowercase letters, we can "clean" the extensions to become all lowercase by:
  - i. Right-clicking the Extension column.
  - ii. Point to Transform.
  - iii. Click on lowercase.

A <sup>B</sup> <sub>C</sub> Name	A <sup>B</sup> <sub>C</sub> Extension	-	🖳 Date accessed 🛛 💌 🖾 Date	modi	fied 💌	Date created
Oakland.csv	.csv	Ē	Сору		:19:44 PM	7/2/2018 1:21:11 PM
Oakland.txt	.txt 1	183	Remove		:20:01 PM	7/2/2018 1:21:11 PM
Oakland.xlsx	.xlsx		Remove Other Columns		1:11:53 PM	7/2/2018 1:21:11 PM
Portland.xlsm	,xlsm		Duplicate Column		:20:09 PM	7/2/2018 1:21:11 PM
Prices.accdb	.accdb	國	Add Column From Examples		:20:34 PM	7/2/2018 1:21:11 PM
SanFrancisco.XLSM	XLSM				:20:39 PM	7/2/2018 1:21:11 PM
Seattle.xlsx	.xlsx		Remove Duplicates		:20:46 PM	7/2/2018 1:21:11 PM
Tacoma.XLSX	.XLSX		Remove Errors		1:20:52 PM	7/2/2018 1:21:11 PM
	$\frown$		Change Type	•		$\sim$
			Transform	Þ	low	ercase 3
			Replace Values Replace Errors	ne forman and a second second		

12) **To filter out non-Excel files**, go to the Extension Field, click the Filter Dropdown Arrow, point to the Text Filter option, then click on "Contains" option. Then in the Filter Rows contains text box, type ".xls", as seen here:

Filter Rows Basic O Advance Keep rows where 'E				<u>Contains Condition = ".xls"</u> This filter will import these file extensions:
contains	▼ A <sup>B</sup> <sub>C</sub> ▼ .xis		*	<ul><li>.xls</li><li>.xlsx</li></ul>
● And O Or	▼ A <sup>B</sup> <sub>C</sub> ▼ Enter	or select a valu	•	<ul><li>.xlsm</li><li>.xlsb</li></ul>
				OK Cancel

13) **Clean File Name**. Next, we need to "clean" the Name column so that only the City File Name remains.

First, we must:

- i. Right-clicking the Name column.
- ii. Point to Split Column.
- iii. Click on By Delimiter.

A <sup>B</sup> <sub>C</sub> Name		A <sup>B</sup> <sub>C</sub> Extension <b>T Date</b> accessed	d	- 10	Date modified	- E
akland	E	Сору	:53 P	М	7/2/2018 2:11:5	3 PM
Portland 1	1	Remove	:11 P	М	7/2/2018 1:20:0	9 PM
SanFrancisco.xLS		Remove Other Columns	:11 P	М	7/2/2018 1:20:3	9 PM
Seattle.xlsx		Duplicate Column	:11 P	М	7/2/2018 1:20:4	6 PM
Tacoma.XLSX	12	Add Column From Examples	:11 P	м	7/2/2018 1:20:5	2 PM
		Remove Duplicates Remove Errors				
		Change Type >				
		Transform +				
$\sim$	1 ⇒2	Replace Values Replace Errors				
2	rĨh	Split Column 🔸		By	Delimiter	
	В	Group By		By	Number of Charac	ters

- 14) When the Split Column by Delimiter dialog box pops up:
  - i. Type the Delimiter period (dot).
  - ii. Click dialog button for "Right-most delimiter".
  - iii. Click OK.

