Microsoft Power Platform

Power BI
BETA - DAX in a Day

Lab 06

Modify DAX filter context in Power BI Desktop Models

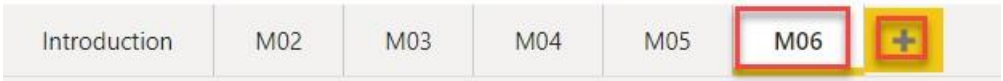
Overview

The estimated time to complete this lab is: 20 min

Exercise 1 – Apply Boolean Expression Filter.

The next exercise shows how to create a measure using the Boolean expression filter.

1. Open the **Adventure Works DW M05.pbix** Power BI Desktop file.
2. Add a new page M06.



3. Add a new **table visual, add CountryRegion from [Address] and Revenue from [MeasuresTable]**.

CountryRegion	Revenue
Canada	$1,180.46
United Kingdom	$1,167.53
United States	$10,290.56
Total	**$12,638.55**

4. Create a new Measure with the following formula.

```
Revenue United States =
    CALCULATE([Revenue],Address[CountryRegion]="United States")
```

```
1  Revenue United States =
2      CALCULATE([Revenue],'Address'[CountryRegion]="United States")
3
```

5. Bring the new measure into the table, we should have a table similar as below.

CountryRegion	Revenue	Revenue United States
Canada	$1,180.46	10,290.56
United Kingdom	$1,167.53	10,290.56
United States	$10,290.56	10,290.56
Total	**$12,638.55**	**10,290.56**

6. Notice the output of the column, for every row in this table the measure is evaluated and each time it returns United States Revenue.

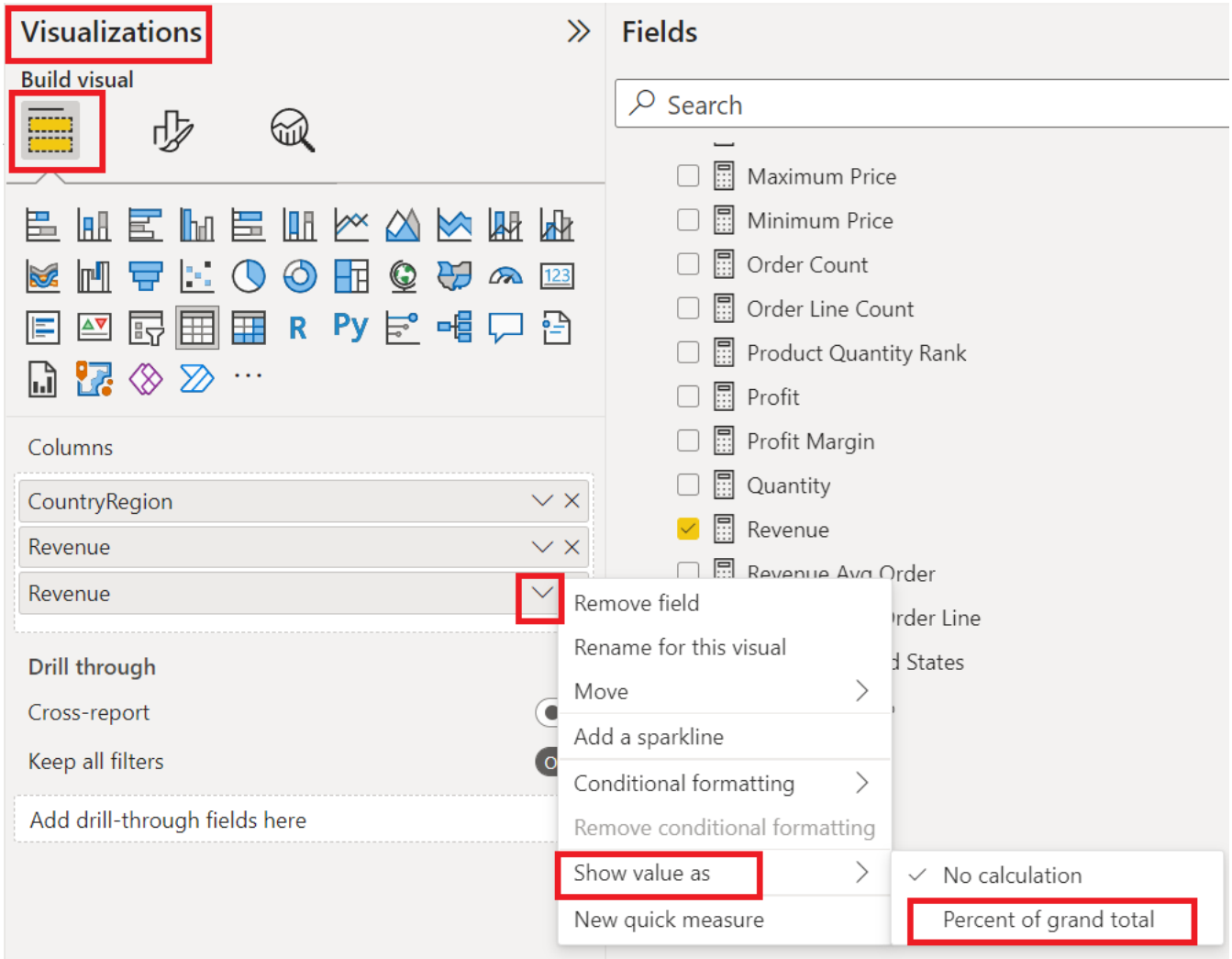
Exercise 2 – Remove Filters, use ALL

The next exercise shows how to create a measure that uses the ALL functions.

