



Western Carolina UNIVERSITY

“Power” Tools for IR Reporting

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AIR Annual Forum 2015

- **10,382** students
- **Master’s Comprehensive**
- **Mountain location**
- **Residential and Distance**



Outcomes for workshop

You will:

- leave with a meaningful understanding of the capabilities of the "Power" tools from Microsoft
- learn basic techniques for leveraging multiple software systems to simplify and streamline reporting
- be able to apply basic techniques leveraging the power of Power Pivot, Power View, Power Map, and Power Query
- have a roadmap for reproducing these concepts into your own offices



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Assumptions for workshop

- **Familiarity with Excel**
- **Comfortable with basic functions (SUM, IF, etc.)**
- **Desire to connect to “dynamic” data**



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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



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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
- Row limitation



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Connecting to Data



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Connecting to Data

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



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Connecting to Data

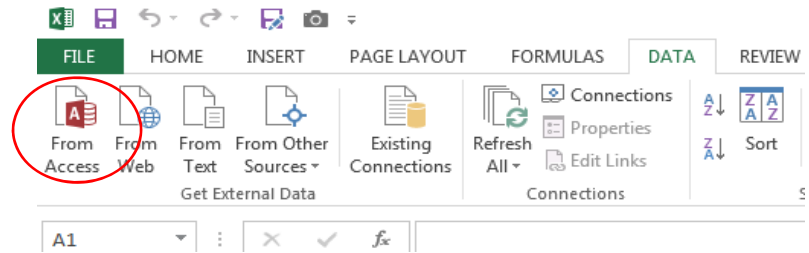
- Connects to:
 - Tables
 - Queries



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Connecting to Data



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Connecting to Data

The screenshot shows the Excel ribbon with the 'Get External Data' and 'Connections' tabs. The 'Import Data' dialog box is open, allowing the user to choose how to view data in the workbook. The 'Existing worksheet' option is selected, and the text box contains '=SAS1'. Other options include 'Table', 'PivotTable Report', 'PivotChart', 'Power View Report', and 'Only Create Connection'. There are also buttons for 'Properties...', 'OK', and 'Cancel'.

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Connecting to Data

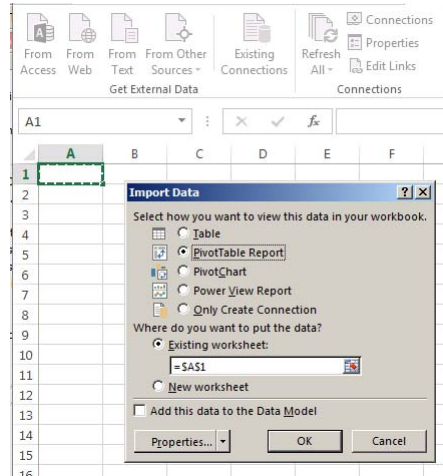
The screenshot shows the Excel ribbon with the 'Table' tab selected. The table 'Table_Workshop' is visible, with columns: Academic year, Term, Semester, Year, ID, and A. The data rows are as follows:

	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

➔ 12



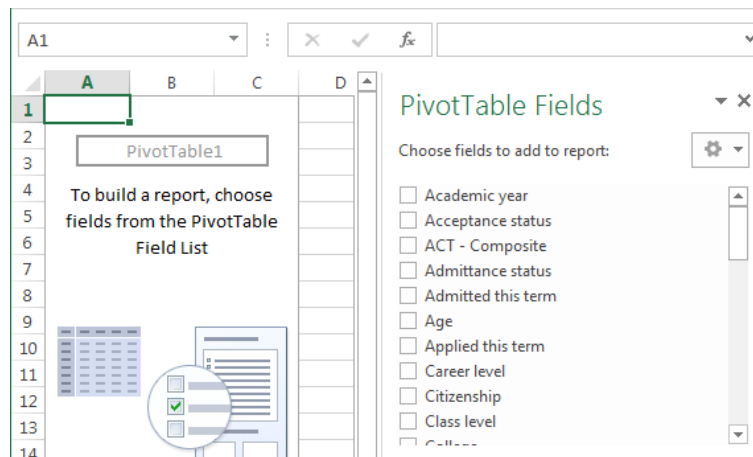
Connecting to Data



➔
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Connecting to Data



➔
14



Connecting to Data

External Data Connections Exercise 1.1



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Connecting to Data

Data is connected

Now What?



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Displaying Data – Pivot Tables



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Displaying Data – Pivot Tables

1. Get a data source ✓
2. Insert a pivot table ✓
3. Populate pivot table grid



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Displaying Data – Pivot Tables

PivotTable Fields

Choose fields to add to report:

- Academic year
- Term
- Semester
- Year
- ID
- Applied this term
- Admitted this term

Drag fields between areas below:

<p>▼ FILTERS</p>	<p> COLUMNS</p>
<p>≡ ROWS</p>	<p>Σ VALUES</p>

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Displaying Data – Pivot Tables

Drag fields between areas below:

<p>▼ FILTERS</p>	<p> COLUMNS</p>
<p>≡ ROWS</p>	<p>Σ VALUES</p>

	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

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Displaying Data – Pivot Tables

Drag fields between areas below:

FILTERS
Semester

ROWS
Program name

Move to Beginning
Move to End
Move to Report Filter
Move to Row Labels
Move to Column Labels
Move to Values
Remove Field
Value Field Settings...
Sum of ID

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	



Displaying Data – Pivot Tables

Pivot Table Introduction

Exercise 2.1

**Structure, Features, and Deficiencies of Pivot
Tables**

Exercise 2.2



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Displaying Data – Power Pivot

**New and
improved
Pivot Tables!**

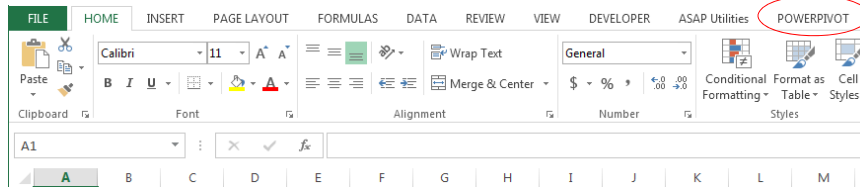


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Displaying Data – Power Pivot

- **Set-up**



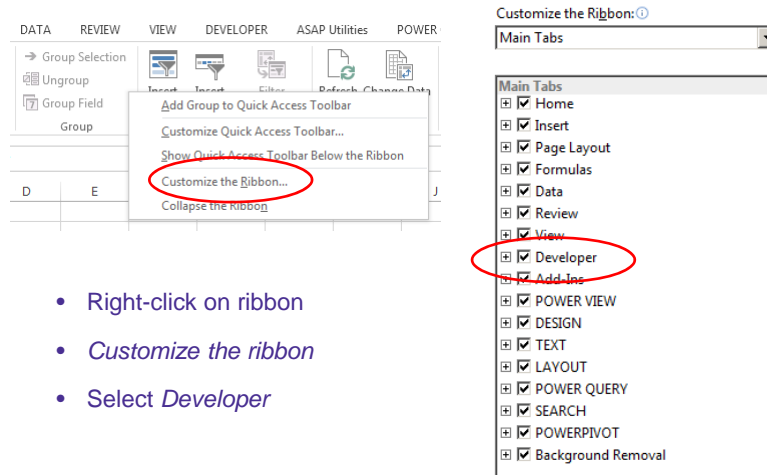
- Installed with Excel 2013
- Downloadable add-in for Excel 2010
- **Not available prior to Excel 2010**



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Displaying Data – Power Pivot



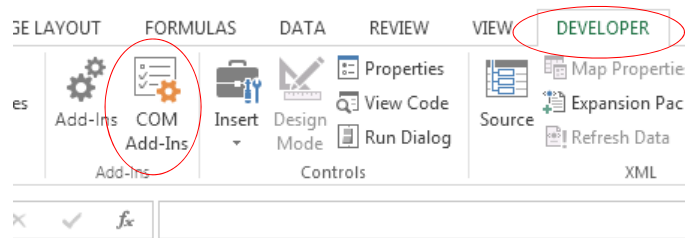
- Right-click on ribbon
- *Customize the ribbon*
- Select *Developer*



