“Power” Tools for IR Reporting

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NCAIR Summer Drive-In 2014

- 10,107 students
- Master's Comprehensive
- Mountain location
- Residential and Distance

Western Carolina UNIVERSITY

Presentation Overview

- Pivot tables and their limitations
- Power Pivot and DAX Formulas
- Power Query
- Power Map
- Power View

Pivot Tables

Why Pivot Tables

- Summarize large datasets
- Quickly add, remove, rearrange elements
- (Little to) No formula-writing
- Can be a basis for self-service data
- Can connect to a refreshable data source

Limitations of Pivot Tables

- Connected to only 1 table
- Formatting not maintained
- Calculated fields need to be created for each Pivot Table
- Can’t count the way universities usually want to count

Connecting to Data

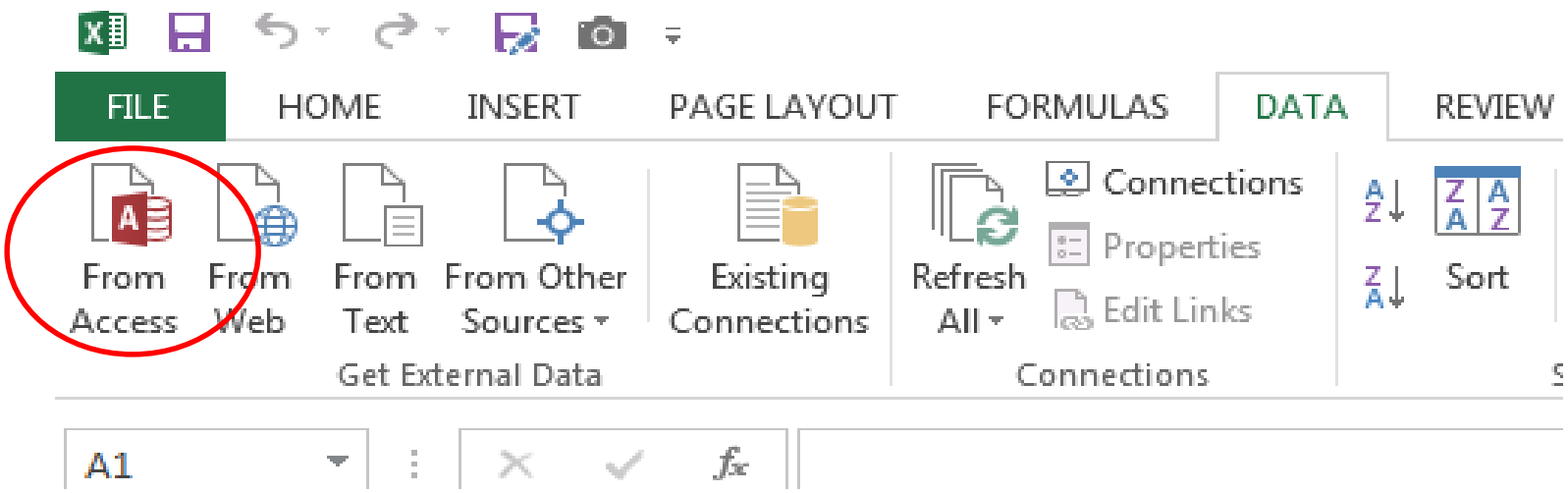
Connecting to Data

- **Wide variety of data sources, including:**
  - Access
  - SQL Server
  - Text files (csv)
  - XML
  - OLEDB
  - Etc.

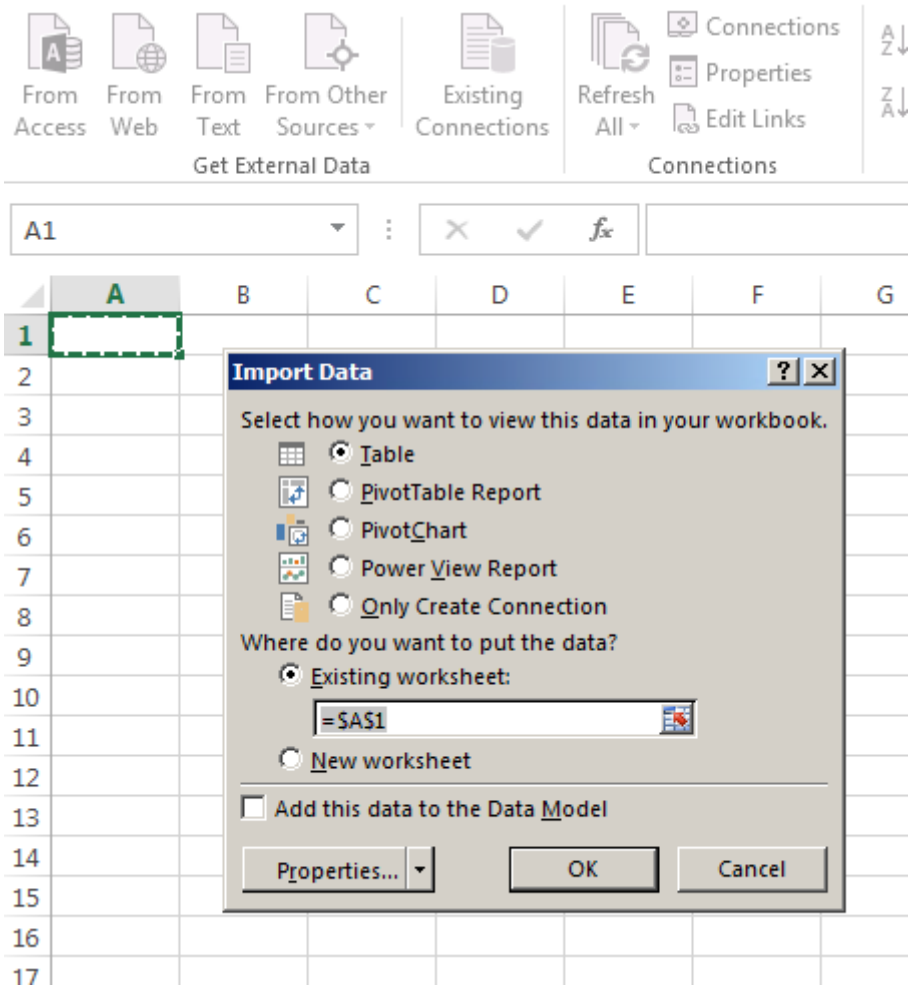
Connecting to Data

- **Connects to:**
  - Tables
  - Queries

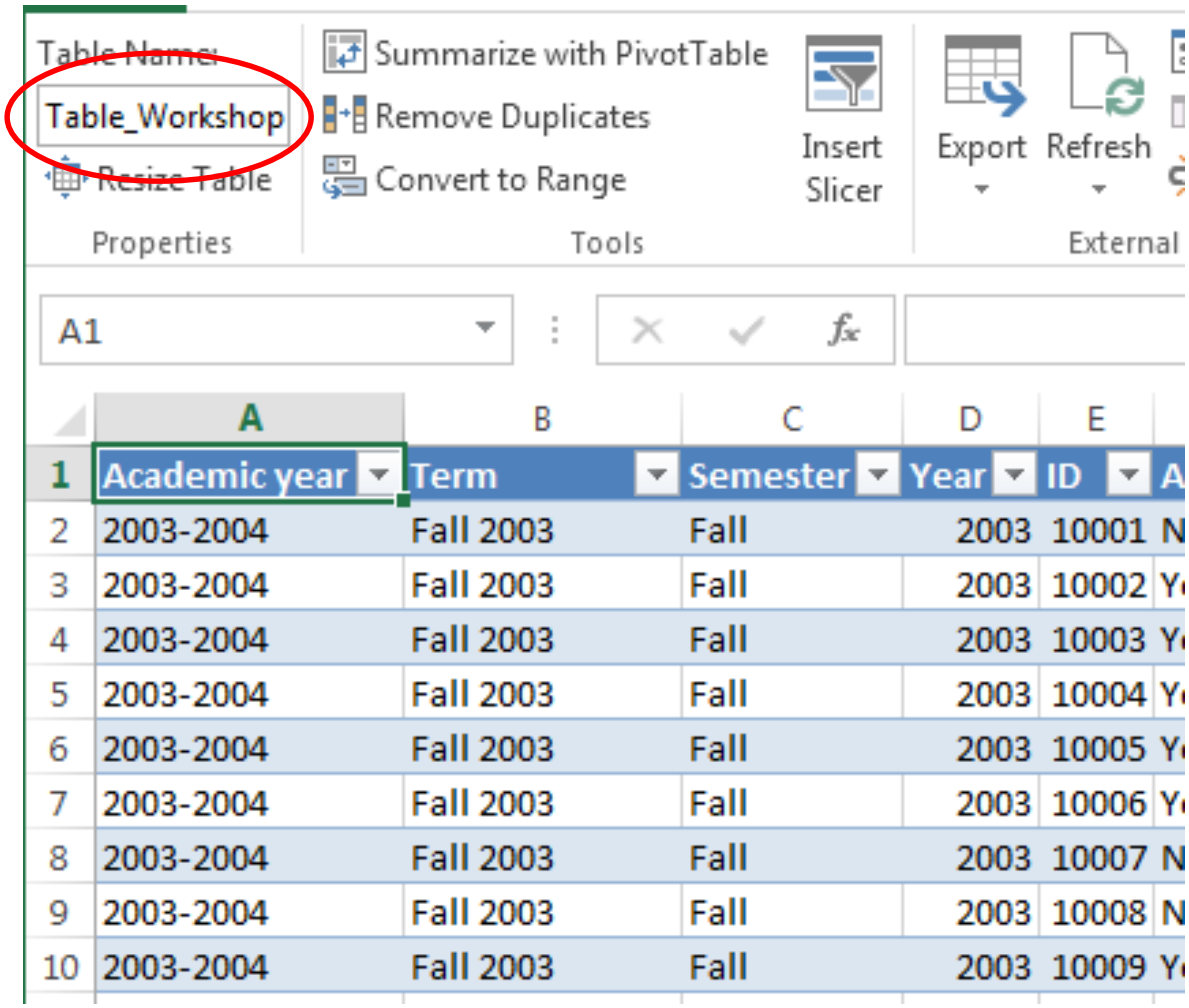
Connecting to Data



Connecting to Data



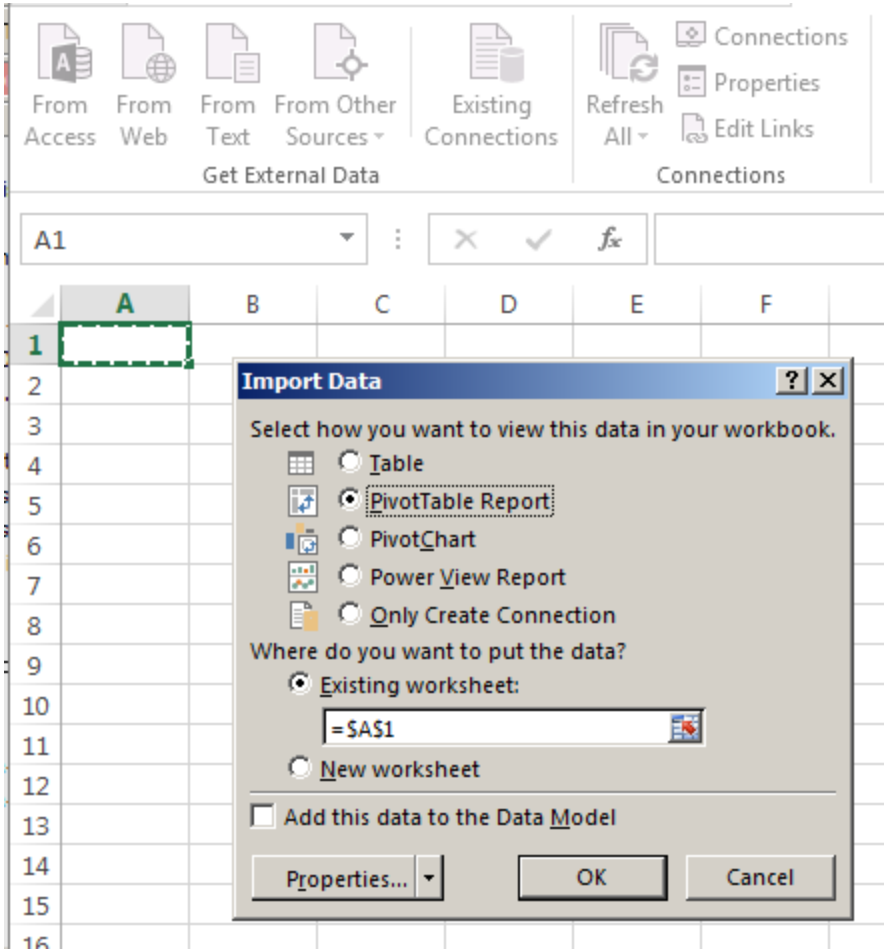
Connecting to Data



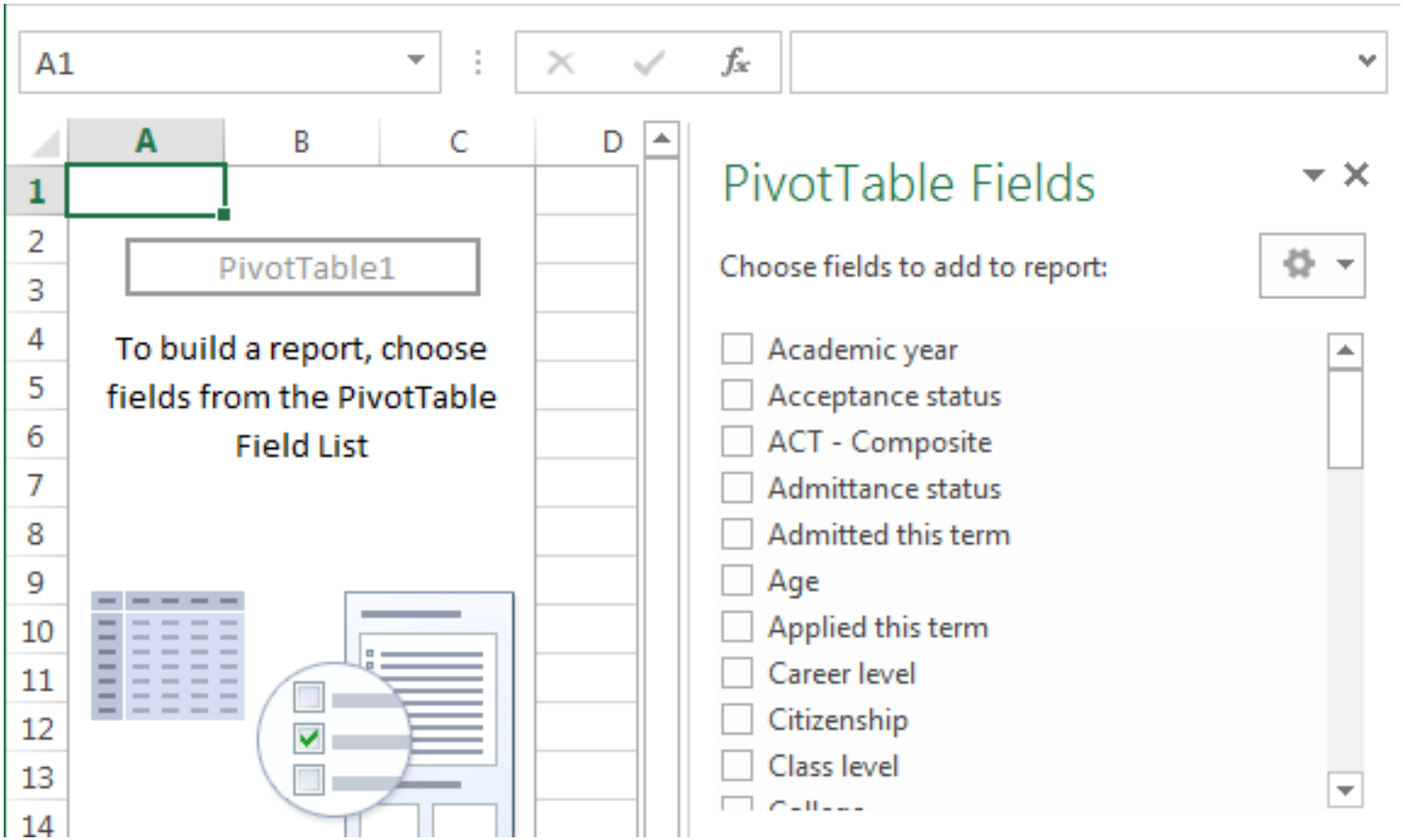
	A	B	C	D	E	
1	Academic year	Term	Semester	Year	ID	A
2	2003-2004	Fall 2003	Fall	2003	10001	N
3	2003-2004	Fall 2003	Fall	2003	10002	Y
4	2003-2004	Fall 2003	Fall	2003	10003	Y
5	2003-2004	Fall 2003	Fall	2003	10004	Y
6	2003-2004	Fall 2003	Fall	2003	10005	Y
7	2003-2004	Fall 2003	Fall	2003	10006	Y
8	2003-2004	Fall 2003	Fall	2003	10007	N
9	2003-2004	Fall 2003	Fall	2003	10008	N
10	2003-2004	Fall 2003	Fall	2003	10009	Y

Displaying Data –
Pivot Tables

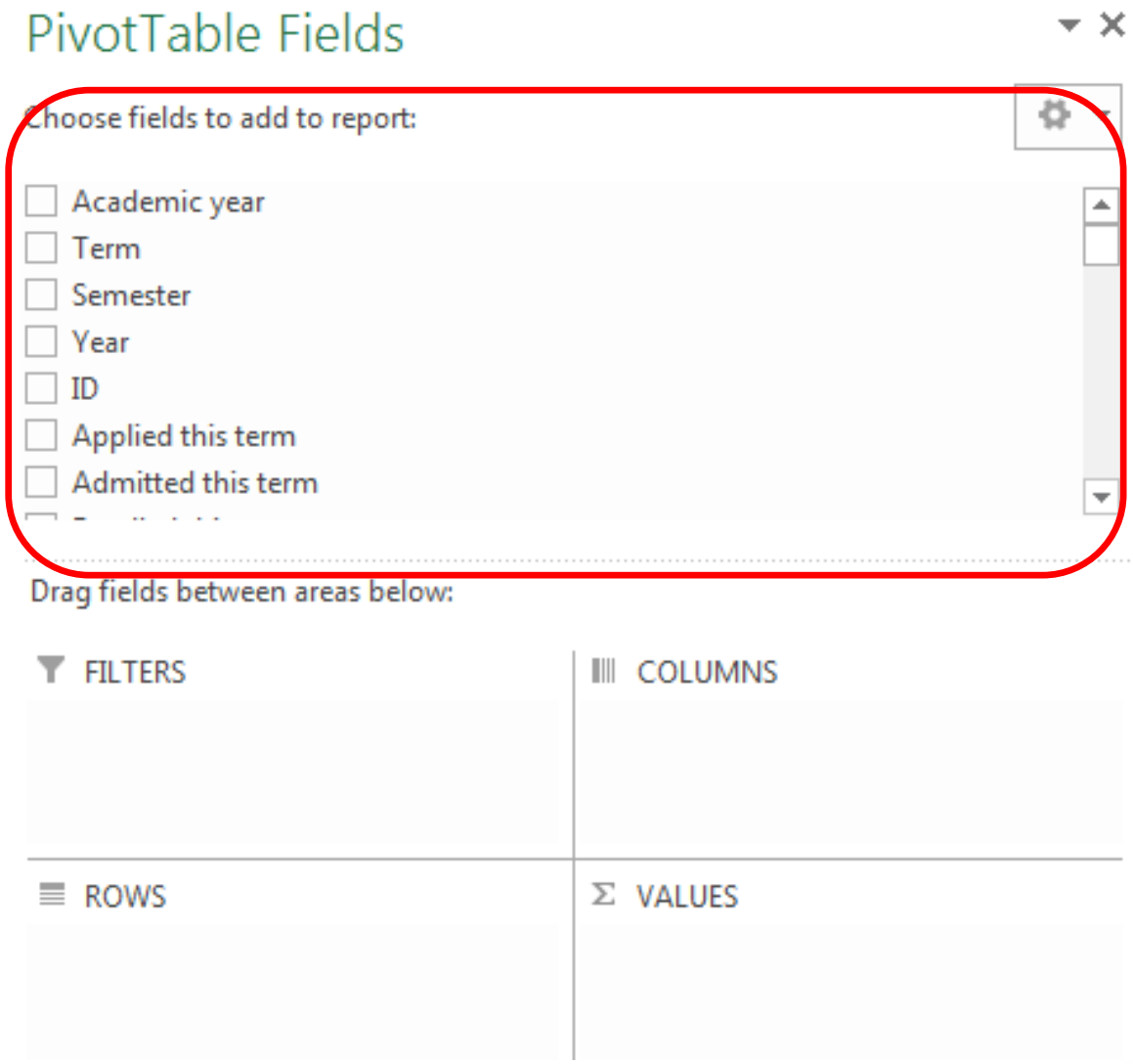
Connecting to Data



Connecting to Data



Displaying Data – Pivot Tables



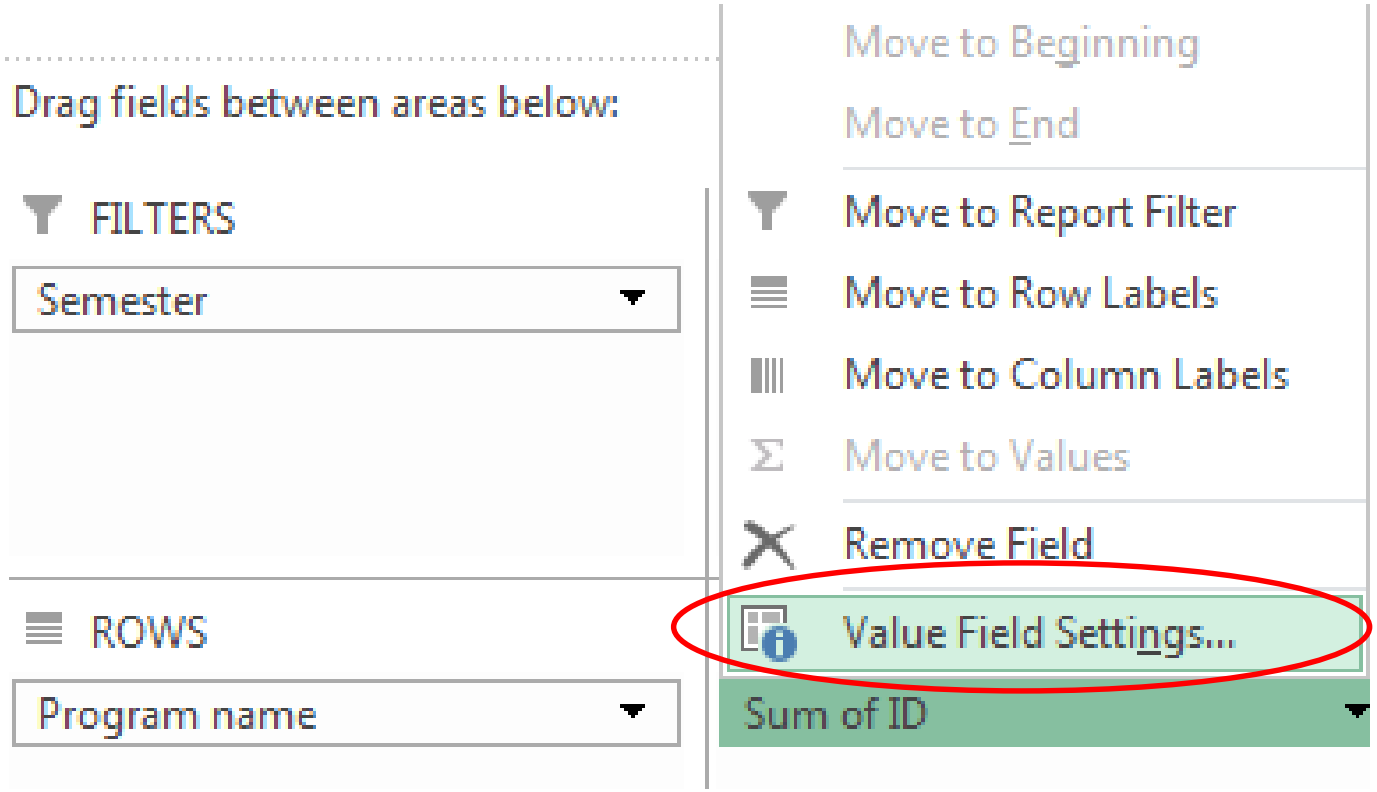
Displaying Data – Pivot Tables

Drag fields between areas below:

FILTERS	COLUMNS
ROWS	VALUES

	A	B	C
1	Semester	Fall	
2			
3	Count of ID	Column Labels	
4	Row Labels	2003-2004	2004-2005
5	Aerospace Engineering	44	66
6	Architecture	180	274
7	Biomedical Research	49	67
8	Ecosystem Health	56	72

Displaying Data – Pivot Tables



Sum
Count
Average
Max
Min
Product
Count Numbers
StdDev
StdDevp
Var
Varp

Displaying Data – Pivot Tables

ROWS

- College
- Department
- Program name

	A	B	C	D	E
1	Semester	Fall			
2					
3	Count of ID	Column Labels			
4	Row Labels	2003-2004	2004-2005	2005-2006	2006-2007
5	College of Information Studies	150	197	182	181
6	Information Management	115	154	139	145
7	Information Management	115	154	139	145
8	Library Science	35	43	43	36
9	Library Science	35	43	43	36

Questions

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Displaying Data –
Power Pivot

New and improved Pivot Tables!

