Microsoft Power Platform

Power BI
BETA - DAX in a Day

Lab 06

Modify DAX filter context in Power BI Desktop Models

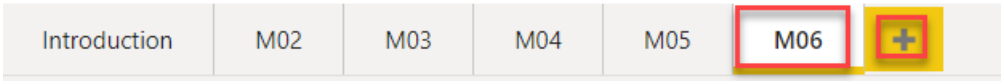
Overview

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 2020 M05.pbix** Power BI Desktop file.
2. Add a new page M06.

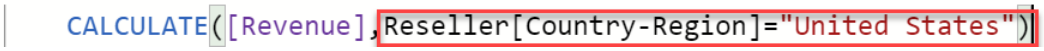


3. Add a new **table visual, add Country-Region from [Reseller] and Revenue from [Sales]**.

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

4. Create a new Measure with the following formula.

```
Revenue United States =
    CALCULATE([Revenue],Reseller[Country-Region]="United States")
```



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

Country-Region	Revenue	Revenue United States
[Not Applicable]	$29,358,677.22	$53,607,801.2102
Australia	$1,594,335.38	$53,607,801.2102
Canada	$14,377,925.60	$53,607,801.2102
France	$4,607,537.94	$53,607,801.2102
Germany	$1,983,988.04	$53,607,801.2102
United Kingdom	$4,279,008.83	$53,607,801.2102
United States	$53,607,801.21	$53,607,801.2102
Total	**$109,809,274.20**	**$53,607,801.2102**

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.