1. Continue with the file used from exercise 1.
2. Remove the "`Revenue United States`" Measure from the table.
3. Add [Revenue] measure one more time in the table, you will have to drag the Revenue measure into the table.

Country-Region	Revenue	Revenue
[Not Applicable]	$29,358,677.22	$29,358,677.22
Australia	$1,594,335.38	$1,594,335.38
Canada	$14,377,925.60	$14,377,925.60
France	$4,607,537.94	$4,607,537.94
Germany	$1,983,988.04	$1,983,988.04
United Kingdom	$4,279,008.83	$4,279,008.83
United States	$53,607,801.21	$53,607,801.21
Total	**$109,809,274.20**	**$109,809,274.20**

4. From the field list under visualization, select the drop down next to second [Revenue] measure and select "show value as" ➐ "Percent of grand total"



5. See the output changing to percent of grand total.

CountryRegion	Revenue	%GT Revenue
Canada	$1,180.46	9.34%
United Kingdom	$1,167.53	9.24%
United States	$10,290.56	81.42%
Total	**$12,638.55**	**100.00%**

6. In next couple of steps, we will dissect this measure and create our own to return similar result. If we see the logic, we need a way to produce the [Total] row for each row and then divide it with individual rows Revenue. Like the previous step, we need a measure which return the Total Revenue but ignore the Country-Region filter applied at each row.
7. Let's create a measure as follows.

```
Revenue all Country-Region =
CALCULATE([Revenue],all(Address[CountryRegion]))
```

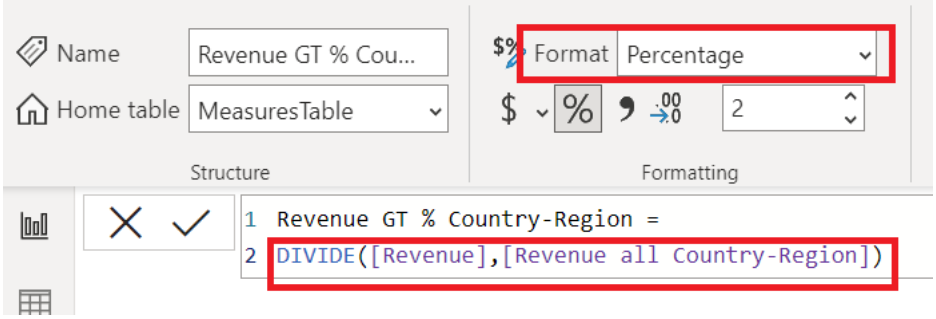
```
1  Revenue all Country-Region =
2  CALCULATE([Revenue],all('Address'[CountryRegion]))
3
```

8. Let's add the new measure in our table.

CountryRegion	Revenue	%GT Revenue	Revenue all Country-Region
	$4,399,043.27	99.71%	$4,411,681.82
Canada	$1,180.46	0.03%	$4,411,681.82
United Kingdom	$1,167.53	0.03%	$4,411,681.82
United States	$10,290.56	0.23%	$4,411,681.82
Total	**$4,411,681.82**	**100.00%**	**$4,411,681.82**

9. We can see the total revenue now showing up for each row ignoring the filter applied on the same column Country-Region. Let's create another measure as follows.

```
Revenue GT % Country-Region =
DIVIDE([Revenue],[Revenue all Country-Region])
```



10. Ensure we format the measure we created as Percentage. Let's add the new measure in the table. We can see the result showing same view as [%GT Revenue]

CountryRegion	Revenue	%GT Revenue	Revenue all Country-Region	Revenue GT % Country-Region
	$4,399,043.27	99.71%	$4,411,681.82	99.71%
Canada	$1,180.46	0.03%	$4,411,681.82	0.03%
United Kingdom	$1,167.53	0.03%	$4,411,681.82	0.03%
United States	$10,290.56	0.23%	$4,411,681.82	0.23%
Total	**$4,411,681.82**	**100.00%**	**$4,411,681.82**	**100.00%**

Exercise 3 – Remove Filters – use AllSelected

The next exercise shows how to create a measure that uses AllSelected Function.

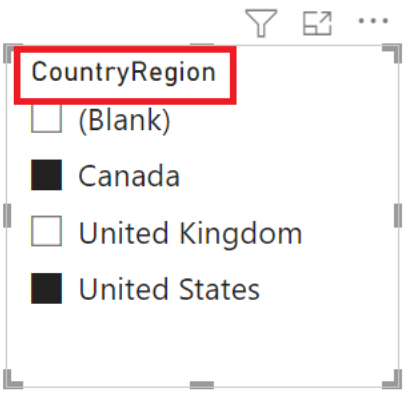
1. Continue with the file used from exercise 2.