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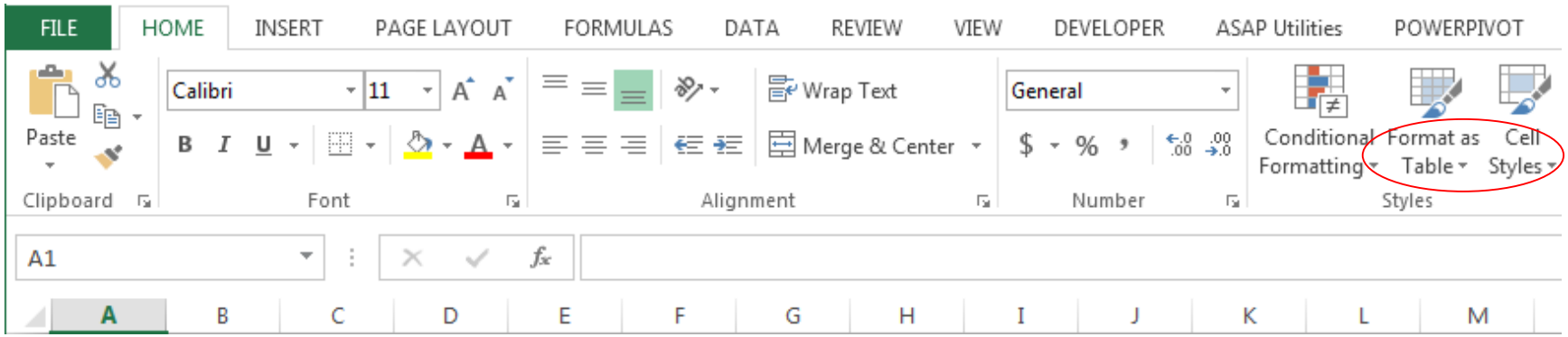
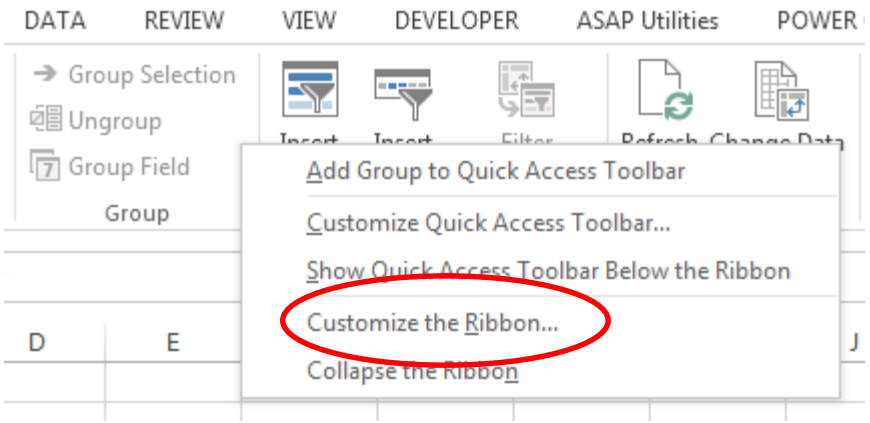
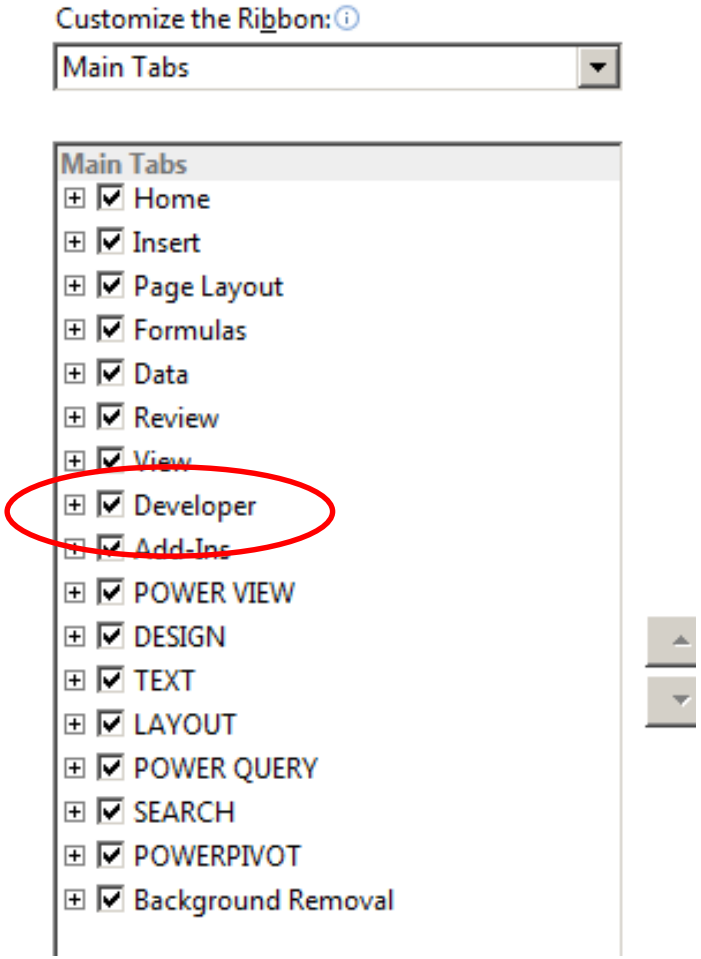
Getting Started – Power Pivot



- Installed with Excel 2013
- Downloadable add-in for Excel 2010 (http://goo.gl/3xEE0T)
- **Not available for Excel 2011, prior to 2010, or on Office Web Apps**
- Best experience with Excel 2013 or Office 365 on Windows 64bit
- Best experience with Excel 2013 or Office 365 on Windows 64bit
- bit.ly/**upgradehorror**

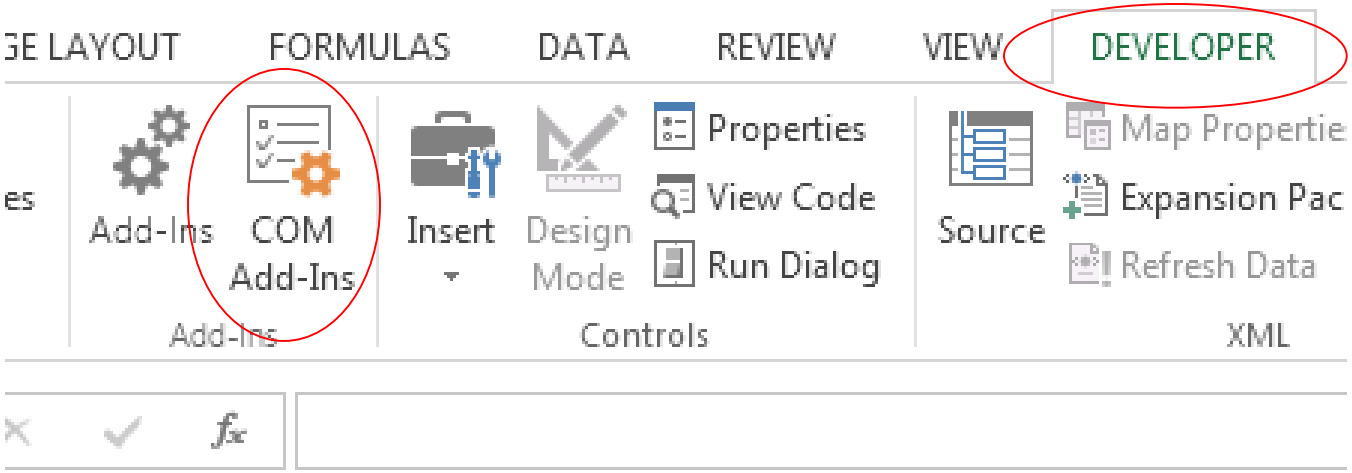
Enabling Add-Ins – Power Pivot



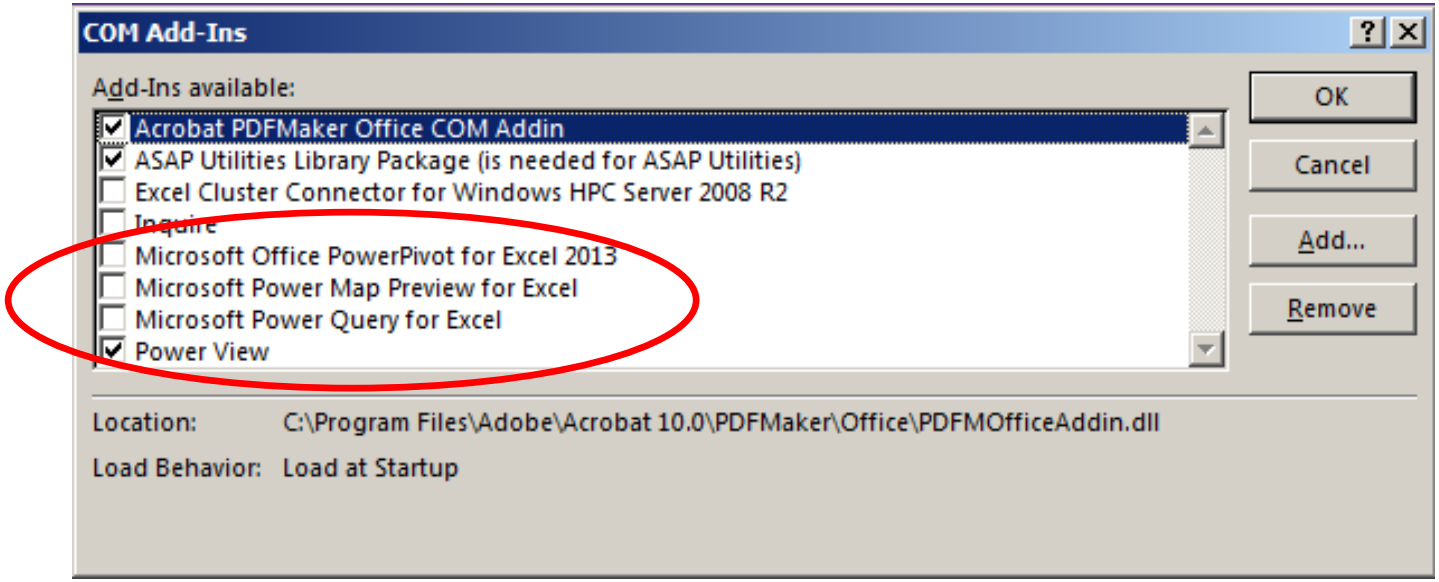


- Right-click on ribbon
- *Customize the ribbon*
- Select *Developer*

Enabling Add-Ins – Power Pivot



Enabling Add-Ins – Power Pivot



Limitations – Power Pivot

- **The Power Pivot environment**
  - Number of tables per PowerPivot database (2^31) - 1
    2,147,483,647
  - Number of rows in a table

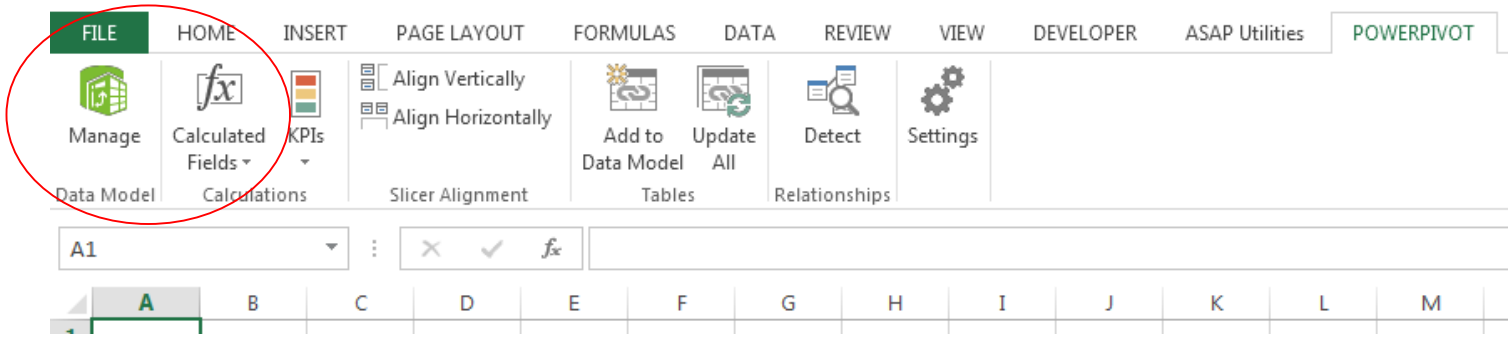
    1,999,999,997
  - Number of calculated measures in a table

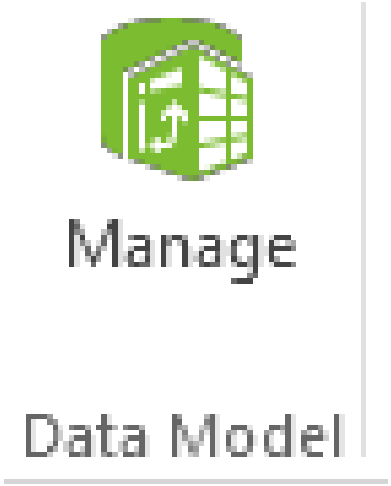
    (2^31) - 1 = 2,147,483,647
  - String Length

    512 MB

Getting Started – Power Pivot

- **The Power Pivot environment**

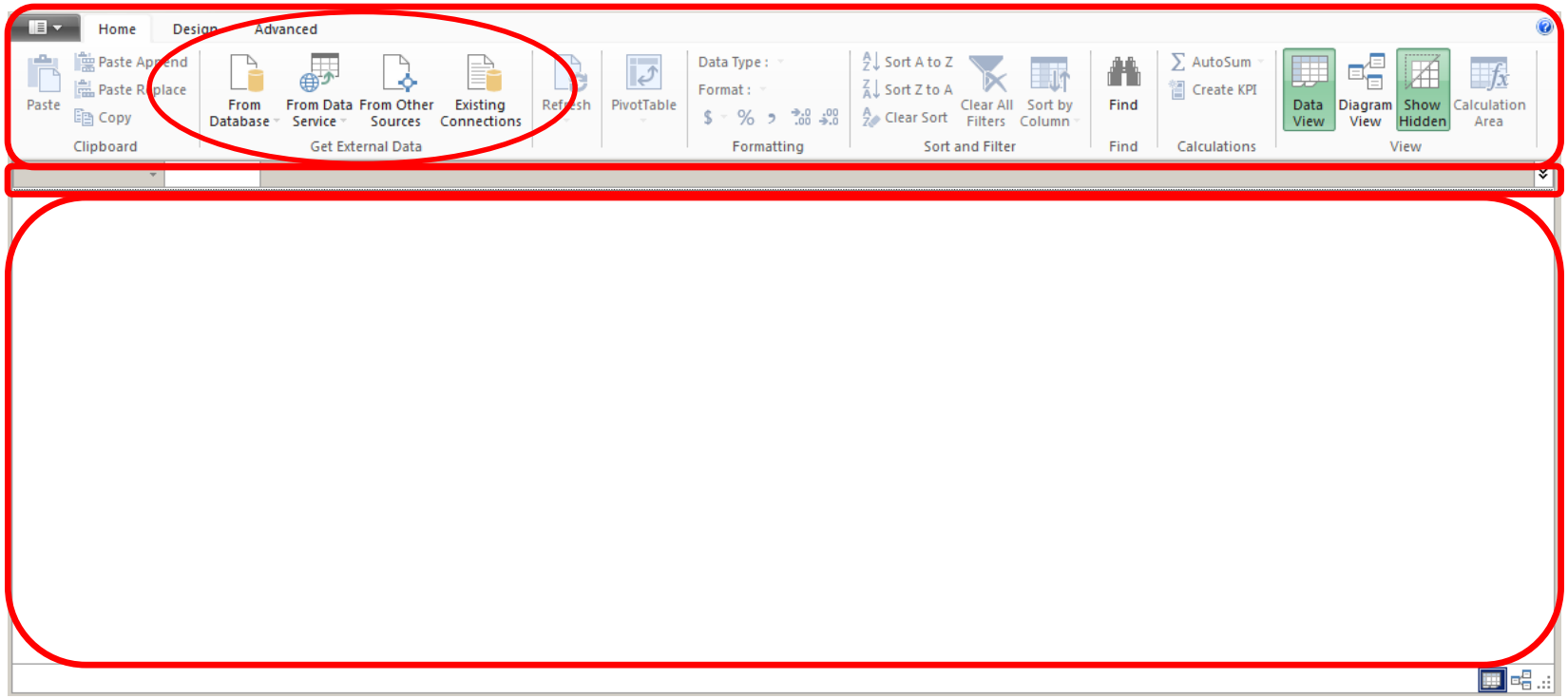




Open Power Pivot

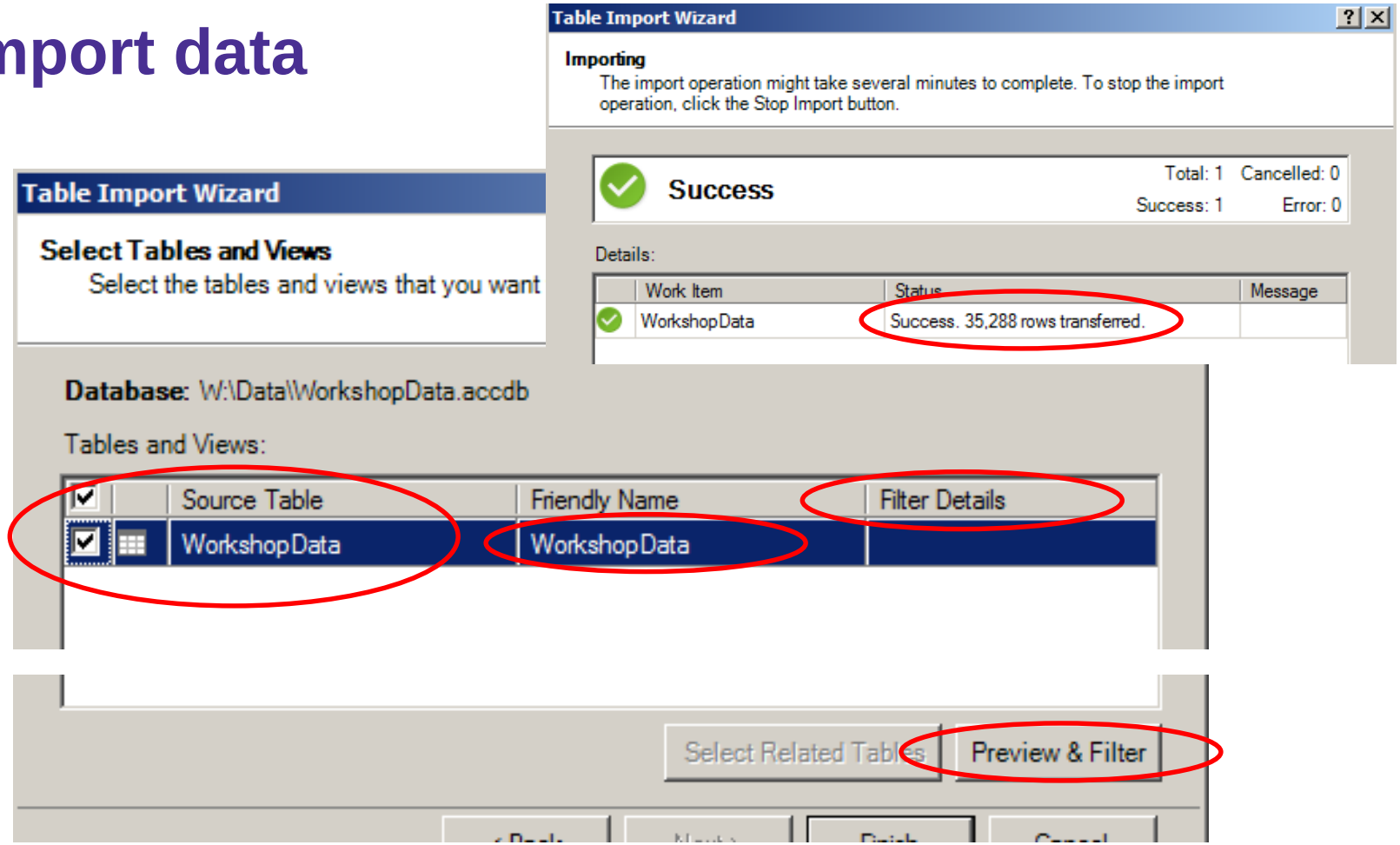
Getting Started – Power Pivot

- **The Power Pivot environment**



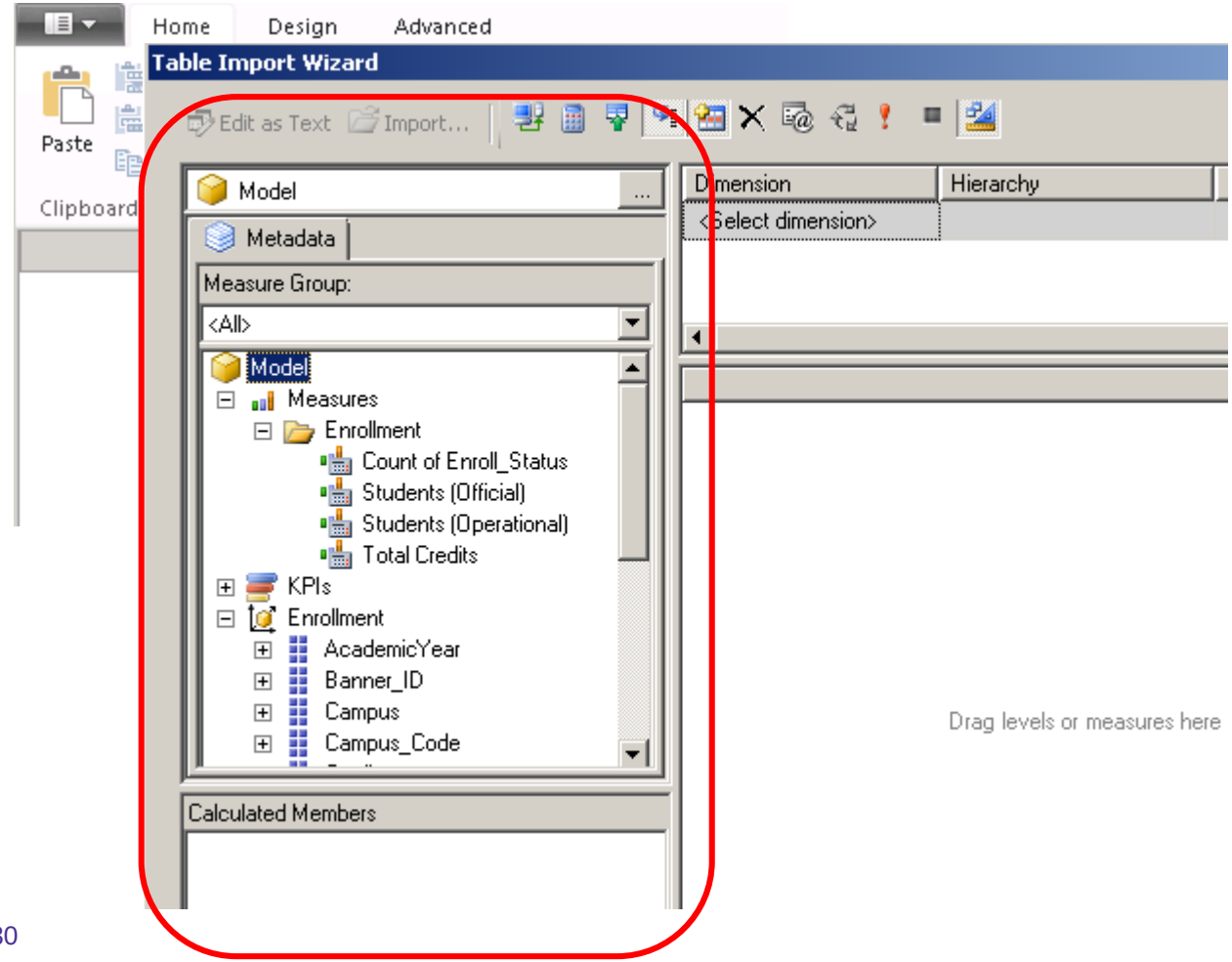
Importing Data – Power Pivot

- **Import data**



Importing Data – Power Pivot

- **Import from another Power Pivot (SharePoint)**



Importing Data – Power Pivot

- **How the imported data will look**

Academic year	Term	Semester	Year	ID	Applied this term	Admitted this term
2003-2004	Fall 2003	Fall	2003	10584	No	No
2003-2004	Spring ...	Spring	2004	10584	No	No
2004-2005	Fall 2004	Fall	2004	10518	No	No
2004-2005	Spring ...	Spring	2005	10380	No	No
2004-2005	Spring ...	Spring	2005	10518	No	No
2004-2005	Summ...	Summer	2005	10380	No	No
2005-2006	Summ...	Summer	2005	10380	No	No
2005-2006	Summ...	Summer	2005	10518	No	No
2006-2007	Fall 2006	Fall	2006	10076	No	No
2006-2007	Fall 2006	Fall	2006	10178	No	No

WorkshopData

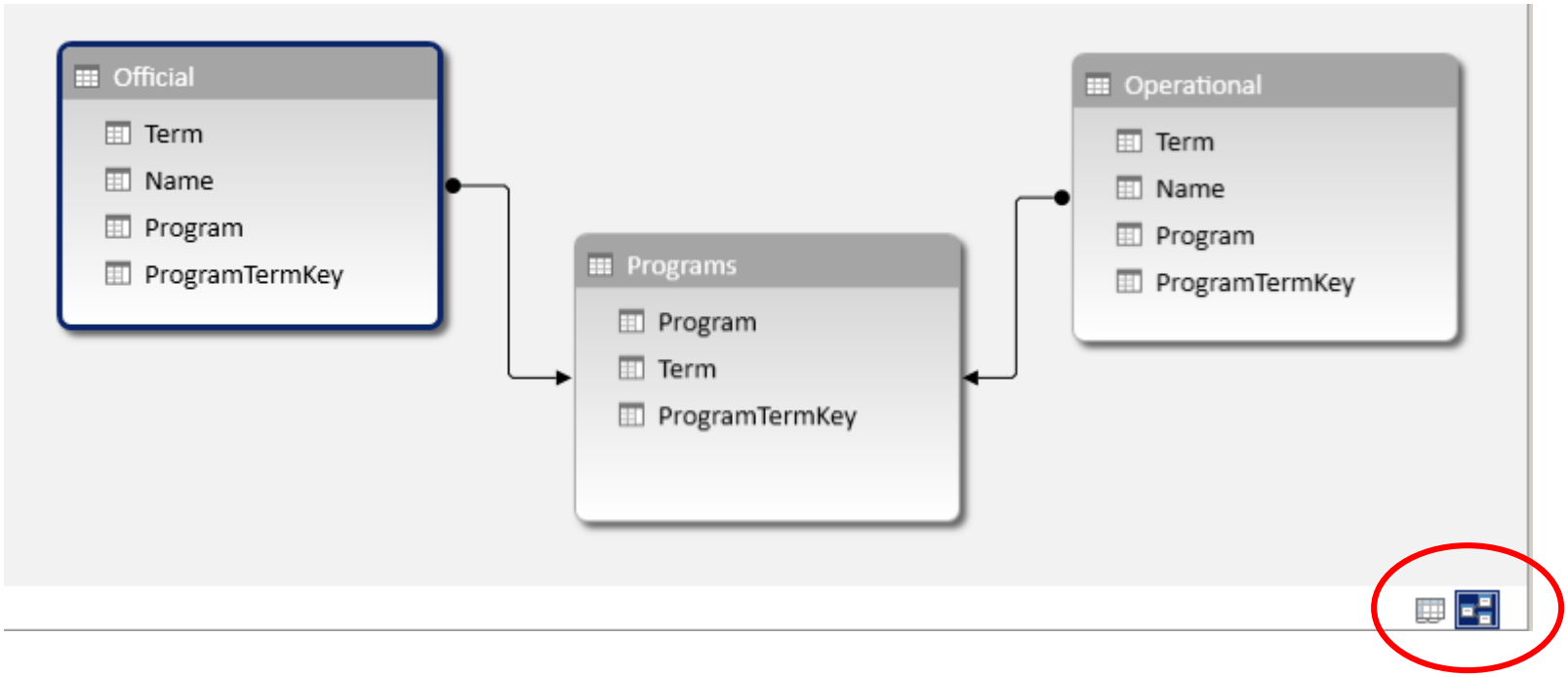
Record: 1 of 34,918

Modeling Data – Power Pivot

- **Joining Tables in Power Pivot** (for SQL Lovers)
  - Basically, a LEFT OUTER JOIN
  - Can be used in a single Excel Pivot Table or chart
  - Only one-to-one and many-to-one relationships are supported
  - You can cheat with one-to-many-to-one

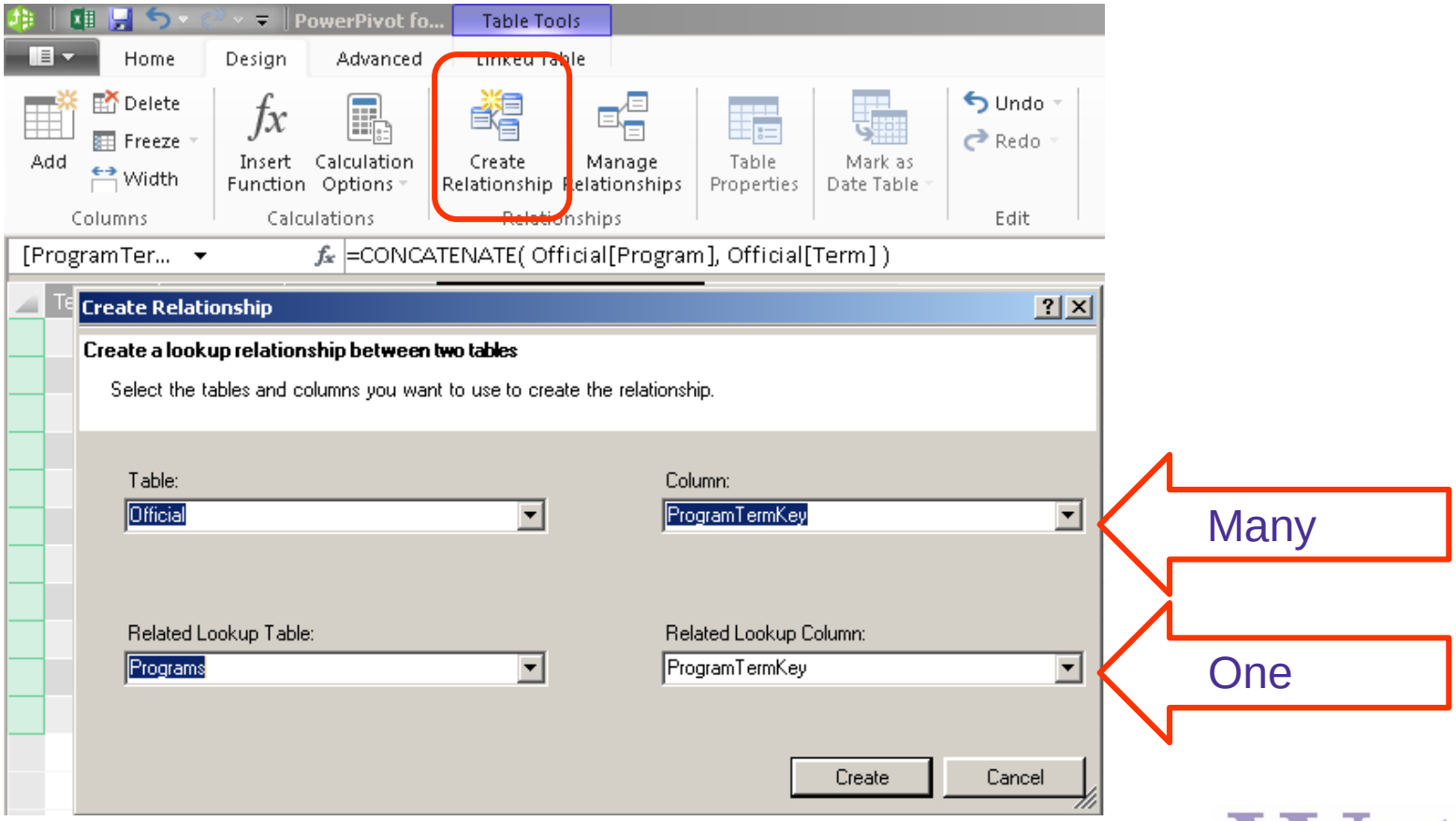
Modeling Data – Power Pivot

- **Joining Power Pivot Tables**
  - Use Diagram View to view and manage relationships