Split Column by Deli		
Specify the delimiter used to	split the text column.	
Select or enter delimiter		
Custom		
a contraction of the second se		
C		
Split at O Left-most delimiter	$\frown$	
<ul> <li>Right-most delimiter</li> </ul>	(2)	
Each occurrence of the delin		
Advanced options		
100		$\frown$

15) This will give us the file that we want to import and transform, as seen in the picture below. As soon as this filtered list appears, rename the Name.1 column by double clicking the column header and typing the word "City", as seen below:

L	forers.	Onland	alse	Labor	7/0/0008 2:11:52 /W/	7/2/2028 2:12:55 PM	7/2/2018 1-22-12 PM Berry	< PROPERTIES	
	Dinary	factored	atom.	Labore	2/2/2018 2 (21:11 PM	7/2/2018 1.20 09 PM	7/2/2019 1.21 11 PM Record	Sime	
Ē	Renary	Service	30.305	Abite	7/0/2008 1.21.11 /W/	7/2/2018 £ 201-319 PMF	7/2/2018 1.31:31 AM Recov	Al BuckChertDataIntoCheTable	
i	Denary	Searce	atta:	1404	7/2/2916 1.21 11 PM	2/2/2018 1.20146 PAR	X/2/2018 1.11:33 PM Report	All Properties	
Ē	Birary	Tacone	35.58	alas	7/2/2014 1 21 11 PM	7/3/3018 1 20-52 PM	2/2/2019 1:21:21 PM Record	* APPLIED STEPS	
								Source Lowercoverl Text Fibered Rows Split Column by Deletitor N Recover Column	

16) Next, we need to remove all columns except the Content and City columns. To do this we click on the Content Column, then hold the Ctrl Key and click on the City Column. Then with both columns selected, right-click one of the two columns and point to Remove Other Columns, as seen here:



17) Custom Column using Excel.Workbook Function. In order to extract the correct objects from each Excel File, we need to add a Custom Column. Custom Columns allow us to use formulas (like we would in Excel) to accomplish a task that is not available in the Ribbon Tabs. When we add our Custom Column, we will use the Power Query Function (M Code) called Excel.Workbook. To add a Custom Column, go to the Add Column Ribbon Tab, then in the General group click the Custom Column button, as seen here:



18) Then in the Custom Column dialog box:

- i. In the New column name textbox, type the name: "GetExcelObjects".
- ii. In the Custom column formula textbox, type the formula:

### = Excel.Workbook([Content],true)

iii. Then click OK. Custom Colum New column name GetExcelData			
2 Custom column formula = Excel.Workbook([C		C	ailable columns: ontent ty
The first argument in the function is the name of the column that contains the Excel File. This is so that as the formula is copied down the Custom Column, the function can see the objects in each Excel File.	y formulas ave been de	The second argument in the function instructs Power Query to "Promote Headers" for each Proper data Set, which means that it will interpret the first row in each Proper Data Set as Field Names for each table.	<< Insert

- 19) The result of the Custom Column is seen below.
  - i. The Custom Column named GetExcelData delivers a table for each row that gives us information about what kind of objects are in each Excel File.
  - ii. If you click to the right of the word table in the first cell of the GetExcelData column, you can see a table appear in the lower part of the query.
  - iii. The table in the lower part of the query has five columns that give us information about what type of objects are in the Excel File. For example, in the "Kind" column we can see that some of the objects are Excel Worksheets (Sheet), one is an Excel Table (Table) and some are Defined Names (DefinedName). This information will help us to filter the objects and import only object that have data that we want.