2. Remove the [Revenue] and [Revenue all Country-Region] measure from the table.

CountryRegion	%GT Revenue	Revenue GT % Country-Region
	99.71%	99.71%
Canada	0.03%	0.03%
United Kingdom	0.03%	0.03%
United States	0.23%	0.23%
Total	**100.00%**	**100.00%**

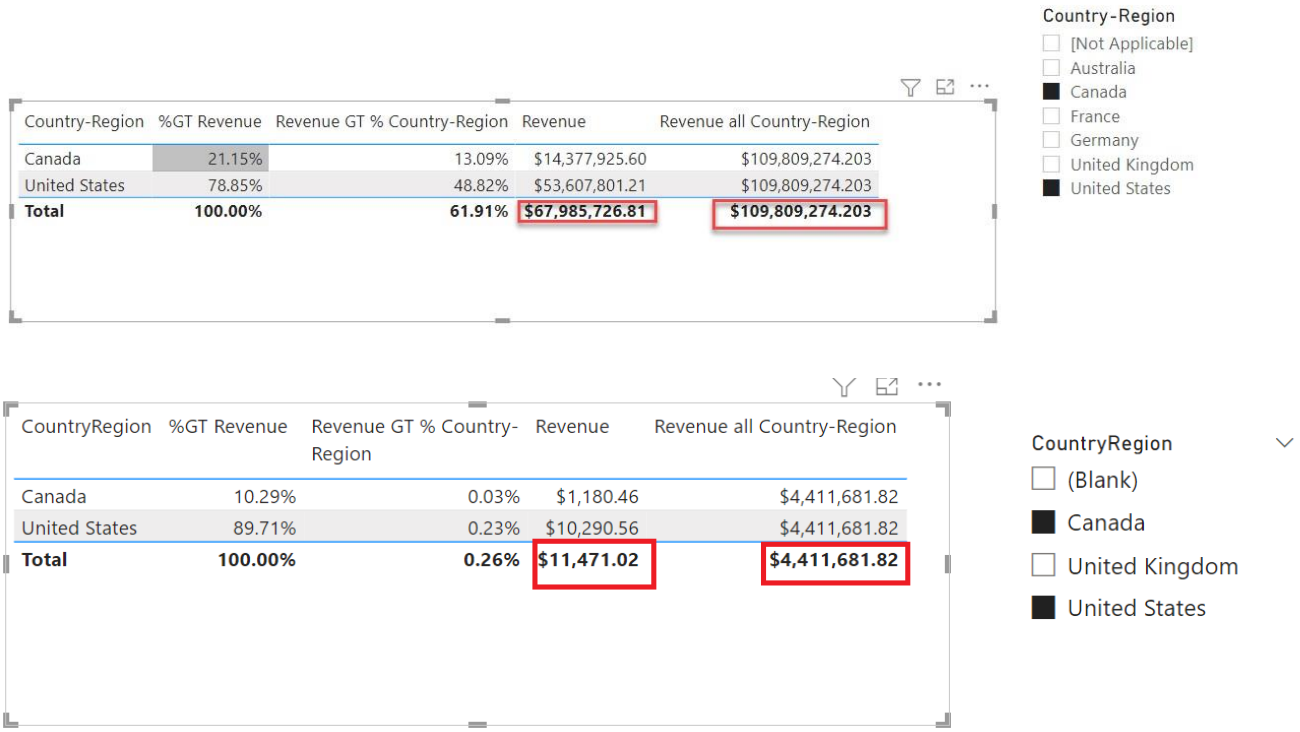
3. Let's add a slicer and use [CountryRegion] column from Address table. What if we are only interested to look at Country such as "Canada, United States", lets choose them from the slicer and observe the result.

CountryRegion	%GT Revenue	Revenue GT % Country-Region
Canada	10.29%	0.03%
United States	89.71%	0.23%
Total	**100.00%**	**0.26%**



4. Notice the two measures showing different result. Can you think why?

5. Let's add [Revenue] and [Revenue all Country-Region] back into the table. You can drag [Revenue] into the table again, by default it would show being selected under the field list.



Country-Region	%GT Revenue	Revenue GT % Country-Region	Revenue	Revenue all Country-Region
Canada	21.15%	13.09%	$14,377,925.60	$109,809,274.203
United States	78.85%	48.82%	$53,607,801.21	$109,809,274.203
Total	**100.00%**	**61.91%**	**$67,985,726.81**	**$109,809,274.203**

Country-Region
- [Not Applicable]
- Australia
- Canada
- France
- Germany
- United Kingdom
- United States

CountryRegion	%GT Revenue	Revenue GT % Country-Region	Revenue	Revenue all Country-Region
Canada	10.29%	0.03%	$1,180.46	$4,411,681.82
United States	89.71%	0.23%	$10,290.56	$4,411,681.82
Total	**100.00%**	**0.26%**	**$11,471.02**	**$4,411,681.82**

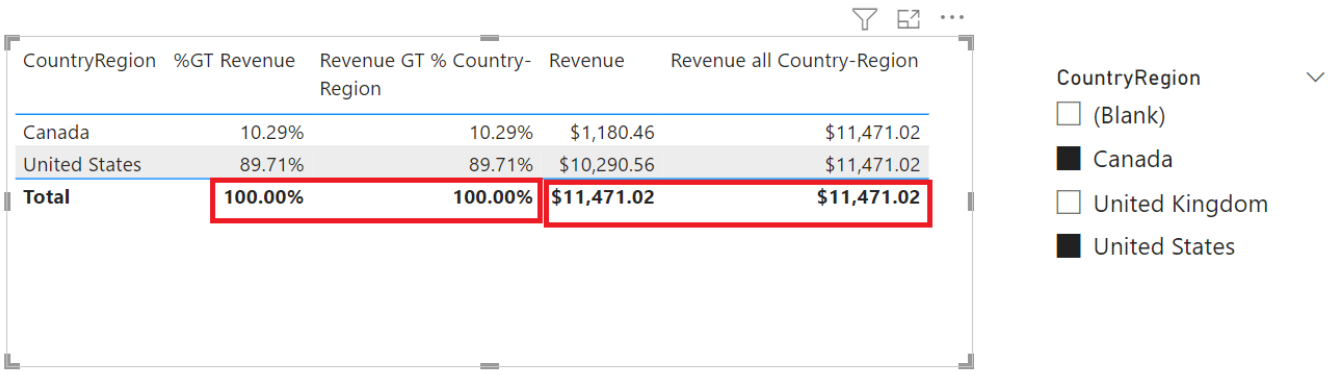
CountryRegion
- (Blank)
- Canada
- United Kingdom
- United States