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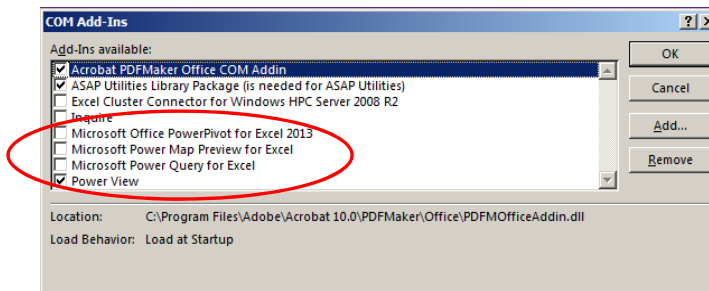
Displaying Data – Power Pivot



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Displaying Data – Power Pivot

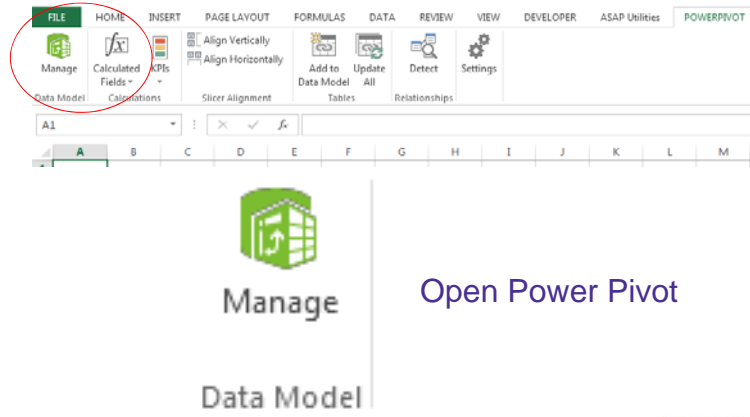


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Displaying Data – Power Pivot

- The Power Pivot environment

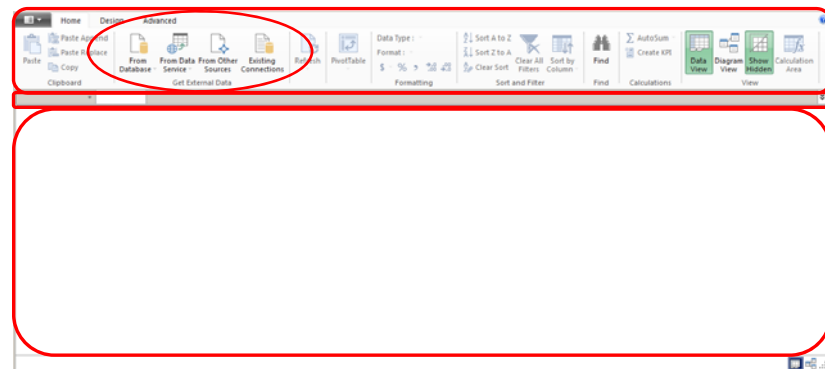


➔
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Displaying Data – Power Pivot

- The Power Pivot environment

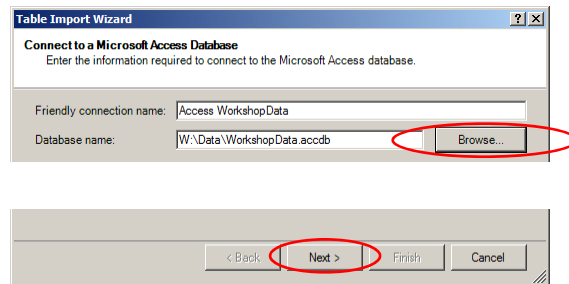


➔
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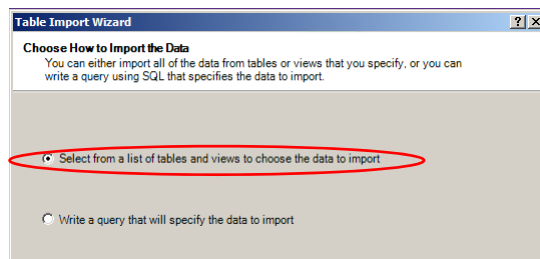
Displaying Data – Power Pivot

- Import data



Displaying Data – Power Pivot

- Import data



Displaying Data – Power Pivot

- Import data

The screenshot shows the 'Table Import Wizard' dialog box. The top section indicates a successful import of 'WorkshopData' with 35,288 rows transferred. The main section shows a table with columns: 'Source Table', 'Friendly Name', and 'Filter Details'. The 'WorkshopData' table is selected. The 'Preview & Filter' button is highlighted at the bottom right.

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Displaying Data – Power Pivot

- How the imported data 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

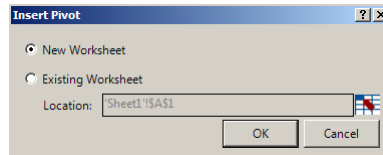
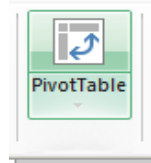
WorkshopData
Record: 1 of 34,918

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Displaying Data – Power Pivot

- Bringing data into Excel



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Displaying Data – Power Pivot

- PivotTable vs. Power Pivot PivotTable

Semester	Fall		
Count of ID	Column Labels		
Row Labels	2003-2004	2004-2005	2005-2006
College of Information Studies	153	200	185
Information Management	116	155	140
Information Management	116	155	140
Library Science	37	45	45

PivotTable Fields

Choose fields to add to report:

- Academic year
- Acceptance status
- ACT - Composite
- Admittance status
- Admitted this term

Semester	Fall		
Count of ID	Column Labels		
Row Labels	2003-2004	2004-2005	
College of Information Studies	153	200	
Information Management	116	155	
Information Management	116	155	
Library Science	37	45	

PivotTable Fields

ACTIVE | ALL

Choose fields to add to report:

- WorkshopData
- Academic year
- Term
- Semester



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Displaying Data – Power Pivot

Power Pivot Introduction Exercise 3.1



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Displaying Data – Power Pivot

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



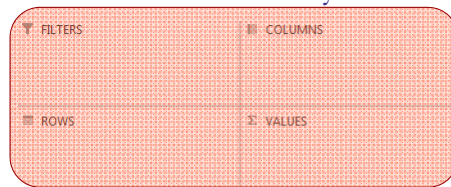
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Displaying Data – Power Pivot

- **Calculated Columns**

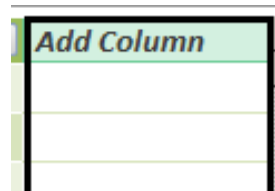
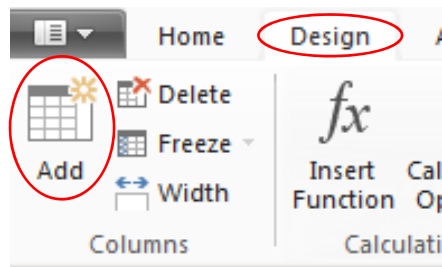
- Used to add an additional column to data table
- Can be a column added from a related table (like a VLOOKUP) or new data, derived from existing data (sum to combined SAT, length of name, substring of longer string, etc.)
- Column can be used in any area of the pivot



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Displaying Data – Power Pivot

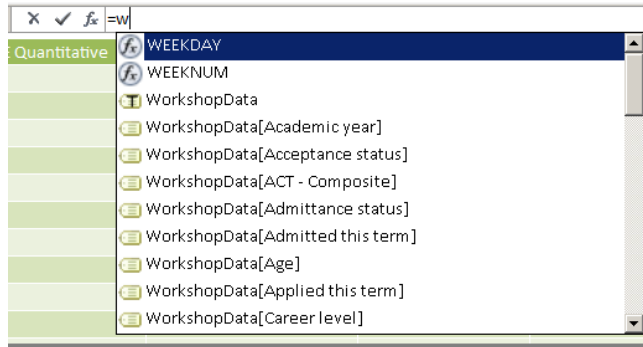
- **Adding a calculated column**



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Displaying Data – Power Pivot