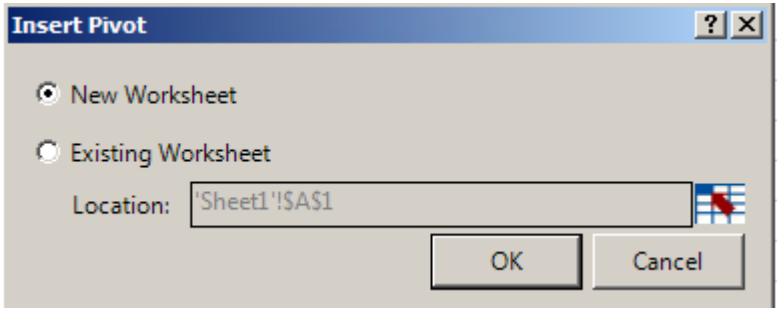
Modeling Data – Power Pivot

- **Manually Joining Tables in Power Pivot**



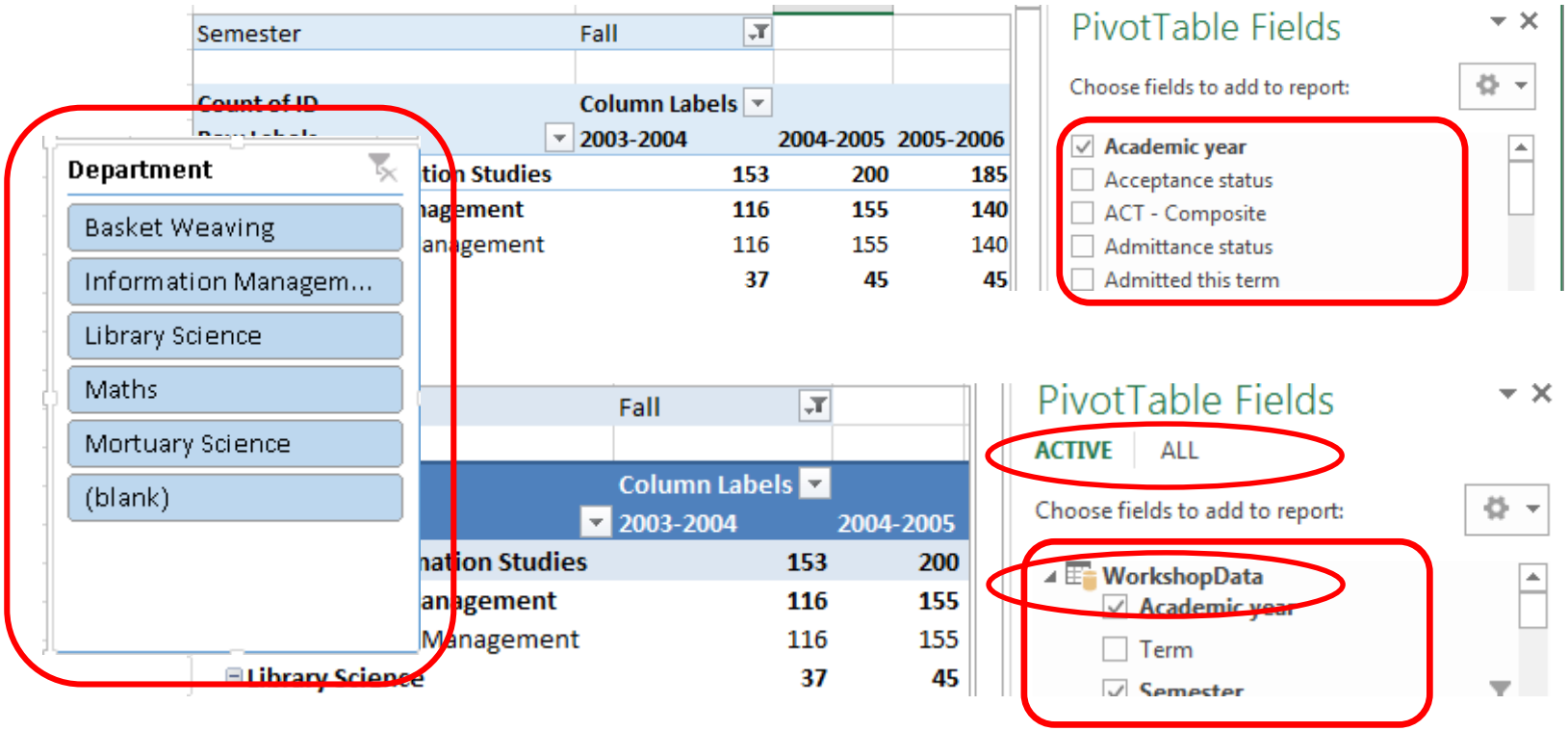
Displaying Data – Power Pivot

- **Bringing data into Excel**



Displaying Data – Power Pivot

- **PivotTable vs. Power Pivot PivotTable**



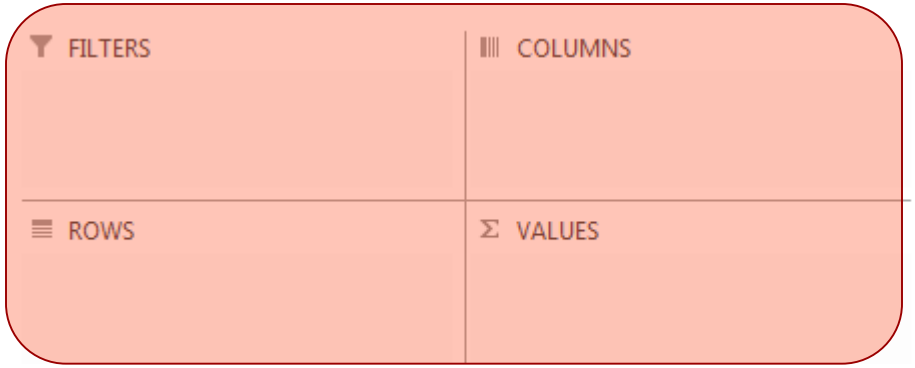

```
=IF( ISNULL( Banner[Department] ),
    "Unknown", Banner[Department]
  )
```

Adding Calculations – Power Pivot

- **DAX**
  - Data Analysis Expressions (DAX)
  - Formula language for Power Pivot
  - Used to create **Calculated Columns** and **Calculated Fields** (Measures)

Adding Calculations – Power Pivot

- **Calculated Columns**
  - Used to add an additional column to data table
  - Can be a column added from a related table (like a VLOOKUP) or new data, derived from existing data (sum to combined SAT, length of name, substring of longer string, etc.)
  - Column can be used in any area of the pivot



Calculated Columns – Power Pivot

– Can use EARLIER() function to loop

[Athletes On T...

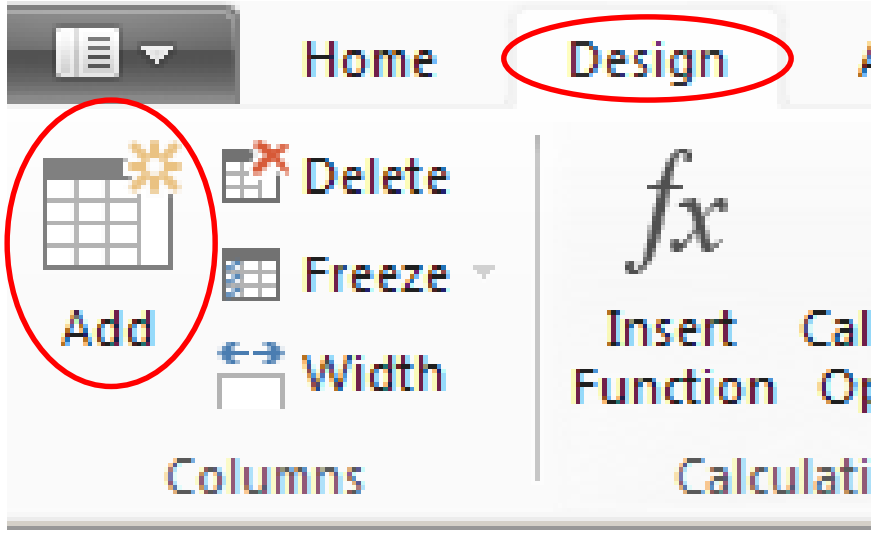
```
=CALCULATE(
  DISTINCTCOUNT( Athletes[Name] ),
  FILTER( Athletes,
    Athletes[Sport] = EARLIER( Athletes[Sport] )
  )
)
```

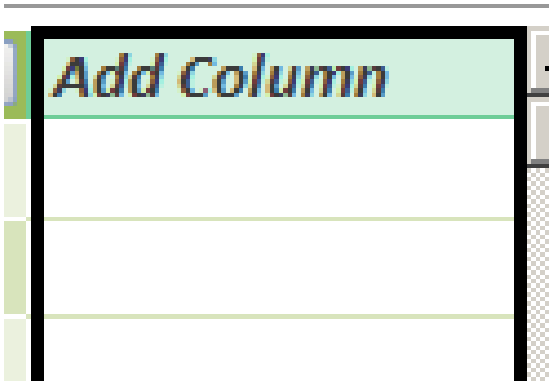
EARLIER(ColumnName, **[Number]**)

Name	Sport	Athletes On Team	Add Column
John	Football	5	
Jimmy-John	Football	5	
John-Jimmy	Golf	2	
Jimmy-Jimmy	Football	5	
Billy Bob	Football	5	
Jimmy-John	Golf	2	
Sabastian	Football	5	

Calculated Columns – Power Pivot

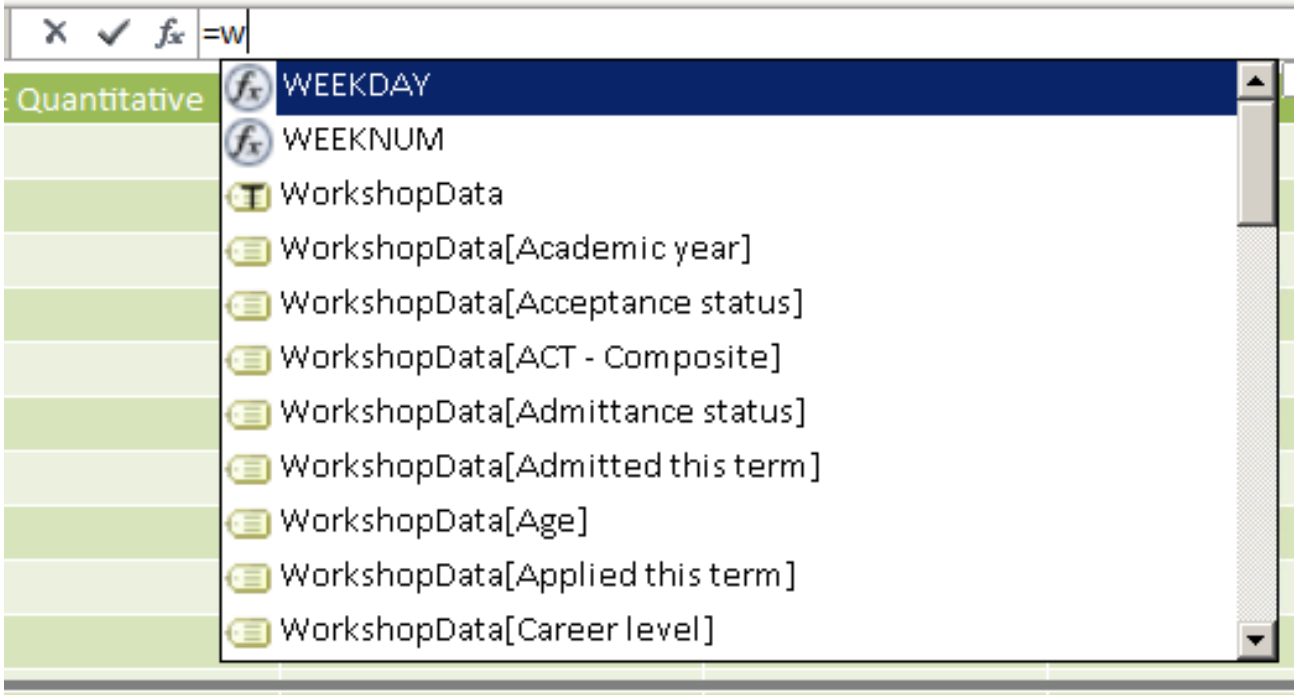
- **Adding a calculated column**





Calculated Columns – Power Pivot

- **Adding a calculated column**

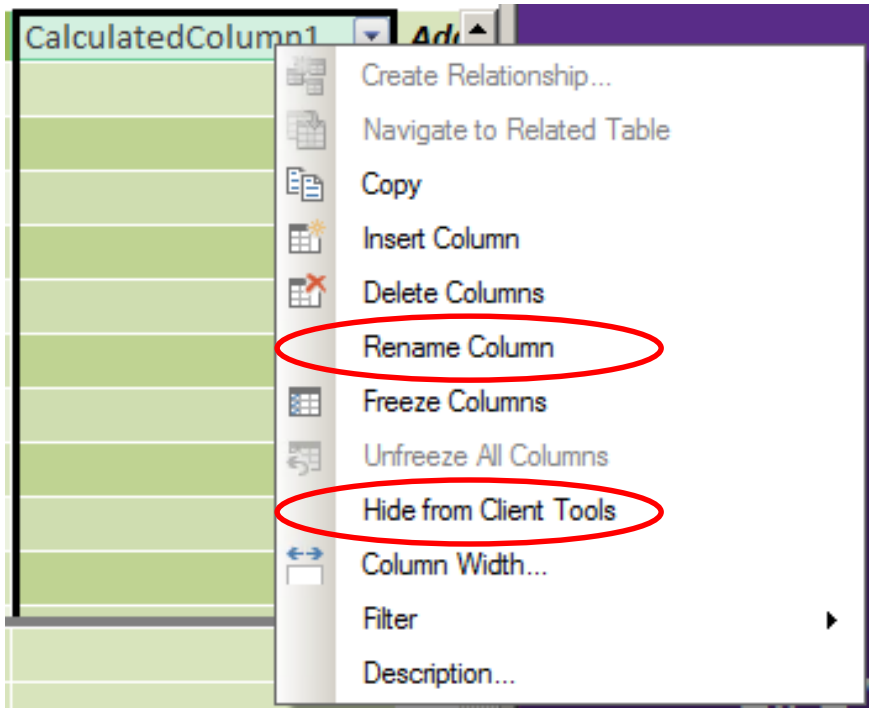


Calculated Columns – Power Pivot

- **Adding a calculated column**

```
=WorkshopData[SAT - Critical reading]+WorkshopData[SAT - Math]
```

CalculatedColumn1
930
930
1260
940
1260



Evaluation Contexts

- Row context

- Filter context

Evaluation Contexts

- Row context
  - The one row being evaluated
  - Automatic for calculated columns
  - Carries across related tables
- Filter context

Row Context

f_x =WorkshopData[SAT - Critical reading]+WorkshopData[SAT - Math]

mulative GPA	HS GPA	SAT - Critical reading	SAT - Math	SAT - Total	AC
3.13800001144409	3.150000...	540	390	930	
3.17499995231628	3.150000...	540	390	930	
3.53699994087219	4.559999...	520	740	1260	
1.8289999961853	3.25	510	430	940	
3.58999991416931	4.559999...	520	740	1260	
1.94900000095367	3.25	510	430	940	

Evaluation Contexts

- Row context
  - The one row being evaluated
  - Automatic for calculated columns
  - Can be created in other ways as well (SUMX, AVERAGEX, etc.)
- Filter context
  - The filters being applied by the pivot table
  - Filters can be explicit or implicit
  - Can add additional filters only with CALCULATE

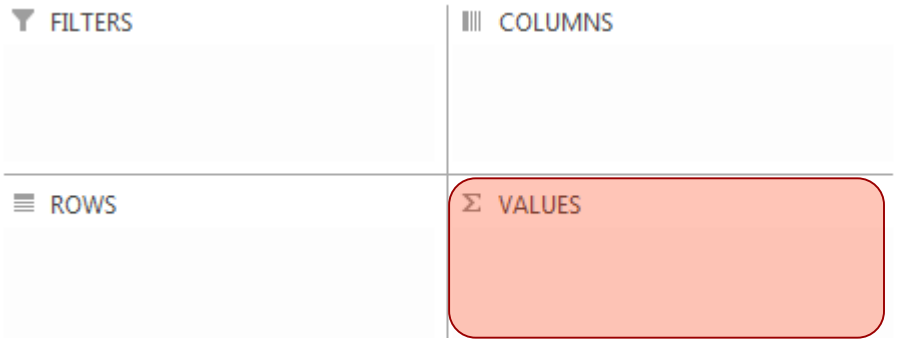
Filter Context

Semester	Fall	

	Column Labels		
	2003-2004		200
Row Labels	Count of ID	Average SAT	Cou
College of Information Studies	153	1062.592593	
Information Management	116	1081.188119	
Information Management	116	1081.188119	
Library Science	37	1007.352941	
Library Science	37	1007.352941	
College of Journalism	67	1045.5	

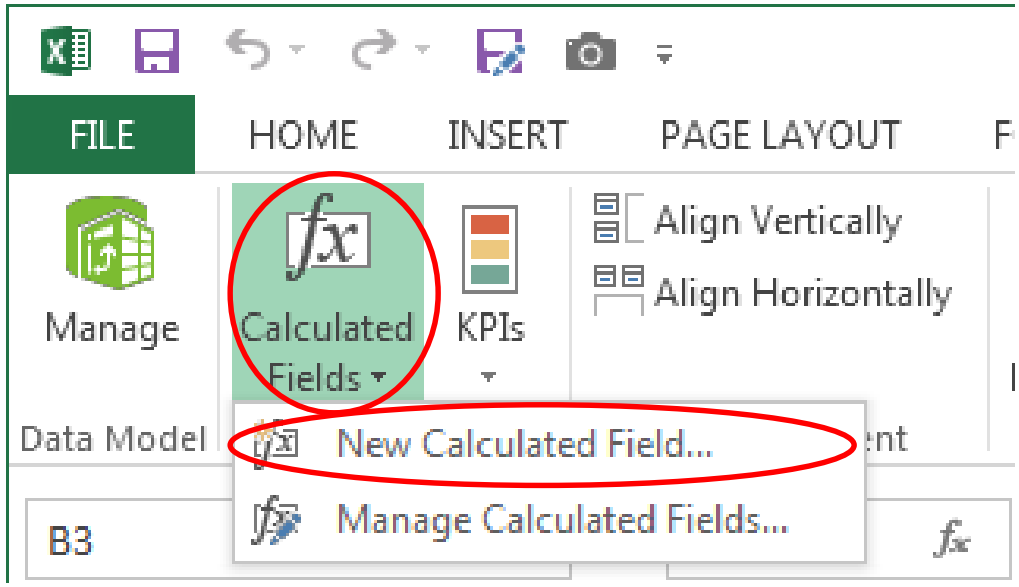
Adding Calculations – Power Pivot

- **Calculated Fields**
  - Used to add a calculated Value
  - Aggregate function that applies to whole table, column, or range
  - Something that needs to be recalculated
  - Much faster than a Calculated Column



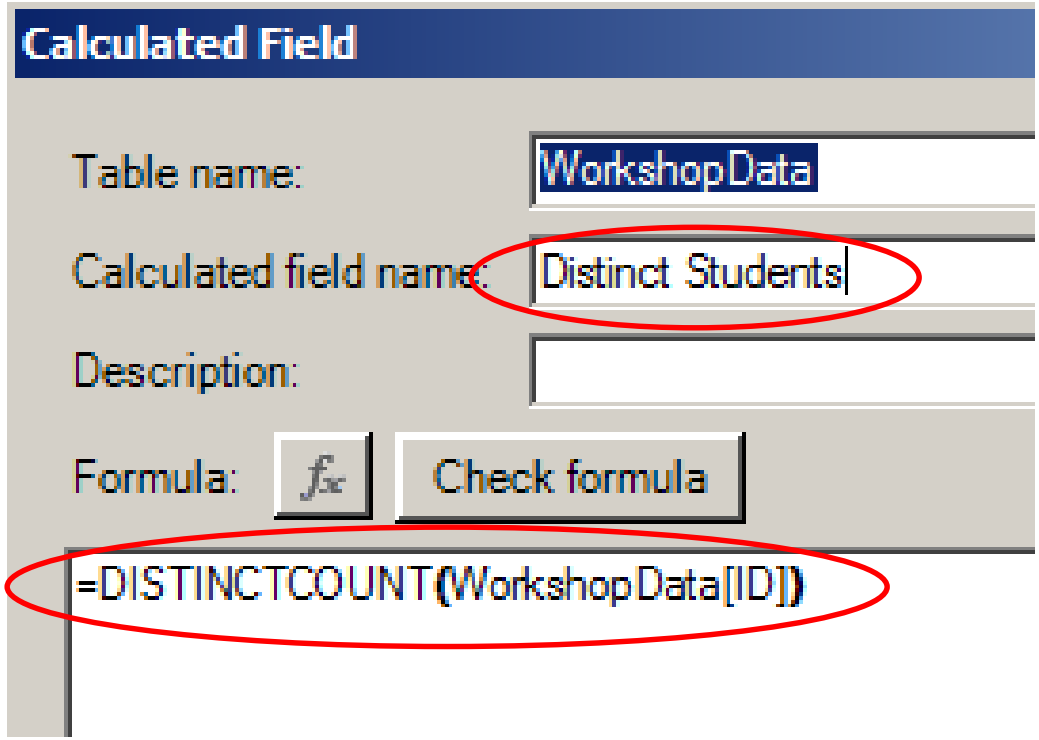
Calculated Fields – Power Pivot

- **Adding a Calculated Field**



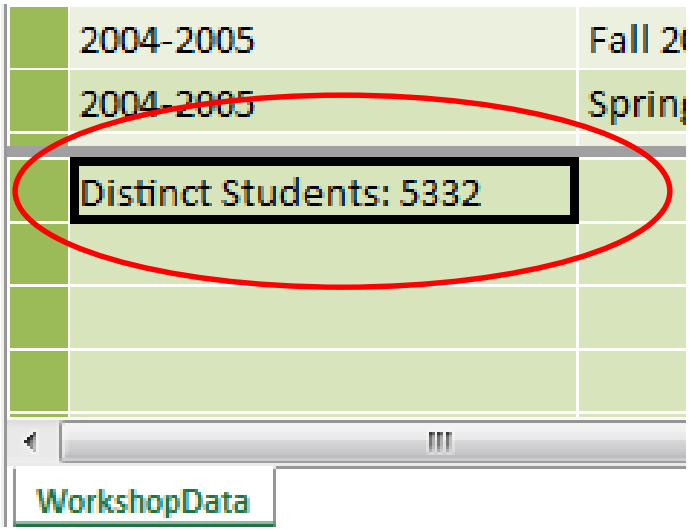
Calculated Fields– Power Pivot

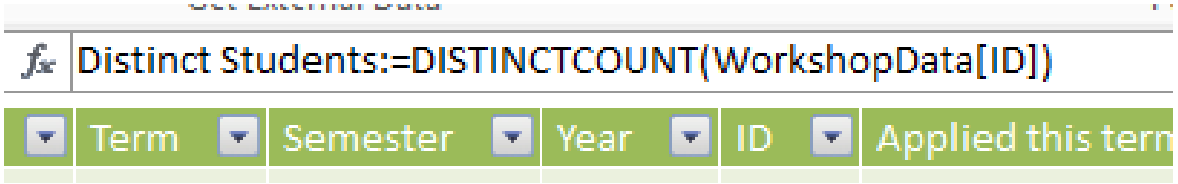
- **Adding a Calculated Field**



Calculated Fields – Power Pivot

- **Calculated Field in Power Pivot**





Questions

DAX Example –
Power Pivot

DAX Example– Power Pivot

Row Labels	Column Labels 2003-2004 Distinct Enrolled Students	% Above Average GPA Enrolled Undergraduates	2004- Distin
College of Information Studies	**152**	**42.11 %**	
Information Management	**116**	**44.83 %**	
Information Management	116	44.83 %	
Library Science	**37**	**32.43 %**	
Library Science	37	32.43 %	
College of Journalism	**66**	**45.45 %**	
Journalism	**66**	**45.45 %**	
Journalism	66	45.45 %	

DAX Example – Power Pivot

- **DISTINCTCOUNT**

  DISTINCTCOUNT(<column>)

  – Counts unique values in column

  – Works with both Strings (characters) and numbers

DAX Example – Power Pivot

- **Adding a Calculated Field**

Row Labels	Column Labels 2003-2004 Count of ID	Distinct Students	2 C
College of Information Studies	**153**	**152**	
Information Management	**116**	**116**	
Information Management	116	116	
Library Science	**37**	**37**	

DAX Example– Power Pivot

- **CALCULATE**

CALCULATE(expression, <filter1>, <filter2>…)

- Supercharged SUMIFS
- Allows filtering (IFs) on any aggregate function (imagine "MAXIFS", "MEDIANIFS", etc.)
- Operators for filters: =, <, >, <=, >=, <>
- Can also use || in filter on same column

DAX Example– Power Pivot

```
First-time Freshmen Distinct Students:=
    CALCULATE(
      [Distinct Students],
      WorkshopData[Class level]="Freshman",
      WorkshopData[Is new student this term]="Yes"
    )
```

DAX Example – Power Pivot

- **ALL**

ALL(table_or_column, <column1>, <column2>, …)

  – Returns all the rows in a table, or all the values in a column, removing any filters that might have been applied

DAX Example– Power Pivot

```
All Distinct Enrolled Students:=
  CALCULATE(
    [Distinct Enrolled Students],
    ALL( WorkshopData[Class level] )
  )
```

DAX Example– Power Pivot

Row Labels	2009-2010 Distinct Enrolled Students	All Distinct Enrolled Students
Aerospace Engineering	**107**	**107**
Freshman	18	107
Sophomore	13	107
Junior	37	107
Senior	39	107
Architecture	**276**	**276**
Freshman	40	276

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DAX Example – Power Pivot

```
% of All Distinct Enrolled Students:=
  DIVIDE([Distinct Enrolled Students],
     [All Distinct Enrolled Students] )
```

DAX Example – Power Pivot

Row Labels	2009-2010 Distinct Enrolled Students	% of All Distinct Enrolled Students	2010 Dist
Aerospace Engineering	**107**	**100.00 %**	
Freshman	18	16.82 %	
Sophomore	13	12.15 %	
Junior	37	34.58 %	
Senior	39	36.45 %	
Architecture	**276**	**100.00 %**	
Freshman	40	14.49 %	

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DAX Example– Power Pivot

- **FILTER**

FILTER(TableToFilter, FilterExpression)

– Returns a table filtered by FilterExpression

DAX Example – Power Pivot

```
Above Average GPA Enrolled Undergraduates:=

    CALCULATE(

        [Distinct Enrolled Students],

        FILTER(

            WorkshopData,

            WorkshopData[Institutional cumulative GPA] >
                    [Average GPA Enrolled Undergraduates]
            )

    )
```

DAX Example– Power Pivot

Row Labels	Column Labels 2003-2004 Distinct Enrolled Students	% Above Average GPA Enrolled Undergraduates	2004- Distin
College of Information Studies	**152**	**42.11 %**	
Information Management	**116**	**44.83 %**	
Information Management	116	44.83 %	
Library Science	**37**	**32.43 %**	
Library Science	37	32.43 %	
College of Journalism	**66**	**45.45 %**	
Journalism	**66**	**45.45 %**	
Journalism	66	45.45 %	

Displaying Data – Power Pivot

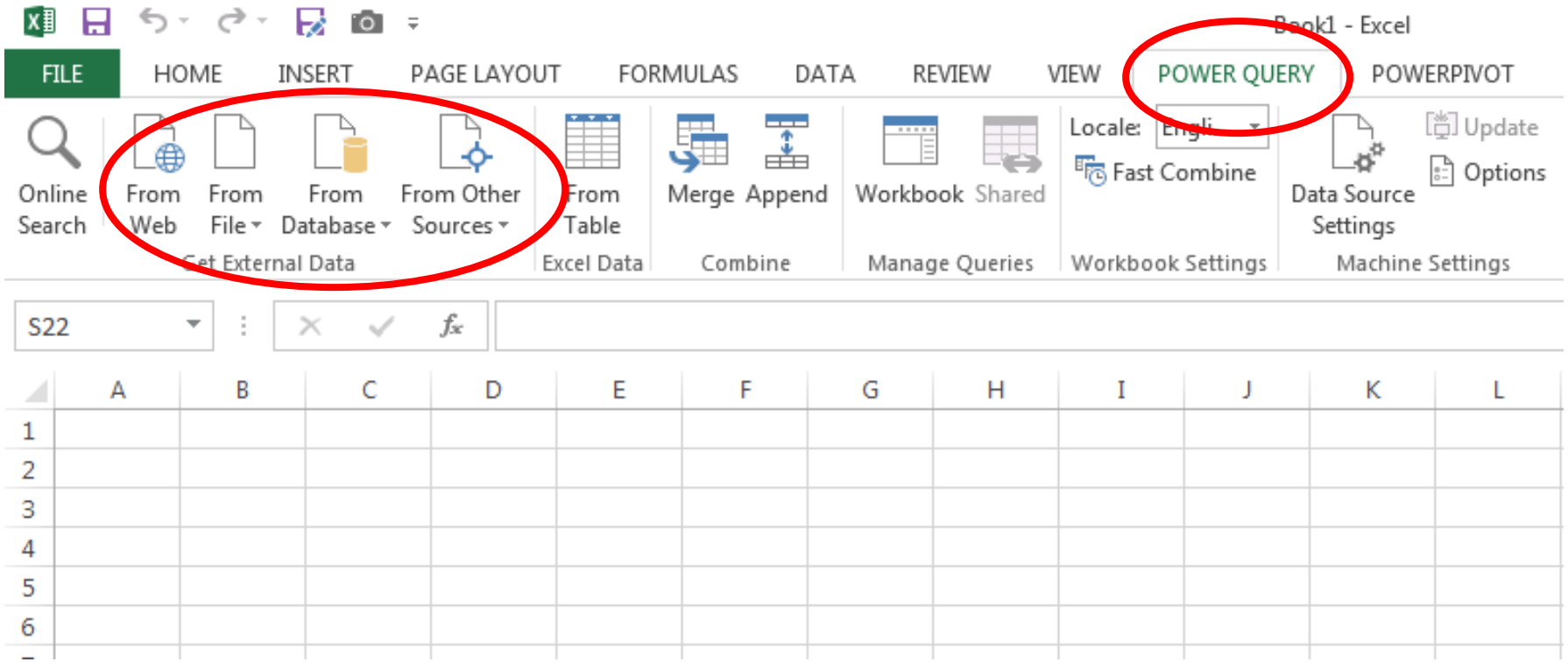
- **Resources**
  - DAX Formatter:
    http://www.daxformatter.com/
  - DAX Patterns:
    http://www.daxpatterns.com/
- **Twitter**
  - Christopher Webb @Technitrain
  - Marco Russo @marcorus
  - Alberto Ferrari @FerrariAlberto
  - Rob Collie @powerpivotpro

