

DAX - 3

MCT - Last week of September. [Only 2 weeks.]

- Create a Calculated Column to extract the year part from the birth date column.
 - Create a calculated column to extract the year part from the birth date column and another column extracting the current year to calculate the age of each customer.
 - Create a calculated column to extract the first three letters from the month name column from the calendar table.
 - Create a calculated column to extract username from email id.
 - Create a calculated column to pull the "product price" column from the "products" table to the "sales" table.
 - Create a calculated column "Revenue" from "f-sales" using "order quantity" and "product price".
 - Create a measure to calculate the return rate of each subcategory.
 - Count the number of products in each category.
 - Count the number of a unique number of orders in a table.
 - Total Items of Clothing Category.
 - Total Weekend Orders.
 - Total High Price Point Products.

Revenue(CC) = 'F-Sales'[Price] * 'F-Sales'[OrderQuantity]

	OrderQuantity	d-product.ProductCost	d-product.ProductPrice	d-customer.Gender	d-customer.Occupation	Revenue	Index	Price	Revenue(CC)
1	1	\$1,105.8	\$2,049.1	M	Professional	\$2,049.1	29	\$2,049.10	\$2,049.1
1	1	\$1,105.8	\$2,049.1	F	Professional	\$2,049.1	35	\$2,049.10	\$2,049.1

```
revenue2 = 'F-Sales'[OrderQuantity] * RELATED('d-product'[ProductPrice])
```

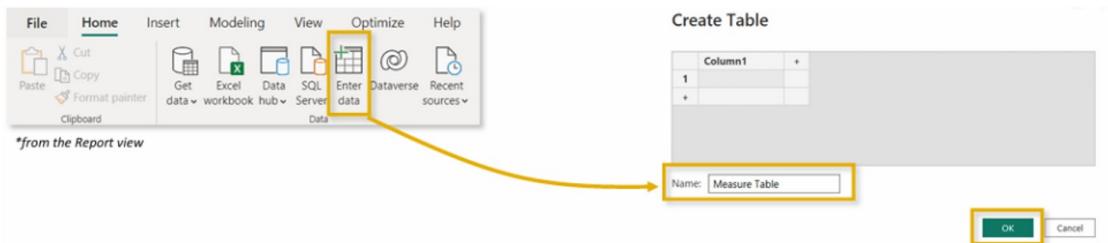
	OrderQuantity	d-product.ProductCost	d-product.ProductPrice	d-customer.Gender	d-customer.Occupation	Revenue	Index	Price	Revenue(CC)	revenue2
1	1	\$1,105.8	\$2,049.1	M	Professional	\$2,049.1	29	\$2,049.10	\$2,049.1	\$2,049.1
1	1	\$1,105.8	\$2,049.1	F	Professional	\$2,049.1	35	\$2,049.10	\$2,049.1	\$2,049.1

PRO TIP: MEASURE TABLES

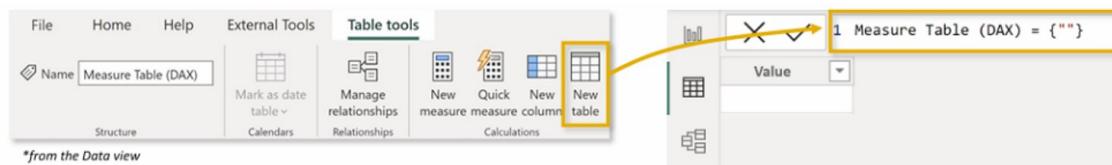
It's a common best practice to create a dedicated table to store your measures; this will help you stay organized, find measures quickly, and allow you to group related measures into folders.

related measures into folders.