- Adding a calculated column

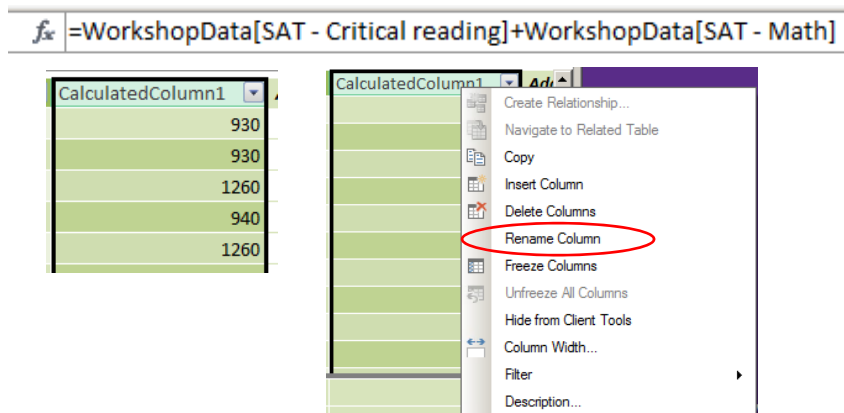


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Displaying Data – Power Pivot

- Adding a calculated column



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Displaying Data – Power Pivot

- Adding a calculated column to pivot table

Column Labels	2003-2004	2004-2005
Row Labels	Count of ID	Average SAT
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
Journalism	67	1045.5
Journalism	67	1045.5



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Evaluation Contexts

- Row context
- Filter context



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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



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Row Context

$\sum_{\text{row}} \text{WorkshopData}[\text{SAT - Critical reading}] + \text{WorkshopData}[\text{SAT - Math}]$

cumulative 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	



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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



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Filter Context

Semester	Column Labels	Count of ID	Average SAT	Count
Fall	2003-2004			200
	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	



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Displaying Data – Power Pivot

DAX & Calculated Columns Introduction Exercise 3.2



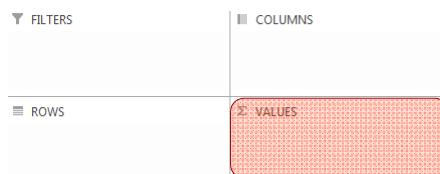
49



Displaying Data – Power Pivot

- **Calculated Fields**

- Used to add a calculated element
- Aggregate function that applies to whole table, column, or range
- Something that needs to be recalculated
- Fields can only be used in the VALUES section

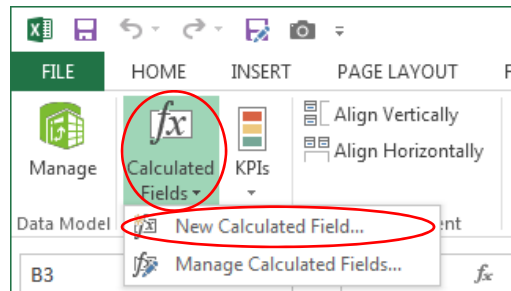


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Displaying Data – Power Pivot

- Adding a Calculated Field



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Displaying Data – Power Pivot

- Adding a Calculated Field

A screenshot of the 'Calculated Field' dialog box in Excel. The dialog has a blue header with the text 'Calculated Field'. It contains several input fields: 'Table name:' with 'WorkshopData' entered; 'Calculated field name:' with 'Distinct Students' entered and circled in red; and 'Description:'. Below these is a 'Formula:' field with an 'fx' icon and a 'Check formula' button. The formula entered in the field is '=DISTINCTCOUNT(WorkshopData[ID])', which is also circled in red.



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Displaying Data – Power Pivot

- **DISTINCTCOUNT**

DISTINCTCOUNT(<column>)

– Counts unique values in column



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Displaying Data – Power Pivot

- **Adding a Calculated Field**

Calculated Field	
Table name:	WorkshopData
Calculated field name:	Distinct Students
Description:	
Formula:	<input type="button" value="fx"/> <input type="button" value="Check formula"/>
=DISTINCTCOUNT(WorkshopData[ID])	



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Displaying Data – Power Pivot

- Adding a Calculated Field

Row Labels	Column Labels	2003-2004	2004-2005
	Count of ID	153	152
College of Information Studies		116	116
Information Management		116	116
Information Management		37	37
Library Science			



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Displaying Data – Power Pivot

- Calculated Field in Power Pivot

2004-2005	Fall 2004
2004-2005	Spring 2004
Distinct Students: 5332	



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```

fx Distinct Students:=DISTINCTCOUNT(WorkshopData[ID])
Term Semester Year ID Applied this term
    
```



Displaying Data – Power Pivot

DAX & Calculated Fields Introduction

Exercise 3.3



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Displaying Data – Power Pivot

DAX
CALCULATE, ALL, FILTER



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Displaying Data – Power Pivot: DAX CALCULATE

- **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



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Displaying Data – Power Pivot: DAX CALCULATE

First-time Freshmen Distinct Students: =

```
CALCULATE(
  [Distinct Students],
  WorkshopData[Class Level]="Freshman",
  WorkshopData[Is new student this term]="Yes"
)
```



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Displaying Data – Power Pivot: DAX CALCULATE

Column Labels	2003-2004		
Row Labels	Distinct Enrolled Students	First-time Freshmen Distinct Students	First-time Freshmen Distinct Students
Aerospace Engineering	44		10
Freshman	12		10
No	2		10
Yes	10		10
Sophomore	15		10
No	12		10
Yes	3		10
Junior	9		10
No	6		10



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Displaying Data – Power Pivot: DAX CALCULATE

DAX - CALCULATE
Exercise 3.4



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Displaying Data – Power Pivot: DAX ALL

- 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



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Displaying Data – Power Pivot: DAX ALL

All Distinct Enrolled Students: =

```
CALCULATE(
    [Distinct Enrolled Students],
    ALL( WorkshopData[Class Level] )
)
```



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Displaying Data – Power Pivot: DAX ALL

2009-2010		
Row Labels	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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Displaying Data – Power Pivot: DAX ALL

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



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Displaying Data – Power Pivot

- **DIVIDE**

DIVIDE(<num>, <den>, [<alt>])

- “Safe” divide
- Can specify alternate result for divide by zero



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Displaying Data – 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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Displaying Data – Power Pivot: DAX ALL

DAX - ALL Exercise 3.5



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Displaying Data – Power Pivot: DAX FILTER

- **FILTER**

`FILTER(TableToFilter, FilterExpression)`

– Returns a table filtered by FilterExpression



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Displaying Data – Power Pivot: DAX CALCULATE

Above Average GPA Enrolled Undergraduates: =

```

CALCULATE(
    [Distinct Enrolled Students],
    FILTER(
        WorkshopData,
        WorkshopData[Institutional cumulative GPA] >
        [Average GPA Enrolled Undergraduates]
    )
)
    
```



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Displaying Data – Power Pivot: DAX CALCULATE

Row Labels	2003-2004 Distinct Enrolled Students	Average GPA Enrolled Undergraduates
College of Information Studies	152	2.922505829
Information Management	116	2.922505829
Information Management	116	2.922505829
Library Science	37	2.922505829
Library Science	37	2.922505829
College of Journalism	66	2.922505829
Journalism	66	2.922505829



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Displaying Data – Power Pivot: DAX FILTER

Row Labels	2003-2004 Distinct Enrolled Students	% Above Average GPA Enrolled Undergraduates	2004-2005 Distinct Enrolled Students
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 %	



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Displaying Data – Power Pivot: DAX FILTER

- **ALLEXCEPT**

ALLEXCEPT(<table>, <column>[, <column>...])

– Similar to ALL function, but excludes the column(s) specified from the ALL



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Displaying Data – Power Pivot: DAX FILTER