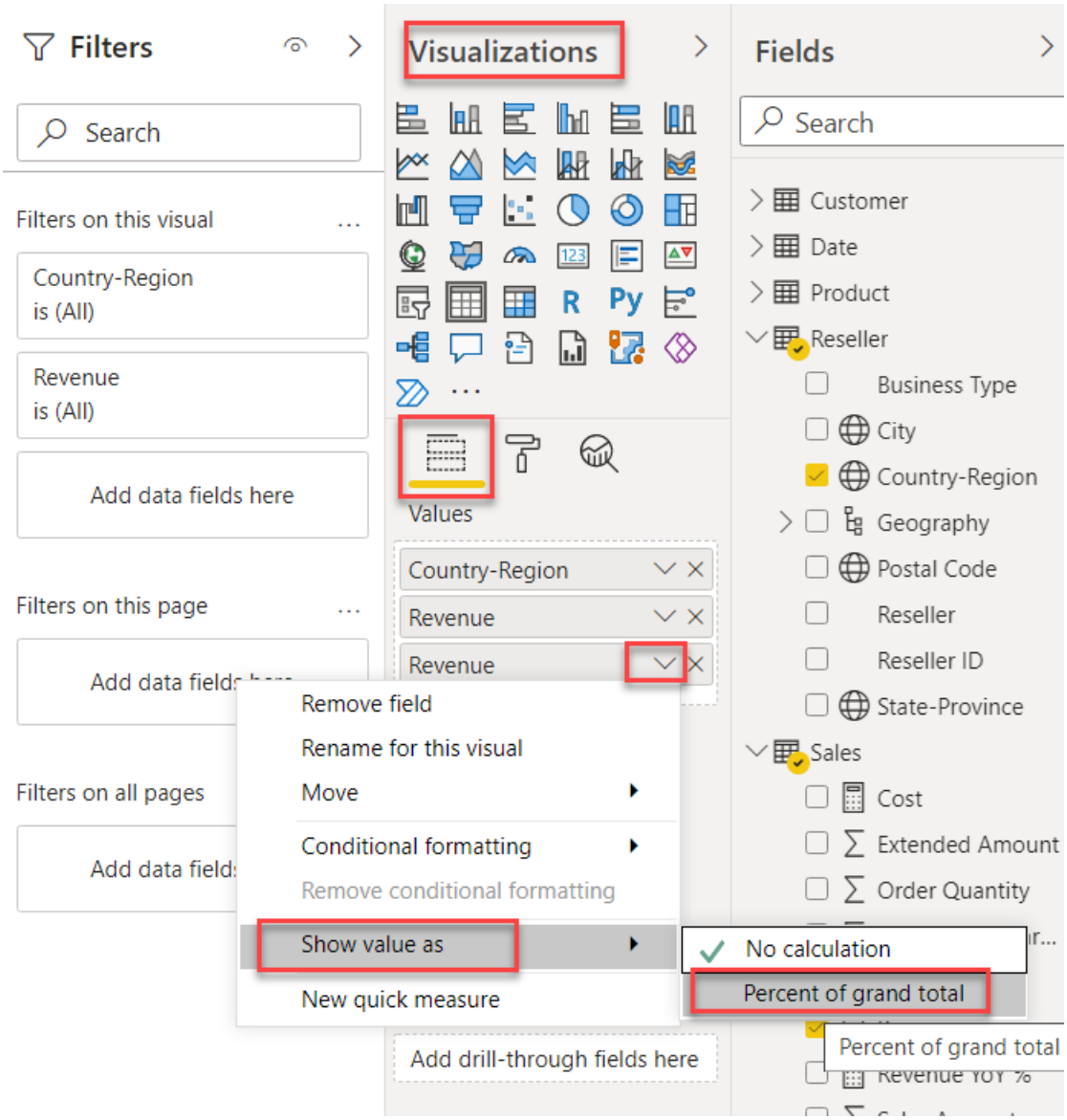
Exercise 2 – Remove Filters, use ALL

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" → "Percent of grand total"