🛄 = Content	±± A <sup>B</sup> <sub>C</sub> City	▼ ABC GetExcelData ↑/	1				
1 Binary	Oakland	Table	$\bigcirc$			PROPERTIES	
2 Binary	Portiand	Table				Name	
3 Binary	SanFrancis	co Table				AllExcelSheetDataIntoOneTable	6
4 Binary	Seattle	Table	$\sim$			All Properties	
5 Binary	Tacoma	Table	(2)			APPLIED STEPS	
						Filtered Rows Split Column by Delimiter	* *
Name	Data	ltem	Kind	Hidden		Renamed Columns	3
Name Fran	Data Table	ltem Fran	Kind	Hidden			
			and the second		Â	Renamed Columns	4
Fran	Table	Fran Gab	Sheet	FALSE	*	Renamed Columns Removed Other Columns	4
Fran Gab	Table Table	Fran Gab	Sheet Sheet	FALSE FALSE	*	Renamed Columns Removed Other Columns	4
Fran Gab Popi	Table Table Table	Fran Gab Popi 3	Sheet Sheet Sheet	FALSE FALSE FALSE	*	Renamed Columns Removed Other Columns	4
Fran Gab Popi Sheet1	Table Table Table Table Table	Fran Gab Popi Sheet1	Sheet Sheet Sheet Sheet	FALSE FALSE FALSE FALSE	*	Renamed Columns Removed Other Columns	* *
Fran Gab Popi Sheet1 SmallTable02	Table Table Table Table Table	Fran Gab Popi Sheet1 SmallTable02	Sheet Sheet Sheet Sheet Table	FALSE FALSE FALSE FALSE FALSE		Renamed Columns Removed Other Columns	4
Fran Gab Popi Sheet1 SmallTable02 _xlnmFilterDatabase	Table Table Table Table Table Table	Fran Gab Popi Sheet1 SmallTable02 Sheet1!_xlnmFilterDatabase	Sheet Sheet Sheet Sheet Table DefinedName	FALSE FALSE FALSE FALSE FALSE TRUE	* E	Renamed Columns Removed Other Columns	*

- 20) The next step is to remove the Content column, so we right-click the Content column and click on Remove.
- 21) To expand the tables in each row and repeat the City name for each row associated with that file:
  - i. Click Expand button.
  - ii. Uncheck "Use original column name as prefix".
  - iii. Click OK.

<b>.</b>	A <sup>B</sup> <sub>C</sub> City	ABC 123 GetExcelData	41/2
1	Oakland	Table	Search Columns to Expand
2	Portland	Table	
3	SanFrancisco	Table	Expand      Aggregate
4	Seattle	Table	✓ (Select All Columns)
5	Tacoma	Table	✓ Name
			🗹 Data
			☑ Item
	-	111	V Kind
	4	a	✓ Hidden
			2 Use original column name as prefix
	1) Click th		List may be incomplete.
	Expand b	utton	
			ОК З

#### 22) The Expanded Table with each Excel Files objects looks like this:

- i. The City column repeats the City File Name for each row that belongs to the specified file.
- ii. The Name and Item columns are similar in that they contain the name of the object. The Item column has slight more descriptive name for the Defined Names because the name also lists the Excel Worksheet Name as part of the full name.
- iii. The Data column contains the data for each object.
- iv. The Kind column tells us what type or "Kind" of object contains the data from the Data column. We can use this column, for example, to filter and then import on Sheet objects.
- v. The Hidden column tells us whether or not the object is hidden. For example, the Defined Name for the table that had the Filter Feature Applied (row 6) shows TRUE in the Hidden column because this is a Hidden Defined Name in an Excel Workbook File.

<b>.</b>	A <sup>B</sup> <sub>C</sub> City	ABC Name	ABC Data 123 Data	+ ABC Item	- ABC Kind -	BC Hidden 💌		
1	Oakland	Fran	Table	Fran	Sheet	FALSE	*	PROPERTIES
2	Oakland	Gab	Table	Gab	Sheet	FALSE		Name
3	Oakland	Popi	Table	Рорі	Sheet	FALSE		AllExcelSheetDataIntoOneTable
4	Oakland	Sheet1	Table	Sheet1	Sheet	FALSE		All Properties
5	Oakland	SmallTable02	Table	SmallTable02	Table	FALSE		▲ APPLIED STEPS
6	Oakland	_xinmFilterDatabase	Table	Sheet1!_xinmFilterDatabase	DefinedName	TRUE		
7	Oakland	_xlnm.Criteria	Table	Sheet11_xInm.Criteria	DefinedName	FALSE		Source 4
8	Oakland	_xinm.Extract	Table	Sheet1!_xInm.Extract	DefinedName	FALSE		Lowercased Text
9	Oakland	_xlnm.Print_Area	Table	Sheet11_xInm.Print_Area	DefinedName	FALSE		Filtered Rows
10	Oakland	SmallTable	Table	SmallTable	DefinedName	FALSE	=	Split Column by Delimiter
11	Portland	Sioux	Table	Sioux	Sheet	FALSE		Removed Other Columns
12	Portland	Chîn	Table	Chin	Sheet	FALSE		Added Custom
13	Portland	Tyrone	Table	Tyrone	Sheet	FALSE		Removed Columns
14	SanFrancisco	Miki	Table	Miki	Sheet	FALSE		× Expanded GetExcelData