Option 1: Enter Data into Power Query (loads the table to the data model – table is visible in Power Query)



Option 2: Create a calculated table using DAX directly in the model (table is not visible in Power Query)



FILTER CONTEXT

Measures are evaluated based on filter context, which means that they recalculate whenever the fields or filters around them change

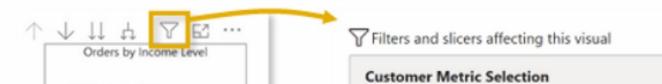
Top 10 Products	Orders	Revenue	Return %
Water Bottle - 30 oz.	3,983	\$39,755	1.95%
Patch Kit/8 Patches	2,952	\$13,506	1.61%
Mountain Tire Tube	2,846	\$28,333	1.64%
Road Tire Tube	2,173	\$17,265	1.55%
Sport-100 Helmet, Red	2,099	\$73,444	3.33%
AWC Logo Cap	2,062	\$35,865	1.11%
Sport-100 Helmet, Blue	1,995	\$67,112	3.31%
Fender Set - Mountain	1,975	\$8,041	1.36%
Sport-100 Helmet, Black	1,940	\$65,262	2.68%
Mountain Bottle Cage	1,896	\$38,062	2.02%
Total	15,587	\$465,644	1.85%

For this value in the matrix (2,846), the Orders measure is calculated based on the following filter context:
Products[Product Name] = "Mountain Tire Tube"

- This allows the measure to return the total order quantity for each product specifically (or whatever context the row and column labels dictate – years, countries, categories, customer names, etc.)

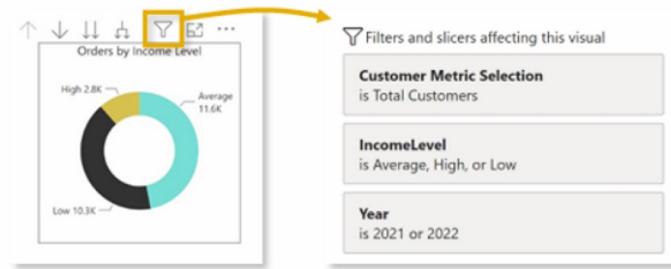
This total (15,587) does NOT calculate by summing the values above; it evaluates as an independent measure with no filter context applied

- IMPORTANT: Every measure value in a report evaluates independently (like an island) and calculates based on its own filter context



Customer Metric Selection

PRO TIP: Clicking the filter



PRO TIP: Clicking the filter icon will show you the filters currently applied to a selected visual

EXAMPLE: FILTER CONTEXT

MEASURE: Revenue Per Customer

FILTER CONTEXT:

- *Calendar[Year]* = 2021 or 2022



MEASURE: Total Orders

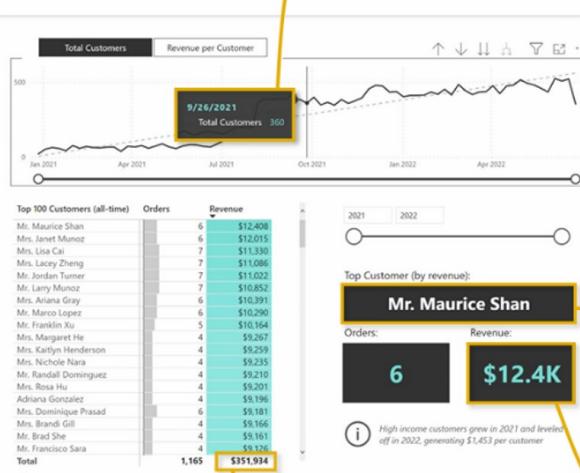
FILTER CONTEXT:

- *Calendar[Year]* = 2021 or 2022
- *Customers[Occupation]* = Skilled Manual

MEASURE: Total Customers

FILTER CONTEXT:

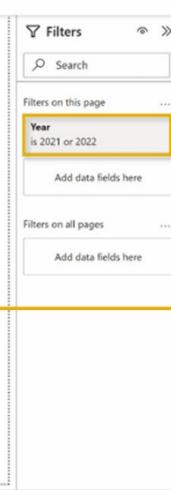
- *Calendar[Date]* = September 26, 2021



MEASURE: Total Revenue

FILTER CONTEXT:

- *Calendar[Year]* = 2021 or 2022
- *Customer[Full Name]* = Top 100 by Total Orders



This is a **page-level filter**, which impacts **ALL** visuals on this report page (more on this later!)