Questions

Power Query

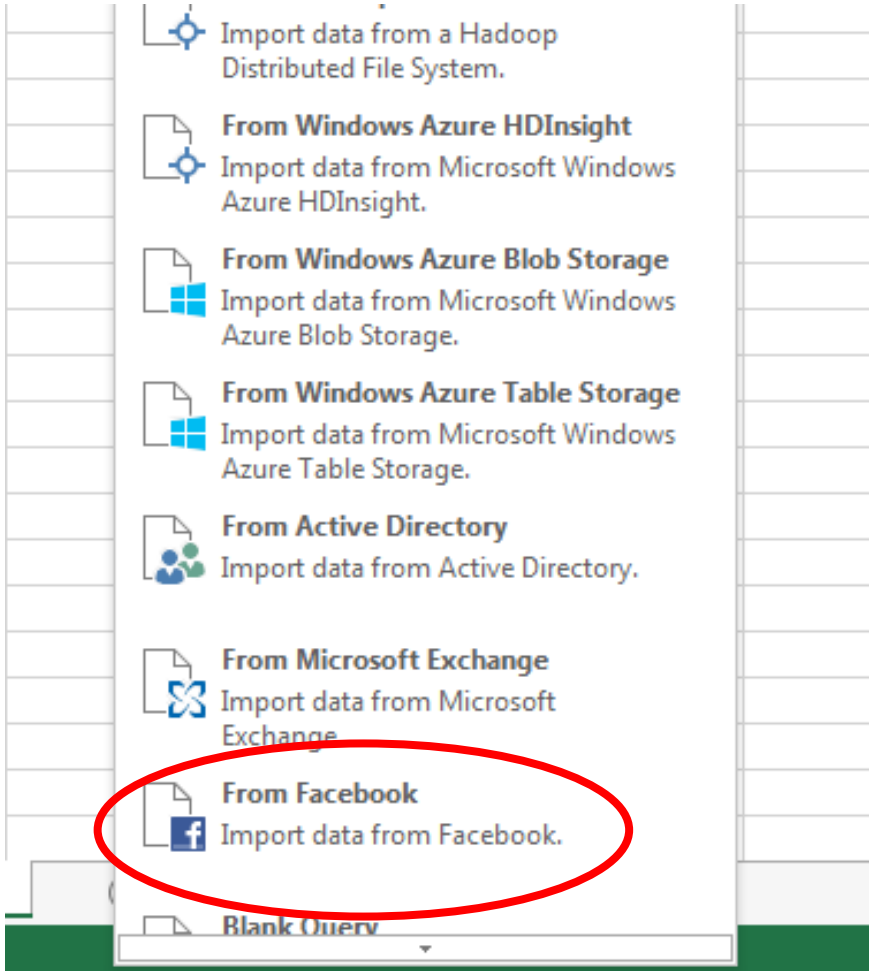
Power Query data sources

- **Retrieve data from a variety of external sources (web searches, webpages, files, databases, and more)**

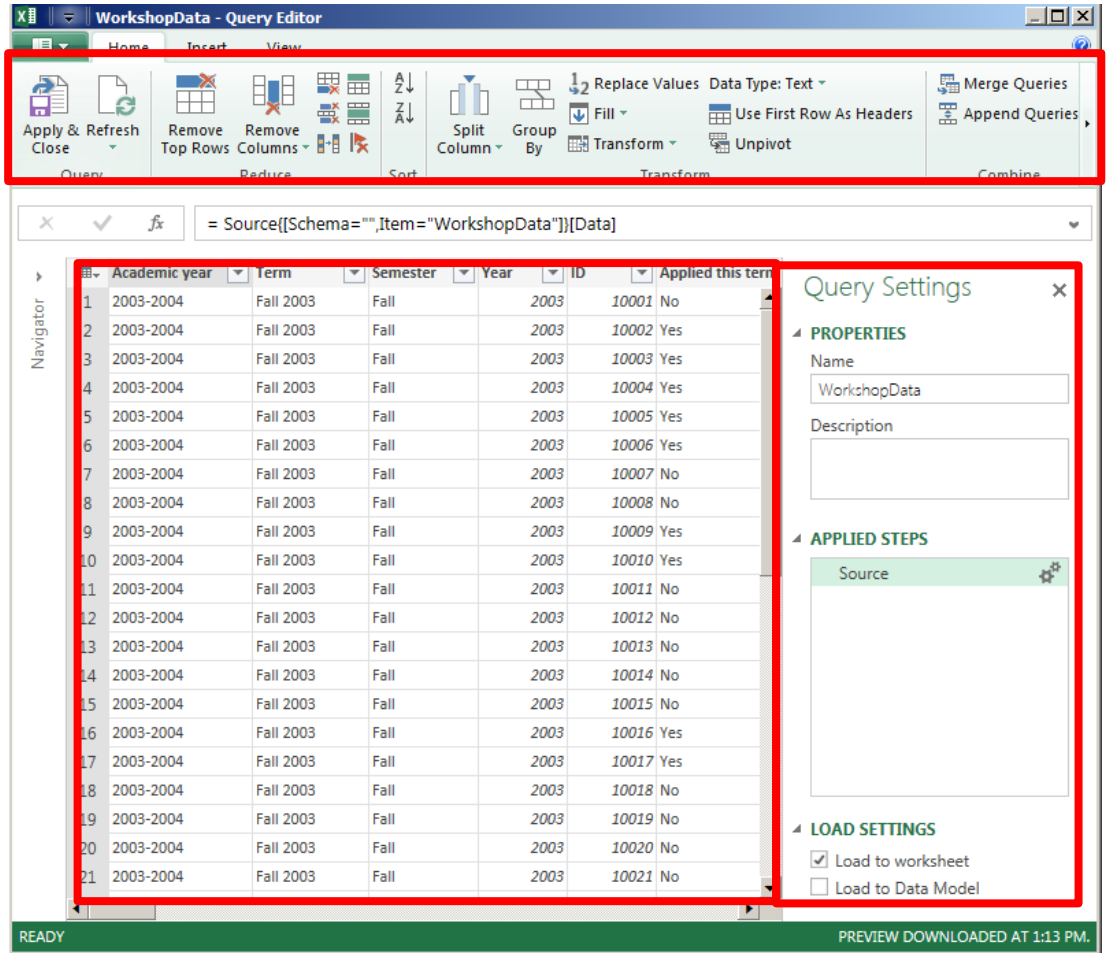


Power Query data sources

- **Access to sources of data not readily available to Power Pivot**

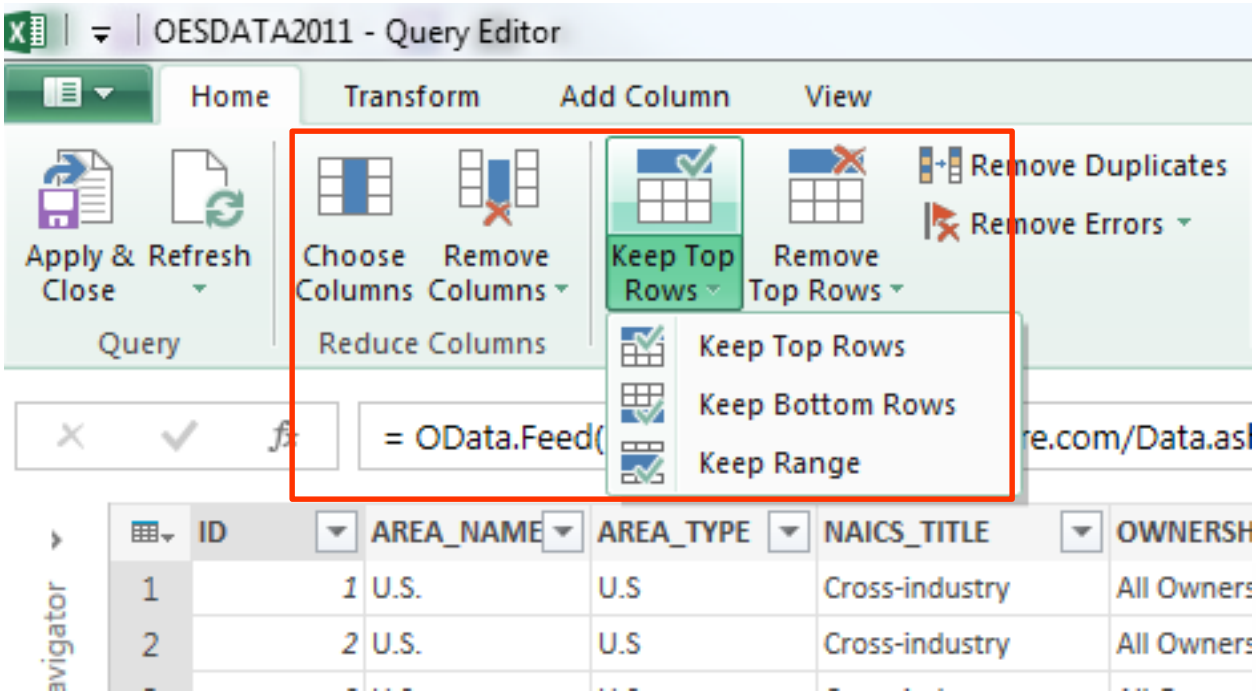


Power Query preview (Query Editor)



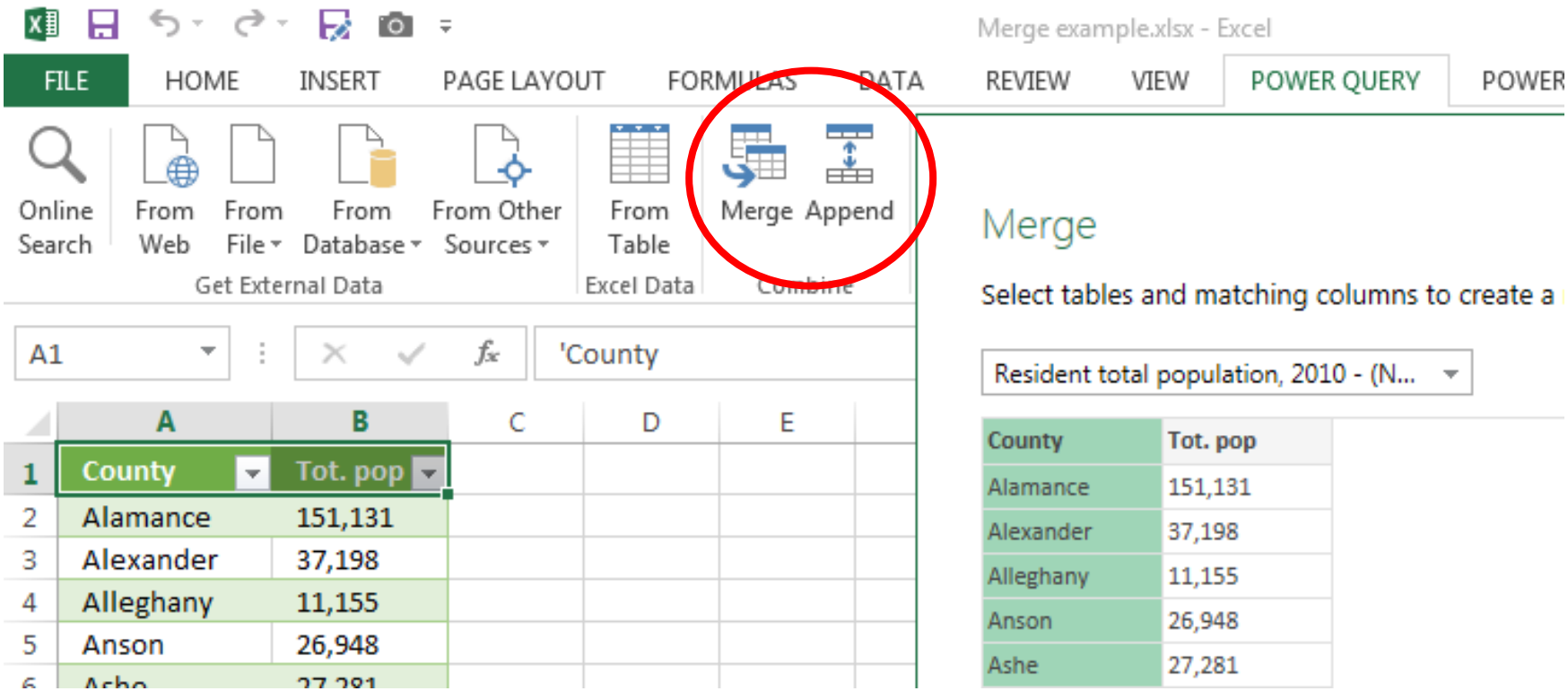
Power Query features

- Limit the data you bring into your model
  - Keep you model to a reasonable size (< 1M records) to prevent processing problems
  - Bring in only what you need



Power Query features

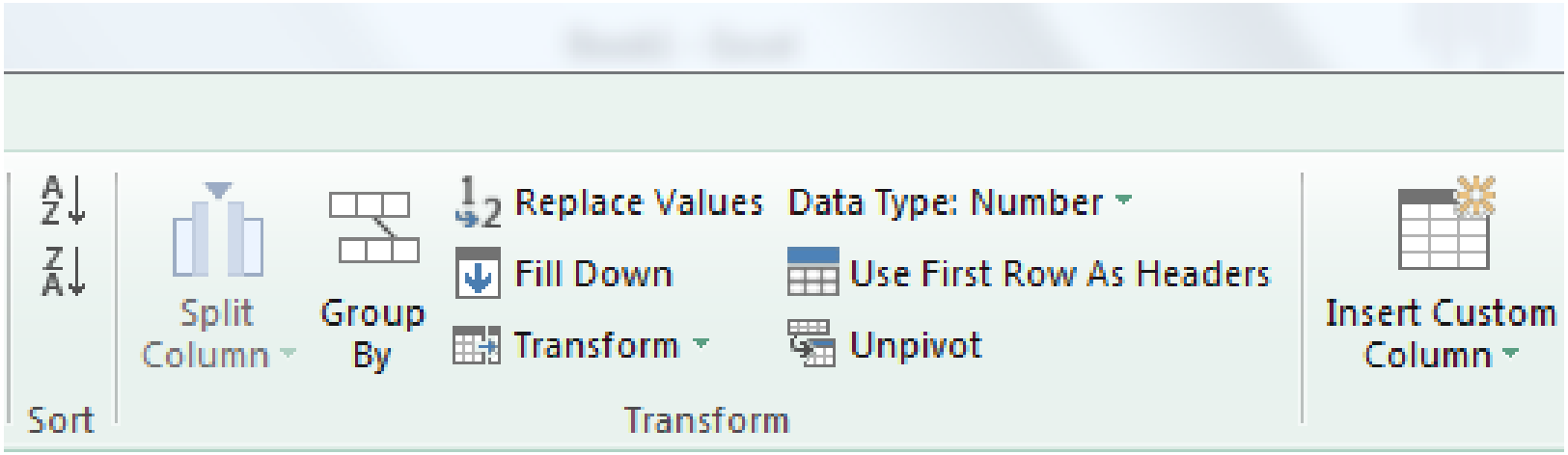
- **Consolidate multiple tables into one**



Power Query features

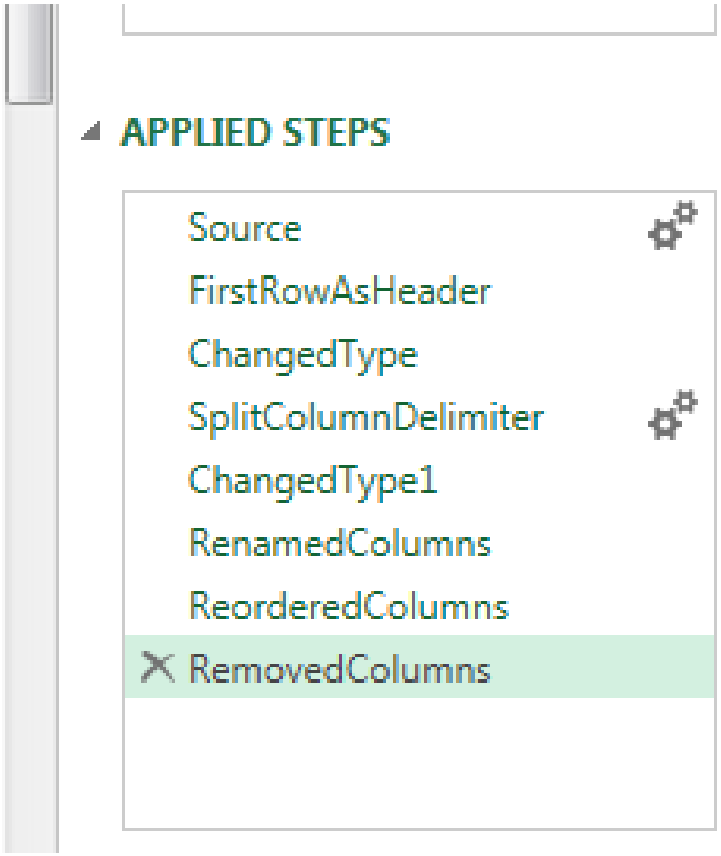
- Consolidate multiple tables into one

- **In-line data transformations**



Power Query features

- Consolidate multiple tables into one
- In-line data transformations
- **All transformation steps are listed, and reversible**



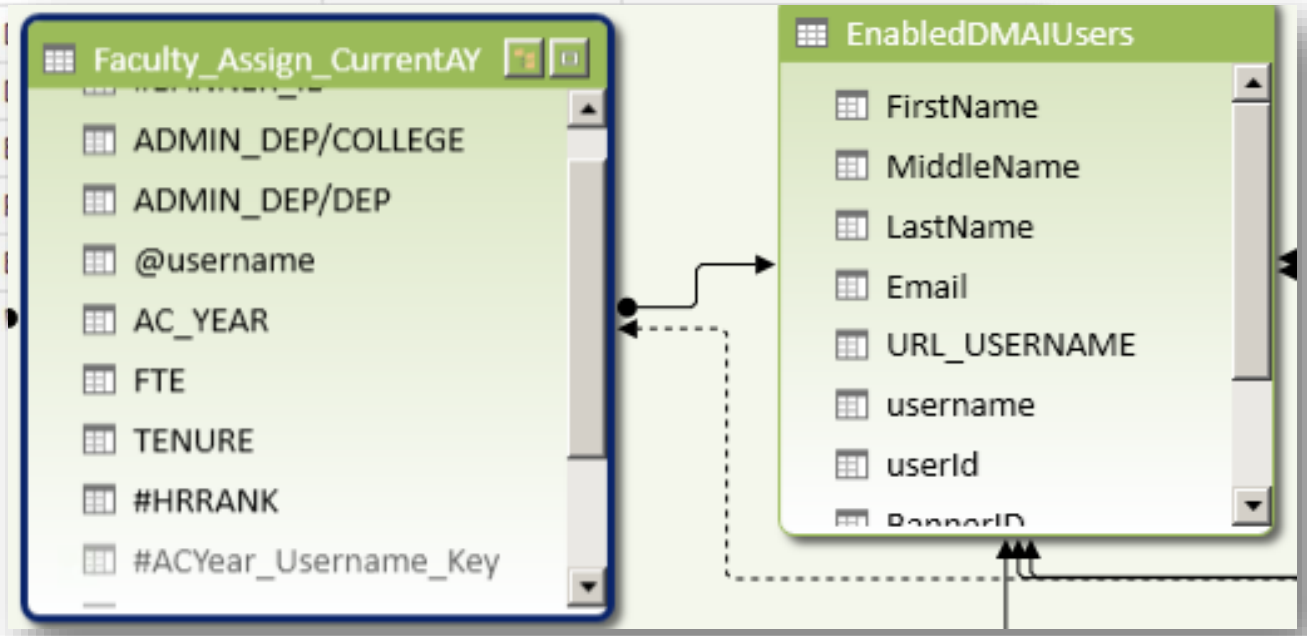
Power Query @ WCU

- **Connect to online faculty database**
  - Import active users from Digital Measures (from Web URL)
  - Merge with local data (Banner)
  - Export updated data to Digital Measures

Western Carolina UNIVERSITY

Power Query @ WCU

	FirstName	MiddleName	LastName	Email
1	Millicent	H	Abel	abel@email.wcu.edu
2	Yogita	*null*	Abichandani	yabichandani@email.wcu.edu
3	Susan	M	Abram	smabram@email.wcu.edu
4	J.	P	Acheson	pacheson@email.wcu.edu
5	Michele	*null*	Acker-Hocevar	ackerhocevar@email.wcu.edu
6	Warren			
7	Andrew			
8	Erin			
9	Mark			
10	Mary			
11	Mary			



Power Query demonstrations

- **Data from an online search**
- **Data from websites**
- **Power Query Editor functions**
  - Split columns, remove columns/rows, merge, insert calculated columns, etc.
- **Data from Facebook**

DEMO: Power Query Online Search

Tim Metz

Occupational Employment Statistics (2011)

From Bureau of Labor Statistics, last modified on Sunday, January 05, 2014.

The Occupational Employment Statistics (OES) program produces employment and wage estimates for over 800 occupations. These are estimates of the number of people employed in certain occupations, and estimates of the wages paid to them. Self-employed persons are not included in the estimates. These estimates are available for the nation as a whole, for individual States, and for metropolitan and nonmetropolitan areas; national occupational estimates for specific industries are also available

ID	AREA_NAME	AREA_TYPE	NAICS_TITLE	OWNERSHIP_CODE	OES_CODE_OCCUPATION	OCC_TITL
1	U.S.	U.S	Cross-industry	All Ownerships	00-0000	All Oc
2	U.S.	U.S	Cross-industry	All Ownerships	11-0000	Manag
3	U.S.	U.S	Cross-industry	All Ownerships	11-1011	Chief I
4	U.S.	U.S	Cross-industry	All Ownerships	11-1021	Gener
5	U.S.	U.S	Cross-industry	All Ownerships	11-1031	Legisla
6	U.S.	U.S	Cross-industry	All Ownerships	11-2011	Advert
7	U.S.	U.S	Cross-industry	All Ownerships	11-2021	Marke
8	U.S.	U.S	Cross-industry	All Ownerships	11-2022	Sales I
9	U.S.	U.S	Cross-industry	All Ownerships	11-2031	Public

Columns [26]

ID, AREA_NAME, AREA_TYPE, NAICS_TITLE, OWNERSHIP_CODE, OES_CODE_OCCUPATION, OCC_TITLE, MAJOR_TOTAL_OCC_GROUP, TOTAL_EMPLOYMENT_EST, STD_ERROR_PRSNT, OCC_JOBS_PER_1000_JOBS, OCC_SHARE_TO_US_OCC_SHARE_RATIO, PRSNT_INDUSTRY_EMPLOYMENT, Mean_Hourly_Wage, Mean_Annual_Wage,

Documentation

http://www.bls.gov/oes

Data Sources [1]

http://www.bls.gov/oes/#data

ADD TO WORKSHEET EDIT LEGAL TERMS

Online Search

employment

350 results

Occupational Employmen...
From Bureau of Labor Statistics on S...
The Occupational Employment Statistics (OES) program produces employment and...

Growth, employment and ...
From Wikipedia on Monday, January...
Employment - Wikipedia, the free encyclopedia

Employment-to-populatio...
From Wikipedia on Monday, January...
Employment-to-population ratio - Wikipedia, the free encyclopedia

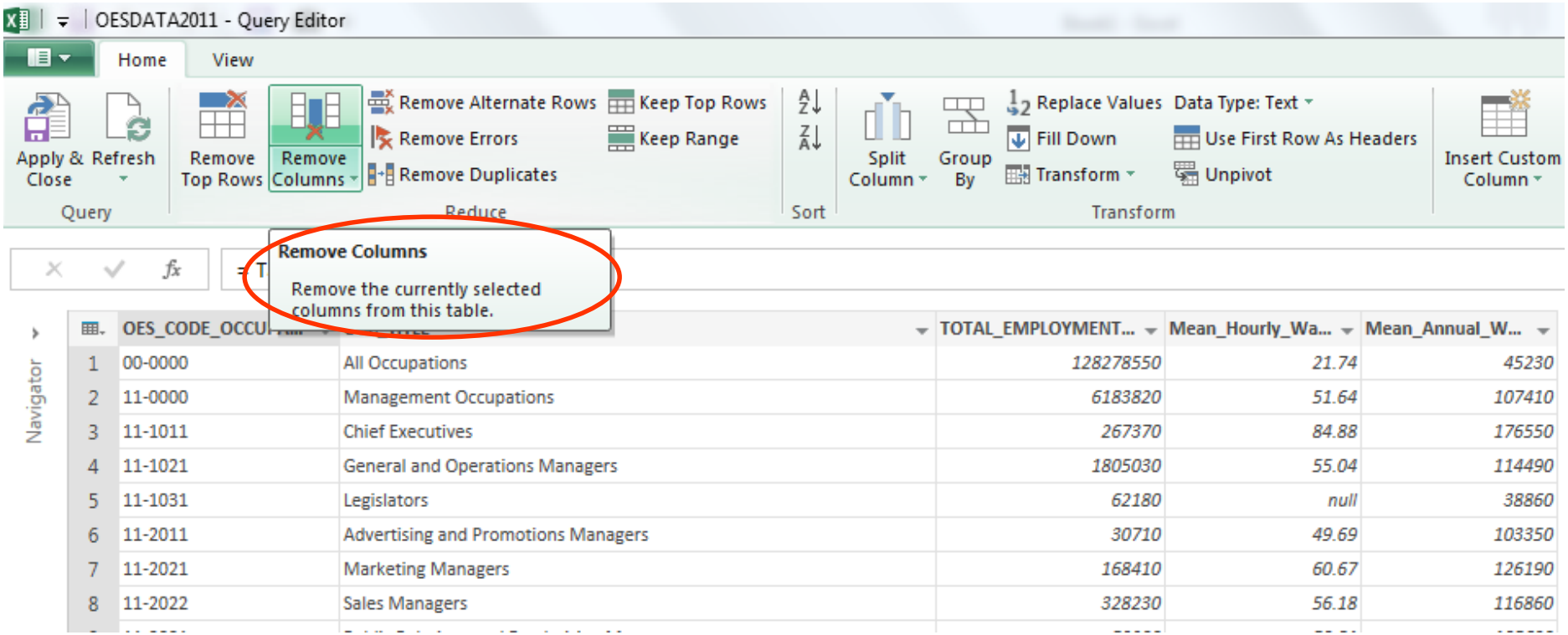
Chairs of the EEOC - Equa...
From Wikipedia on Monday, January...
Equal Employment Opportunity

1 2 3 4 5 Next

100%

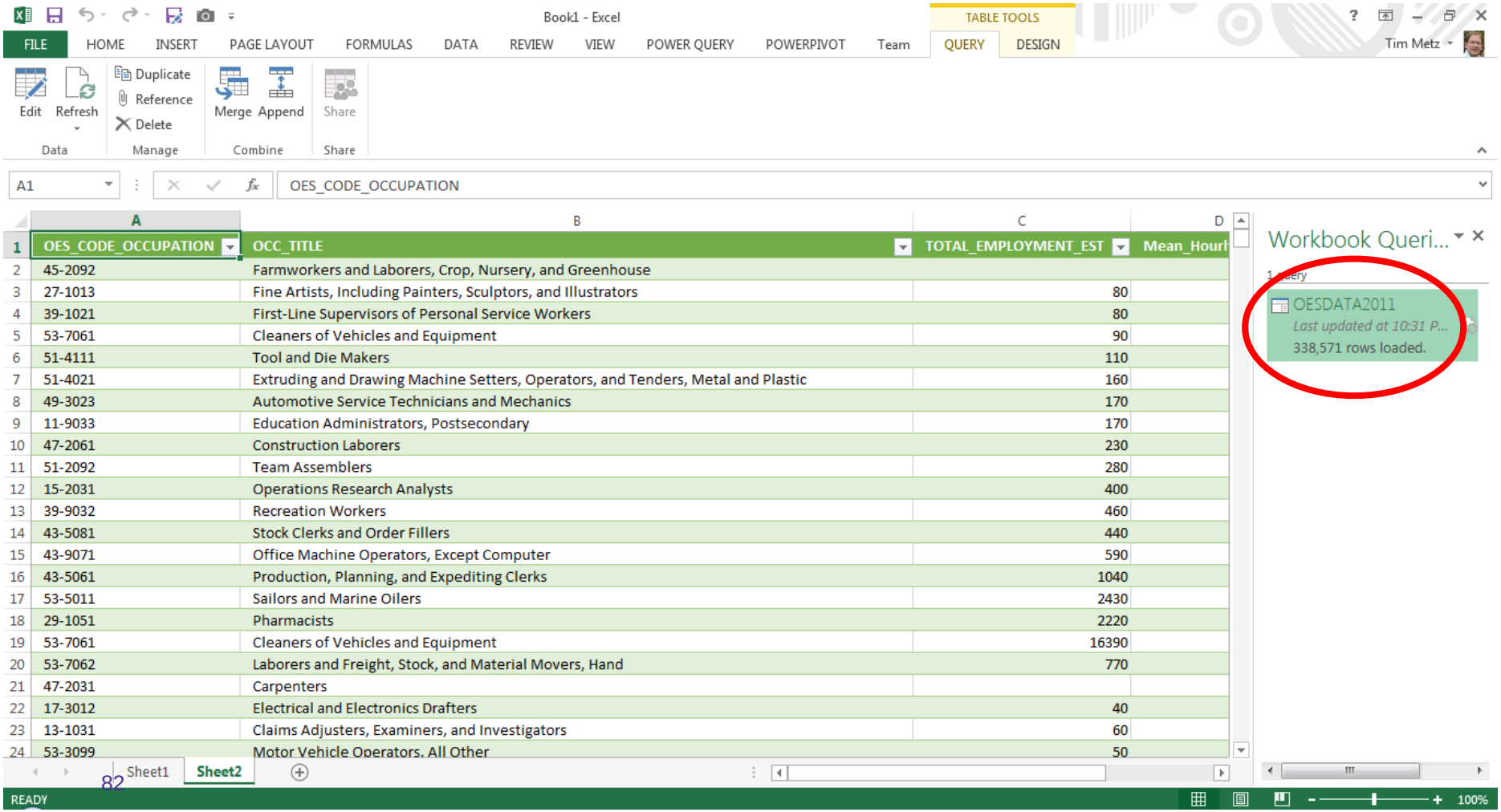
DEMO: Power Query Online Search

- **Query Editor: Transform data as desired**



DEMO: Power Query Online Search

- **Load transformed data set into data model**



OES_CODE_OCCUPATION	OCC_TITLE	TOTAL_EMPLOYMENT_EST	Mean_Hourl
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse		
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	80	
39-1021	First-Line Supervisors of Personal Service Workers	80	
53-7061	Cleaners of Vehicles and Equipment	90	
51-4111	Tool and Die Makers	110	
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	160	
49-3023	Automotive Service Technicians and Mechanics	170	
11-9033	Education Administrators, Postsecondary	170	
47-2061	Construction Laborers	230	
51-2092	Team Assemblers	280	
15-2031	Operations Research Analysts	400	
39-9032	Recreation Workers	460	
43-5081	Stock Clerks and Order Fillers	440	
43-9071	Office Machine Operators, Except Computer	590	
43-5061	Production, Planning, and Expediting Clerks	1040	
53-5011	Sailors and Marine Oilers	2430	
29-1051	Pharmacists	2220	
53-7061	Cleaners of Vehicles and Equipment	16390	
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	770	
47-2031	Carpenters		
17-3012	Electrical and Electronics Drafters	40	
13-1031	Claims Adjusters, Examiners, and Investigators	60	
53-3099	Motor Vehicle Operators, All Other	50	

DEMO: Power Query From Web

http://www.usa.com/rank/north-carolina-state--median-household-income--county-rank.htm?yr=3000&tag=Richest+Counties+by+Income+in+NC

North Carolina Median househ... | North Carolina Median Hou...