23) **Headers Have Been Promoted**. To prove to ourselves that the second argument in the Excel.Workbook Function actually did promoter the first row of each table, so they became Field Names, we can click to the right of the word "Table" in the second row of the Data column. The table that appears in the lower part of the Query Editor, shows the Proper Data Set with Field Names.

	ARC City		123 Name		123.Data	er 123 Item =
1	Catland		Fran		Table	Fran
-2	Oakland		Geb		Table	Gab
3	Cakland		Popi.		Table	Popi
4			Shert1		Table	Sheet1
5	Oaktand		SmallTabled	12	Table	SmallTable02
6	Gatland				Table	Sheet11_xinm_FinerDatabase
7	Cellend		_xinm.Criteria		Teble	Sheet11_winm Criteria
8	Califord		_xinm Extract		Table	Sheet11_xinm Extract
9	Caklend		_sinm.Print_Area		Table	Sheet11_stron Print_Area
10	Ciakland		Smalifable	SmaliTable		SmailTable
Date		Produ	ct	Units	Soles	
	10/19/2017	Aussie	Found	108	3289	65
12/6/2017		(2017 Aussie Round		48	1450	15
	3/31/2017	Aussie	Round	24	765	12
	11/9/2017	Quet		12	508	56

24) Filter to import only Sheet Objects. With the goal of filtering out objects that are not Sheet Objects,

we can:

- i. Click the Filter Arrow in the Kind Column
- ii. From the Unique List of items, uncheck everything except for "Sheet"
- iii. Clock OK.

8C 23	Data	tr 123 Item	▼ ABC 123 Kind ▼
Tab	A↓ s	Sort Ascending	
Tab	ZI S	Sort Descending	
Tab		Tear Sort	
Tab			
at	5	Clear Filter	
ab.	F	Remove Empty	
Tab	1	ext Filters	F.
Tab			
Tab		Search	
Tab		(Select All)	
2 Tab	)	☐ DefinedName ✔ Sheet ☐ Table	
Tab			
Tab			ок 3
Table	e	Sindy	Sheet
Table	e	Mo	Sheet

25) **Filter to remove Sheet objects that Begin with "Sheet"**. To remove Sheet Objects that have not been properly named with a SalesRep name, go to the Name Field, click the Filter Dropdown Arrow, point to the Text Filter option, then click on "Does not begin with" option. Then in the Filter Rows "does not begin with" text box, type "Sheet", as seen here:

Filter Rows							
Basic O Advanced Keep rows where 'Nam							
does not begin with	•	A <sup>B</sup> C * S	heet	•			
● And ○ Or							
	•	A <sup>B</sup> C *	nter or select a	valu 🝷			
					25	-28	
					112	ОК	Cancel

26) Now we are left with only rows that contain Proper Data Sets where the object is a Sheet object and the Sheet Name does not begin with the word "Sheet" (has a SalesRep Name), as seen here:

	A <sup>B</sup> <sub>C</sub> City	ABC Name -	ABC 123 Data 112	ABC 123 Item	ABC Kind	ABC Hidden 💌
1	Oakland	Fran	Table	Fran	Sheet	FALSE
2	Oakland	Gab	Table	Gab	Sheet	FALSE
3	Oakland	Popi	Table	Popi	Sheet	FALSE
4	Oakland	Sheet1	Table	Sheet1	Sheet	FALSE
5	Portland	Sioux	Table	Sioux	Sheet	FALSE

27) In the above picture, the "Name" column does not have a useful name. In order to change the name, double lick and change the column name to "SalesRep.

