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Scenario: Overview of Scenario

- **Scenario Description:** In this scenario, data is displayed in either a Table Visual and/or a Matrix Visual. One of the columns is executing a count of data and thus displaying a numeric value. When data is counted like this, a Total Row appears. This data is then exported to Microsoft Excel. Then to compare the data and ensure that numbers are displaying correctly and totaling correctly, the data is summed in Microsoft Excel. This data does not match the data that we see in Power BI.
- **Data:** Distinct Count of Job Title per City
- **Dilemma:** The summed data in Microsoft Excel does not match that of the Total Row in Power BI. Why?

In this scenario, I am using the AdventureWorks SQL DB sample to help illustrate the issue, provide the analysis and additional information.

Here you will see the list of Cities and we are counting the Job Title in each of the Cities.

The first thing you will notice, is that the Total of the "Count of JobTitle" column is different between Power BI and Microsoft Excel.

VERY IMPORTANT TO NOTE

The "Count of JobTitle" is a Count (Distinct) of the data.

VERY IMPORTANT TO NOTE

City	Count of JobTitle
Bellevue	20
Berlin	1
Bordeaux	1
Bothell	11
Calgary	1
Cambridge	1
Carnation	5
Detroit	1
Duluth	1
Duvall	7
Edmonds	8
Everett	12
Gold Bar	5
Index	4
Issaquah	10
Kenmore	10
Kent	1
Melbourne	1
Memphis	1
Minneapolis	1
Monroe	8
Nevada	1
Newport Hills	7
Ottawa	1
Portland	1
Redmond	15
Renton	12
Sammamish	10
San Francisco	2
Seattle	14
Snohomish	5
Total	67

City	Count of JobTitle
Bellevue	20
Berlin	1
Bordeaux	1
Bothell	11
Calgary	1
Cambridge	1
Carnation	5
Detroit	1
Duluth	1
Duvall	7
Edmonds	8
Everett	12
Gold Bar	5
Index	4
Issaquah	10
Kenmore	10
Kent	1
Melbourne	1
Memphis	1
Minneapolis	1
Monroe	8
Nevada	1
Newport Hills	7
Ottawa	1
Portland	1
Redmond	15
Renton	12
Sammamish	10
San Francisco	2
Seattle	14
Snohomish	5
Total	178

Scenario: Reduction of data for problem isolation

- **Goal:** My goal here is reduce the amount of data I am working with here, so to simplify the issue and be able to provide a clear explanation as to what is occurring here. In doing so, I will be grouping and filtering the data.
- **Data:** Distinct Count of Job Title per City Filtered on Job Title = Accountant
- **Discovery:**
 - The Total Row in Power BI for a Count(Distinct) is a Distinct Count of all of the data for the Column that is being Counted, regardless of groupings.
 - The Total Row in Excel is a Sum of the Count.

scenario_AdventureWorks_LineageView - Power BI Desktop

Wabi AdminTest

File Home Insert Modeling View Help Format Data / Drill

Themes Scale to fit Mobile layout Mobile Page options

Gridlines Snap to grid Lock objects

Filters Bookmarks Selection Performance analyzer Sync slicers

City Count of JobTitle

City	Count of JobTitle
Index	1
Accountant	1
Seattle	1
Accountant	1
Total	1

I added JobTitle to Rows, so that I can group the data.

I then filtered the data JobTitle column to 'Accountant'.

NOTE: I chose Accountant, because it was a small number. (2) By keeping the number small, it provides an easier avenue to explain what is occurring.

Filters

Search

Filters on this visual

City is (All)

Count of JobTitle is (All)

JobTitle is Accountant

Filter type

Basic filtering

Search

Select all

Accountant 2

Accounts Manager 1

Accounts Payable Sp... 2

Accounts Receivable... 3

Application Specialist 4

Accountant to the Chief... 1

Require single selection

Visualizations

Rows

City

JobTitle

Columns

Add data fields here

Values

Count of JobTitle

Drill through

File Home Insert Draw Page Layout

Clipboard Font Alignment

A	B	C
1	City	JobTitle
2	Index	Accountant
3	Seattle	Accountant
4	Total	2

City Count of JobTitle

City	Count of JobTitle
Index	1
Accountant	1
Seattle	1
Accountant	1
Total	1

We can now visualize the issue a bit more closely to see what is happening.

In Power BI, we see that the Total for "Count of JobTitle" is 1.

In Microsoft Excel, we see that the Total for "Count of JobTitle" is 2.

Why?

The reason falls to what we are doing with the Values. (ie. Count(Distinct)).

The Total for a Distinct Count column, is the Distinct Count of the value in that column. For this scenario, we are doing a Count (Distinct) on JobTitle.

If we change the grouping and group by JobTitle, then we can see that the distinct value of 'Accountant' occurs only once, even though there are two cities that it resides.