6. If we pay attention to the Revenue total and [Revenue all country-region] you would notice the difference. [Revenue all country-region] is removing the filter applied on this column and producing the number for all country irrespective of what is selected in the slicer. What if we need to ignore the filter coming from outside the table and ignore only the filter available in the table.
7. Let's modify [Revenue all country-Region] as follows.

```
Revenue all Country-Region =
 CALCULATE([Revenue],ALLSELECTED(Address[Country Region]))
```

```
1  Revenue all Country-Region =
2  CALCULATE([Revenue] ALLSELECTED('Address'[CountryRegion] )
3
```

8. Notice the calculation showing the result now like [%GT Revenue]



CountryRegion	%GT Revenue	Revenue GT % Country-Region	Revenue	Revenue all Country-Region
Canada	10.29%	10.29%	$1,180.46	$11,471.02
United States	89.71%	89.71%	$10,290.56	$11,471.02
Total	**100.00%**	**100.00%**	**$11,471.02**	**$11,471.02**

Exercise 4 – Preserve Filters – use KeepFilters

1. Continue with the file used from exercise 3.
2. Remove all the measure except [Revenue].

CountryRegion	Revenue
Canada	$1,180.46
United Kingdom	$1,167.53
United States	$10,290.56
Total	**$12,638.55**

3. From our exercise 1 remember we created a measure [Revenue United States], lets add the measure into the table.

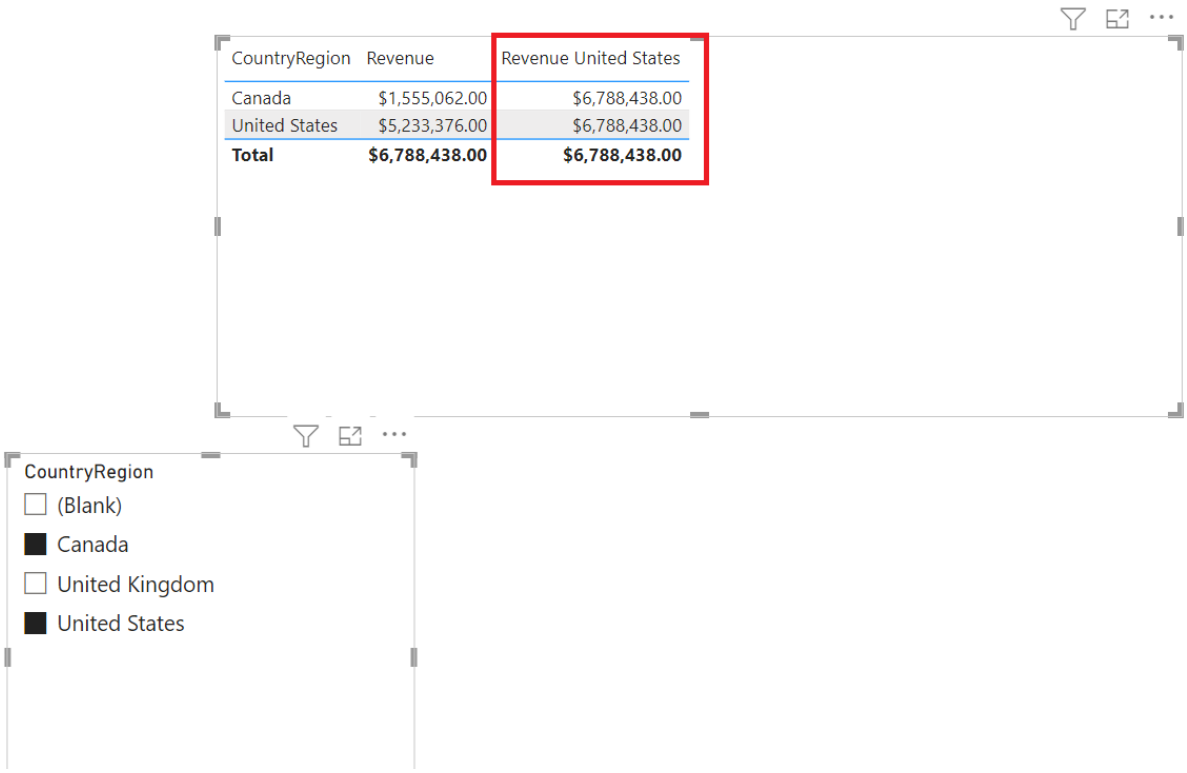
CountryRegion	Revenue	Revenue United States
Canada	$1,180.46	10,290.56
United Kingdom	$1,167.53	10,290.56
United States	$10,290.56	10,290.56
Total	**$12,638.55**	**10,290.56**

4. What if we need to look at both United States and Canada total Revenue? Let's modify the measure to include another condition for Canada. We could use logical operator || (OR), && (AND) as follows.

```
Revenue United States =
    CALCULATE([Revenue],Address[CountryRegion]="United States"
|| Address[CountryRegion]="Canada")
```

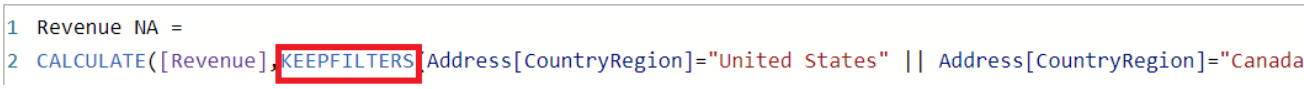
```
1 Revenue United States =
2     CALCULATE([Revenue],'Address'[CountryRegion]="United States" || 'Address'[CountryRegion]="Canada")
3
```

5. If we see the result now, we have the result from both Canada and United States ignoring the Country-Region value on the row axis.