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

Country-Region	Revenue	%GT Revenue
[Not Applicable]	$29,358,677.22	26.74%
Australia	$1,594,335.38	1.45%
Canada	$14,377,925.60	13.09%
France	$4,607,537.94	4.20%
Germany	$1,983,988.04	1.81%
United Kingdom	$4,279,008.83	3.90%
United States	$53,607,801.21	48.82%
Total	**$109,809,274.20**	**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 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(Reseller[Country-Region]))
```

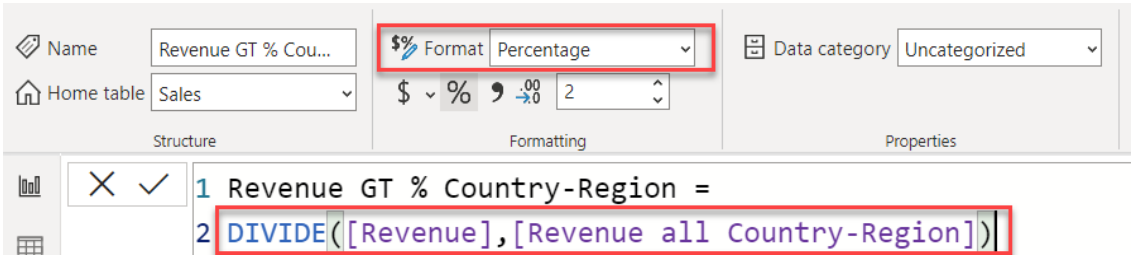
```
1 Revenue all Country-Region =
2 CALCULATE([Revenue],all(Reseller[Country-Region]))
```

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

Country-Region	Revenue	%GT Revenue	Revenue all Country-Region
[Not Applicable]	$29,358,677.22	26.74%	$109,809,274.203
Australia	$1,594,335.38	1.45%	$109,809,274.203
Canada	$14,377,925.60	13.09%	$109,809,274.203
France	$4,607,537.94	4.20%	$109,809,274.203
Germany	$1,983,988.04	1.81%	$109,809,274.203
United Kingdom	$4,279,008.83	3.90%	$109,809,274.203
United States	$53,607,801.21	48.82%	$109,809,274.203
Total	**$109,809,274.20**	**100.00%**	**$109,809,274.203**

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]

Country-Region	Revenue	%GT Revenue	Revenue all Country-Region	Revenue GT % Country-Region
[Not Applicable]	$29,358,677.22	26.74%	$109,809,274.203	26.74%
Australia	$1,594,335.38	1.45%	$109,809,274.203	1.45%
Canada	$14,377,925.60	13.09%	$109,809,274.203	13.09%
France	$4,607,537.94	4.20%	$109,809,274.203	4.20%
Germany	$1,983,988.04	1.81%	$109,809,274.203	1.81%
United Kingdom	$4,279,008.83	3.90%	$109,809,274.203	3.90%
United States	$53,607,801.21	48.82%	$109,809,274.203	48.82%
Total	**$109,809,274.20**	**100.00%**	**$109,809,274.203**	**100.00%**

Exercise 3 – Remove Filters – use AllSelected