- 28) The final columns we need for our Appended Proper Data Set are:
  - i. Data (contains the correct Proper Data Sets)
  - ii. City (contains the correct City name)
  - iii. SalesRep (contains the SalesRep name).
- 29) To remove the unwanted columns, select the columns using the Ctrl Key by first clicking on the Data column, then the City column, and finally the SalesRep column. With the columns selected, right-click any one of the columns and then click on Remove Other Columns, as seen in the picture below:

<b>.</b>	A <sup>B</sup> <sub>C</sub> City	ABC Name	ASC Data	40	ABC 123 Ki
1	Oakland	Fran	Table	Ē	Сору
2	Oakland	Gab	Table	Lina X	Remove Columns
3	Oakland	Рорі	Table	-	Remove Other Columns
4	Portland	Sioux	Table	1	Add Column From Examples
5	Portland	Chin	Table	EL.	Add column nom Examples

30) **Final Append with all Proper Data Sets**. To complete our final append process to combine all the Proper Data Sets into a single table with six columns, click on the expand button in the Data column, uncheck the "Use original column name as prefix" and then click OK.

	ABC 123 Data	41₽ A <sup>B</sup> <sub>C</sub> City ▼ <sup>ABC</sup> <sub>123</sub> SalesRep ▼
1	Table	2
2	Table	
3	Table	Expand O Aggregate
4	Table	✓ (Select All Columns)
5	Table	☑ Date
6	Table	Product
7	Table	☑ Units
8	Table	☑ Sales
9	Table	Use original column name as prefix
10	Table	
11	Table	Load more Load more
12	Table	OK Cancel
13	Table	

31) Here is a picture of the final Proper Data Set, including the last Power Query transformation stop on adding the correct Data Types for each column. There should be 15 steps in the Import, Extract, Clean, Transformation and Load Query, as seen in the below picture:

	🛄 Date 🖃	A <sup>B</sup> <sub>C</sub> Product	1 <sup>2</sup> 3 Units 💌	\$ Sales 💌	A <sup>B</sup> <sub>C</sub> City 💌	A <sup>B</sup> <sub>C</sub> SalesRep		
1	11/8/2017	Aussie Round	216	7108.56	Oakland	Fran	~	PROPERTIES
2	11/14/2017	Tri Fly	84	551.88	Oakland	Fran		Name
3	12/18/2017	Tri Fly	276	1443.48	Oakland	Fran		AllExcelSheetDataIntoOneTable
4	11/18/2017	Bellen	48	1362.72	Oakland	Fran		All Properties
5	12/28/2016	Bellen	72	2027.52	Oakland	Fran		
6	11/11/2017	Sunshine	96	1888.32	Oakland	Fran	E	APPLIED STEPS
7	9/12/2017	Aussie Round	60	1942.8	Oakland	Fran		Source *
8	11/23/2016	Aspen	144	2655.36	Oakland	Fran		Lowercased Text
9	11/28/2017	Aussie Round	204	6587.16	Oakland	Fran		Filtered Rows
10	12/18/2016	Tri Fly	72	484.56	Oakland	Fran		Split Column by Delimiter
11	11/7/2017	Tri Fly	48	318.24	Oakland	Fran		Renamed Columns
12	11/4/2017	Aspen	96	1728.96	Oakland	Fran		Removed Other Columns 🚸
13	10/24/2017	Carlota	72	2020.32	Oakland	Fran		Removed Columns
14	2/12/2016	Aspen	96	1593.6	Oakland	Fran		Expanded GetExcelData
15	12/7/2017	Tri Fly	264	1172.16	Oakland	Fran		Filtered Rows1
16	11/27/2017	Quad	72	3107.52	Oakland	Fran		Filtered Rows2
17	11/20/2017	Carlota	12	347.76	Oakland	Fran		Renamed Columns1
18	12/2/2017	Aspen	72	1326.24	Oakland	Fran		Removed Other Columns1 *
19	11/1/2016	Quad	72	3053.52	Oakland	Fran		Expanded Data 🚯
20	10/18/2017	Aspen	132	2195.16	Oakland	Fran		× Changed Type
21	12/18/2016	Quad	108	4453.92	Oakland	Fran		
22	12/19/2017	Aussie Round	72	2298.96	Oakland	Fran	÷	