6. Notice the same result repeating multiple times and displaying the same result as the grand total. What if we need to preserve the filter at the row axis, but as the grand total will have total including both the country? Let's create another measure as follows.

```
Revenue NA =
CALCULATE([Revenue],KEEPFILTERS(Address[CountryRegion]="United States" || Address[CountryRegion]="Canada"))
```



7. Bring the new measure into the table, notice the result and clear the selection from the slicer. Notice how calculation is preserving each row filter and at the end the total for both countries.

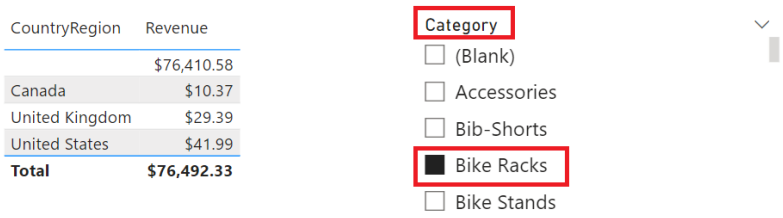
CountryRegion	Revenue	Revenue United States	Revenue NA
Canada	$1,180.46	11,471.02	$1,180.46
United Kingdom	$1,167.53	11,471.02	
United States	$10,290.56	11,471.02	$10,290.56
Total	**$12,638.55**	**11,471.02**	**$11,471.02**

Exercise 5 – HASONEVALUE

1. Continue with the file used from exercise 4.
2. Remove all the measure except [Revenue].

CountryRegion	Revenue
Canada	$1,180.46
United Kingdom	$1,167.53
United States	$10,290.56
Total	**$12,638.55**

3. Let's add a slicer from Product Category [Category] column into the report. From the slicer select any one value as an example "Bike Racks".



4. Let's create a measure as follow.

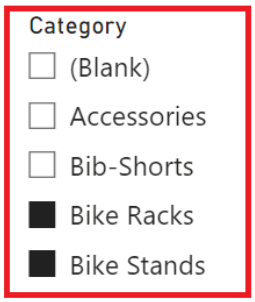
```
Category hasvalue =
if(
                HASONEVALUE('Product Category'[Category]),
                CONCATENATE("Category value is
:",VALUES('Product Category'[Category]))
                )
```

5. Let's add the newly created measure into the table.

CountryRegion	Revenue	Category hasvalue
	$76,410.58	Category value is :Bike Racks
Canada	$10.37	Category value is :Bike Racks
United Kingdom	$29.39	Category value is :Bike Racks
United States	$41.99	Category value is
Total	**$76,492.33**	**Category value is :Bike Racks**

6. What happens when we make another selection in the slicer, lets add another slicer value “Bike Stands”.

CountryRegion	Revenue	Category hasvalue
	$76,410.58	
Canada	$10.37	
United Kingdom	$29.39	
United States	$41.99	
Total	**$76,492.33**	



7. Let’s create another measure as before but to use CountryRegion.

```
Country-region hasonevalue =  if(
                HASONEVALUE(Address[CountryRegion]),
                CONCATENATE("Category value is
:",VALUES(Address[CountryRegion]))
                )
```

8. Let’s add the newly created measure into the table. Ensure that the Category slicer has only one value, as an example “Bike Racks”

CountryRegion	Revenue	Category hasvalue	Country-region hasonevalue
	$76,410.58	Category value is :Bike Racks	
Canada	$10.37	Category value is :Bike Racks	Category value is :Canada
United Kingdom	$29.39	Category value is :Bike Racks	Category value is :United Kingdom
United States	$41.99	Category value is :Bike Racks	Category value is :United States
Total	**$76,492.33**	**Category value is :Bike Racks**	

9. Why is the [Country-Region hasonevalue] don’t show any values at the Total level?

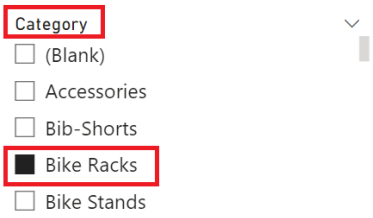
Exercise 6 – ISINSCOPE

1. Continue with the file used from exercise 5.
2. Remove all the measure except [Revenue].

CountryRegion	Revenue
	$4,399,043.27
Canada	$1,180.46
United Kingdom	$1,167.53
United States	$10,290.56
Total	**$4,411,681.82**

3. Let's add a slicer from Product [Category] column into the report (If not already exist). From the slicer select any one value as an example "Bike Racks".