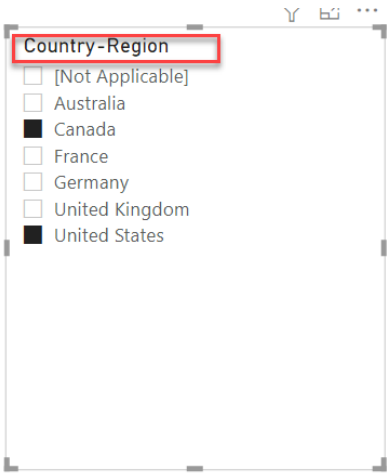
The next exercise shows how to create a measure that uses AllSelected Function.

1. Continue with the file used from exercise 2.

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

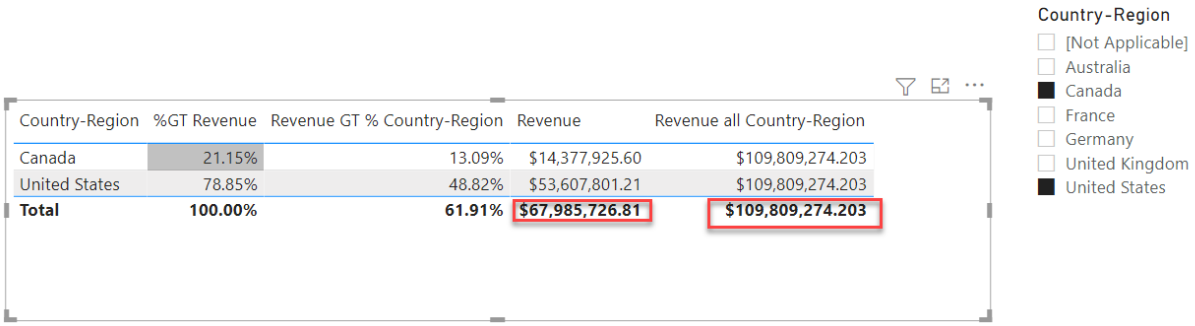
Country-Region	%GT Revenue	Revenue GT % Country-Region
[Not Applicable]	26.74%	26.74%
Australia	1.45%	1.45%
Canada	13.09%	13.09%
France	4.20%	4.20%
Germany	1.81%	1.81%
United Kingdom	3.90%	3.90%
United States	48.82%	48.82%
Total	**100.00%**	**100.00%**

3. Let's add a slicer and use [Country-Region] column from Reseller 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.



Country-Region	%GT Revenue	Revenue GT % Country-Region
Canada	21.15%	13.09%
United States	78.85%	48.82%
Total	**100.00%**	**61.91%**

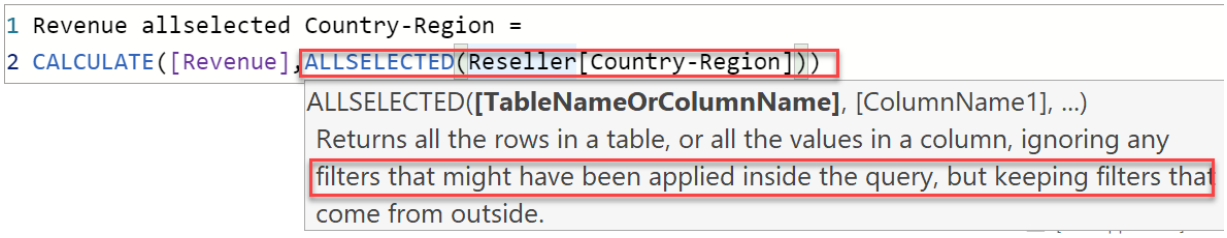
4. Notice the two measures showing different result. Can you think why?
5. Let's add [Revenue] and [Revenue all Country-Region] back into the table. You can drag [Revenue] into the table again, by default it would show being selected under the field list.



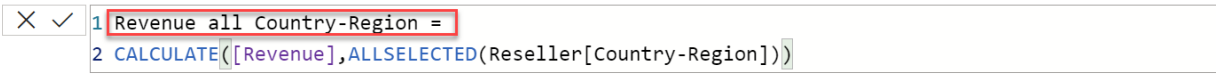
Country-Region	%GT Revenue	Revenue GT % Country-Region	Revenue	Revenue all Country-Region
Canada	21.15%	13.09%	$14,377,925.60	$109,809,274.203
United States	78.85%	48.82%	$53,607,801.21	$109,809,274.203
Total	**100.00%**	**61.91%**	**$67,985,726.81**	**$109,809,274.203**

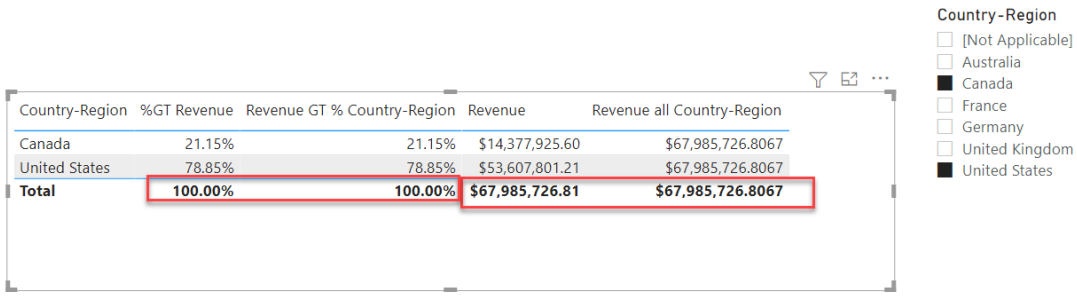
6. If we pay attention to the Revenue total and [Revenue all country-region] you would notice the difference. [Revenue all country-region] is removing the filter applied on this column and producing the number for all country irrespective of what is selected in the slicer. What if we need to ignore the 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(Reseller[Country-Region]))
```