```
=CALCULATE(  
    AVERAGE( WorkshopData[Insti tuti onal cumul ati ve GPA] ),  
    ALLEXCEPT( WorkshopData, WorkshopData[Semester] ),  
    WorkshopData[Career Level]="Undergraduate",  
    WorkshopData[Enroll ed thi s term]="Yes"  
)
```



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Displaying Data – Power Pivot: DAX FILTER

DAX - FILTER

Exercise 3.6



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Displaying Data – Power Map & Power View



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Displaying Data – Power Map

- **Power Map**

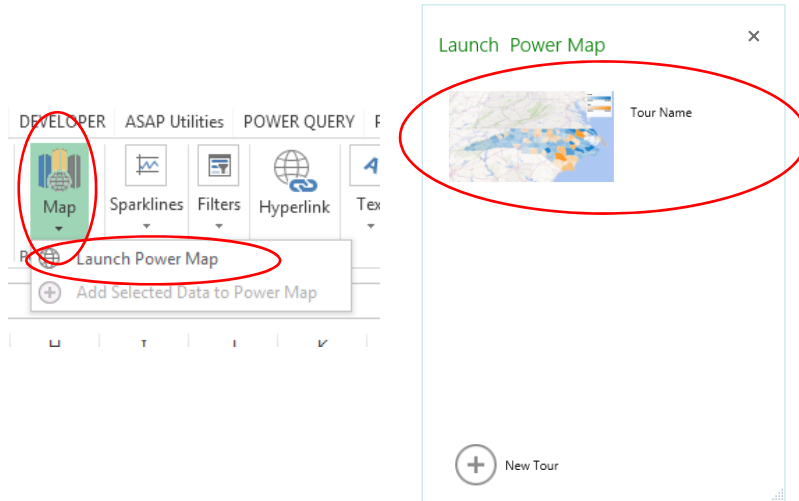
- Automated way to map geographic data
- Doesn't require geo-location information like longitude and latitude (just country, state, or county names)
- Can add elements to look at aggregate function on variables across physical space



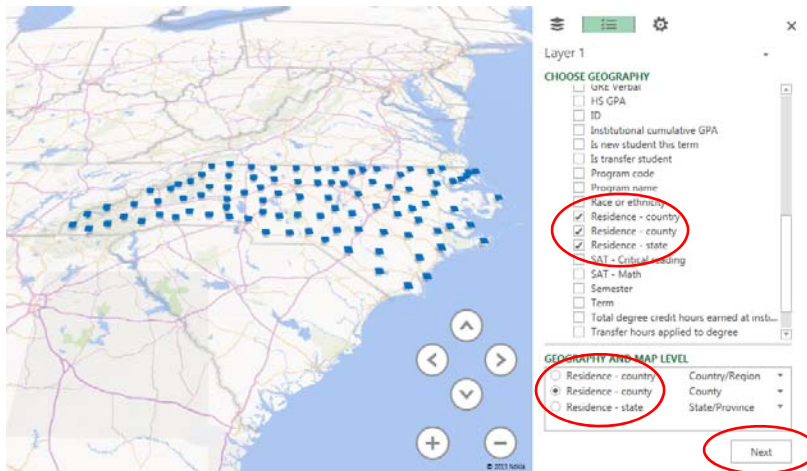
78



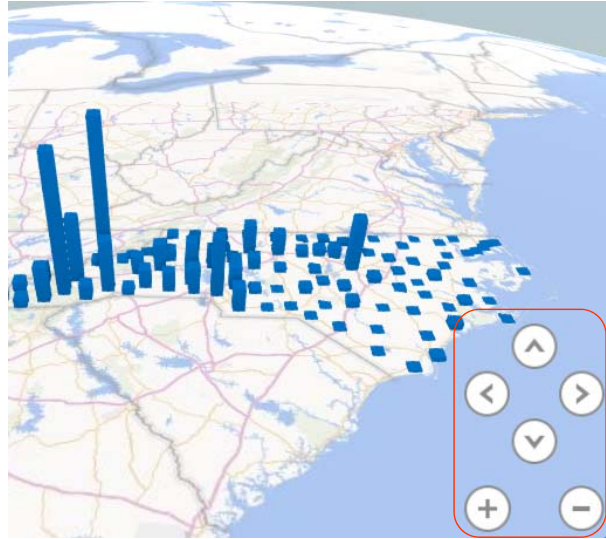
Displaying Data – Power Map



Displaying Data – Power Map

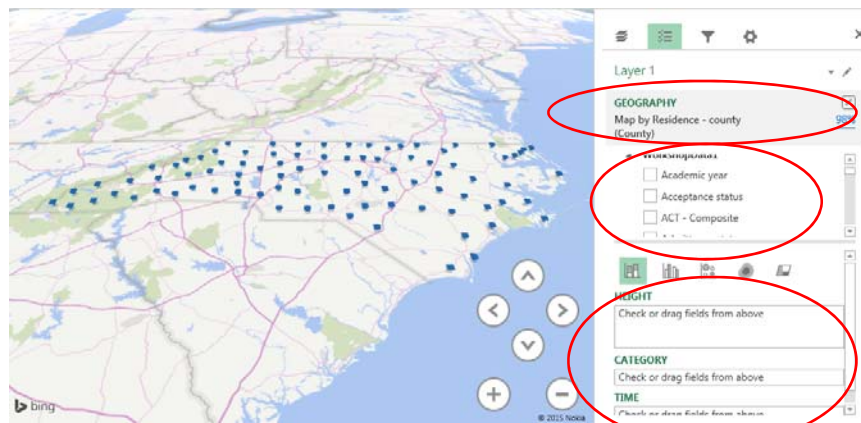


Displaying Data – Power Map



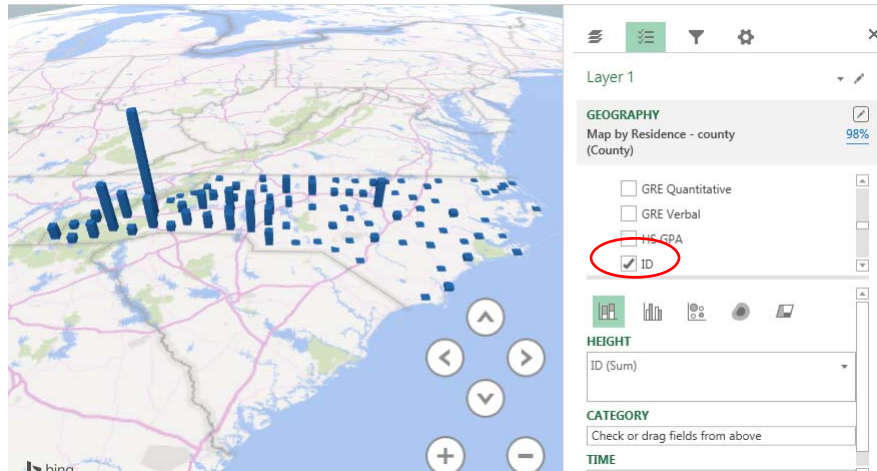
81

Displaying Data – Power Map



82

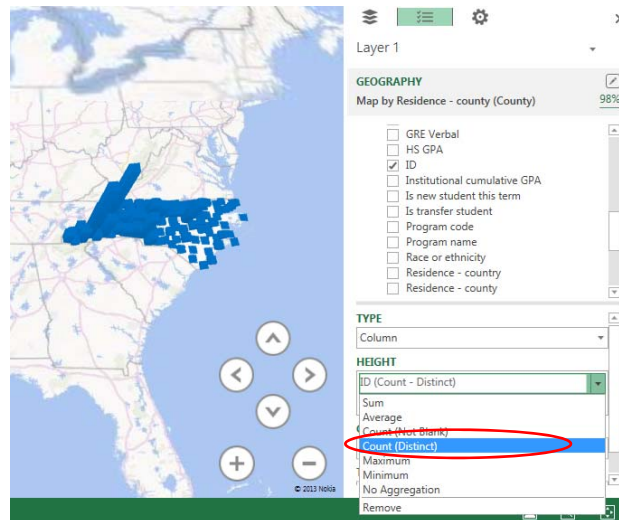
Displaying Data – Power Map



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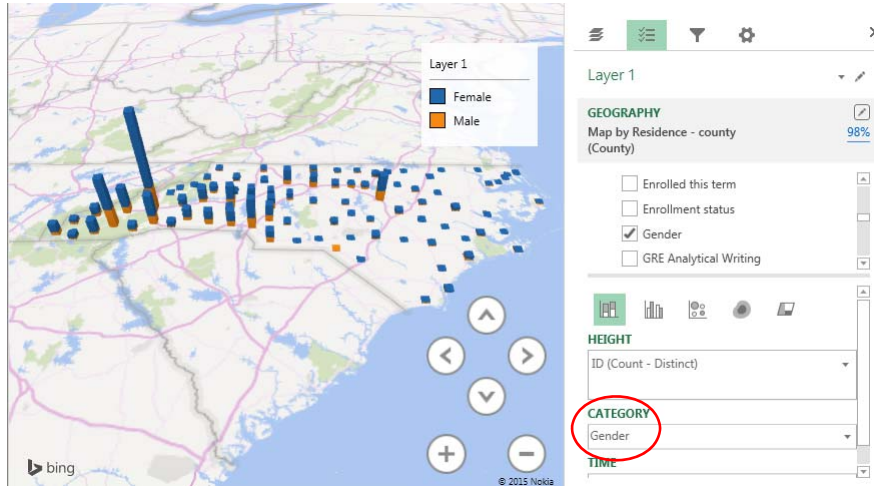
Displaying Data – Power Map



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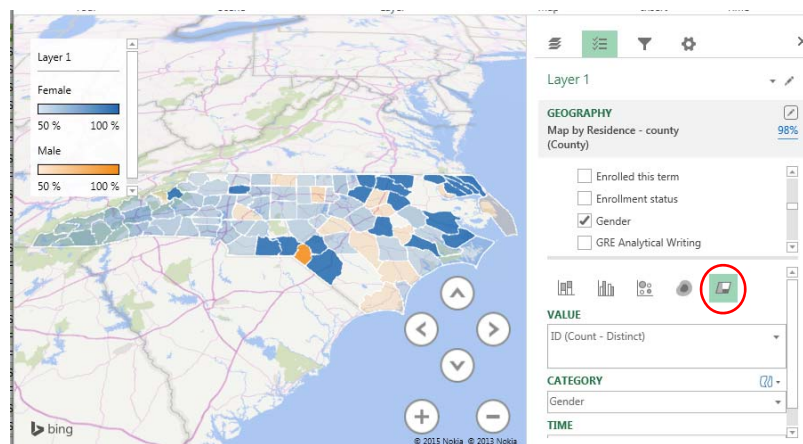
Displaying Data – Power Map



➔ 85



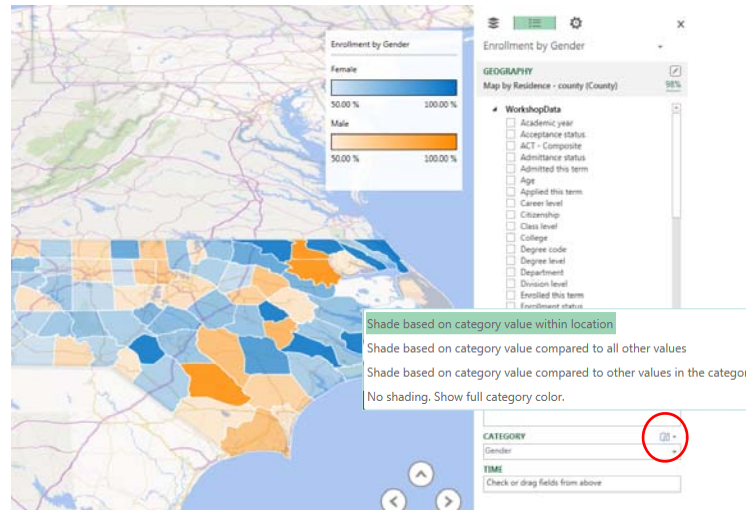
Displaying Data – Power Map



➔ 86



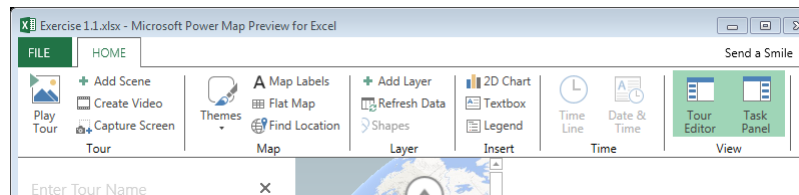
Displaying Data – Power Map



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Displaying Data – Power Map



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Displaying Data – Power Map