JobTitle Count of JobTitle

JobTitle	Count of JobTitle
Accountant	1
Index	1
Seattle	1
Total	1

Visualizations

Filters

Rows

City

JobTitle

Columns

Add data fields here

Values

Count of JobTitle

Remove field

Remove

Move to

Conditional formatting

Remove conditional formatting

First

Last

Count (Distinct)

Count

File Home Insert Draw Page Layout

Clipboard Font Alignment

A	B	C
1	City	JobTitle
2	Index	Accountant
3	Seattle	Accountant
4	Total	2

Scenario: Filtered Data with New Measure

- **Goal:** The goal here, is to see if we can add a column to the visual (Table or Matrix) that will have the same Total as Microsoft Excel, once exported and summed. In doing so, we will need to add a New Measure to be able to sum the data and have it resemble the same number when exported to Excel. Initially, we will keep the data filtered, so that we can see this visually with a reduced amount of data.
- **Data:** Distinct Count of Job Title per City Filtered on Job Title = Accountant
- **Challenge:**
 - o How to have the Total Row be the Sum of the Data for the Count(Distinct) Column, so that when exporting to Excel the data resembles each other.

First, need to create the new Measure.

MEASURE

```
Measure Sum of Distinct Count JobTitle = Sumx( VALUES('HumanResources  
vEmployee'[City] ), CALCULATE(DISTINCTCOUNT('HumanResources  
vEmployee'[JobTitle])))
```

The screenshot displays the Microsoft Power BI interface. On the left, the DAX formula bar contains the following measure definition:

```
1 Measure Sum of Distinct Count JobTitle = Sumx( VALUES  
( 'HumanResources vEmployee'[City] ), CALCULATE(DISTINCTCOUNT  
( 'HumanResources vEmployee'[JobTitle] ) ) )
```

In the center, a cursor is visible. To the right, the 'Visualizations' pane shows a grid of chart types, with the 'Table' icon selected. Below this, the 'Rows' section shows 'JobTitle' and 'City' as the primary dimensions. The 'Columns' section is currently empty, with the placeholder text 'Add data fields here'. On the far right, the 'Fields' pane lists the columns of the 'HumanResources vEmployee' table. The 'City' and 'JobTitle' fields are checked, indicating they are part of the current visual. At the bottom of the 'Fields' list, the newly created measure 'Measure Sum of Distinct Count JobTitle' is also checked.

City	Measure Sum of Distinct Count JobTitle	Count of JobTitle
Index	1	1
Accountant	1	1
Seattle	1	1
Accountant	1	1
Total	2	1

City	JobTitle	Measure Sum of Distinct Count JobTitle	Count of JobTitle
Index	Accountant	1	1
Seattle	Accountant	1	1
	Total	2	2

Now that we have a new measure in place, we can see that the Total between Power BI and the Measure Sum of Distinct Count JobTitle.

Power BI (Measure Sum Of Distinct Count JobTitle) = 2
 Microsoft Excel (Measure Sum of Distinct Count JobTitle) = 2 as well as the Count of JobTitle

Scenario: Non-Filtered Data with New Measure

- **Goal:** Now, let's look at all of the data together so that we can see the output with the new measure in place.
- **Data:** Distinct Count of Job Title per City Not Filtered
- Snapshots with the New Measure Column being added

City	Measure Sum of Distinct Count JobTitle	Count of JobTitle
Bellevue	20	20
Berlin	1	1
Bordeaux	1	1
Bothell	11	11
Calgary	1	1
Cambridge	1	1
Carnation	5	5
Detroit	1	1
Duluth	1	1
Duvall	7	7
Edmonds	8	8
Everett	12	12
Gold Bar	5	5
Index	4	4
Issaquah	10	10
Kenmore	10	10
Kent	1	1
Melbourne	1	1
Memphis	1	1
Minneapolis	1	1
Monroe	8	8
Nevada	1	1
Newport Hills	7	7
Ottawa	1	1
Portland	1	1
Redmond	15	15
Renton	12	12
Sammamish	10	10
San Francisco	2	2
Seattle	14	14
Accountant	1	1
Production Supervisor - WC10	1	1
Total	178	67

City	Count of JobTitle	Measure Sum of Distinct Count JobTitle
Bellevue		20
Berlin		1
Bordeaux		1
Bothell		11
Calgary		1
Cambridge		1
Carnation		5
Detroit		1
Duluth		1
Duvall		7
Edmonds		8
Everett		12
Gold Bar		5
Index		4
Issaquah		10
Kenmore		10
Kent		1
Melbourne		1
Memphis		1
Minneapolis		1
Monroe		8
Nevada		1
Newport Hills		7
Ottawa		1
Portland		1
Redmond		15
Renton		12
Sammamish		10
San Francisco		2
Seattle		14
Snohomish		5
Total	178	178

Now we can see all of the data unfiltered.

Again, we can see that the column "Measure Sum of Distinct Count JobTitle" is equaling the same as what is summed in Microsoft Excel.