COLUMN: Customer Full Name

FILTER CONTEXT:

- *Calendar[Year]* = 2021 or 2022
- *Customer[Full Name]* = Top 1 by Total Revenue

MEASURE: Total Revenue

FILTER CONTEXT:

- *Calendar[Year]* = 2021 or 2022
- *Customer[Full Name]* = Mr. Maurice Shan

STEP-BY-STEP MEASURE CALCULATION

Product Color	Quantity Sold
Black	10,590
Red	4,011
Yellow	4,638

How exactly is this measure value calculated?

- NOTE: This all happens instantly behind the scenes, every time the filter context changes

STEP 1

Filter context is detected & applied





Product Color	Quantity Sold
Black	10,590
Red	4,011
Yellow	4,638

'Product Lookup'[Product Color] = "Black"

Product ID	Product Name	Product Color
P-000001	Smartphone X	Black
P-000002	Smartphone Y	Red
P-000003	Smartphone Z	Yellow
P-000004	Laptop A	Black
P-000005	Laptop B	Red
P-000006	Laptop C	Yellow
P-000007	Monitor A	Black
P-000008	Monitor B	Red
P-000009	Monitor C	Yellow
P-000010	Headphones X	Black
P-000011	Headphones Y	Red
P-000012	Headphones Z	Yellow
P-000013	Keyboard A	Black
P-000014	Keyboard B	Red
P-000015	Keyboard C	Yellow
P-000016	Mouse A	Black
P-000017	Mouse B	Red
P-000018	Mouse C	Yellow
P-000019	Power Bank A	Black
P-000020	Power Bank B	Red
P-000021	Power Bank C	Yellow
P-000022	Smartwatch A	Black
P-000023	Smartwatch B	Red
P-000024	Smartwatch C	Yellow
P-000025	Bluetooth Speaker A	Black
P-000026	Bluetooth Speaker B	Red
P-000027	Bluetooth Speaker C	Yellow
P-000028	Smart Home Hub A	Black
P-000029	Smart Home Hub B	Red
P-000030	Smart Home Hub C	Yellow
P-000031	Wireless Charger A	Black
P-000032	Wireless Charger B	Red
P-000033	Wireless Charger C	Yellow
P-000034	Smart Glasses A	Black
P-000035	Smart Glasses B	Red
P-000036	Smart Glasses C	Yellow
P-000037	Smartphone D	Black
P-000038	Smartphone E	Red
P-000039	Smartphone F	Yellow
P-000040	Laptop D	Black
P-000041	Laptop E	Red
P-000042	Laptop F	Yellow
P-000043	Monitor D	Black
P-000044	Monitor E	Red
P-000045	Monitor F	Yellow
P-000046	Headphones D	Black
P-000047	Headphones E	Red
P-000048	Headphones F	Yellow
P-000049	Keyboard D	Black
P-000050	Keyboard E	Red
P-000051	Keyboard F	Yellow
P-000052	Mouse D	Black
P-000053	Mouse E	Red
P-000054	Mouse F	Yellow
P-000055	Power Bank D	Black
P-000056	Power Bank E	Red
P-000057	Power Bank F	Yellow
P-000058	Smartwatch D	Black
P-000059	Smartwatch E	Red
P-000060	Smartwatch F	Yellow
P-000061	Bluetooth Speaker D	Black
P-000062	Bluetooth Speaker E	Red
P-000063	Bluetooth Speaker F	Yellow
P-000064	Smart Home Hub D	Black
P-000065	Smart Home Hub E	Red
P-000066	Smart Home Hub F	Yellow
P-000067	Wireless Charger D	Black
P-000068	Wireless Charger E	Red
P-000069	Wireless Charger F	Yellow
P-000070	Smart Glasses D	Black
P-000071	Smart Glasses E	Red
P-000072	Smart Glasses F	Yellow