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





Country-Region	%GT Revenue	Revenue GT % Country-Region	Revenue	Revenue all Country-Region
Canada	21.15%	21.15%	$14,377,925.60	$67,985,726.8067
United States	78.85%	78.85%	$53,607,801.21	$67,985,726.8067
Total	**100.00%**	**100.00%**	**$67,985,726.81**	**$67,985,726.8067**

Exercise 4 – Preserve Filters – use KeepFilters

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

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

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

Country-Region	Revenue	Revenue United States
[Not Applicable]	$29,358,677.22	$53,607,801.2102
Australia	$1,594,335.38	$53,607,801.2102
Canada	$14,377,925.60	$53,607,801.2102
France	$4,607,537.94	$53,607,801.2102
Germany	$1,983,988.04	$53,607,801.2102
United Kingdom	$4,279,008.83	$53,607,801.2102
United States	$53,607,801.21	$53,607,801.2102
Total	**$109,809,274.20**	**$53,607,801.2102**

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],Reseller[Country-
Region]="United States" || Reseller[Country-
Region]="Canada")
```

```
1 Revenue United States =
2     CALCULATE([Revenue],Reseller[Country-Region]="United States" || Reseller[Country-Region]="Canada")
```

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.

Country-Region	Revenue	Revenue United States
[Not Applicable]	$29,358,677.22	$67,985,726.8067
Australia	$1,594,335.38	$67,985,726.8067
Canada	$14,377,925.60	$67,985,726.8067
France	$4,607,537.94	$67,985,726.8067
Germany	$1,983,988.04	$67,985,726.8067
United Kingdom	$4,279,008.83	$67,985,726.8067
United States	$53,607,801.21	$67,985,726.8067
Total	**$109,809,274.20**	**$67,985,726.8067**

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(Reseller[Country-Region]="United States" || Reseller[Country-Region]="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.

Country-Region	Revenue	Revenue United States	Revenue NA
[Not Applicable]	$29,358,677.22	$67,985,726.8067	
Australia	$1,594,335.38	$67,985,726.8067	
Canada	$14,377,925.60	$67,985,726.8067	$14,377,925.5965
France	$4,607,537.94	$67,985,726.8067	
Germany	$1,983,988.04	$67,985,726.8067	
United Kingdom	$4,279,008.83	$67,985,726.8067	
United States	$53,607,801.21	$67,985,726.8067	$53,607,801.2102
Total	**$109,809,274.20**	**$67,985,726.8067**	**$67,985,726.8067**

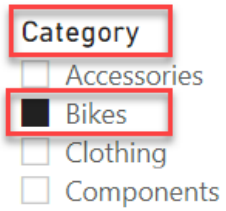
Exercise 5 – HASONEVALUE

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

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

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

Country-Region	Revenue
[Not Applicable]	$28,318,144.65
Australia	$1,323,820.73
Canada	$11,636,380.59
France	$3,560,665.65
Germany	$1,543,015.65
United Kingdom	$3,405,747.21
United States	$44,832,751.73
Total	**$94,620,526.21**



4. Let's create a measure as follow.

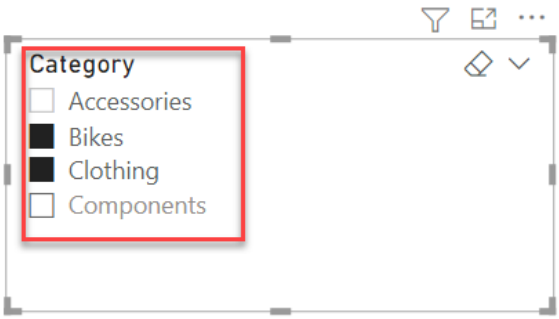
```
Category hasvalue =
            if(
                HASONEVALUE('Product'[Category]),
                CONCATENATE("Category value is
:",VALUES('Product'[Category]))
                )
```

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

Country-Region	Revenue	Category hasvalue
[Not Applicable]	$28,318,144.65	Category value is :Bikes