Power Map Exercise 4.1

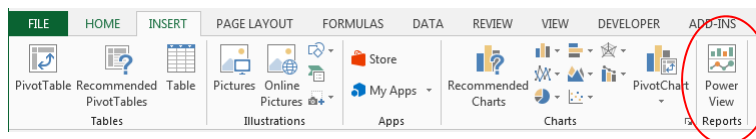


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Displaying Data – Power View

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

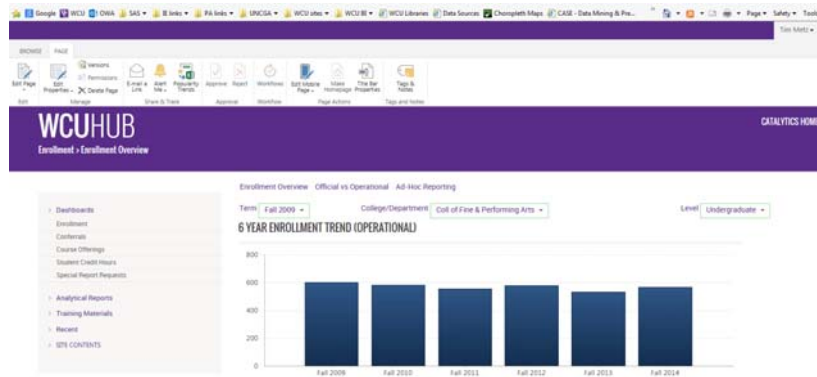


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Displaying Data – Power View

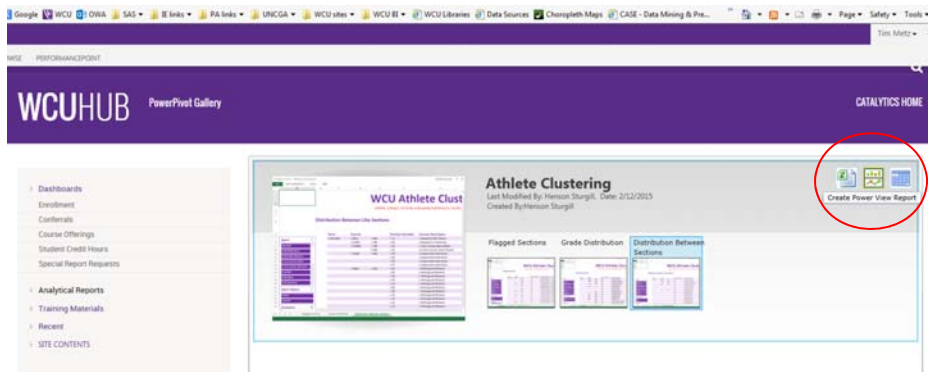
- Use in conjunction with Power Pivot to create a self-service BI tool in SharePoint



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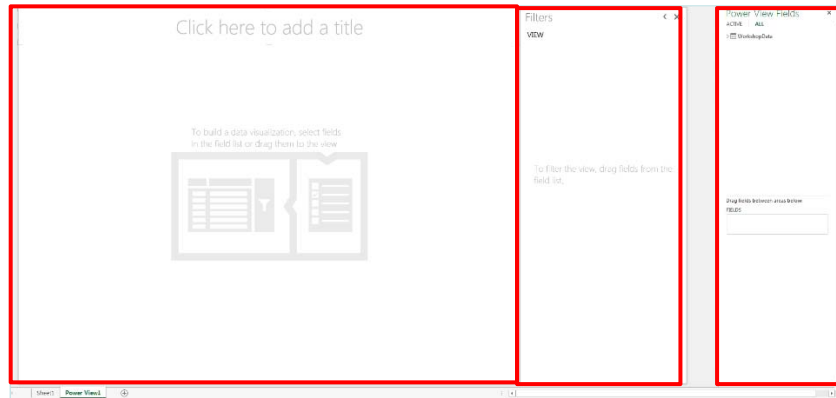
Displaying Data – Power View

- Create Power View reports directly in Share Point Server as well as in Excel

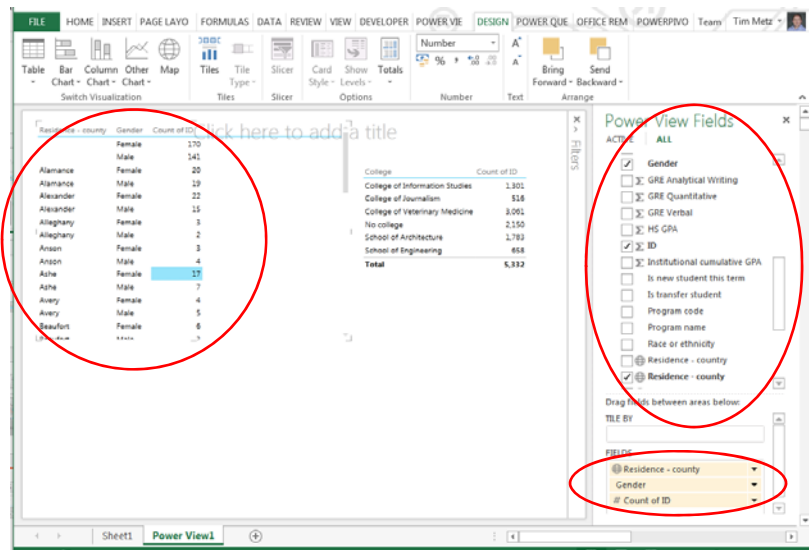


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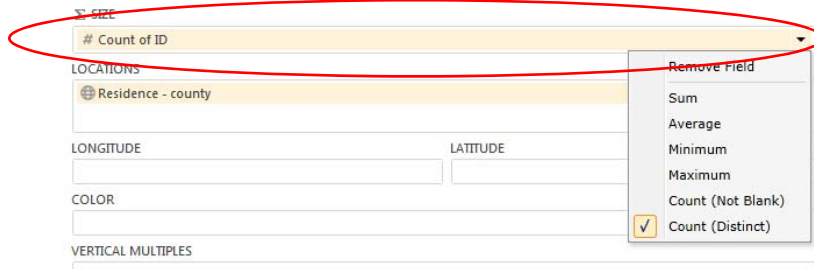
Displaying Data – Power View



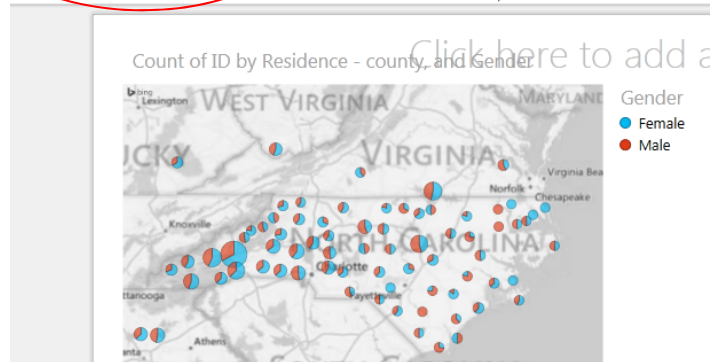
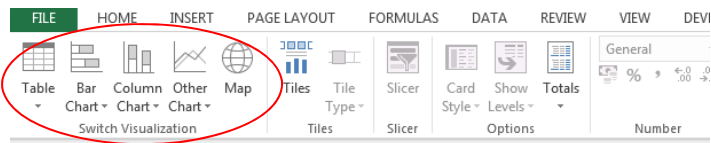
Displaying Data – Power View



Displaying Data – Power View



Displaying Data – Power View



Displaying Data – Power View

Filters

VIEW

- Academic year (All)

Search...

<input type="checkbox"/>	(All)	
<input type="checkbox"/>	2003-2004	1909
<input type="checkbox"/>	2004-2005	2280
<input type="checkbox"/>	2005-2006	3031
<input type="checkbox"/>	2006-2007	3364
<input type="checkbox"/>	2007-2008	3365
<input type="checkbox"/>	2008-2009	3852
<input type="checkbox"/>	2009-2010	4169
<input type="checkbox"/>	2010-2011	4076
<input type="checkbox"/>	2011-2012	4112
<input type="checkbox"/>	2012-2013	4016
<input type="checkbox"/>	2013-2014	1114

WorkshopData

- Academic year
- Acceptance status
- ACT - Composite
- Admittance status
- Admitted this term
- Age
- Applied this term
- Career level
- Citizenship
- Class level
- College
- Degree code
- Degree level
- Department
- Division level