File Edit View Favorites Tools Help

Google WCU OWA SAS Visual Analytics Welcome - SAS Visual An... IE links PA links UNCGA AcadSpaceComm Banner Blackboard CASE - Data Mining &

USA.COM

Local Data Search

Search State, County, City, Zip Code, or Area Code Search

USA.com / Ranks / North Carolina Median Household Income County Rank / Based on ACS 2006-2010 data*

Richest Counties by Income in NC

North Carolina Median Household Income County Rank

Based on ACS 2006-2010 data*

A total of 100 results found. Show Results on Map.

Rank	Median Household Income ▼	County / Population
1.	$63,770	Wake, NC / 850,546
2.	$63,386	Union, NC / 190,346
3.	$61,091	Camden, NC / 9,719
4.	$56,038	Chatham, NC / 61,426
5.	$55,376	Currituck, NC / 23,299
6.	$55,294	Mecklenburg, NC / 882,761
7.	$53,928	Cabarrus, NC / 169,990
8.	$53,889	Dare, NC / 33,650
9.	$52,981	Orange, NC / 129,562
10.	$49,894	Durham, NC / 258,578
11.	$49,745	Johnston, NC / 160,675
12.	$49,727	Davie, NC / 40,581
13.	$48,962	Iredell, NC / 154,632
14.	$48,553	New Hanover, NC / 197,272
15.	$48,319	Moore, NC / 85,914
16.	$48,210	Granville, NC / 58,071
17.	$47,450	Lincoln, NC / 75,697

Refine Your Ranking

Pick a Topic to Rank:

- Popular Topics
- Population and Races
- Income and Careers
- Housing
- Crime, Weather, etc.

Selected Ranking Topic: Median Household Income

Pick Your Location:

Within a Location

State

North Carolina

Rank within a Distance of a Point

Rank By:

County

Select Date of Data:

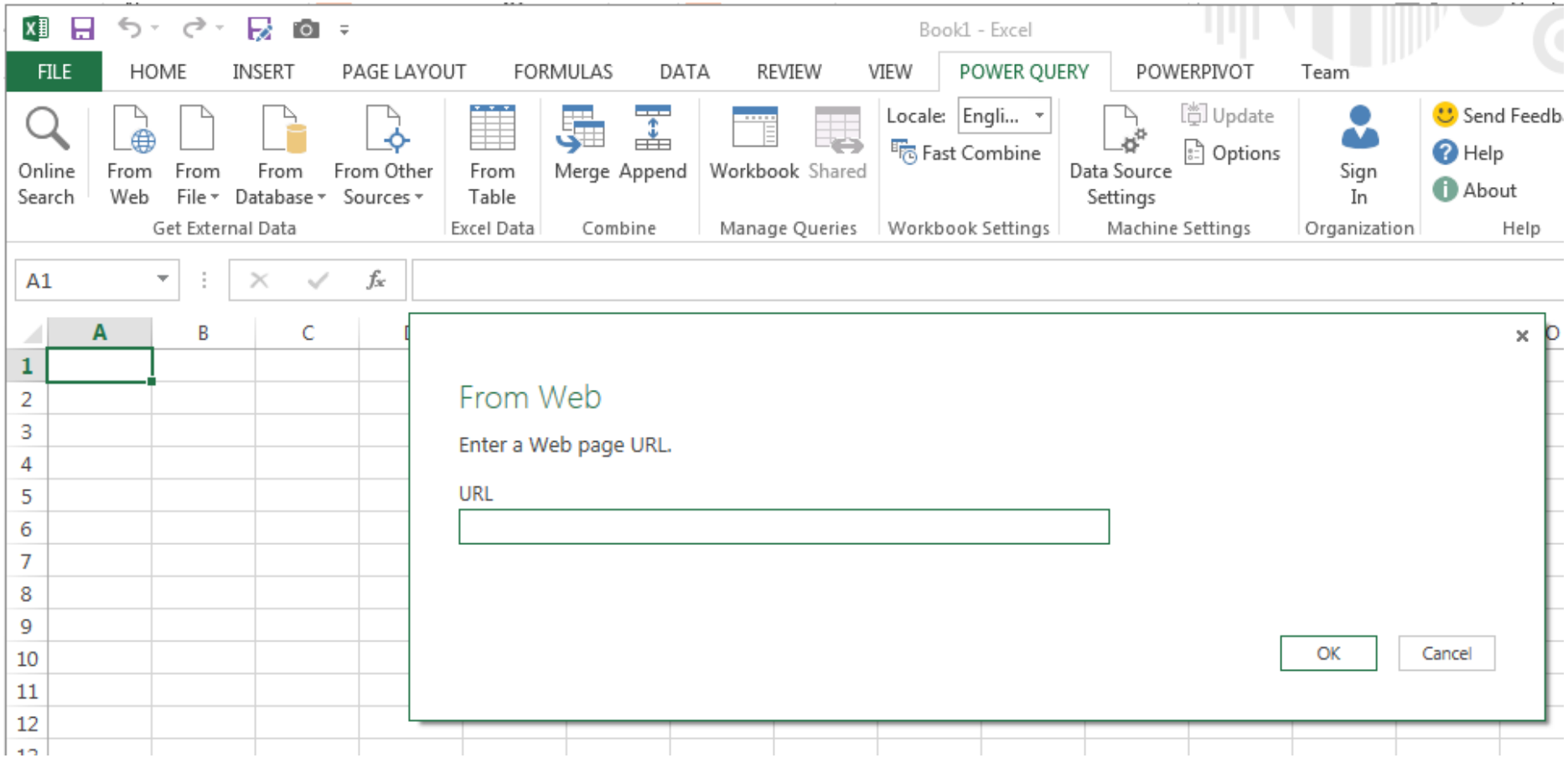
American Community Survey 2006-2010

Limit to Locations with Population:

to (number only, can be blank)

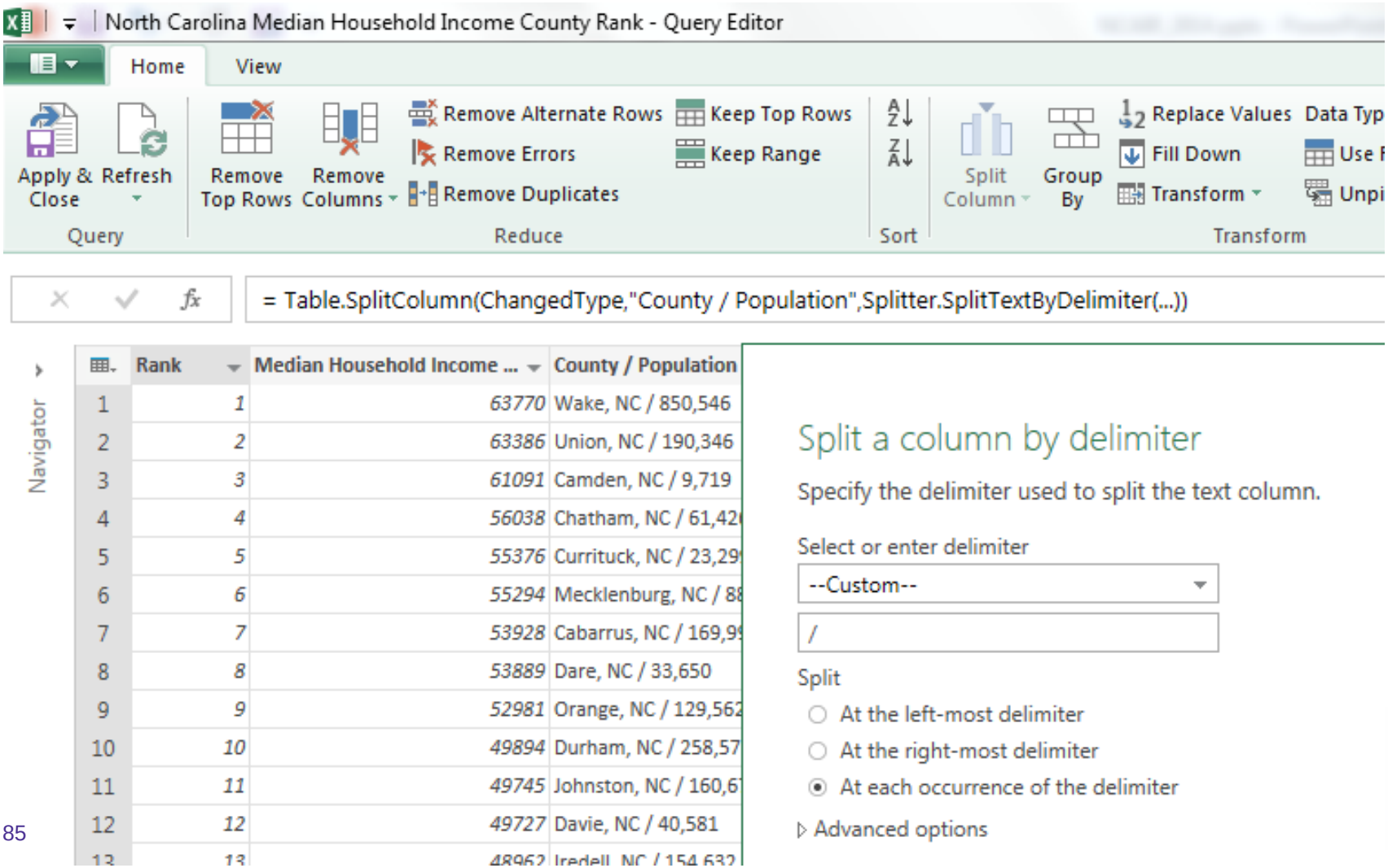
Submit

DEMO: Power Query From Web



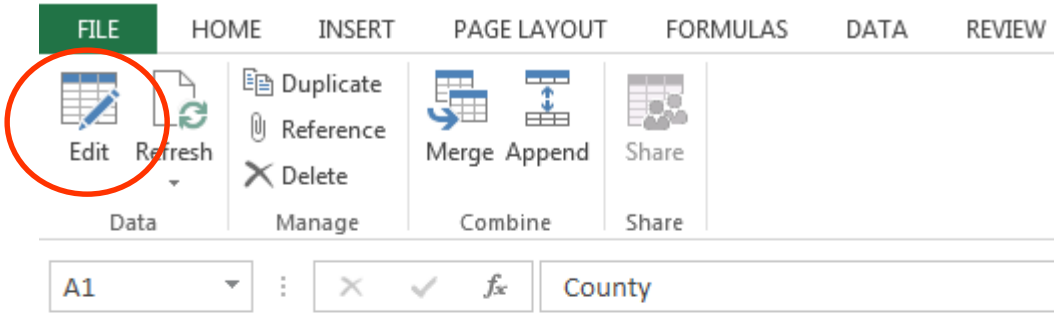
DEMO: Power Query From Web

- **Transform data as needed (split column)**



DEMO: Power Query Editor

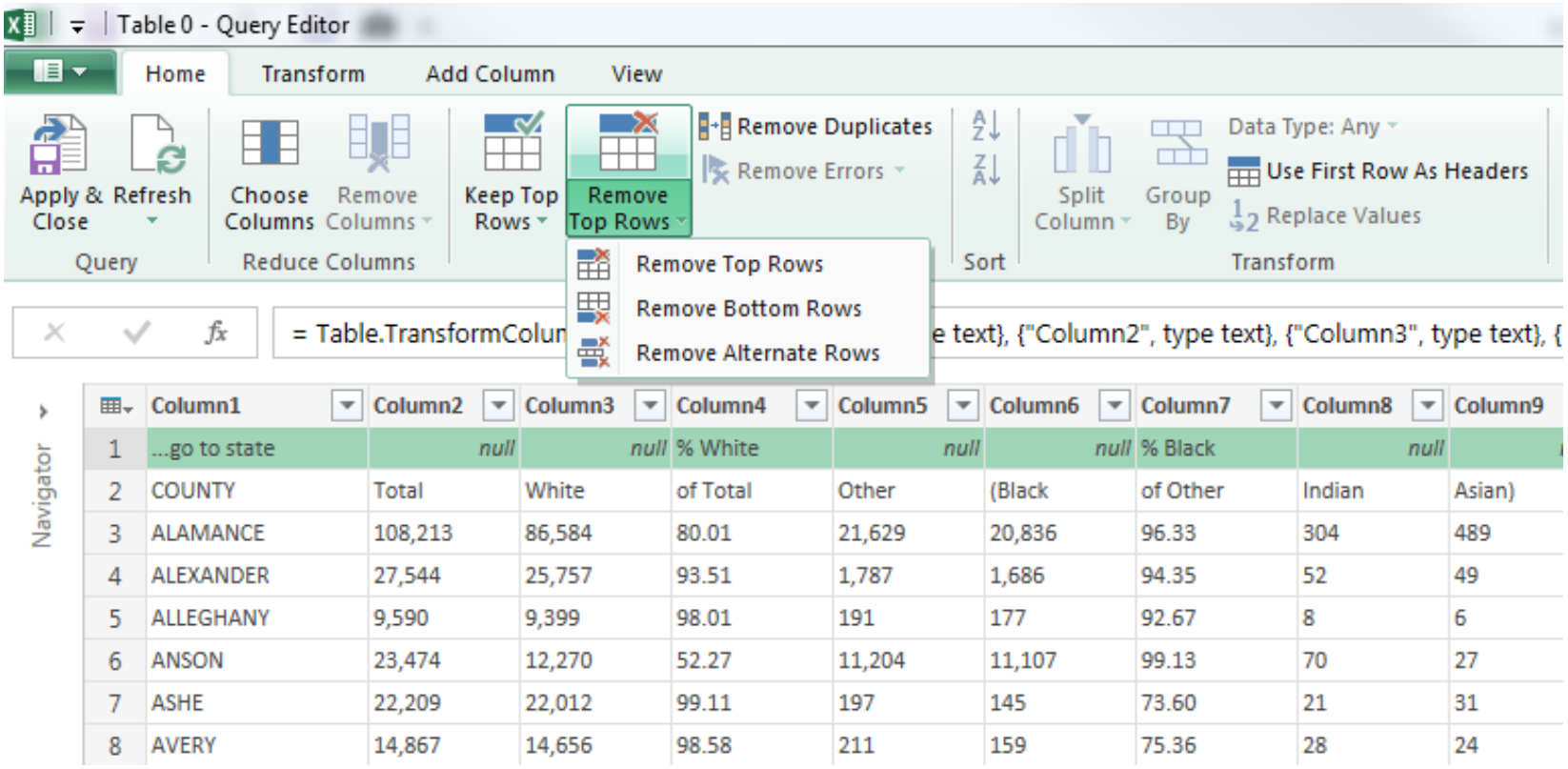
- **Queries can be re-edited, merged and appended as needed**



	A	B	C	D
1	County	Median Household Income	Population	
2	Robeson, NC	29667	131708	
3	Stokes, NC	42689	47194	
4	Caldwell, NC	37261	82162	
5	Graham, NC	28447	8702	
6	Richmond, NC	30439	46477	
7	Transylvania, NC	39408	32404	
8	Lenoir, NC	33625	59307	
9	Perquimans, NC	43041	13091	
10	Brunswick, NC	45806	101994	

DEMO: Power Query Editor

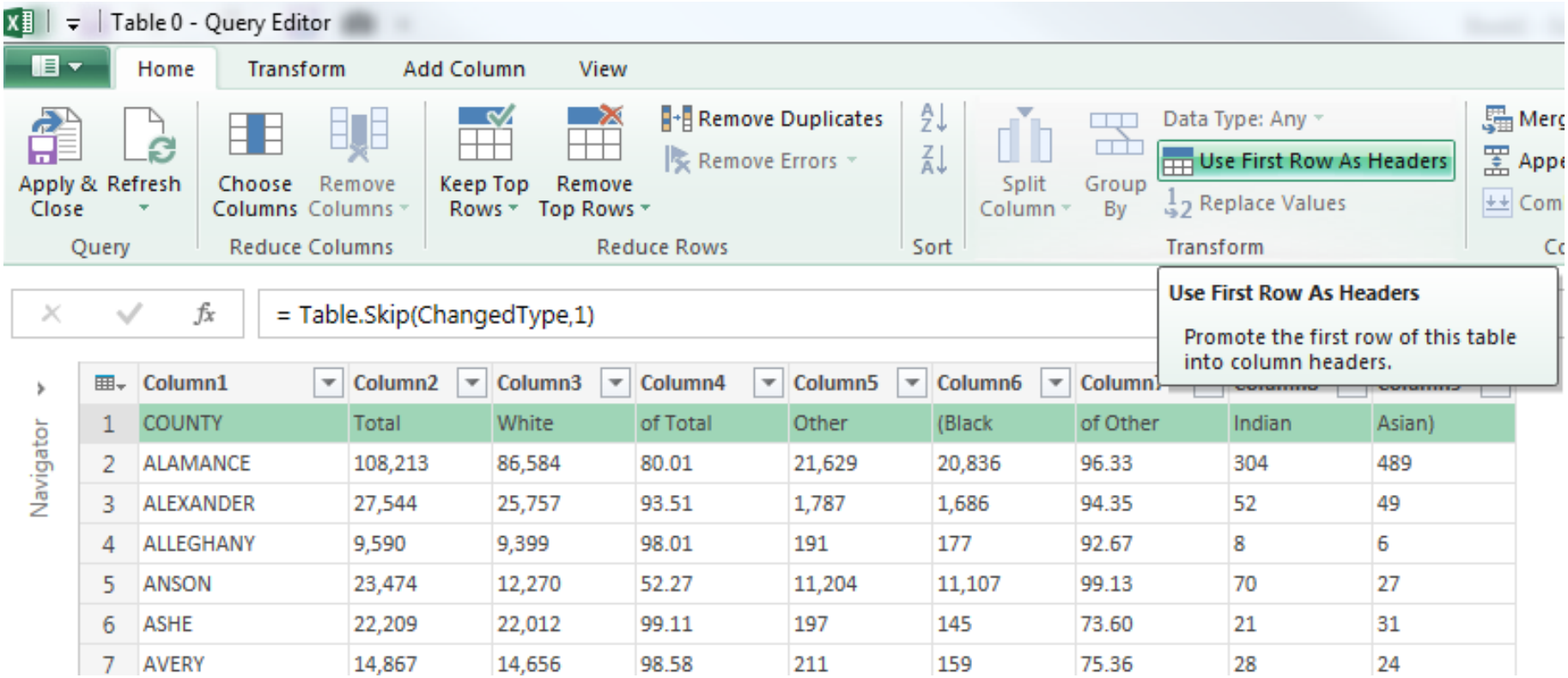
- **Remove rows and/or columns**



	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9
1	...go to state	null	null	% White	null	null	% Black	null	
2	COUNTY	Total	White	of Total	Other	(Black	of Other	Indian	Asian)
3	ALAMANCE	108,213	86,584	80.01	21,629	20,836	96.33	304	489
4	ALEXANDER	27,544	25,757	93.51	1,787	1,686	94.35	52	49
5	ALLEGHANY	9,590	9,399	98.01	191	177	92.67	8	6
6	ANSON	23,474	12,270	52.27	11,204	11,107	99.13	70	27
7	ASHE	22,209	22,012	99.11	197	145	73.60	21	31
8	AVERY	14,867	14,656	98.58	211	159	75.36	28	24

DEMO: Power Query Editor

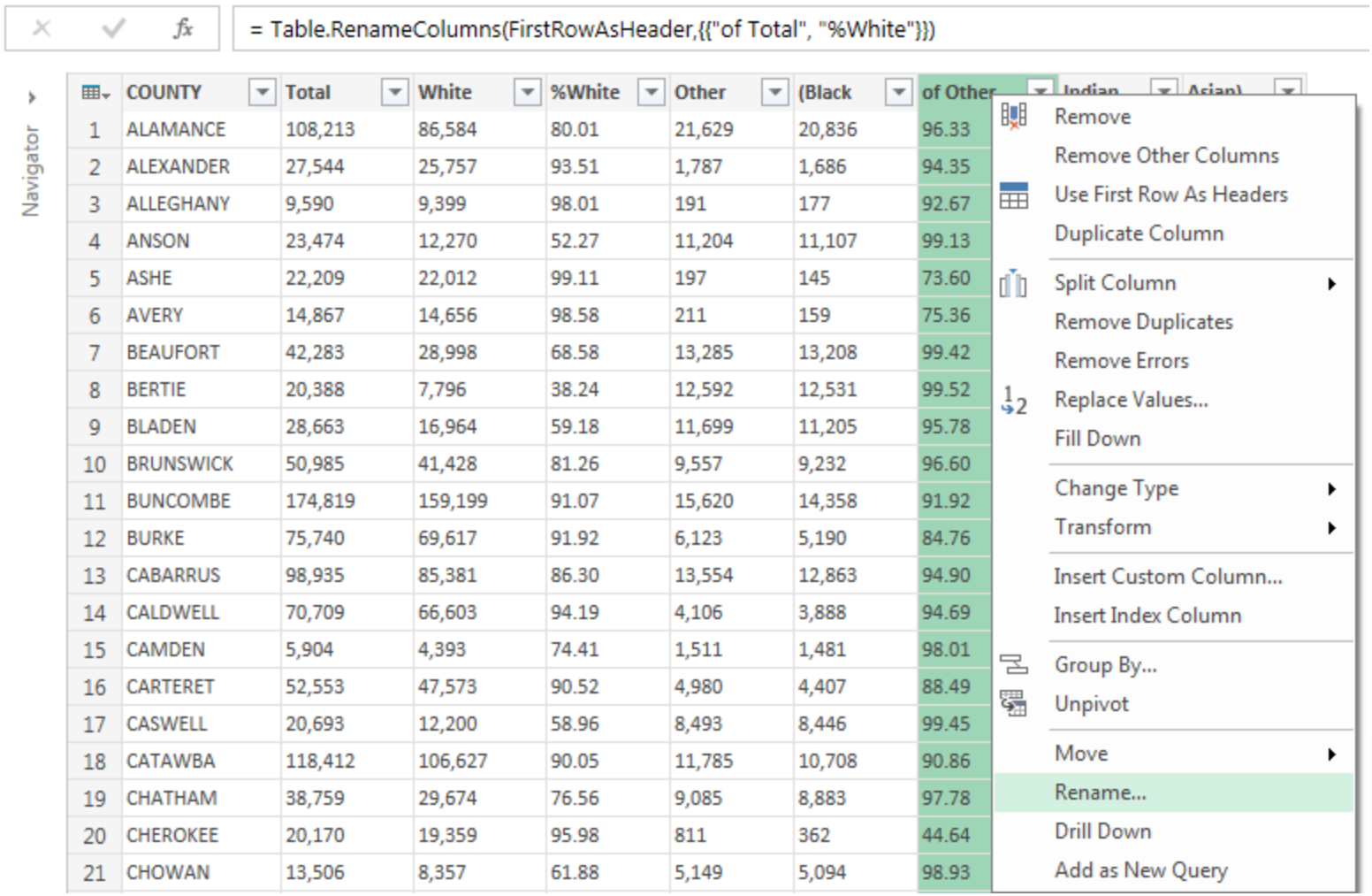
- **Transform first row of data into column headers**



	Column1	Column2	Column3	Column4	Column5	Column6	Column7		
1	COUNTY	Total	White	of Total	Other	(Black	of Other	Indian	Asian)
2	ALAMANCE	108,213	86,584	80.01	21,629	20,836	96.33	304	489
3	ALEXANDER	27,544	25,757	93.51	1,787	1,686	94.35	52	49
4	ALLEGHANY	9,590	9,399	98.01	191	177	92.67	8	6
5	ANSON	23,474	12,270	52.27	11,204	11,107	99.13	70	27
6	ASHE	22,209	22,012	99.11	197	145	73.60	21	31
7	AVERY	14,867	14,656	98.58	211	159	75.36	28	24

DEMO: Power Query Editor

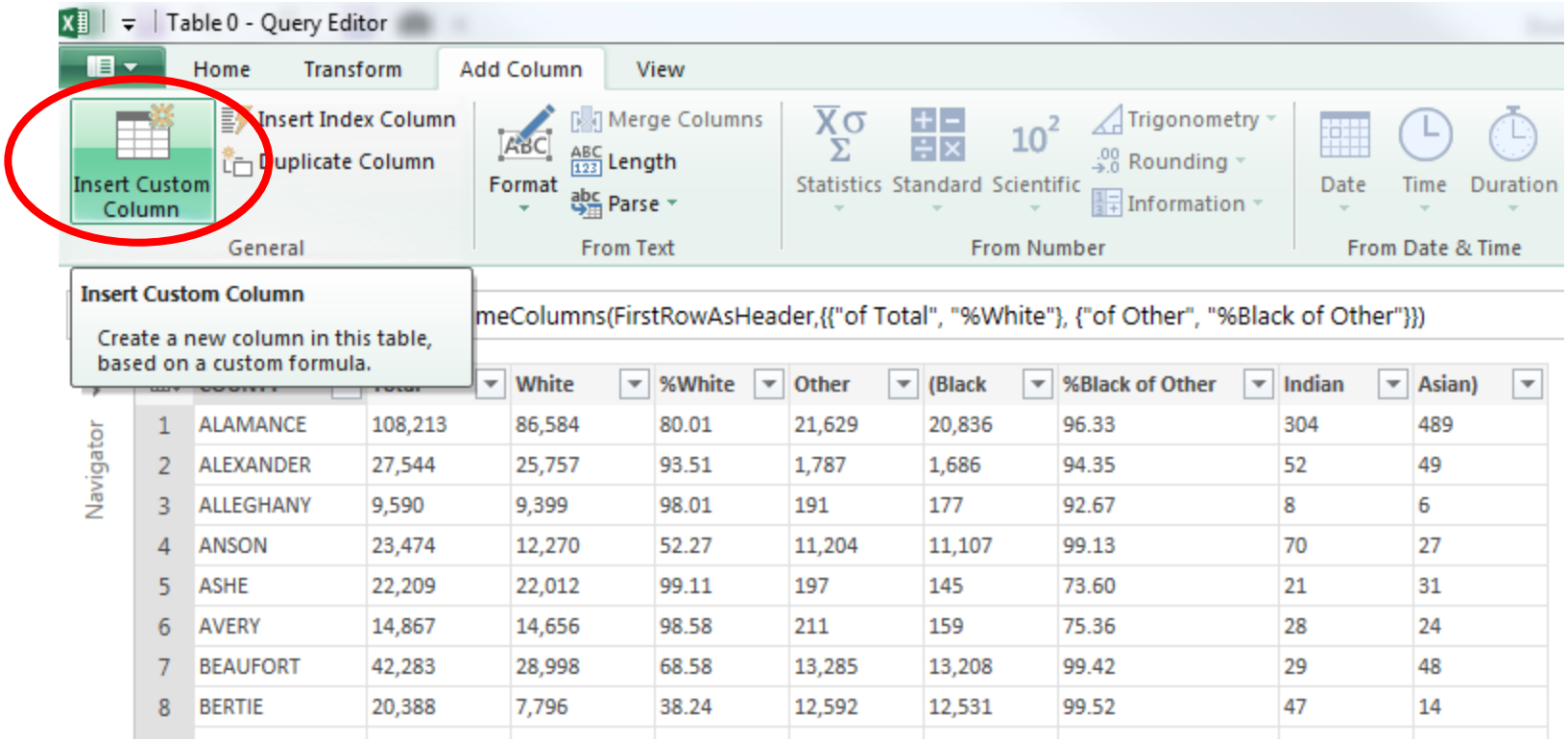
- **Rename column headers**



	COUNTY	Total	White	%White	Other	(Black	of Other	Indian	Asian)
1	ALAMANCE	108,213	86,584	80.01	21,629	20,836	96.33		
2	ALEXANDER	27,544	25,757	93.51	1,787	1,686	94.35		
3	ALLEGHANY	9,590	9,399	98.01	191	177	92.67		
4	ANSON	23,474	12,270	52.27	11,204	11,107	99.13		
5	ASHE	22,209	22,012	99.11	197	145	73.60		
6	AVERY	14,867	14,656	98.58	211	159	75.36		
7	BEAUFORT	42,283	28,998	68.58	13,285	13,208	99.42		
8	BERTIE	20,388	7,796	38.24	12,592	12,531	99.52		
9	BLADEN	28,663	16,964	59.18	11,699	11,205	95.78		
10	BRUNSWICK	50,985	41,428	81.26	9,557	9,232	96.60		
11	BUNCOMBE	174,819	159,199	91.07	15,620	14,358	91.92		
12	BURKE	75,740	69,617	91.92	6,123	5,190	84.76		
13	CABARRUS	98,935	85,381	86.30	13,554	12,863	94.90		
14	CALDWELL	70,709	66,603	94.19	4,106	3,888	94.69		
15	CAMDEN	5,904	4,393	74.41	1,511	1,481	98.01		
16	CARTERET	52,553	47,573	90.52	4,980	4,407	88.49		
17	CASWELL	20,693	12,200	58.96	8,493	8,446	99.45		
18	CATAWBA	118,412	106,627	90.05	11,785	10,708	90.86		
19	CHATHAM	38,759	29,674	76.56	9,085	8,883	97.78		
20	CHEROKEE	20,170	19,359	95.98	811	362	44.64		
21	CHOWAN	13,506	8,357	61.88	5,149	5,094	98.93		