Date	Order Number	Product Key
Wednesday, June 3, 2020	1047158	Black
Thursday, June 4, 2020	1047159	Black
Friday, June 5, 2020	1047160	Black
Saturday, June 6, 2020	1047161	Black
Sunday, June 7, 2020	1047162	Black
Monday, June 8, 2020	1047163	Black
Tuesday, June 9, 2020	1047164	Black
Wednesday, June 10, 2020	1047165	Black
Thursday, June 11, 2020	1047166	Black
Friday, June 12, 2020	1047167	Black
Saturday, June 13, 2020	1047168	Black
Sunday, June 14, 2020	1047169	Black
Monday, June 15, 2020	1047170	Black
Tuesday, June 16, 2020	1047171	Black
Wednesday, June 17, 2020	1047172	Black
Thursday, June 18, 2020	1047173	Black
Friday, June 19, 2020	1047174	Black
Saturday, June 20, 2020	1047175	Black
Sunday, June 21, 2020	1047176	Black
Monday, June 22, 2020	1047177	Black
Tuesday, June 23, 2020	1047178	Black
Wednesday, June 24, 2020	1047179	Black
Thursday, June 25, 2020	1047180	Black
Friday, June 26, 2020	1047181	Black
Saturday, June 27, 2020	1047182	Black
Sunday, June 28, 2020	1047183	Black
Monday, June 29, 2020	1047184	Black
Tuesday, June 30, 2020	1047185	Black
Wednesday, July 1, 2020	1047186	Black
Thursday, July 2, 2020	1047187	Black
Friday, July 3, 2020	1047188	Black
Saturday, July 4, 2020	1047189	Black
Sunday, July 5, 2020	1047190	Black
Monday, July 6, 2020	1047191	Black
Tuesday, July 7, 2020	1047192	Black
Wednesday, July 8, 2020	1047193	Black
Thursday, July 9, 2020	1047194	Black
Friday, July 10, 2020	1047195	Black
Saturday, July 11, 2020	1047196	Black
Sunday, July 12, 2020	1047197	Black
Monday, July 13, 2020	1047198	Black
Tuesday, July 14, 2020	1047199	Black
Wednesday, July 15, 2020	1047200	Black
Thursday, July 16, 2020	1047201	Black
Friday, July 17, 2020	1047202	Black
Saturday, July 18, 2020	1047203	Black
Sunday, July 19, 2020	1047204	Black
Monday, July 20, 2020	1047205	Black
Tuesday, July 21, 2020	1047206	Black
Wednesday, July 22, 2020	1047207	Black
Thursday, July 23, 2020	1047208	Black
Friday, July 24, 2020	1047209	Black
Saturday, July 25, 2020	1047210	Black
Sunday, July 26, 2020	1047211	Black
Monday, July 27, 2020	1047212	Black
Tuesday, July 28, 2020	1047213	Black
Wednesday, July 29, 2020	1047214	Black
Thursday, July 30, 2020	1047215	Black
Friday, July 31, 2020	1047216	Black
Saturday, August 1, 2020	1047217	Black
Sunday, August 2, 2020	1047218	Black
Monday, August 3, 2020	1047219	Black
Tuesday, August 4, 2020	1047220	Black
Wednesday, August 5, 2020	1047221	Black
Thursday, August 6, 2020	1047222	Black
Friday, August 7, 2020	1047223	Black
Saturday, August 8, 2020	1047224	Black
Sunday, August 9, 2020	1047225	Black
Monday, August 10, 2020	1047226	Black
Tuesday, August 11, 2020	1047227	Black
Wednesday, August 12, 2020	1047228	Black
Thursday, August 13, 2020	1047229	Black
Friday, August 14, 2020	1047230	Black
Saturday, August 15, 2020	1047231	Black
Sunday, August 16, 2020	1047232	Black
Monday, August 17, 2020	1047233	Black
Tuesday, August 18, 2020	1047234	Black
Wednesday, August 19, 2020	1047235	Black
Thursday, August 20, 2020	1047236	Black
Friday, August 21, 2020	1047237	Black
Saturday, August 22, 2020	1047238	Black
Sunday, August 23, 2020	1047239	Black
Monday, August 24, 2020	1047240	Black
Tuesday, August 25, 2020	1047241	Black
Wednesday, August 26, 2020	1047242	Black
Thursday, August 27, 2020	1047243	Black
Friday, August 28, 2020	1047244	Black
Saturday, August 29, 2020	1047245	Black
Sunday, August 30, 2020	1047246	Black
Monday, August 31, 2020	1047247	Black
Tuesday, September 1, 2020	1047248	Black
Wednesday, September 2, 2020	1047249	Black
Thursday, September 3, 2020	1047250	Black
Friday, September 4, 2020	1047251	Black
Saturday, September 5, 2020	1047252	Black
Sunday, September 6, 2020	1047253	Black
Monday, September 7, 2020	1047254	Black
Tuesday, September 8, 2020	1047255	Black
Wednesday, September 9, 2020	1047256	Black
Thursday, September 10, 2020	1047257	Black
Friday, September 11, 2020	1047258	Black
Saturday, September 12, 2020	1047259	Black
Sunday, September 13, 2020	1047260	Black
Monday, September 14, 2020	1047261	Black
Tuesday, September 15, 2020	1047262	Black
Wednesday, September 16, 2020	1047263	Black
Thursday, September 17, 2020	1047264	Black
Friday, September 18, 2020	1047265	Black
Saturday, September 19, 2020	1047266	Black