32) Load to Excel Sheet. Because we only have about 60,000 rows of data (not a lot of data), and our calculations can be done with a Standard PivotTable, and we would like to see the data in a sheet (so we can filter and sort), we will load the data to an Excel Worksheet. To Load to the Excel Sheet named data, we use the Close & Load dropdown in the Home Ribbon Tab, then select the "Close and Load To..." option and load the data as a Table in cell A1 on the Data Sheet. The Import Data dialog box is seen here:

Select how you want to view this	data in your workboo
Image: Table in the second	
👸 🔘 Pivot <u>C</u> hart	
📋 🕐 <u>O</u> nly Create Connectio	on
Where do you want to put the da Existing worksheet:	ita?
= \$A\$1	<b>1</b>
💮 <u>N</u> ew worksheet	
Add this data to the Data Moo	

- 4. **Change Default PivotTable Layout & Options**. If we would like our PivotTables (both Standard and Data Model PivotTables) to have the Tabular Layout by default so that Field Names are used rather than generic labels in a PivotTable, we can change it by going to Options in the File Menu, then:
  - i. On the Left, click on the Data Tab.
  - ii. Then on the right, click the Edit Default Layout button, as seen here:

General Formulas	Change options related to data import and data analysis.						
Data	Data options						
Proofing	Make changes to the default layout of PivotTables: Edit Default Layout						
Save	Disable undo for large PivotTable refresh operations to reduce refresh time						
Language	Disable undo for PivotTables with at least this number of data source rows (in thousands): 300						
Ease of Access	Prefer the Excel Data Model when creating PivotTables, QueryTables and Data Connections ①						
Advanced	<ul> <li>Disable undo for large Data Model operations</li> <li>Disable undo for Data Model operations when the model is at least this large (in MB):</li> </ul>						
Customize Ribbon							
	Enable Data Analysis add-ins: Power Pivot, Power View and 3D Maps						
Quick Access Toolbar	Disable automatic grouping of Date/Time columns in PivotTables						
Add-ins	Show legacy data import wizards						
Trust Center	From Access (Legacy) From OData Data Feed (Legacy)						
	From Web (Legacy)						
	☐ From <u>I</u> ext (Legacy)						
	From <u>SQL</u> Server (Legacy)						

- 2) In the Edit Default Layout dialog box, we can change a number of default settings including:
  - i. Using the dropdown in the Report Layout textbox to select "Show in Tabular Form". This setting will force PivotTables to use Field Names as labels in a PivotTable report rather than the generic, "Row labels" and "Column labels".
  - ii. The PivotTable Options button opens the PivotTable Options dialog box with many settings you can change, as seen here:

Layout Import	1 Import
Subtotals	
Show all Subtotals at Top of Group	💽 📃 Include <u>F</u> iltered Items in Total
Grand Totals	
On for Rows and Columns	•
Report Layout	
Show in Tabular Form	💌 🔲 Repeat All Item Labels
Blank Rows Insert <u>B</u> lank Line after Each Item	PivotTable Options 2
Reset to Excel Default	OK Cancel

#### 3) We built a PivotTable Report:

1	A	B	C	D	E	F	G	н	I	J	K	L
1	1											
2												
з	Sum of Sales		Years 💌									
4	Product 🔄	SalesRep 🔻	2016	2017	Grand Total					1		
5	🖻 Carlota	Xan	\$774,669	\$869,892	\$1,644,562	1050	al a constant		×	City	3	-
6		Во	\$749,155	\$716,638	\$1,465,793	Pr	oduct		¥= 🍾		dand	
7		Quin	\$932,335	\$684,593	\$1,616,928	4	Aspen	Aus	sie Round	Uar	uanu	
8	Carlota Total		\$2,456,159	\$2,271,123	\$4,727,283		Bellen Carlota		Portland San Jose			
9	Quad	Xan	\$1,112,996	\$1,153,815	\$2,266,810	E						
10		Во	\$1,036,595	\$1,071,473	\$2,108,067	N	Aajestic Be	Qua	d			
11		Quin	\$1,185,168	\$1,335,792	\$2,520,960	5	unshine	Tri F	lv	San	Francisco	
12	Quad Total		\$3,334,758	\$3,561,080	\$6,895,838				,,	Sea	ttle	
L3	🖻 Tri Fly	Xan	\$166,513	\$185,744	\$352,258					Tac	oma	
14		Во	\$118,796	\$125,959	\$244,755	5				Tac	onna	
15		Quin	\$146,584	\$130,234	\$276,817							
16	Tri Fly Total		\$431,893	\$441,937	\$873,830					-		
17	Grand Total		\$6,222,810	\$6,274,140	\$12,496,951							
18												