CountryRegion	Revenue
	$76,410.58
Canada	$10.37
United Kingdom	$29.39
United States	$41.99
Total	**$76,492.33**



4. Let's create a measure as follows.

```
Country-Region isinscope =  if(
    ISINSCOPE('Address'[CountryRegion]),
    "Country Region is in scope"
)
```

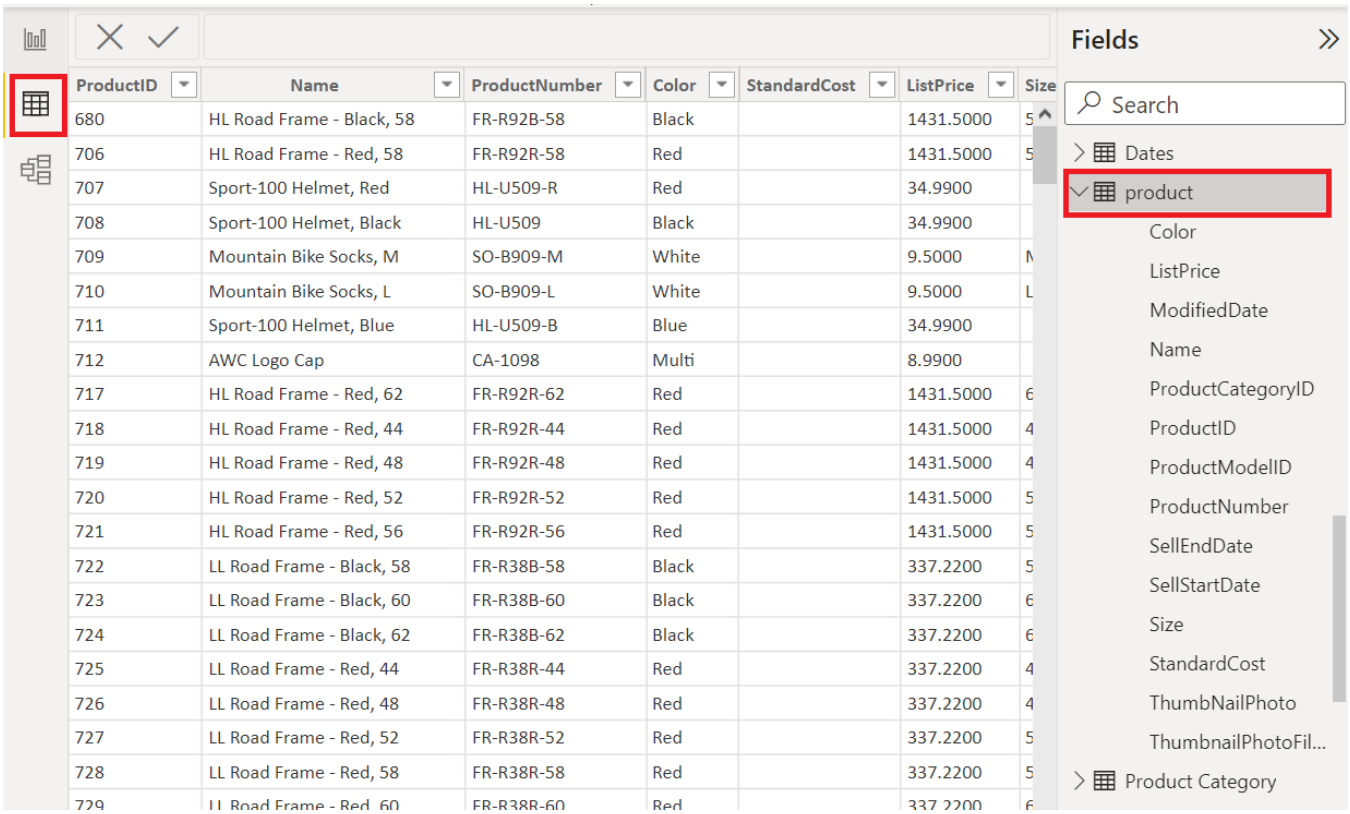
5. Let's add the new measure to the table.

CountryRegion	Revenue	Country-Region isinscope
	$4,399,043.27	Country Region is in scope
Canada	$1,180.46	Country Region is in scope
United Kingdom	$1,167.53	Country Region is in scope
United States	$10,290.56	Country Region is in scope
Total	**$4,411,681.82**	