- Enrolled this term

Drag fields between areas below:

FIELDS

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Displaying Data – Power View

Click here to add a title

College	Count of ID
College of Information Studies	319
College of Journalism	120
College of Veterinary Medicine	1,140
No college	467
School of Architecture	663
School of Engineering	189
Total	2,412

Count of ID by Residence - county and Gender

Gender

- Female
- Male

Filters

VIEW | MAP

- Academic year

Power View Fields

ACTIVE

- program name
- Race or ethnicity
- Residence - county
- Residence - county
- Residence - state
- SAT - Critical reading
- SAT - Math
- Semester
- Term
- Total degree credit hours earned
- Transfer hours applied for credit
- Year

Drag fields between areas below:

Count of ID

LOCATIONS

- Residence - county

LONGITUDE

LATITUDE

COLOR

- Gender

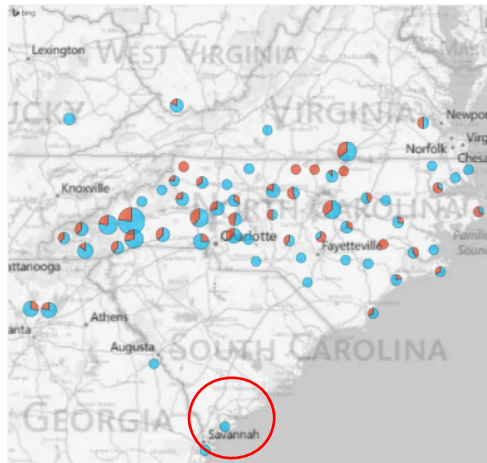
VERTICAL MASTHEADS

HORIZONTAL MASTHEADS

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Displaying Data – Power View

Count of ID by Residence - county, and Gender



Gender
 ● Female
 ● Male

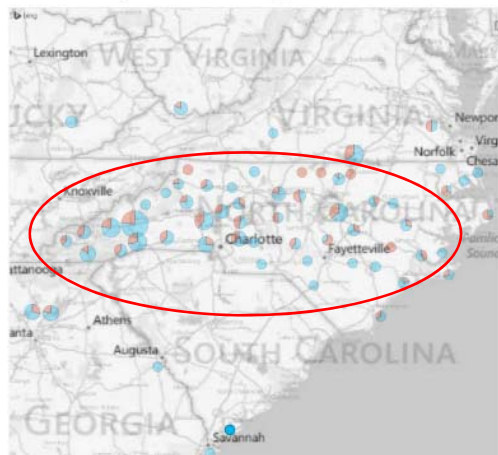
College	Count of ID
College of Information Studies	154
College of Journalism	34
College of Veterinary Medicine	611
No college	35
School of Architecture	181
School of Engineering	91
Total	1,100

➔ 99



Displaying Data – Power View

Count of ID by Residence - county, and Gender



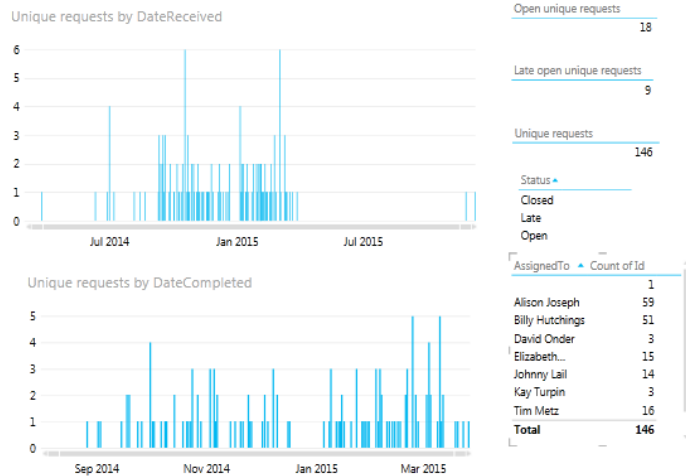
Gender
 ● Female
 ● Male

College	Count of ID
College of Veterinary Medicine	2
Total	2

➔ 100



Displaying Data – Power View (Example)



➔ 101



Displaying Data – Power Map and Power View

Power View Exercise 4.2

➔ 102

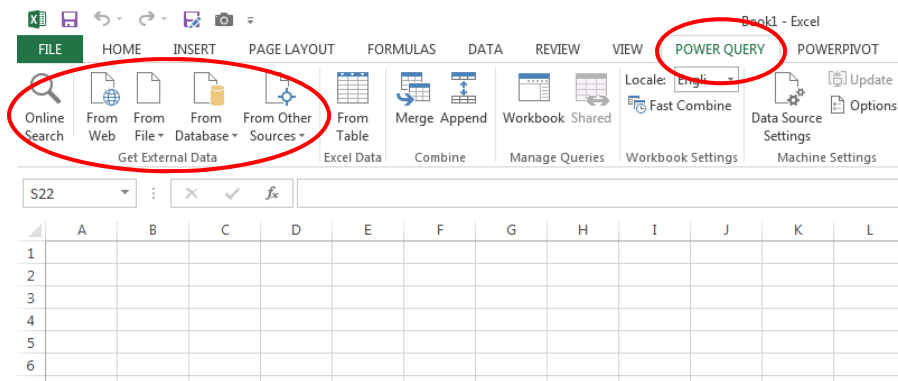


Power Query



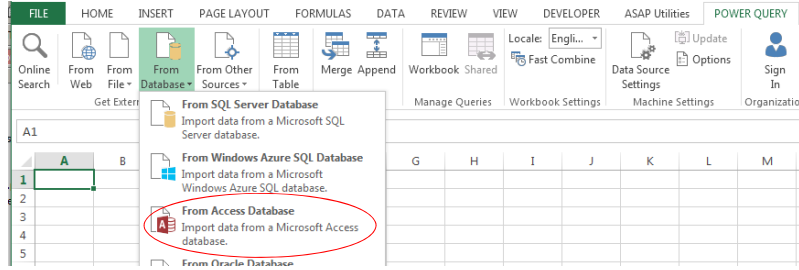