Australia	$1,323,820.73	Category value is :Bikes
Canada	$11,636,380.59	Category value is :Bikes
France	$3,560,665.65	Category value is :Bikes
Germany	$1,543,015.65	Category value is :Bikes
United Kingdom	$3,405,747.21	Category value is :Bikes
United States	$44,832,751.73	Category value is :Bikes
Total	**$94,620,526.21**	**Category value is :Bikes**

6. What happens when we make another selection in the slicer, lets add another slicer value "Clothing".

Country-Region	Revenue	Category hasvalue
[Not Applicable]	$28,657,917.26	
Australia	$1,366,736.54	
Canada	$12,015,328.23	
France	$3,688,757.87	
Germany	$1,614,635.08	
United Kingdom	$3,524,576.00	
United States	$45,870,188.68	
Total	**$96,738,139.66**	



7. Let's create another measure as before but to use Country-Region.

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

8. Let's add the newly created measure into the table. Ensure that the Category slicer has only one value, as an example "Bikes"

Country-Region	Revenue	Category hasvalue	Country-region hasonevalue
[Not Applicable]	$28,318,144.65	Category value is :Bikes	Category value is :[Not Applicable]
Australia	$1,323,820.73	Category value is :Bikes	Category value is :Australia
Canada	$11,636,380.59	Category value is :Bikes	Category value is :Canada
France	$3,560,665.65	Category value is :Bikes	Category value is :France
Germany	$1,543,015.65	Category value is :Bikes	Category value is :Germany
United Kingdom	$3,405,747.21	Category value is :Bikes	Category value is :United Kingdom
United States	$44,832,751.73	Category value is :Bikes	Category value is :United States
Total	**$94,620,526.21**	**Category value is :Bikes**	

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

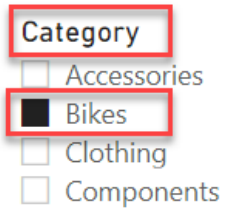
Exercise 6 – ISINSCOPE

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

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

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 "Bikes".

Country-Region	Revenue
[Not Applicable]	$28,318,144.65
Australia	$1,323,820.73
Canada	$11,636,380.59
France	$3,560,665.65
Germany	$1,543,015.65
United Kingdom	$3,405,747.21
United States	$44,832,751.73
Total	**$94,620,526.21**



4. Let's create a measure as follows.

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

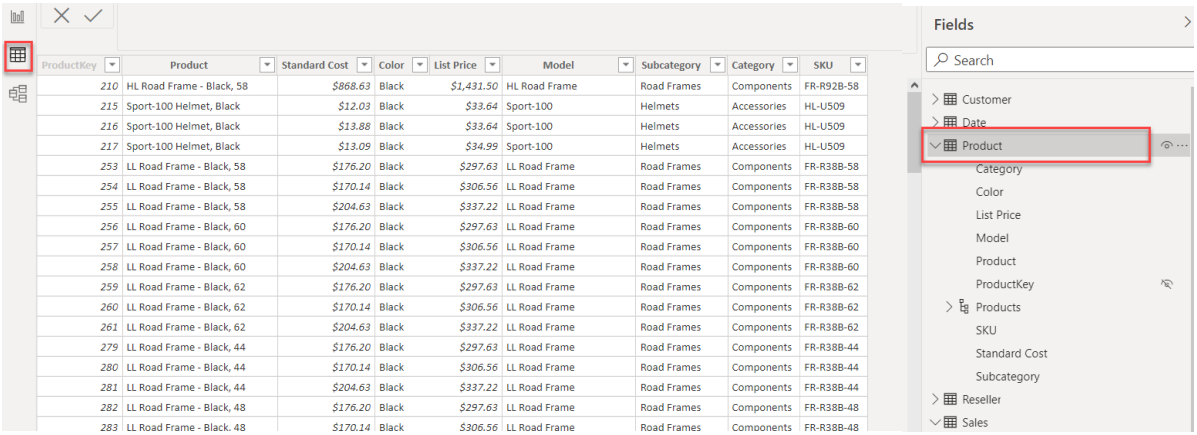
5. Let's add the new measure to the table.

Country-Region	Revenue	Country-Region isinscope
[Not Applicable]	$28,318,144.65	Country Region is in scope
Australia	$1,323,820.73	Country Region is in scope
Canada	$11,636,380.59	Country Region is in scope
France	$3,560,665.65	Country Region is in scope
Germany	$1,543,015.65	Country Region is in scope
United Kingdom	$3,405,747.21	Country Region is in scope
United States	$44,832,751.73	Country Region is in scope
Total	**$94,620,526.21**	

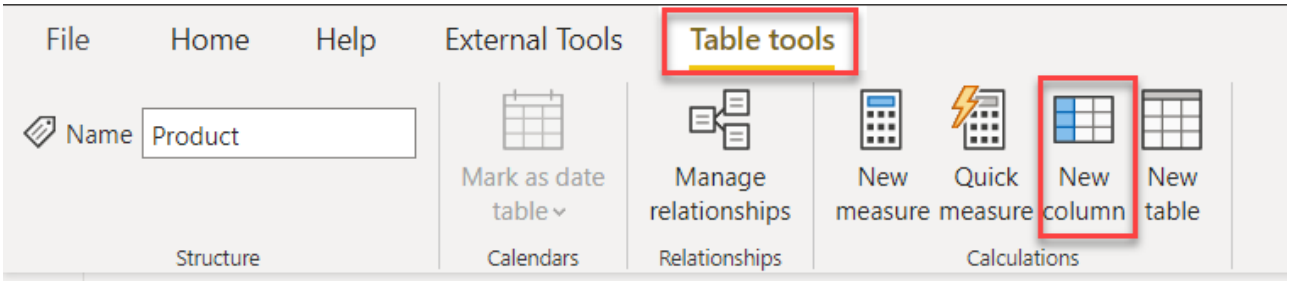
6. At the total level Country-Region is not in scope and hence we notice a blank.

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.



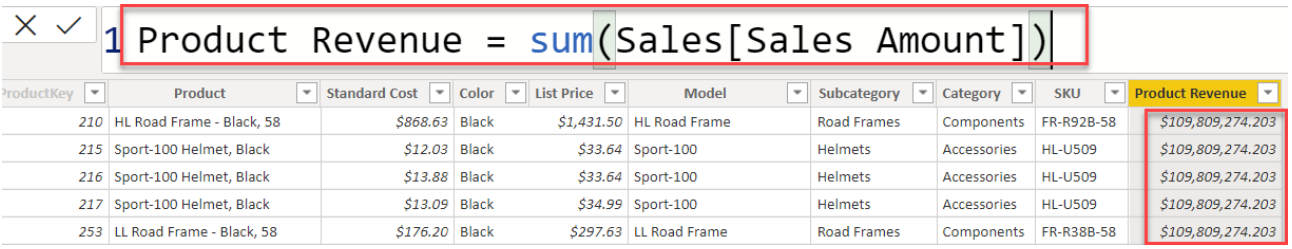
3. From the available list of Table Tools, select New Column.



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