6. At the total level CountryRegion is not in scope and hence we notice a blank.

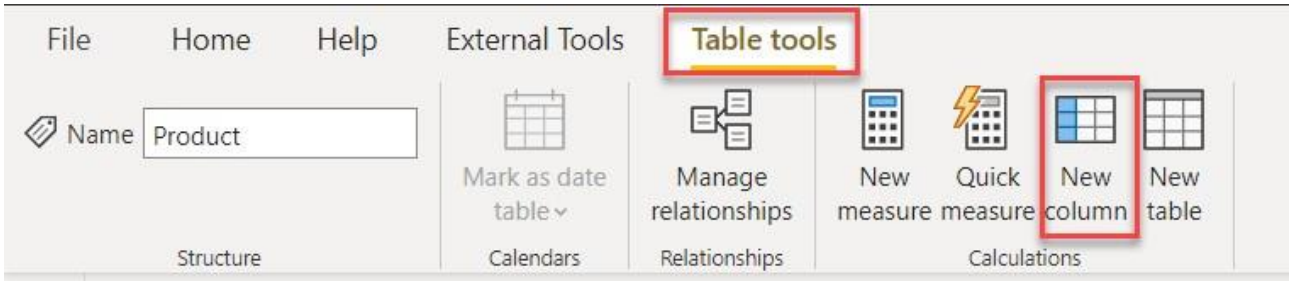
Exercise 7 – Context transition

1. Continue with the file used from exercise 6.
2. Switch to data view, also select Product table from the Fields list.



ProductID	Name	ProductNumber	Color	StandardCost	ListPrice	Size
680	HL Road Frame - Black, 58	FR-R92B-58	Black		1431.5000	5
706	HL Road Frame - Red, 58	FR-R92R-58	Red		1431.5000	5
707	Sport-100 Helmet, Red	HL-U509-R	Red		34.9900	
708	Sport-100 Helmet, Black	HL-U509	Black		34.9900	
709	Mountain Bike Socks, M	SO-B909-M	White		9.5000	M
710	Mountain Bike Socks, L	SO-B909-L	White		9.5000	L
711	Sport-100 Helmet, Blue	HL-U509-B	Blue		34.9900	
712	AWC Logo Cap	CA-1098	Multi		8.9900	
717	HL Road Frame - Red, 62	FR-R92R-62	Red		1431.5000	6
718	HL Road Frame - Red, 44	FR-R92R-44	Red		1431.5000	4
719	HL Road Frame - Red, 48	FR-R92R-48	Red		1431.5000	4
720	HL Road Frame - Red, 52	FR-R92R-52	Red		1431.5000	5
721	HL Road Frame - Red, 56	FR-R92R-56	Red		1431.5000	5
722	LL Road Frame - Black, 58	FR-R38B-58	Black		337.2200	5
723	LL Road Frame - Black, 60	FR-R38B-60	Black		337.2200	6
724	LL Road Frame - Black, 62	FR-R38B-62	Black		337.2200	6
725	LL Road Frame - Red, 44	FR-R38R-44	Red		337.2200	4
726	LL Road Frame - Red, 48	FR-R38R-48	Red		337.2200	4
727	LL Road Frame - Red, 52	FR-R38R-52	Red		337.2200	5
728	LL Road Frame - Red, 58	FR-R38R-58	Red		337.2200	5
729	LL Road Frame - Red, 60	FR-R38R-60	Red		337.2200	6

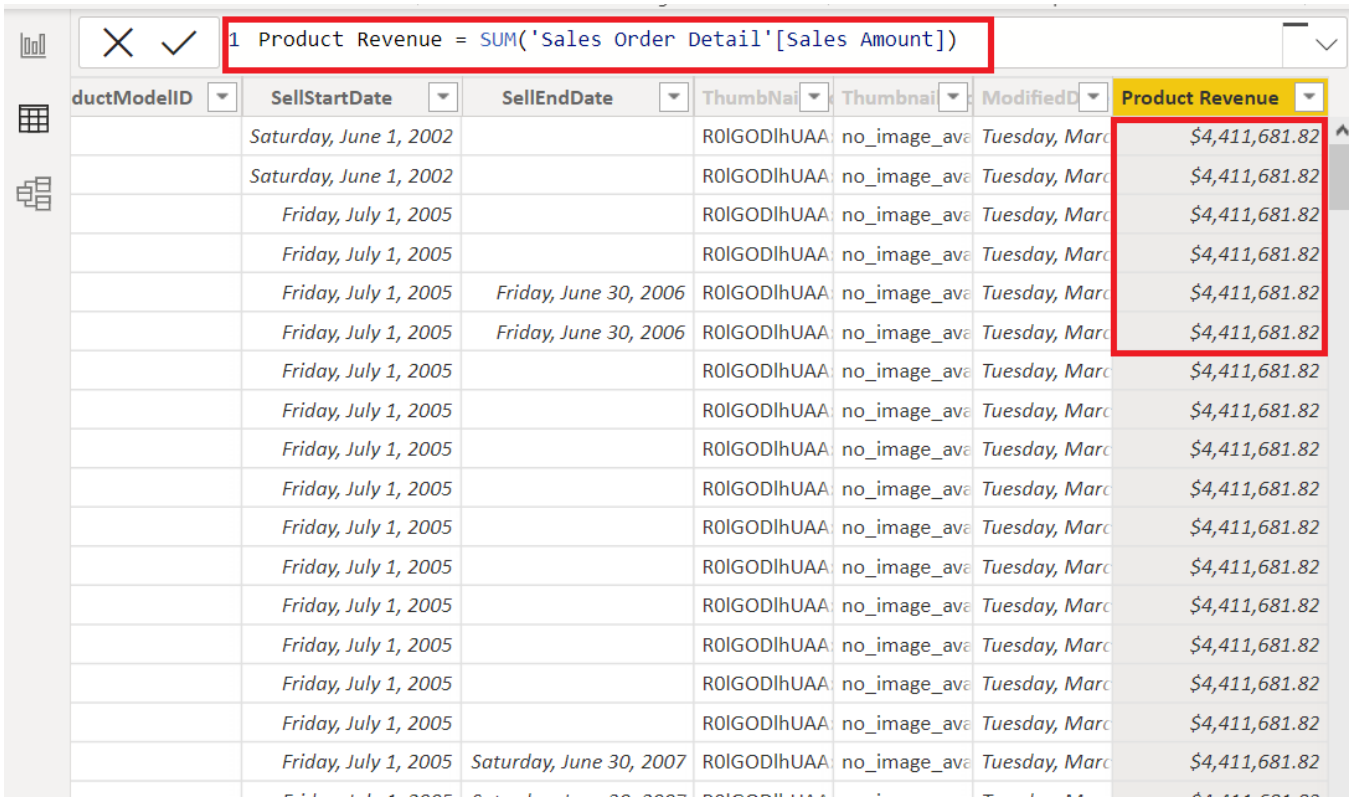
3. From the available list of Table Tools, select New Column.