Sunday, September 20, 2020	1047267	Black
Monday, September 21, 2020	1047268	Black
Tuesday, September 22, 2020	1047269	Black
Wednesday, September 23, 2020	1047270	Black
Thursday, September 24, 2020	1047271	Black
Friday, September 25, 2020	1047272	Black
Saturday, September 26, 2020	1047273	Black
Sunday, September 27, 2020	1047274	Black
Monday, September 28, 2020	1047275	Black
Tuesday, September 29, 2020	1047276	Black
Wednesday, September 30, 2020	1047277	Black
Thursday, October 1, 2020	1047278	Black
Friday, October 2, 2020	1047279	Black
Saturday, October 3, 2020	1047280	Black
Sunday, October 4, 2020	1047281	Black
Monday, October 5, 2020	1047282	Black
Tuesday, October 6, 2020	1047283	Black
Wednesday, October 7, 2020	1047284	Black
Thursday, October 8, 2020	1047285	Black
Friday, October 9, 2020	1047286	Black
Saturday, October 10, 2020	1047287	Black
Sunday, October 11, 2020	1047288	Black
Monday, October 12, 2020	1047289	Black
Tuesday, October 13, 2020	1047290	Black
Wednesday, October 14, 2020	1047291	Black
Thursday, October 15, 2020	1047292	Black
Friday, October 16, 2020	1047293	Black
Saturday, October 17, 2020	1047294	Black
Sunday, October 18, 2020	1047295	Black
Monday, October 19, 2020	1047296	Black
Tuesday, October 20, 2020	1047297	Black
Wednesday, October 21, 2020	1047298	Black
Thursday, October 22, 2020	1047299	Black
Friday, October 23, 2020	1047300	Black
Saturday, October 24, 2020	1047301	Black
Sunday, October 25, 2020	1047302	Black
Monday, October 26, 2020	1047303	Black
Tuesday, October 27, 2020	1047304	Black
Wednesday, October 28, 2020	1047305	Black
Thursday, October 29, 2020	1047306	Black
Friday, October 30, 2020	1047307	Black
Saturday, October 31, 2020	1047308	Black
Sunday, November 1, 2020	1047309	Black
Monday, November 2, 2020	1047310	Black
Tuesday, November 3, 2020	1047311	Black
Wednesday, November 4, 2020	1047312	Black
Thursday, November 5, 2020	1047313	Black
Friday, November 6, 2020	1047314	Black
Saturday, November 7, 2020	1047315	Black
Sunday, November 8, 2020	1047316	Black
Monday, November 9, 2020	1047317	Black
Tuesday, November 10, 2020	1047318	Black
Wednesday, November 11, 2020	1047319	Black
Thursday, November 12, 2020	1047320	Black
Friday, November 13, 2020	1047321	Black
Saturday, November 14, 2020	1047322	Black
Sunday, November 15, 2020	1047323	Black
Monday, November 16, 2020	1047324	Black
Tuesday, November 17, 2020	1047325	Black
Wednesday, November 18, 2020	1047326	Black
Thursday, November 19, 2020	1047327	Black
Friday, November 20, 2020	1047328	Black
Saturday, November 21, 2020	1047329	Black
Sunday, November 22, 2020	1047330	Black
Monday, November 23, 2020	1047331	Black
Tuesday, November 24, 2020	1047332	Black
Wednesday, November 25, 2020	1047333	Black
Thursday, November 26, 2020	1047334	Black
Friday, November 27, 2020	1047335	Black
Saturday, November 28, 2020	1047336	Black
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Monday, November 30, 2020	1047338	Black
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Thursday, December 3, 2020	1047341	Black
Friday, December 4, 2020	1047342	Black
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Monday, December 7, 2020	1047345	Black
Tuesday, December 8, 2020	1047346	Black
Wednesday, December 9, 2020	1047347	Black
Thursday, December 10, 2020	1047348	Black
Friday, December 11, 2020	1047349	Black
Saturday, December 12, 2020	1047350	Black
Sunday, December 13, 2020	1047351	Black
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Tuesday, December 15, 2020	1047353	Black
Wednesday, December 16, 2020	1047354	Black
Thursday, December 17, 2020	1047355	Black
Friday, December 18, 2020	1047356	Black
Saturday, December 19, 2020	1047357	Black
Sunday, December 20, 2020	1047358	Black
Monday, December 21, 2020	1047359	Black
Tuesday, December 22, 2020	1047360	Black
Wednesday, December 23, 2020	1047361	Black
Thursday, December 24, 2020	1047362	Black
Friday, December 25, 2020	1047363	Black
Saturday, December 26, 2020	1047364	Black
Sunday, December 27, 2020	1047365	Black
Monday, December 28, 2020	1047366	Black
Tuesday, December 29, 2020	1047367	Black
Wednesday, December 30, 2020	1047368	Black
Thursday, December 31, 2020	1047369	Black