```
Product Revenue = sum(Sales[Sales Amount])
```

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

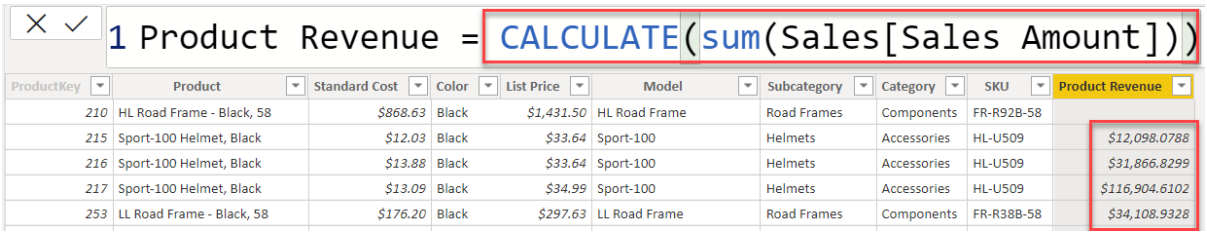


ProductKey	Product	Standard Cost	Color	List Price	Model	Subcategory	Category	SKU	Product Revenue
210	HL Road Frame - Black, 58	$868.63	Black	$1,431.50	HL Road Frame	Road Frames	Components	FR-R92B-58	$109,809,274.203
215	Sport-100 Helmet, Black	$12.03	Black	$33.64	Sport-100	Helmets	Accessories	HL-U509	$109,809,274.203
216	Sport-100 Helmet, Black	$13.88	Black	$33.64	Sport-100	Helmets	Accessories	HL-U509	$109,809,274.203
217	Sport-100 Helmet, Black	$13.09	Black	$34.99	Sport-100	Helmets	Accessories	HL-U509	$109,809,274.203
253	LL Road Frame - Black, 58	$176.20	Black	$297.63	LL Road Frame	Road Frames	Components	FR-R38B-58	$109,809,274.203

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[Sales
Amount]))
```

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



ProductKey	Product	Standard Cost	Color	List Price	Model	Subcategory	Category	SKU	Product Revenue
210	HL Road Frame - Black, 58	$868.63	Black	$1,431.50	HL Road Frame	Road Frames	Components	FR-R92B-58	
215	Sport-100 Helmet, Black	$12.03	Black	$33.64	Sport-100	Helmets	Accessories	HL-U509	$12,098.0788
216	Sport-100 Helmet, Black	$13.88	Black	$33.64	Sport-100	Helmets	Accessories	HL-U509	$31,866.8299
217	Sport-100 Helmet, Black	$13.09	Black	$34.99	Sport-100	Helmets	Accessories	HL-U509	$116,904.6102
253	LL Road Frame - Black, 58	$176.20	Black	$297.63	LL Road Frame	Road Frames	Components	FR-R38B-58	$34,108.9328

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