5. Definition of a PivotTable. In the video we reminded ourselves of what we learned in the prerequisite class: the essence of a PivotTable is that it makes calculations with conditions or criteria. In the picture below, we see that the selected cell is making a sum calculation with four conditions or criteria or filters. We also reminded ourselves that the definition of a PivotTable is: Summary Reports with Calculations based on One or

More Conditions or Criteria.

đ	A		B	, Ç		D	E	÷.	G	H	1	1	1	к	L
										-	-			-	
	Sum of Sales	E.,		Years	*										
	Product	τ.	SalesRep *	2016		2017	Grand Total								
1	≅Aspen		Fran	\$467,	-	\$412,105			_	_			_		-
1			Gab	\$417,	-	100 Lan 100 - 100	and the second se		Product	-	-	三	8	City	扫 \$
			Popi	\$451,	-	and the state of t	\$952,231						-	11000	
Aspen Total		and the second sec	\$1,331,087	and a standard and a set of the s		Aspen	Aspen Aussie Round		br	Oakland					
,	Grand Total			\$1,335,	873	\$1,331,087	\$2,666,960		Bellen		Ca	rlota		Portian	Re.
i									Majestic	Be	Qu	iad		SanFran	icisco
2									Sunshine	6	Tri Fly			Seattle	
3				_	_									Tacoma	
\$		Sı	um Calo	ulati	on	= addi	ng				_			Ale Ballioca	
5	P	ro	duct = /	Aspe	n :	= Criter	ria 1	j			_				_
3	S	al	esRep :	= Ga	b =	Criter	ria 2	j							
1	Vear = 2016 = Criteria 3										_				
2 3 4	(	Ci	ty = Oal	kland	=	Criteri	a 4		-					-	

6. AND Logical Test. We also reminded ourselves that an AND Logical Test means that in order for the record to be included in the calculation, all conditions or criteria must be met.

- 7. Add New Excel Workbook Files to the Folder & Refresh. As we saw in the video, when we added new files to the folder that met all the conditions of the query, and we refreshed both the Query and the PivotTable (two separate refreshes), the data from the new file was incorporated into the Query Load To Output and the PivotTable report.
  - i. We can refresh the Query in a few different places:
    - 1. In the Queries & Connections Pane, we can right-click the Query and click on Refresh.
    - 2. In the Queries & Connections Pane, we click the refresh icon in the upper right corner of the query.
    - 3. We can use the Refresh or Refresh All button in the Data Ribbon Tab in the Queries & Connections group.
    - 4. We can right-click the Query Load To Output in the Excel Worksheet and click on Refresh.
  - ii. We can refresh the PivotTable
    - 1. We can right-click the PivotTable and click on Refresh.
    - 2. We can use the Refresh or Refresh All button in the PivotTable Tools Analyze Ribbon Tab in the Data group.
  - iii. If we Load the Power Query Transformation to an Excel Sheet, we have to perform two separate Refreshes:
    - 1. First Refresh the Query.
    - 2. Second Refresh the PivotTable
  - iv. If we Load the Power Query Transformation to a PivotTable (option in the Import Data dialog box), all we have to do is refresh the PivotTable one time, and then both the Query and PivotTable report are refreshed.
- 8. Edit Query when Folder Path Changes. If the Folder Path changes, the you must edit the first step of the query and change the incorrect folder path to the correct folder path.