DEMO: Power Query Editor

- **Insert custom formula-based columns**



			White	%White	Other	(Black	%Black of Other	Indian	Asian)
1	ALAMANCE	108,213	86,584	80.01	21,629	20,836	96.33	304	489
2	ALEXANDER	27,544	25,757	93.51	1,787	1,686	94.35	52	49
3	ALLEGHANY	9,590	9,399	98.01	191	177	92.67	8	6
4	ANSON	23,474	12,270	52.27	11,204	11,107	99.13	70	27
5	ASHE	22,209	22,012	99.11	197	145	73.60	21	31
6	AVERY	14,867	14,656	98.58	211	159	75.36	28	24
7	BEAUFORT	42,283	28,998	68.58	13,285	13,208	99.42	29	48
8	BERTIE	20,388	7,796	38.24	12,592	12,531	99.52	47	14

DEMO: Power Query Editor

(Black	%Black of Other	Indian	Asian)
20,836	96.33	304	489

Insert Custom Column

New column name

%Black

Custom column formula:

= [#"(Black"]/[Total]

Available columns:

- COUNTY
- Total
- White
- %White
- Other
- (Black
- %Black of Other

<< Insert

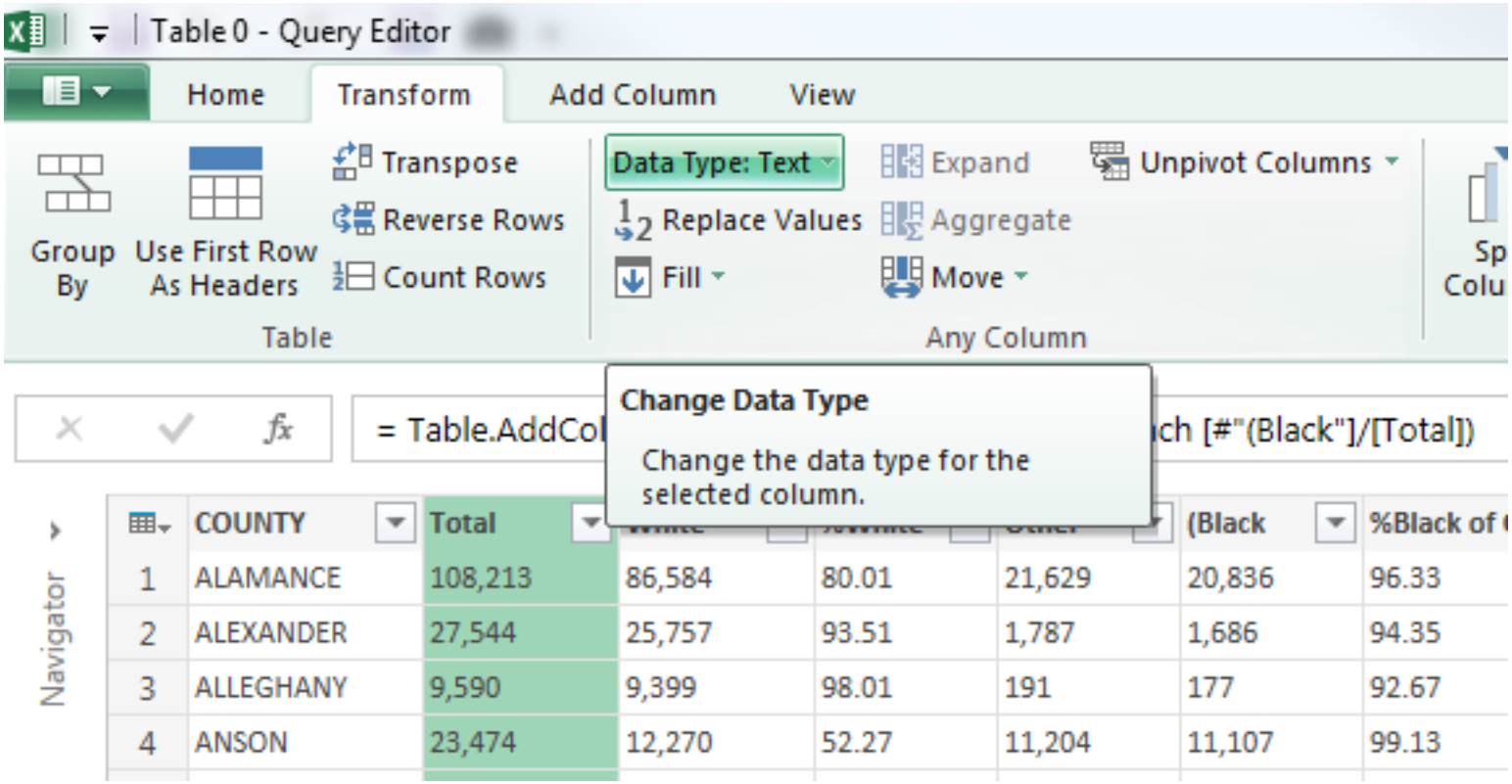
Learn about Power Query formulas

✓ No syntax errors have been detected.

OK Cancel

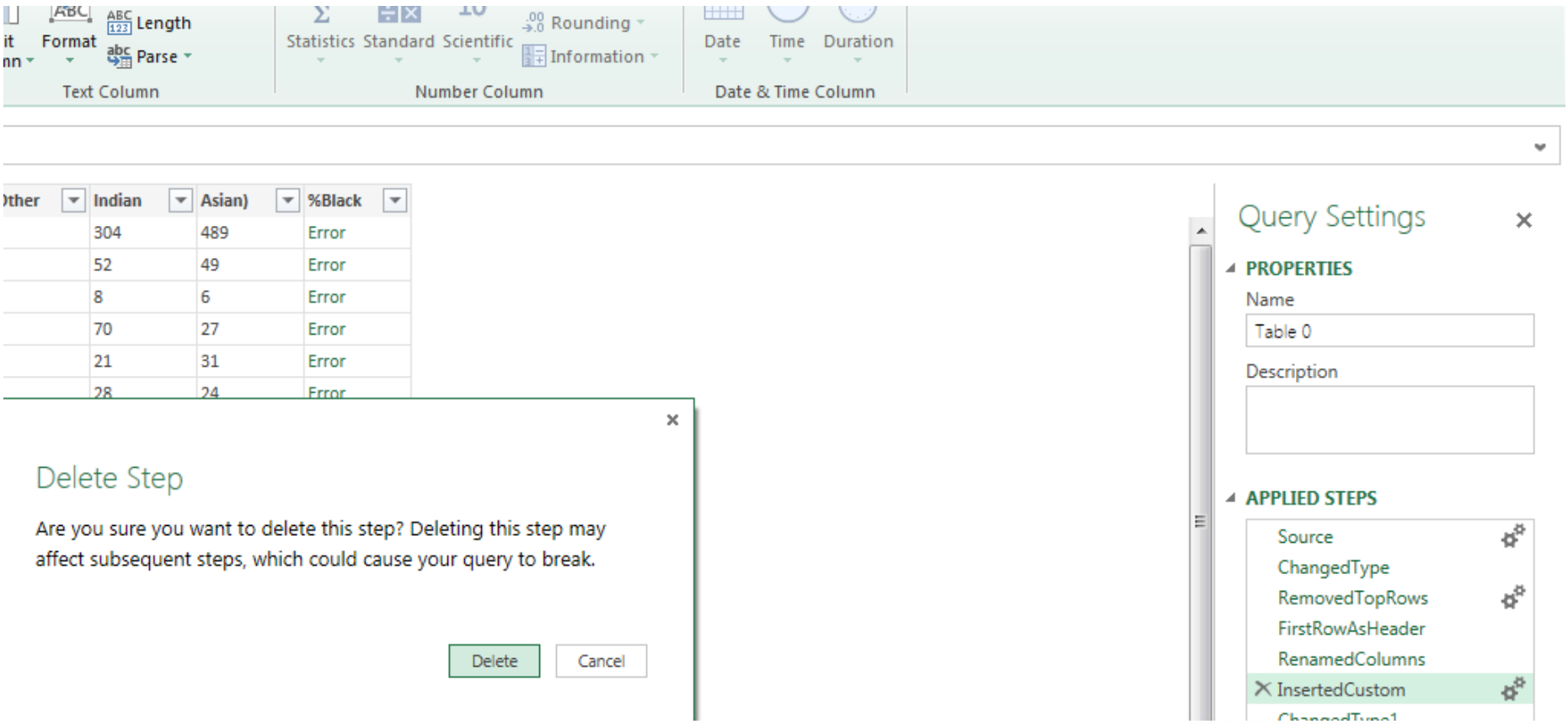
DEMO: Power Query Editor

- **Change data type (text, number, etc.)**

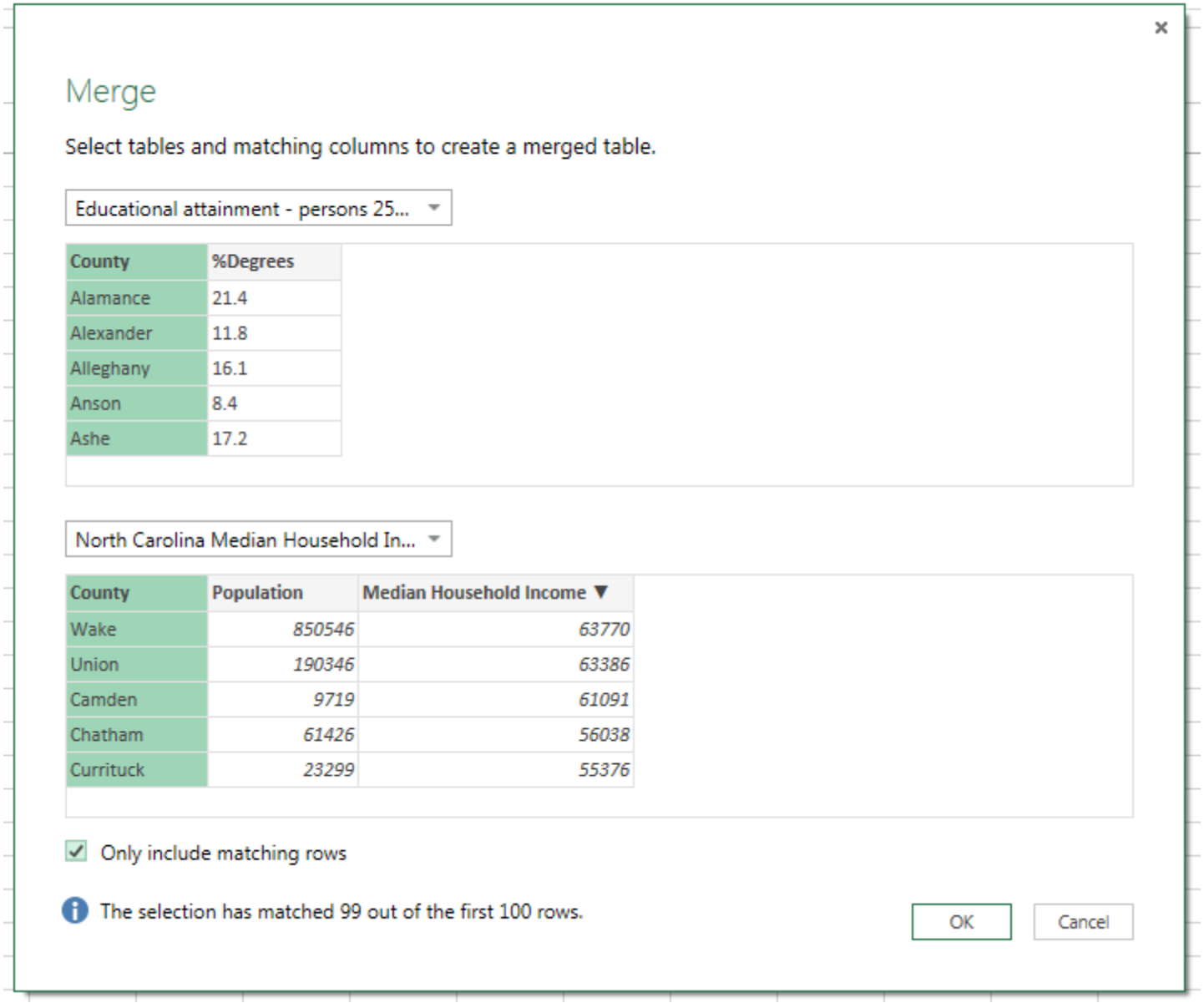


DEMO: Power Query Editor

- **Delete unwanted edits**

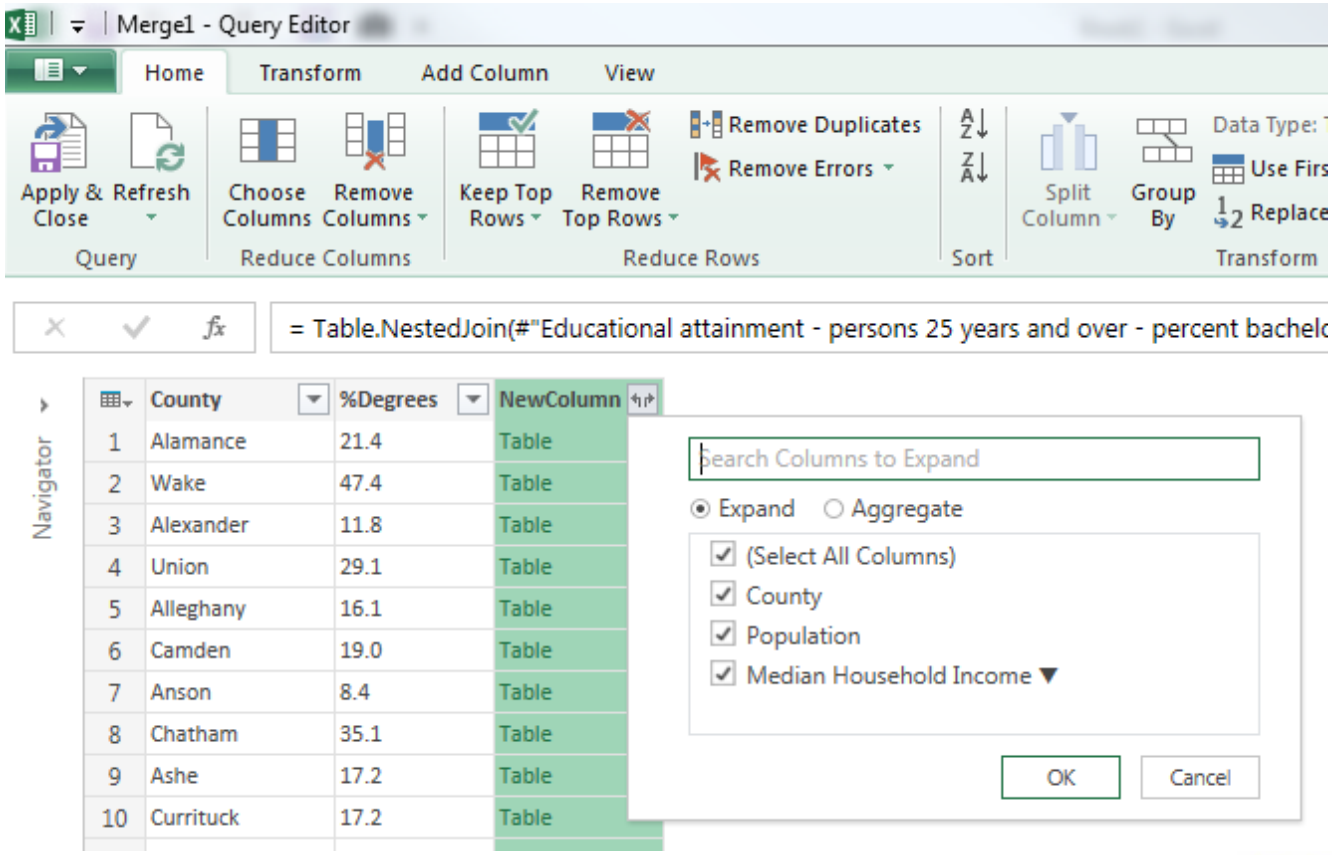


DEMO: Power Query Merge



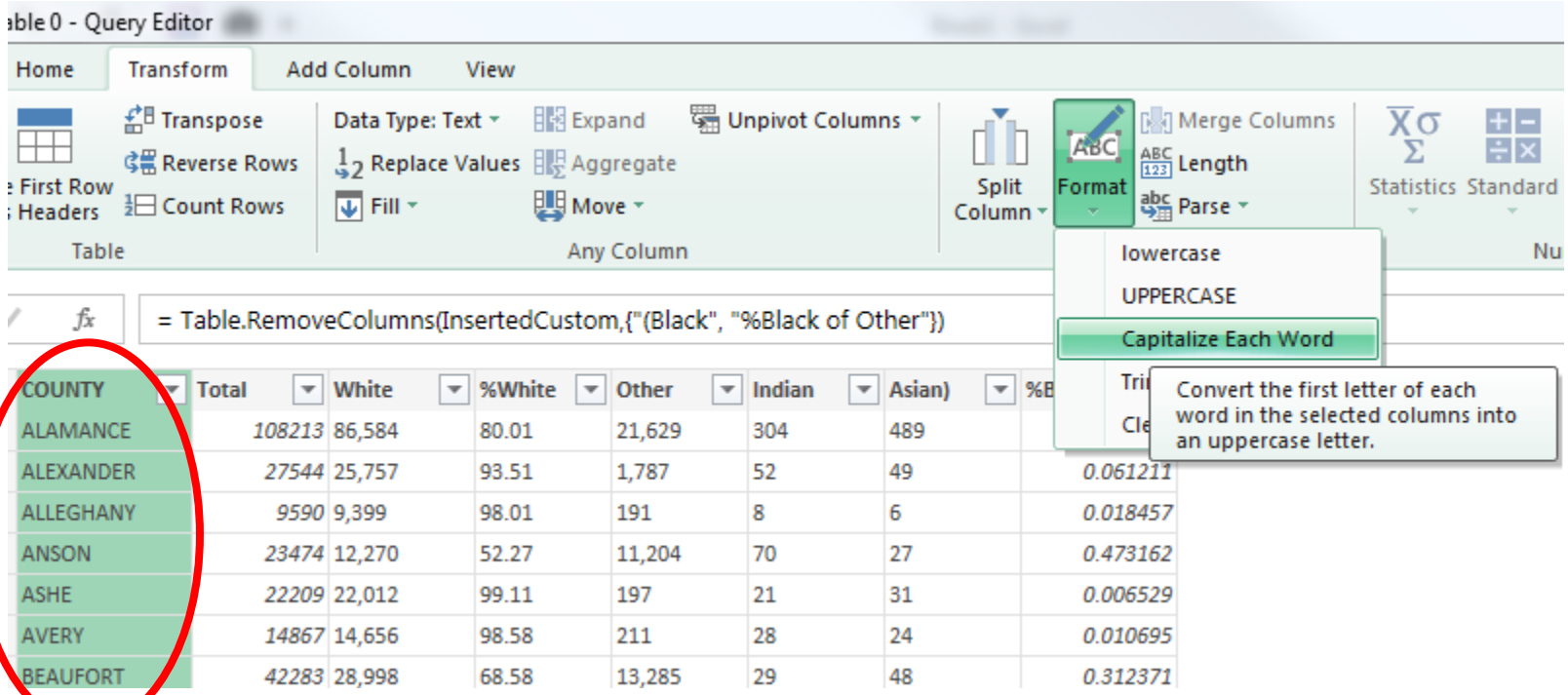
DEMO: Power Query Merge

- **Select columns to include in the merge**



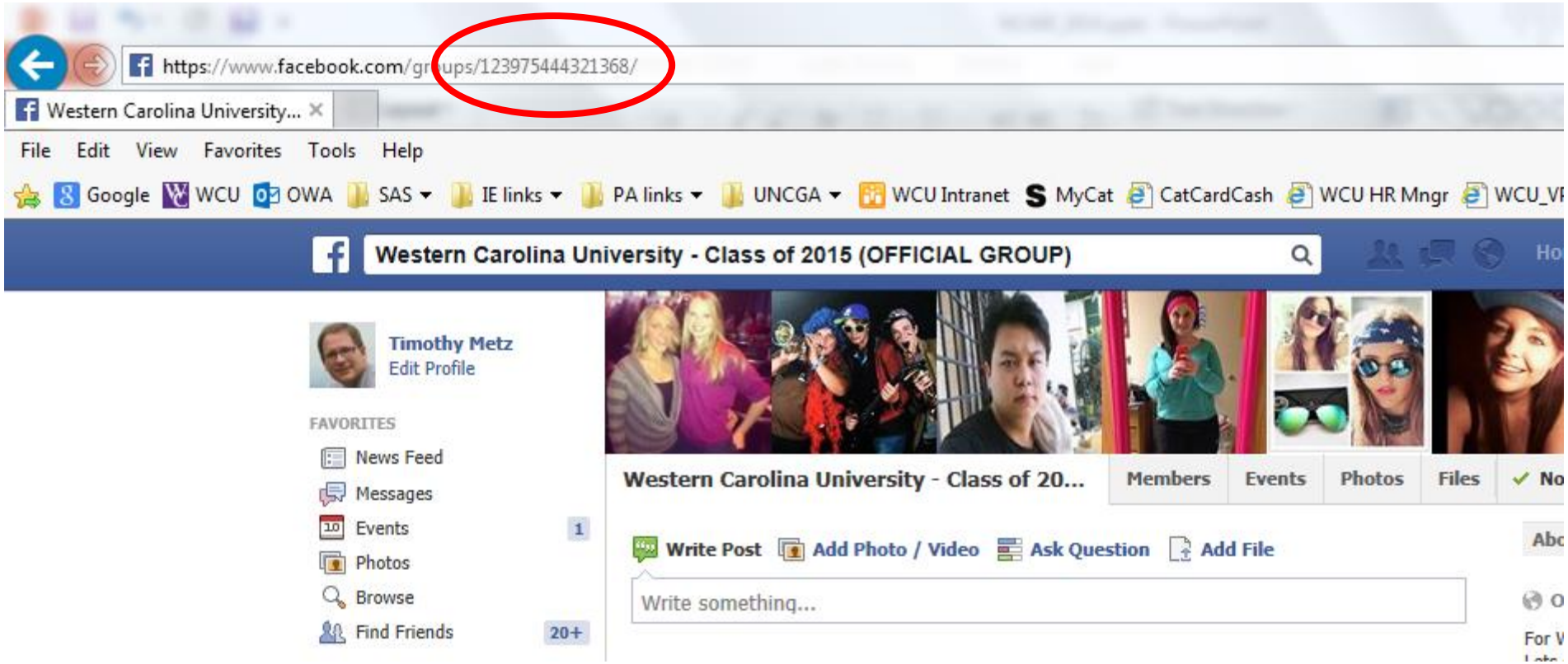
DEMO: Power Query Merge

- **Matching columns must *MATCH*!**



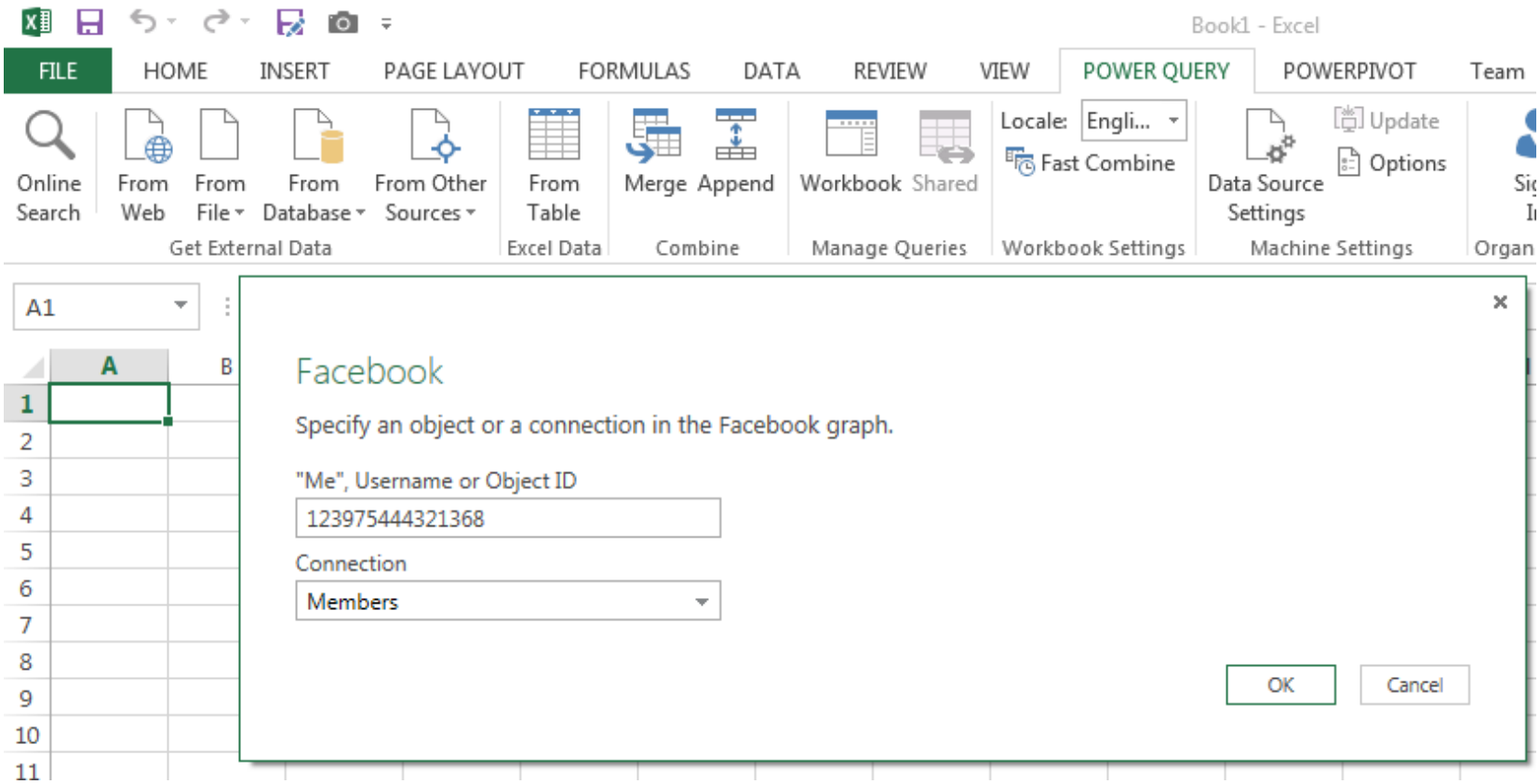
DEMO: Data from Facebook

- **Facebook pages and groups**



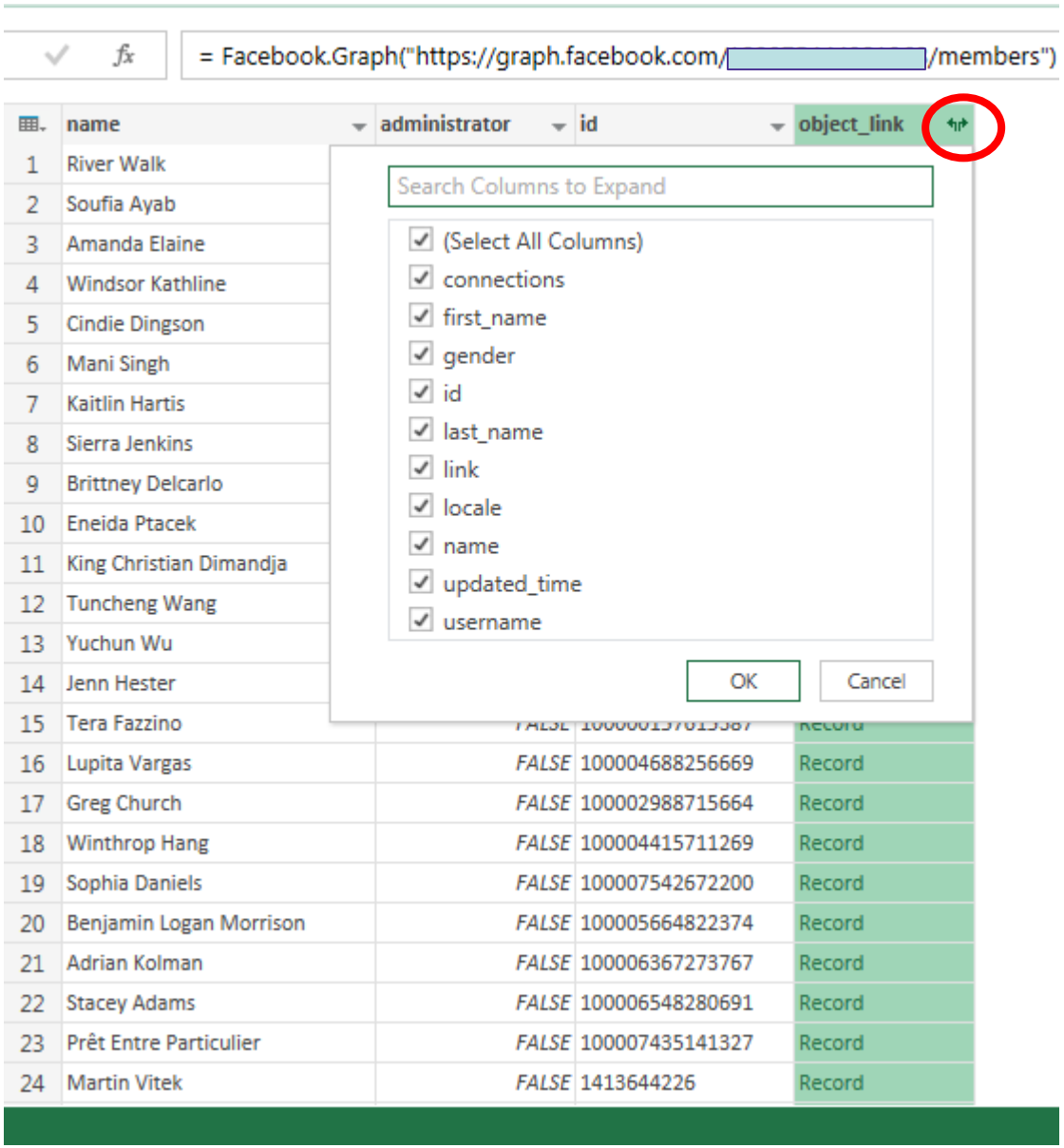
DEMO: Data from Facebook

- **Facebook pages and groups**



DEMO: Data from Facebook

- Drill down for additional data fields in facebook records
- Availability of data fields depends on your personal status with the group/page, and facebook data fields completed and available