1 Quantity Sold =

2 SUM(

3 | 'Sales Data'[Order Quantity]

4)

Sum of values in the Order Quantity

column of the Sales Data table filtered by

*Sum of values in the **Order Quantity** column of the **Sales Data** table, filtered to rows where the product color is “**Black**”*

= 10,590

DAX SYNTAX

MEASURE NAME

- Measures are always surrounded by brackets (i.e. [Total Quantity]) when referenced in formulas, so spaces are OK

Total Quantity: = SUM(Transactions[quantity])

FUNCTION NAME

- Calculated columns don't always use functions, but measures do:
 - In a Calculated Column, =Transactions[quantity] returns the value from the quantity column in each row (since it evaluates one row at a time).
 - In a Measure, = Transactions[quantity] will return an error since Power BI doesn't know how to translate that as a single value – you need some sort of aggregation

Referenced TABLE NAME

Referenced COLUMN NAME

This is a “fully qualified” column, since it's preceded by the table name.

NOTE: Table names with spaces must be surrounded by single quotes:

- Without a space: Transactions[quantity]
- With a space: 'Transactions Table'[quantity]

PRO TIP:

Column references use fully qualified names (i.e. 'Table'[Column])

Measure references just use the measure name (i.e. [Measure]) and can be called by typing an open square bracket “[”

DAX OPERATORS

Arithmetic Operator	Meaning	Example
+	Addition	2 + 7
-	Subtraction	5 - 3
*	Multiplication	2 * 6
/	Division	10 / 2

-	Subtraction	$5 - 3$
*	Multiplication	$2 * 6$
/	Division	$4 / 2$
^	Exponent	$2 ^ 5$

Comparison Operator	Meaning	Example
=	Equal to	[City] = "Boston"
>	Greater than	[Quantity] > 10
<	Less than	[Quantity] < 10
>=	Greater than or equal to	[Unit Price] >= 2.5
<=	Less than or equal to	[Unit Price] <= 2.5
<>	Not equal to	[Country] <> "Mexico"