Power Query data sources

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



Power Query data sources

- Microsoft SQL Server and Access



Power Query data sources: Online Search

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
4	U.S.	U.S	Cross-industry	All Ownerships	11-1021	Gener...
5	U.S.	U.S	Cross-industry	All Ownerships	11-1031	Legisl...
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_PRSENT, 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

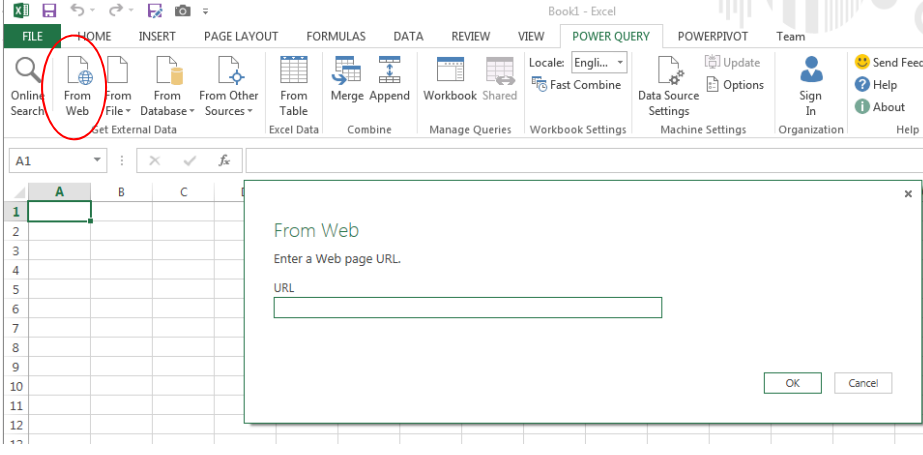
Online Search

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

Power Query data sources: Web page URLs



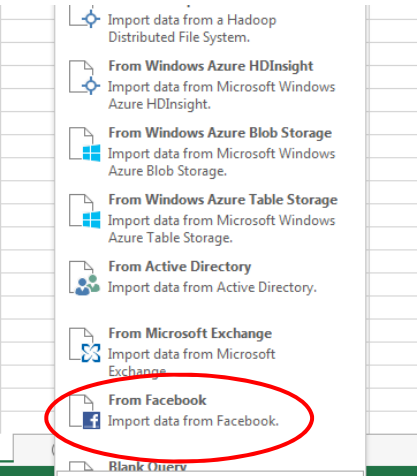
The screenshot shows the Microsoft Excel interface with the 'POWER QUERY' ribbon selected. The 'From Web' button is circled in red. A dialog box titled 'From Web' is open, prompting the user to 'Enter a Web page URL' with a text input field and 'OK' and 'Cancel' buttons.

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Power Query data sources

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

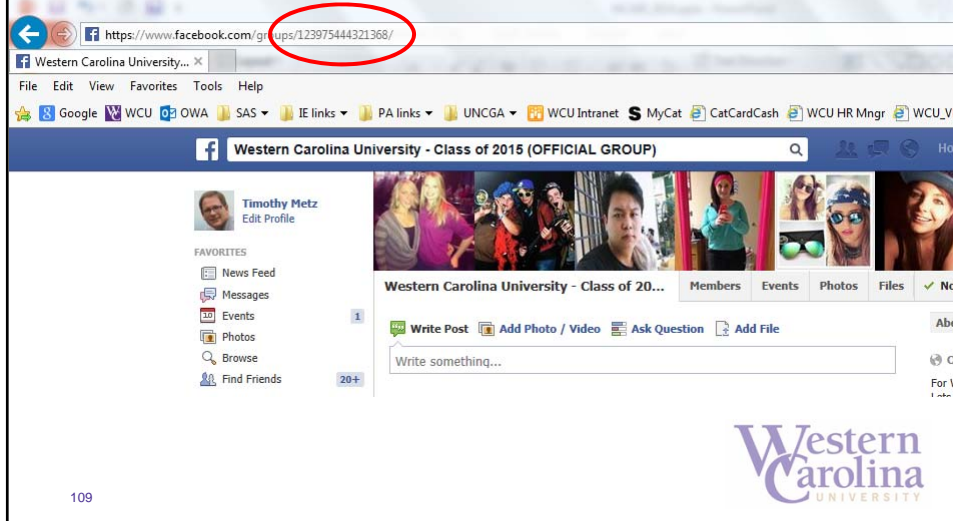


The screenshot shows the 'Get Data' task pane in Excel. It lists several data sources, including 'From Facebook', which is circled in red. Other sources include 'From Hadoop Distributed File System', 'From Windows Azure HDInsight', 'From Windows Azure Blob Storage', 'From Windows Azure Table Storage', and 'From Active Directory'.

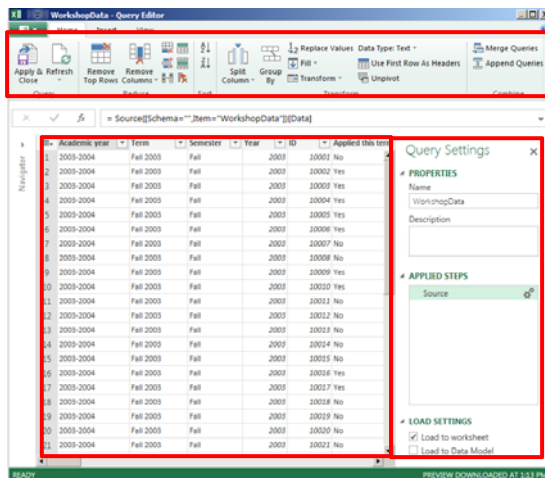


Power Query data sources

- Facebook pages and groups

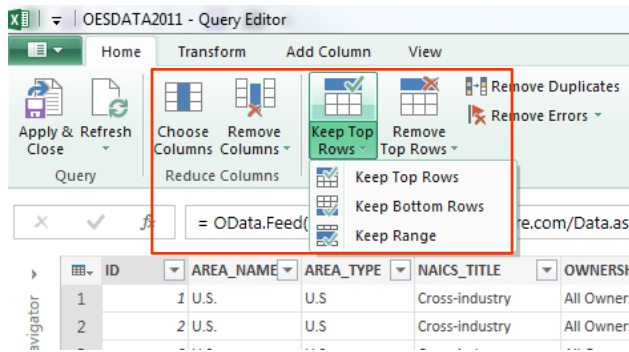


Power Query preview (Query Editor)



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

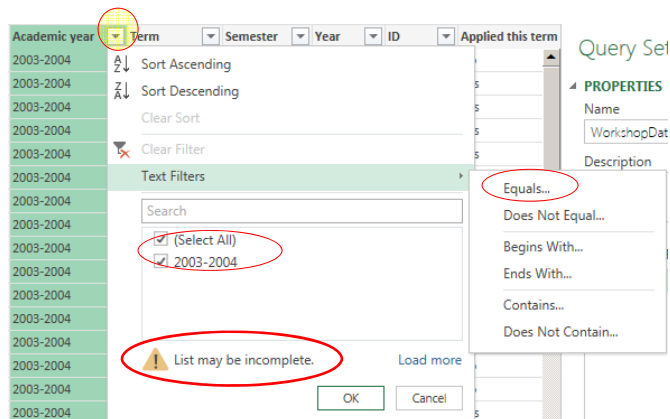


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Power Query features