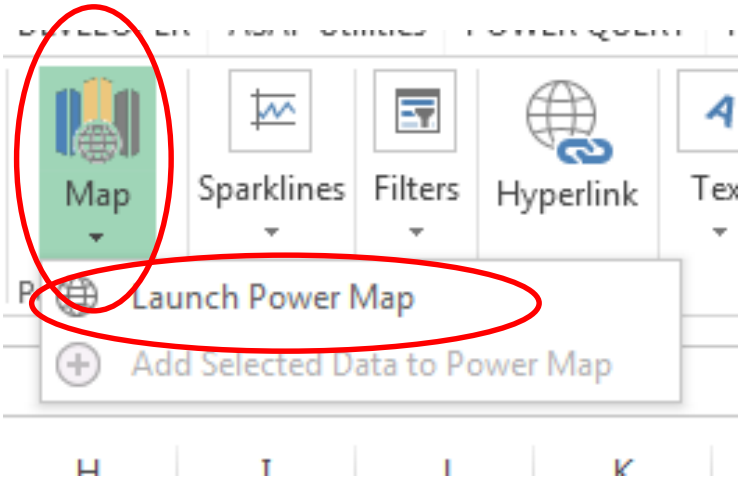
Questions

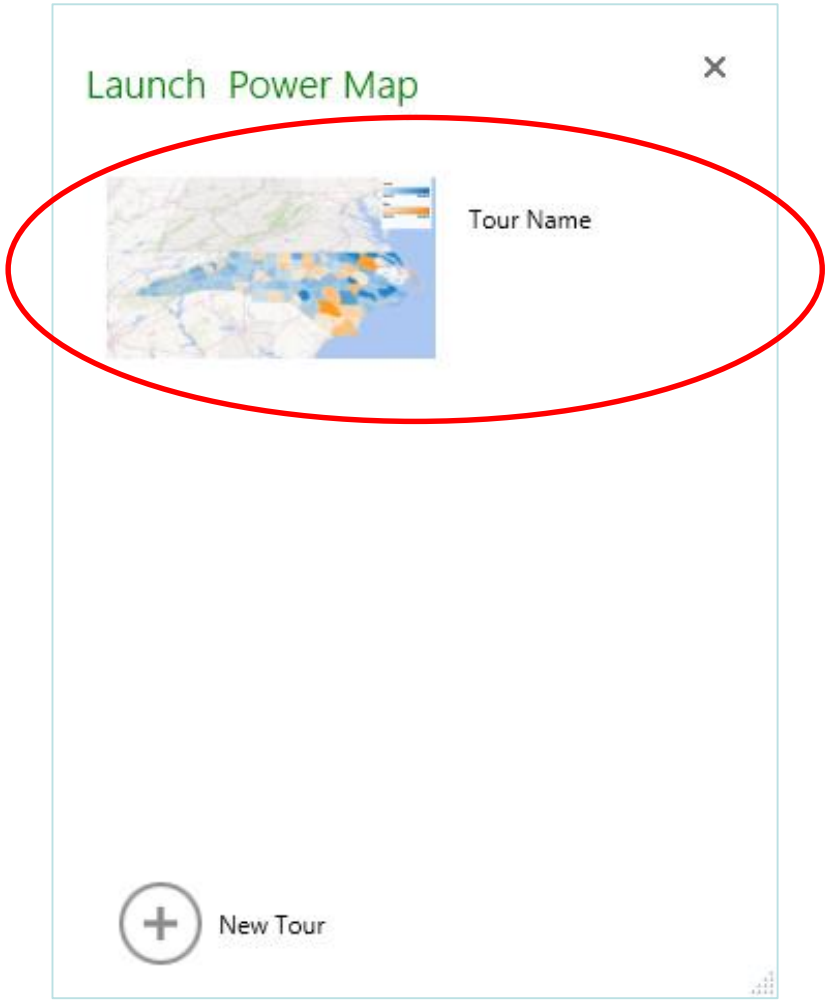
Displaying Data –
Power Map &
Power View

Displaying Data – Power Map

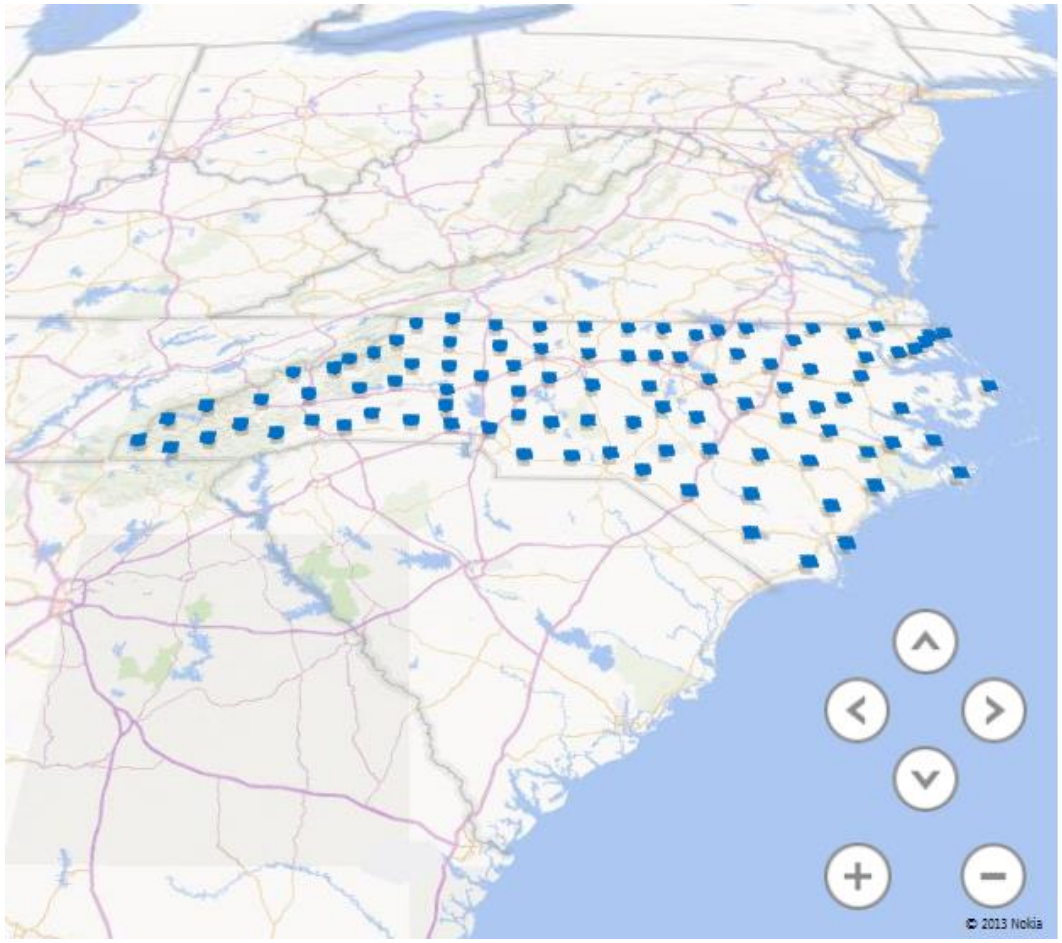
- **Power Map**
  - Automated way to map geographic data
  - Doesn't require geo-location information like longitude and latitude (just country, state, or county names)
  - Can add elements to look at aggregate function on variables across physical space
  - Limited functionality. Office 365 integration will eventually allow for full functionality in future versions.