"Important"



Text/Logical Operator	Meaning	Example
&	Concatenates two values to produce one text string	[City] & " " & [State]
&&	Create an AND condition between two logical expressions	([State] = "MA") && ([Quantity] > 10)
(double pipe)	Create an OR condition between two logical expressions	([State] = "MA") ([State] = "CT")
IN	Creates a logical OR condition based on a given list (using curly brackets)	'Store Lookup'[State] IN { "MA", "CT", "NY" }

COMMON FUNCTION CATEGORIES

MATH & STATS Functions	LOGICAL Functions	TEXT Functions	FILTER Functions	TABLE Functions	DATE & TIME Functions	RELATIONSHIP Functions
<p>Functions used for aggregation or iterative, row-level calculations</p> <p>Common Examples:</p> <ul style="list-style-type: none"> SUM AVERAGE MAX/MIN DIVIDE COUNT/COUNTA COUNTROWS DISTINCTCOUNT <p>Iterator Functions:</p> <ul style="list-style-type: none"> SUMX AVERAGEX MAXX/MINX RANKX COUNTX 	<p>Functions that use conditional expressions (IF/THEN statements)</p> <p>Common Examples:</p> <ul style="list-style-type: none"> IF IFERROR AND OR NOT SWITCH TRUE FALSE 	<p>Functions used to manipulate text strings or value formats</p> <p>Common Examples:</p> <ul style="list-style-type: none"> CONCATENATE COMBINEVALUES FORMAT LEFT/MID/RIGHT UPPER/LOWER LEN SEARCH/FIND REPLACE SUBSTITUTE TRIM 	<p>Functions used to manipulate table and filter contexts</p> <p>Common Examples:</p> <ul style="list-style-type: none"> CALCULATE FILTER ALL ALLEXCEPT ALLSELECTED KEEPFILTERS REMOVEFILTERS SELECTEDVALUE 	<p>Functions that create or manipulate tables and output tables vs. scalar values</p> <p>Common Examples:</p> <ul style="list-style-type: none"> SUMMARIZE ADDCOLUMNS GENERATESERIES DISTINCT VALUES UNION INTERSECT TOPN 	<p>Functions used to manipulate date & time values or handle time intelligence calculations</p> <p>Common Examples:</p> <ul style="list-style-type: none"> DATE DATEDIFF YEARFRAC YEAR/MONTH DAY/HOUR TODAY/NOW WEEKDAY WEEKNUM NETWORKDAYS <p>Time Intelligence:</p> <ul style="list-style-type: none"> DATESYTD DATESMTD DATEADD DATESBETWEEN 	<p>Functions used to manage & modify table relationships</p> <p>Common Examples:</p> <ul style="list-style-type: none"> RELATED RELATEDTABLE CROSSFILTER USERELATIONSHIP

- MAXX/MINX
- RANKX
- COUNTX

- Time Intelligence:
- DATESYTD
 - DATESMTD
 - DATEADD
 - DATESBETWEEN

Measure Table (DAX)

	Value
No.Of Products	
Return Rate	
Total Order Qty	
Total Return Qty	

```
No.Of Products = COUNTROWS('d-product')

Return Rate = DIVIDE([Total Return Qty] , [Total Order Qty], 0)

Total Order Qty = SUM(['F-Sales'[OrderQuantity]])

Total Return Qty = SUM(['F>Returns'[ReturnQuantity]])
```

Category Name	No.Of Products
Accessories	29
Bikes	97
Clothings	35
Components	132
Total	293

SubcategoryName	Return Rate
Bike Racks	4.26%
Bike Stands	6.11%
Bottles and Cages	3.80%
Caps	2.20%
Cleaners	2.64%
Fenders	2.09%
Gloves	3.62%
Helmets	6.06%
Hydration Packs	6.76%
Jerseys	5.65%
Mountain Bikes	4.54%
Road Bikes	7.59%
Shorts	8.47%
Socks	3.87%
Total	4.23%