- Filter on rows and columns

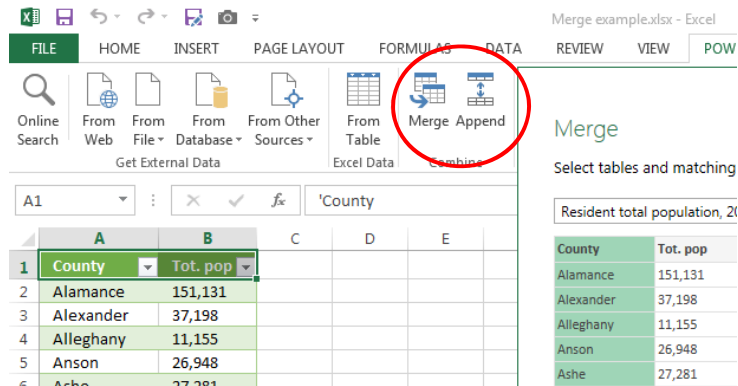


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Power Query features

- Consolidate multiple tables into one

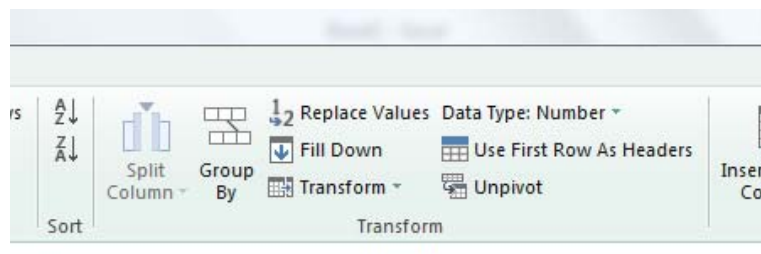


➔
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Power Query features

- Consolidate multiple tables into one
- In-line data transformations

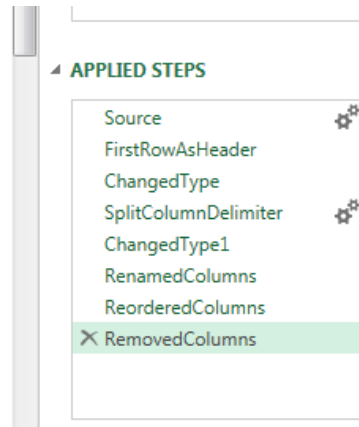


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Power Query features

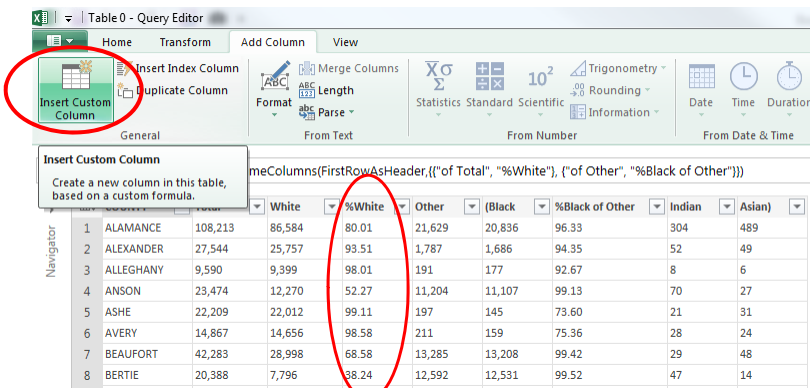
- Consolidate multiple tables into one
- In-line data transformations
- **All transformation steps are listed, and reversible**



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Power Query features

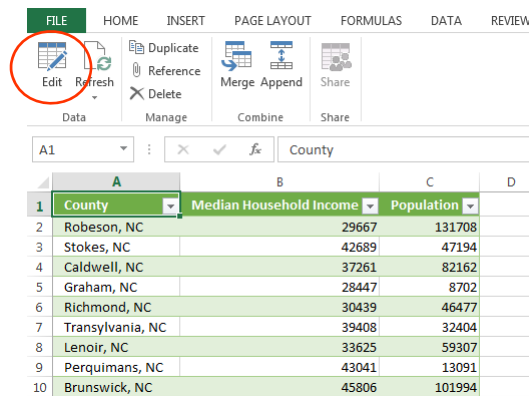
- **Insert custom formula-based columns**



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Power Query features

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



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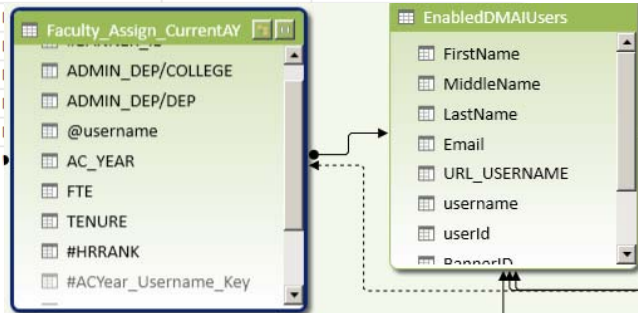
Power Query – Example

- **Connect to online faculty database**
 - Import active users from Digital Measures
 - Merge with local data
 - Export updated data to Digital Measures

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Power Query – Example

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



Power Query – Advanced

Power Query Exercise 5.1

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://cwebbwi.wordpress.com>)**
- **Kasper de Jonge (<http://www.powerpivotblog.nl>)**
- **Purna Duggirala (<http://www.chandoo.org/>)**



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With the help of David Onder, Elizabeth Snyder, Billy Hutchings, and Henson Sturgill

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