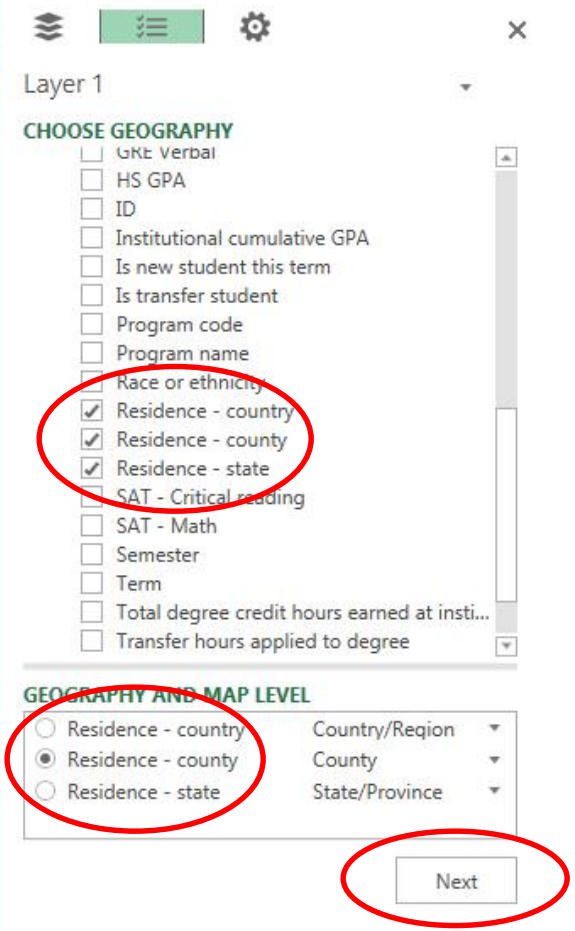
Displaying Data – Power Map



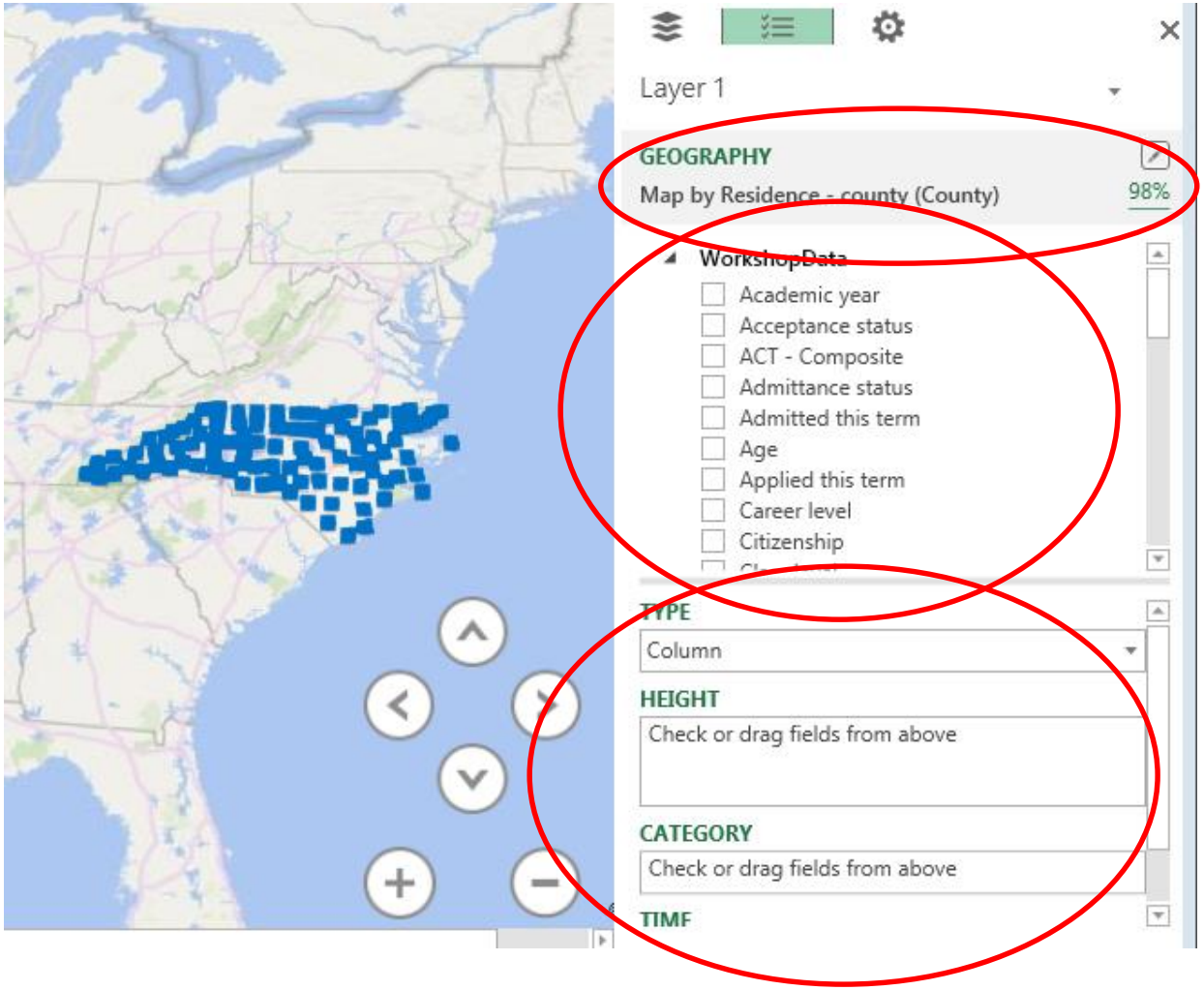


Displaying Data – Power Map

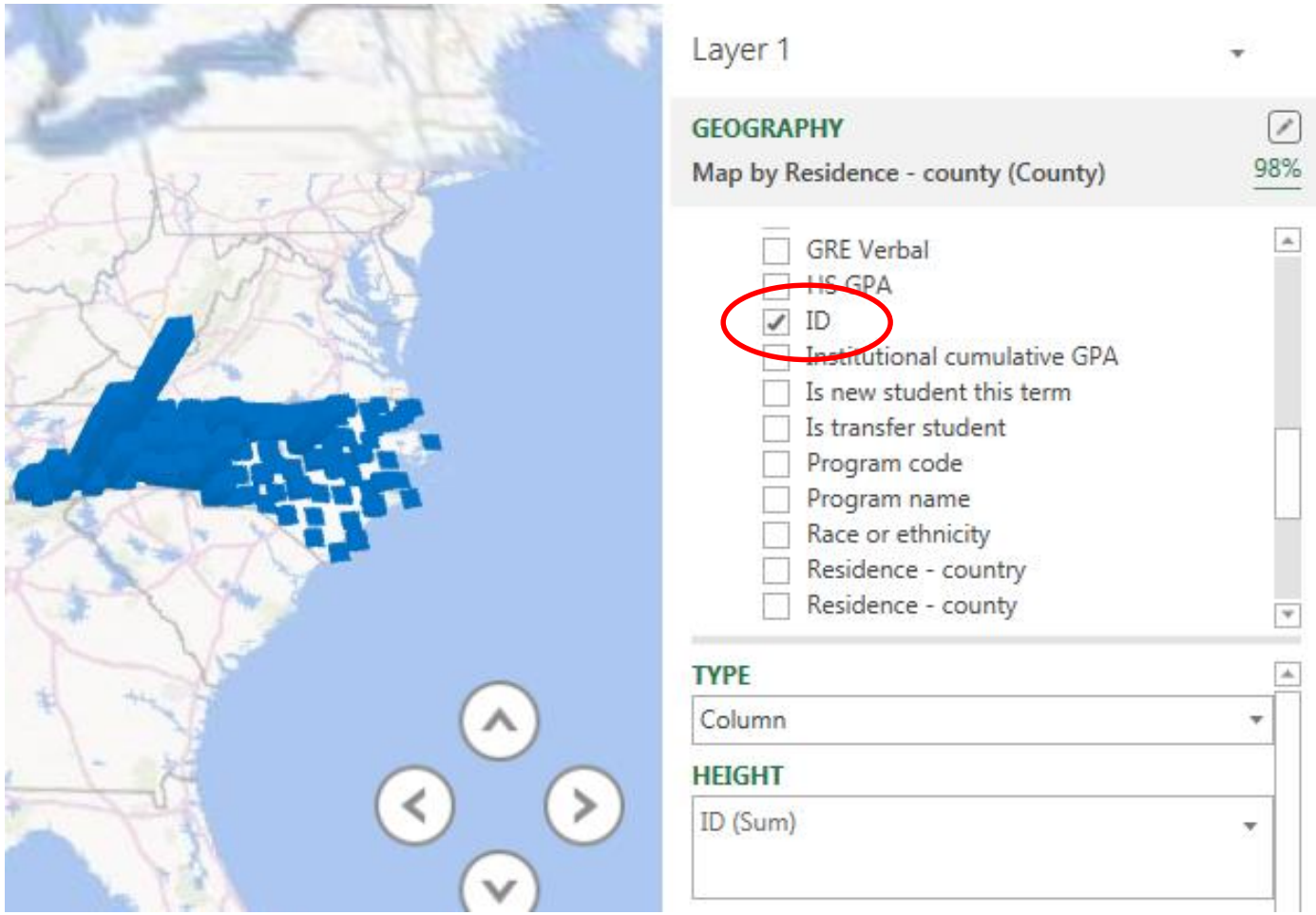




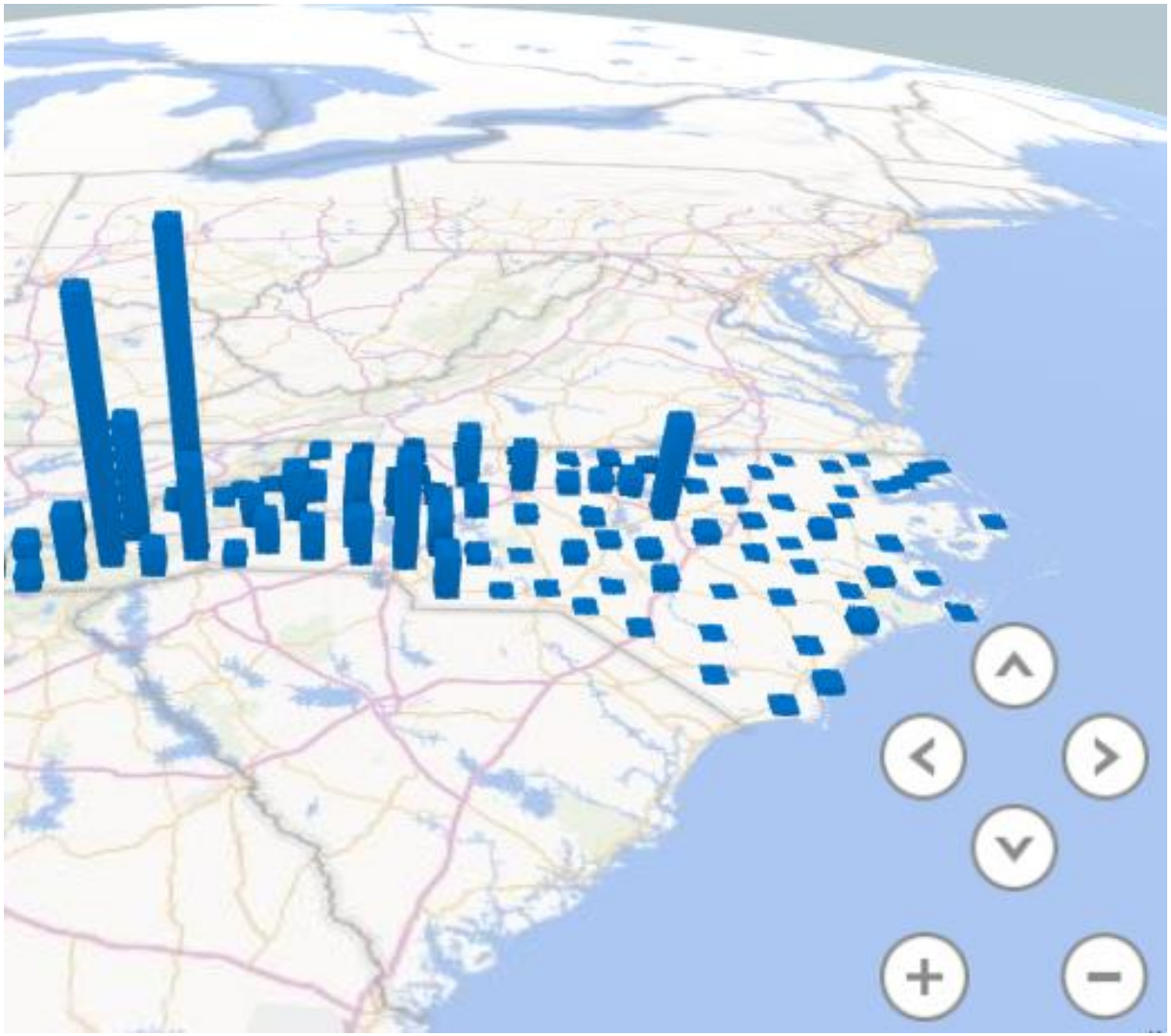
Displaying Data – Power Map



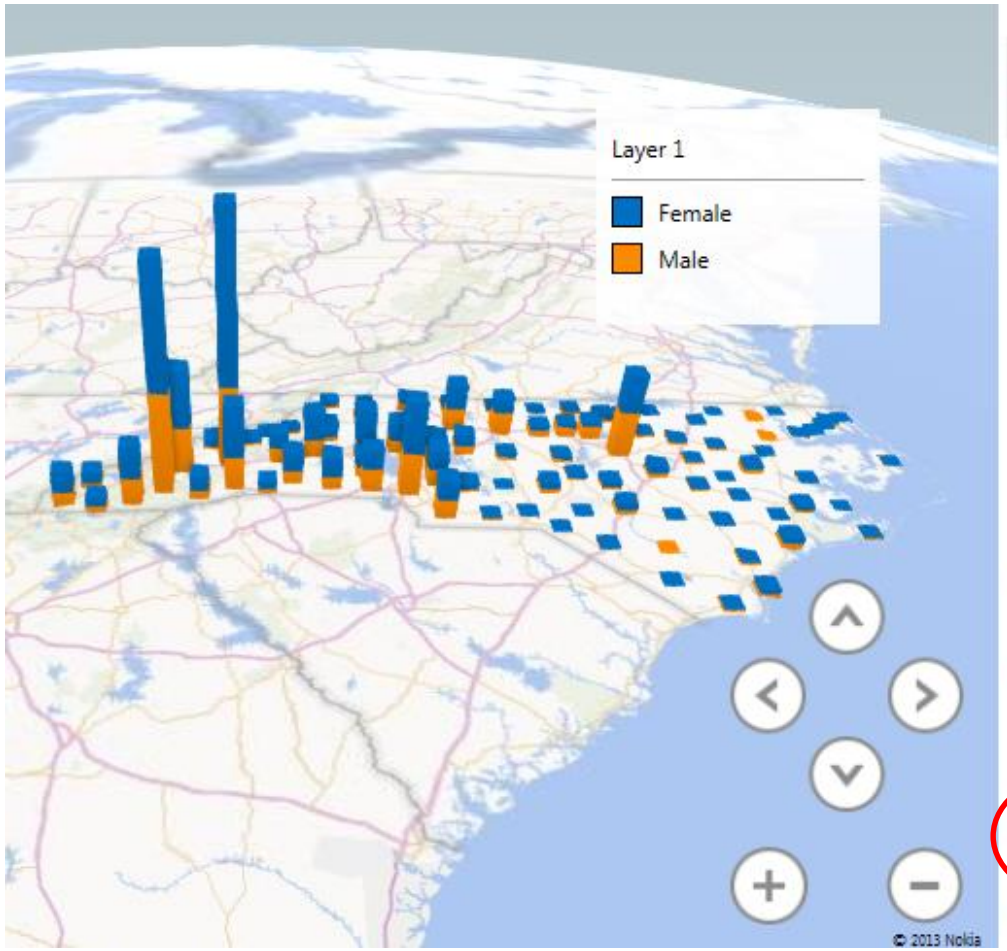
Displaying Data – Power Map

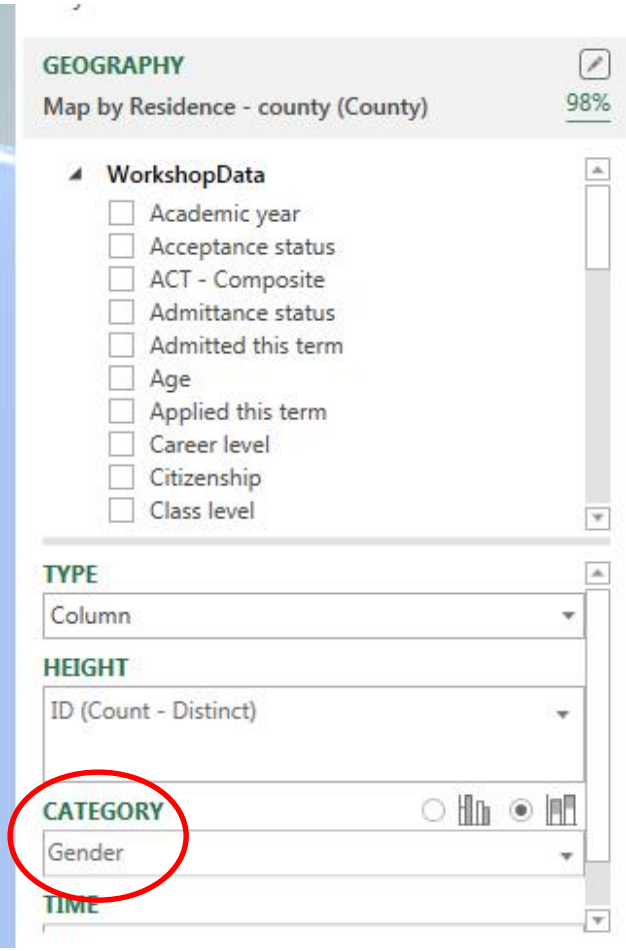


Displaying Data – Power Map

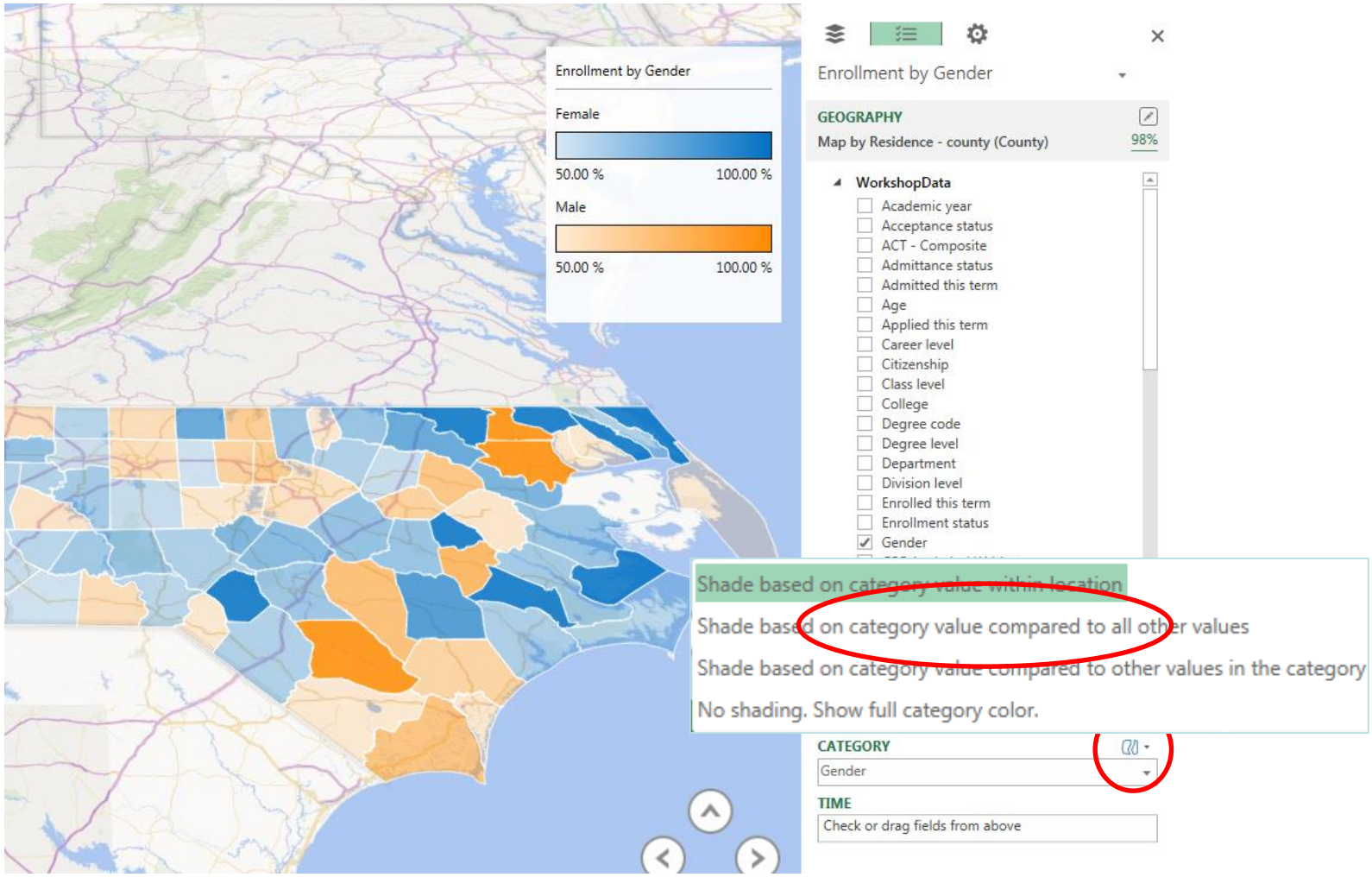


Displaying Data – Power Map





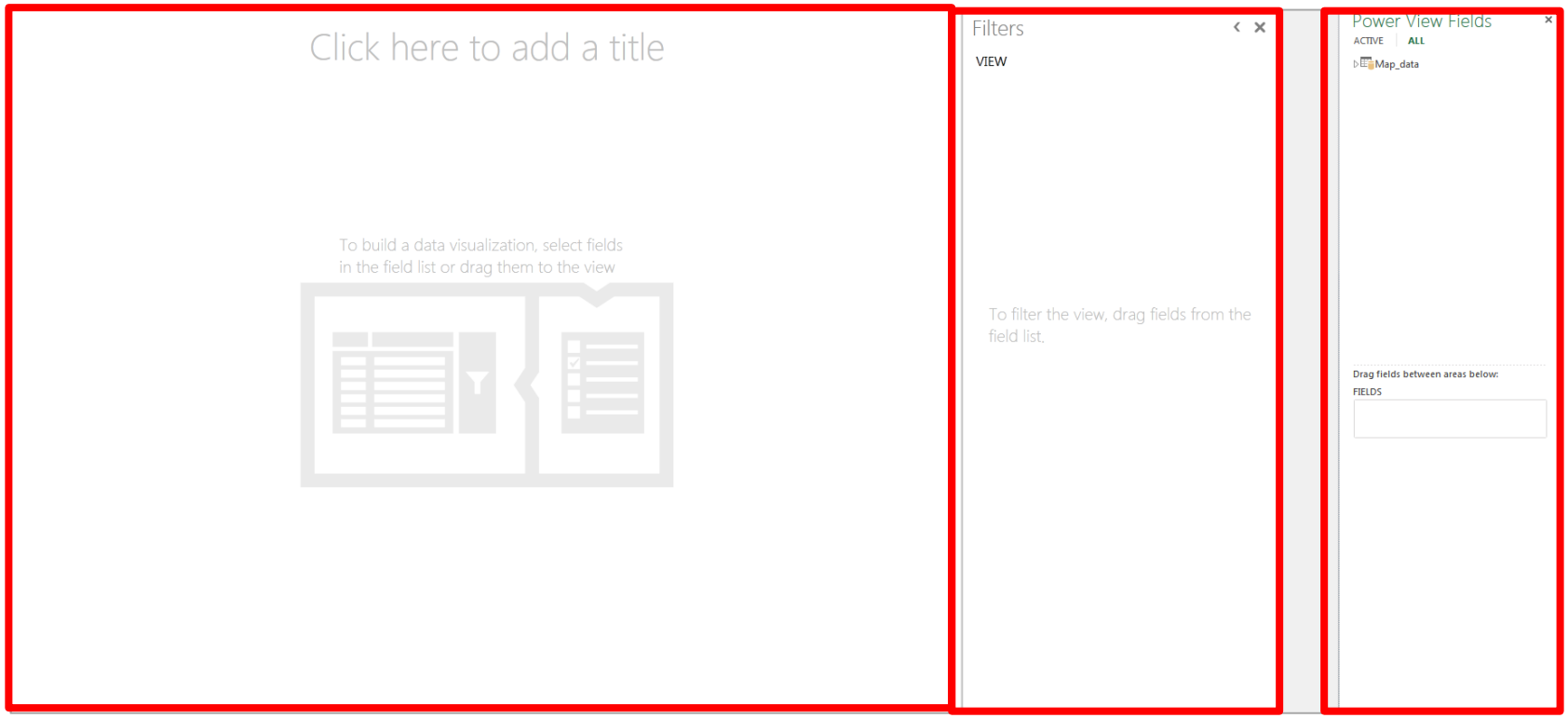
Displaying Data – Power Map



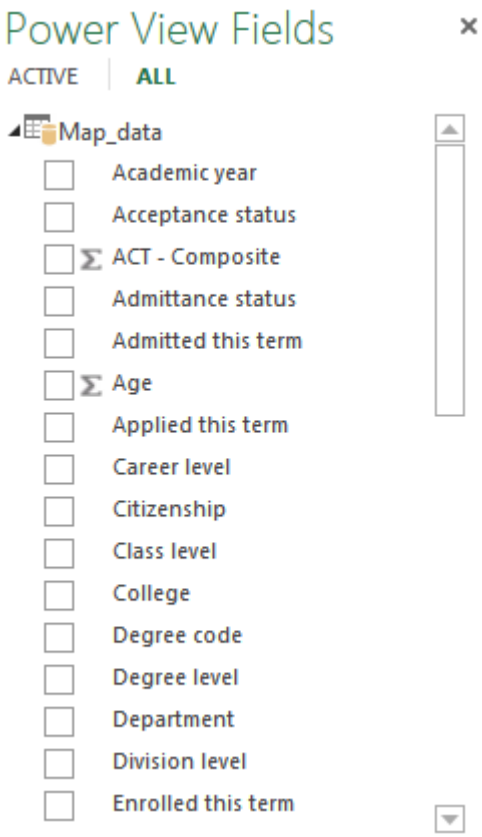
Displaying Data – Power View

- **Power View**
  - Dashboard builder
  - Allows synchronized filtering
  - Bring together tables, graphs, maps

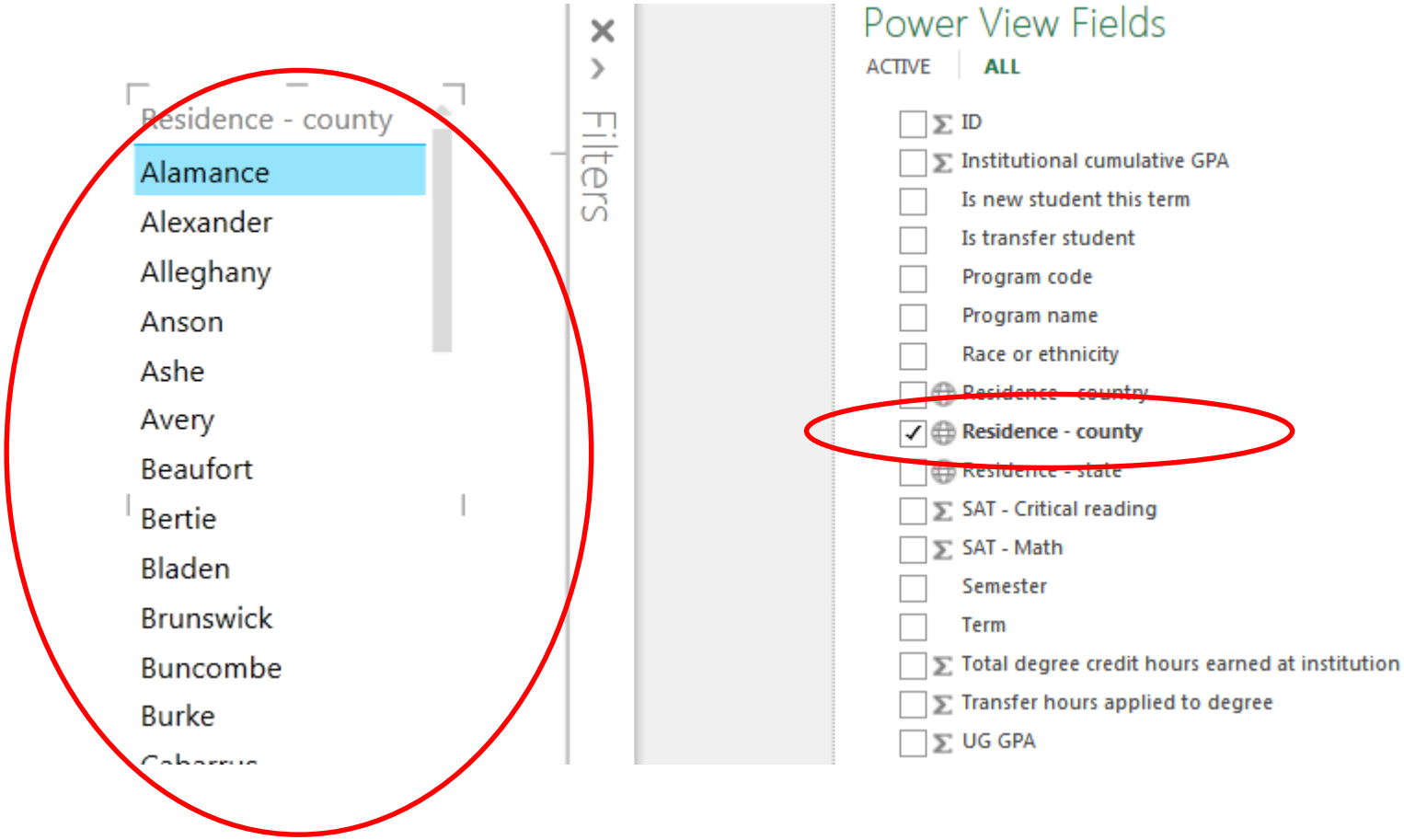
Displaying Data – Power View



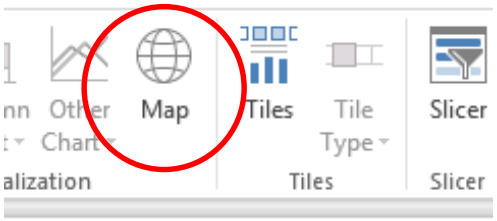
Displaying Data – Power View

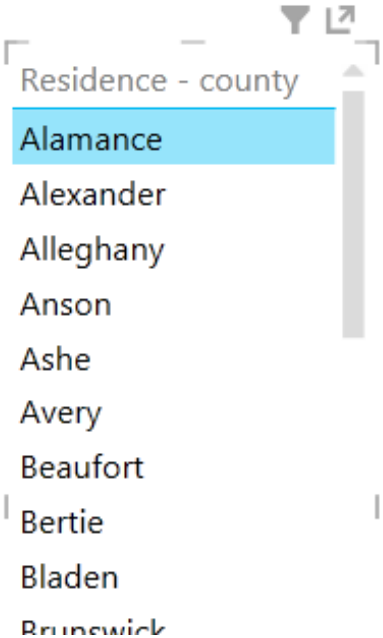


Displaying Data – Power View



Displaying Data – Power View

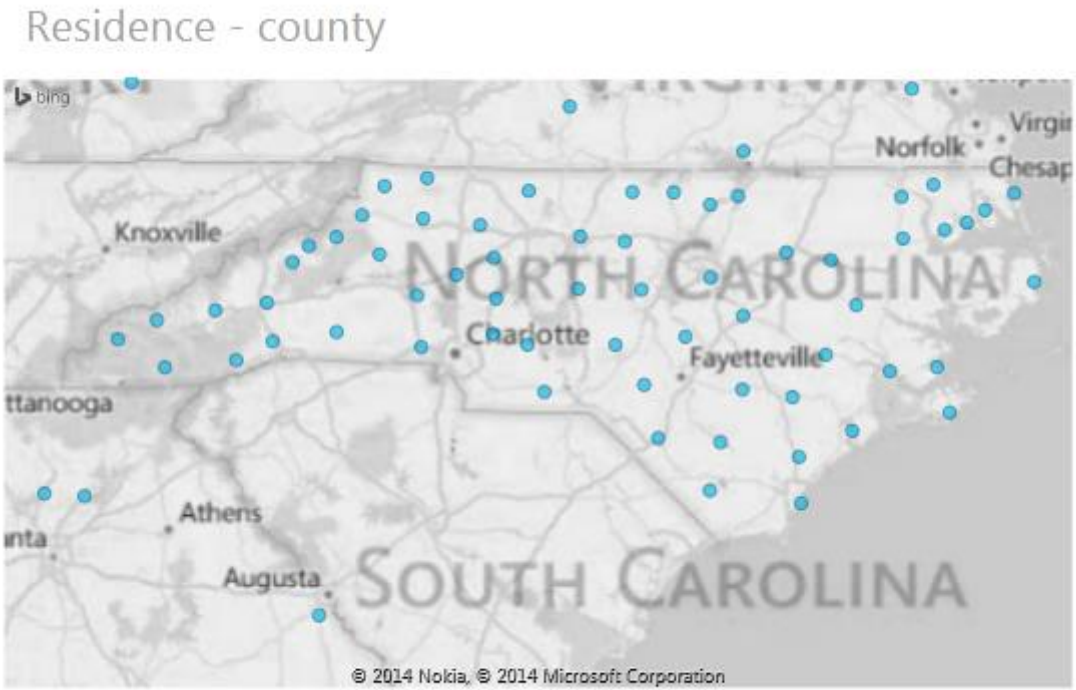




Displaying Data – Power View

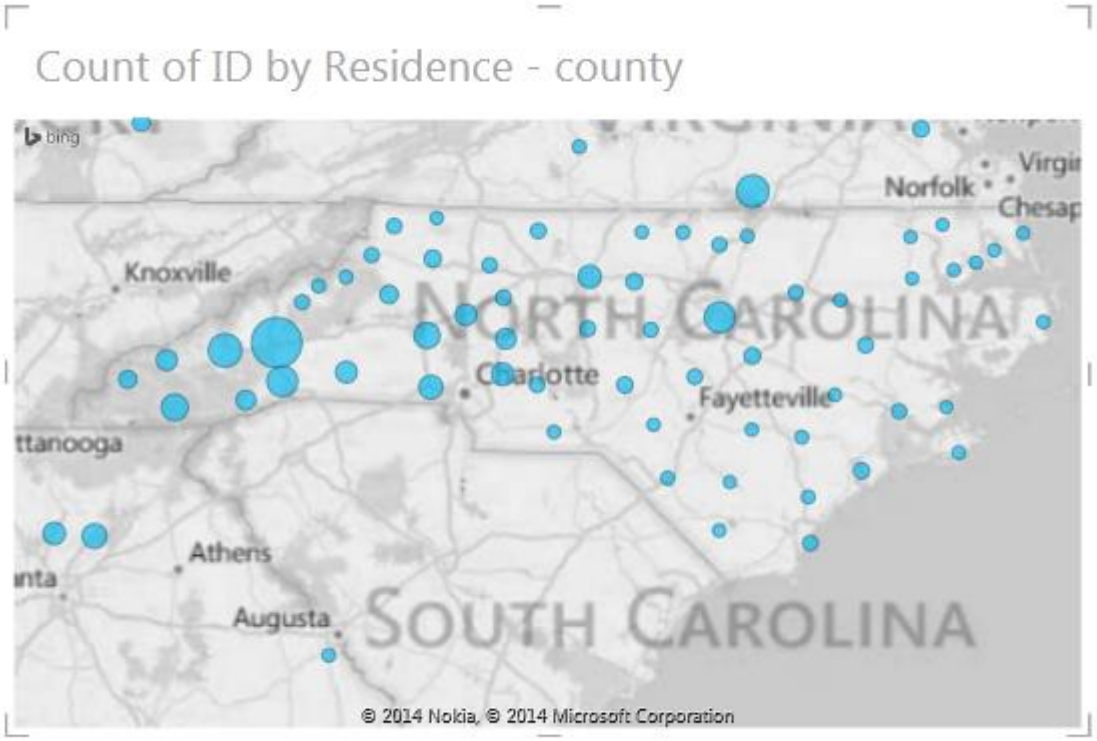
Displaying Data – Power View

Zoom and reposition

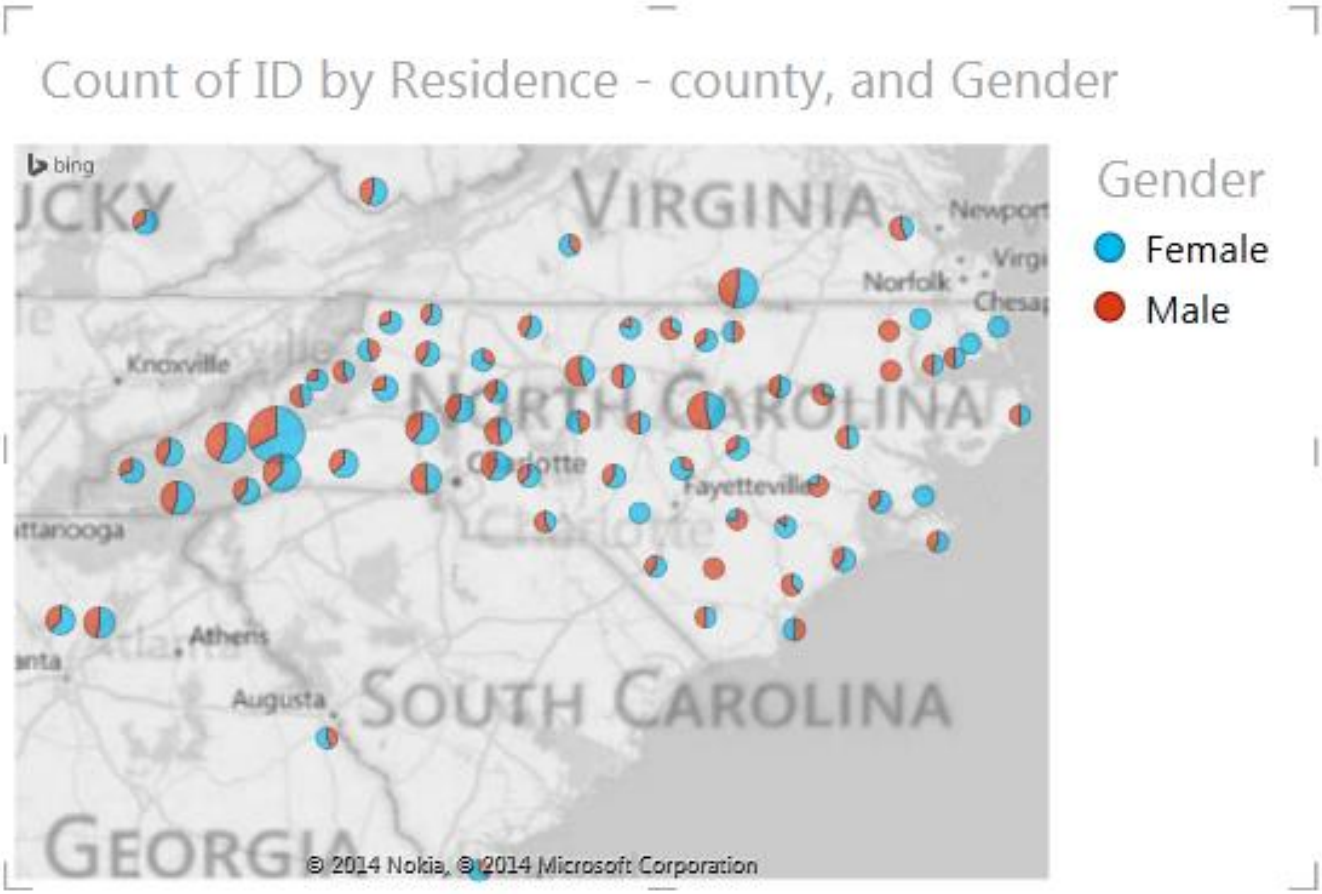


Displaying Data – Power View

Add magnitude to the map by selecting ID (count)



Displaying Data – Power View

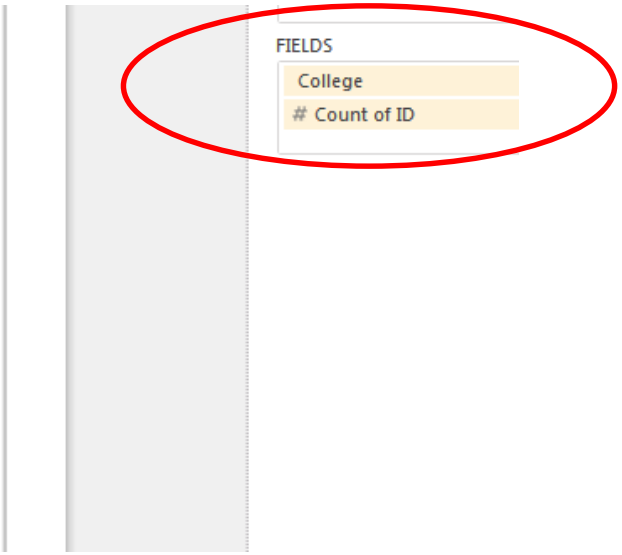


Displaying Data – Power View

- **Add new elements**
  - Click off of existing elements (so nothing is selected)
  - Choose new field from list
  - By default, listing
    - Add additional elements (i.e., ID Count) to construct a table

Displaying Data –Power View

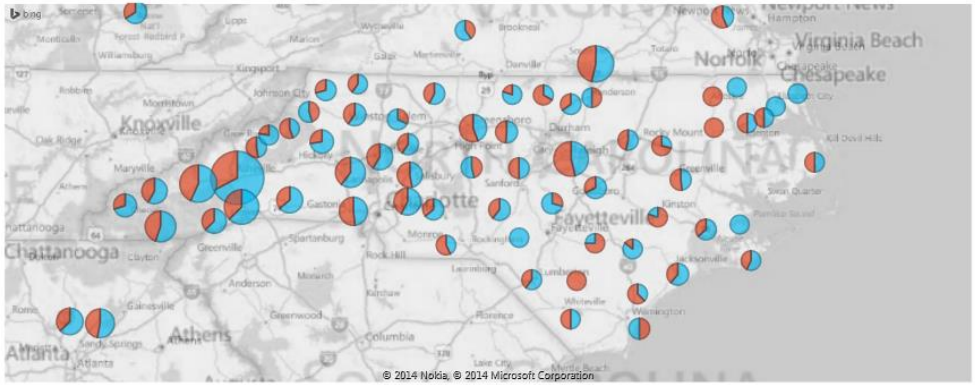
College	Count of ID
College of Information Studies	1,301
College of Journalism	516
College of Veterinary Medicine	3,061
No college	2,150
School of Architecture	1,783
School of Engineering	658
Total	**5,332**



Displaying Data – Power View

Enrollment by County

Count of ID by Residence - county, and Gender

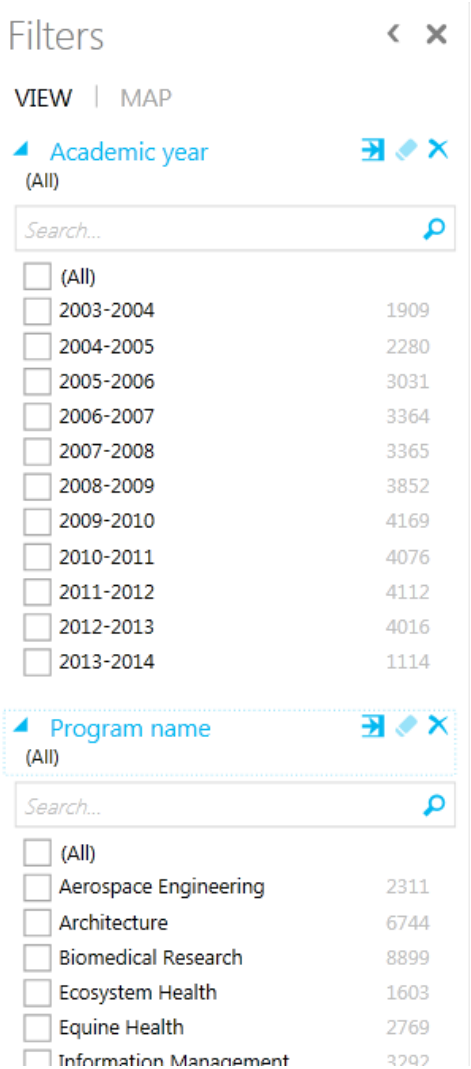


Degree level	Count of ID
Bachelors	5,156
Doctorate	15
Graduate	70
Masters	553
N/A	1
Undergraduate	128
Unknown	2
Total	**5,332**

College	Count of ID
College of Information Studies	1,301
College of Journalism	516
College of Veterinary Medicine	3,061
No college	2,150
School of Architecture	1,783
School of Engineering	658
Total	**5,332**

Is new student this term	Count of ID
Yes	4,811
No	5,050
NA	763
Total	**5,332**

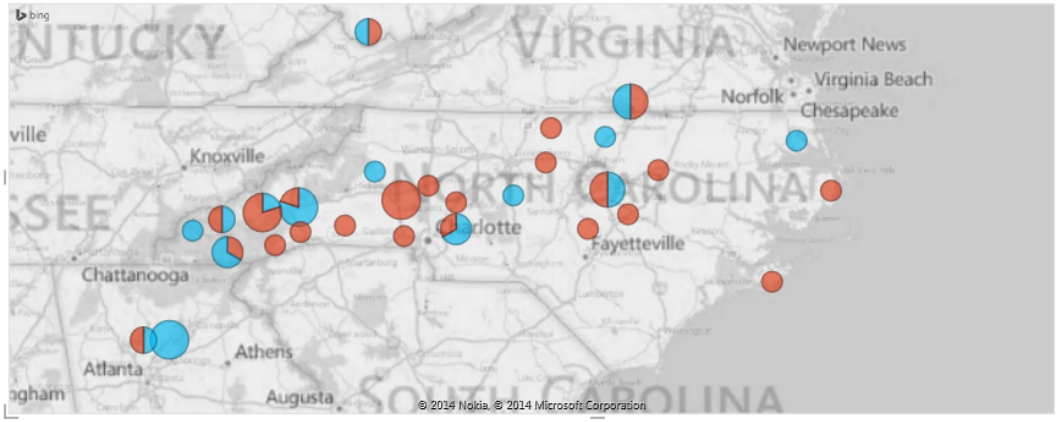
Displaying Data – Power View



Displaying Data – Power View

Enrollment by County

Count of ID by Residence - county, and Gender



Gender
- Female
- Male

Degree level	Count of ID
Bachelors	77
Masters	12
Total	**89**

College	Count of ID
College of Information Studies	55
College of Journalism	34
Total	**89**

Is new student this term	Count of ID
Yes	2
No	87
Total	**89**

Filters

VIEW | MAP

Academic year
is 2013-2014

Search...

(All)	
2003-2004	227
2004-2005	235
2005-2006	310
2006-2007	286
2007-2008	285
2008-2009	299
2009-2010	285
2010-2011	356
2011-2012	361
2012-2013	319
✓ 2013-2014	89

Program name
is Journalism or Library Science

Search...

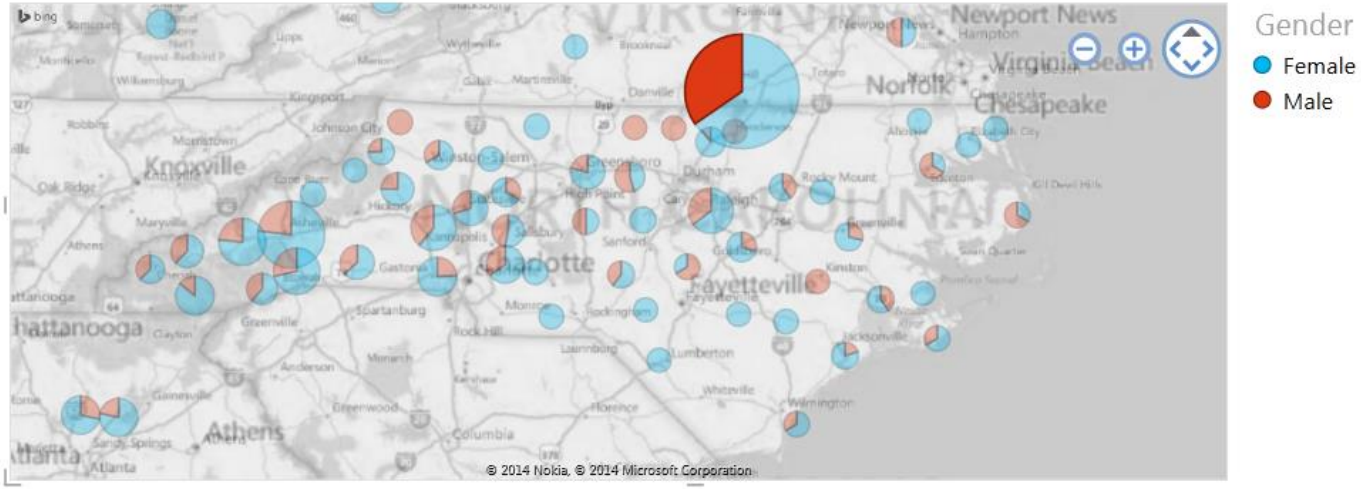
(All)	
Aerospace Engineering	91
Architecture	161
Biomedical Research	460
Ecosystem Health	47
Equine Health	76
Information Management	100
✓ Journalism	34
Landscape Architecture	20
✓ Library Science	55
Undeclared	35
Veterinary Biosciences	35

Western Carolina UNIVERSITY

Displaying Data – Power View

Enrollment by County

Count of ID by Residence - county, and Gender



Degree level	Count of ID
Bachelors	18
Total	**18**

College	Count of ID
College of Information Studies	4
College of Veterinary Medicine	7
School of Architecture	5
School of Engineering	3
Total	**18**

Is new student this term	Count of ID
No	18
Total	**18**

Questions

Resources

- **Rob Collie (http://powerpivotpro)**
  - DAX Formulas for PowerPivot, 2013
- **Bill Jelen (http://mrexcel.com)**
  - PowerPivot for the Data Analyst: Microsoft Excel 2010, 2010
- **Alberto Ferrari and Marco Russo**
  - Microsoft Excel 2013: Building Data Models with PowerPivot
- **Chris Webb (http://cwebbbi.wordpress.com)**
- **Kasper de Jonge (http://www.powerpivotblog.nl)**
- **Purna Duggirala (http://www.chandoo.org/)**

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