4. In the formula bar, lets add the following DAX expression.

```
Product Revenue = sum('Sales Order Detail'[Sales Amount])
```

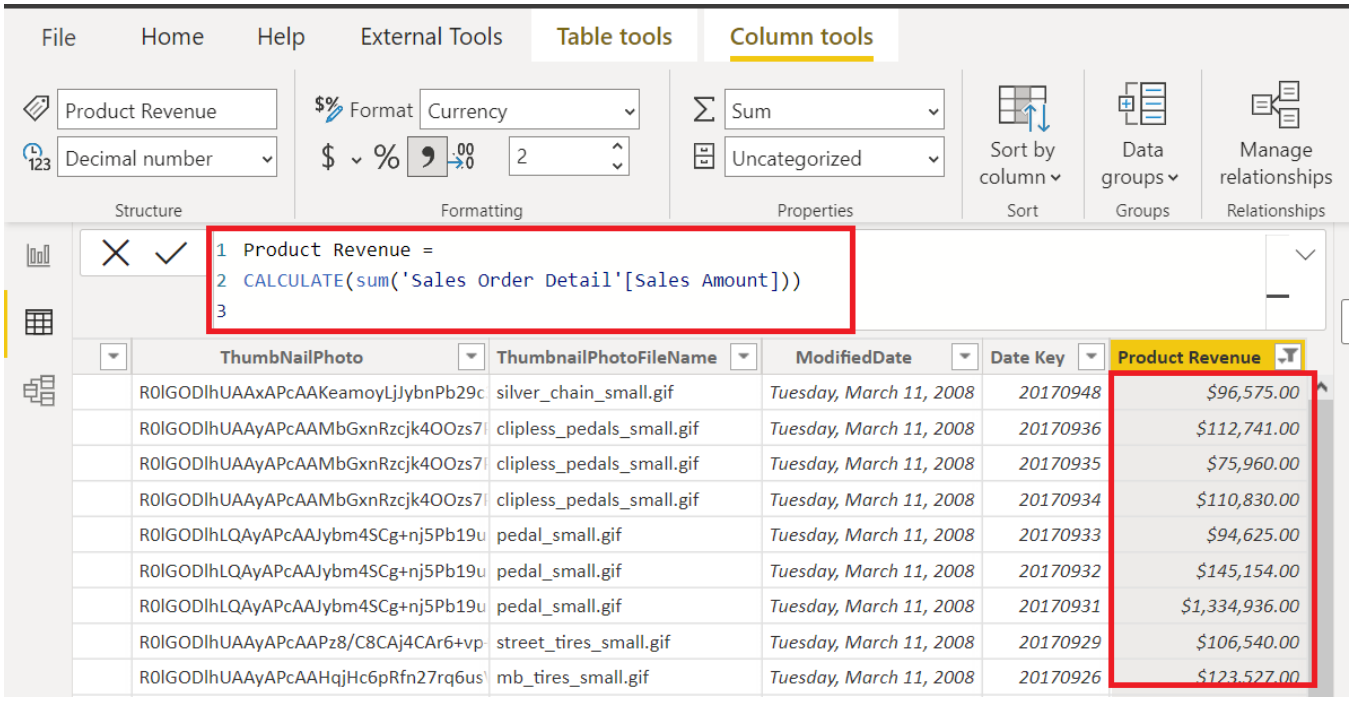
5. Notice a new column is added, but the result is sum of all the sales amount column.



6. In the above case, since we are creating a new column there is a row context but there isn't a filter context. What if we want to convert this row context into a filter context, such that the revenue being displayed would be for each product.
7. Let's change the expression to use our measure [Revenue] or wrap around the sum in a calculate.

```
Product Revenue =
CALCULATE(sum('Sales Order Detail'[Sales Amount]))
```

8. Notice now that the result is what we expect.



ThumbNailPhoto	ThumbnailPhotoFileName	ModifiedDate	Date Key	Product Revenue
R0lGODlhUAAxAPcAAKeamoyLjJybnPb29c	silver_chain_small.gif	Tuesday, March 11, 2008	20170948	$96,575.00
R0lGODlhUAAyAPcAAMbGxnRzcjk4OOzs7I	clipless_pedals_small.gif	Tuesday, March 11, 2008	20170936	$112,741.00
R0lGODlhUAAyAPcAAMbGxnRzcjk4OOzs7I	clipless_pedals_small.gif	Tuesday, March 11, 2008	20170935	$75,960.00
R0lGODlhUAAyAPcAAMbGxnRzcjk4OOzs7I	clipless_pedals_small.gif	Tuesday, March 11, 2008	20170934	$110,830.00
R0lGODlhLQAyAPcAAJybm4SCg+nj5Pb19u	pedal_small.gif	Tuesday, March 11, 2008	20170933	$94,625.00
R0lGODlhLQAyAPcAAJybm4SCg+nj5Pb19u	pedal_small.gif	Tuesday, March 11, 2008	20170932	$145,154.00
R0lGODlhLQAyAPcAAJybm4SCg+nj5Pb19u	pedal_small.gif	Tuesday, March 11, 2008	20170931	$1,334,936.00
R0lGODlhUAAyAPcAAPz8/C8CAj4CAr6+vp	street_tires_small.gif	Tuesday, March 11, 2008	20170929	$106,540.00
R0lGODlhUAAyAPcAAHqjHc6pRfn27rq6us	mb_tires_small.gif	Tuesday, March 11, 2008	20170926	$123,527.00

9. Save the Power BI File as Adventure Works M06.pbix

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