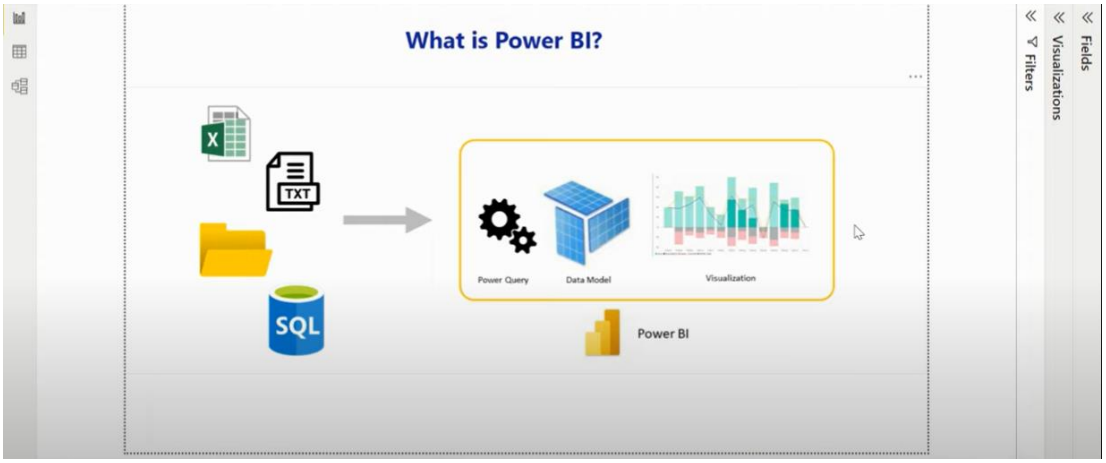
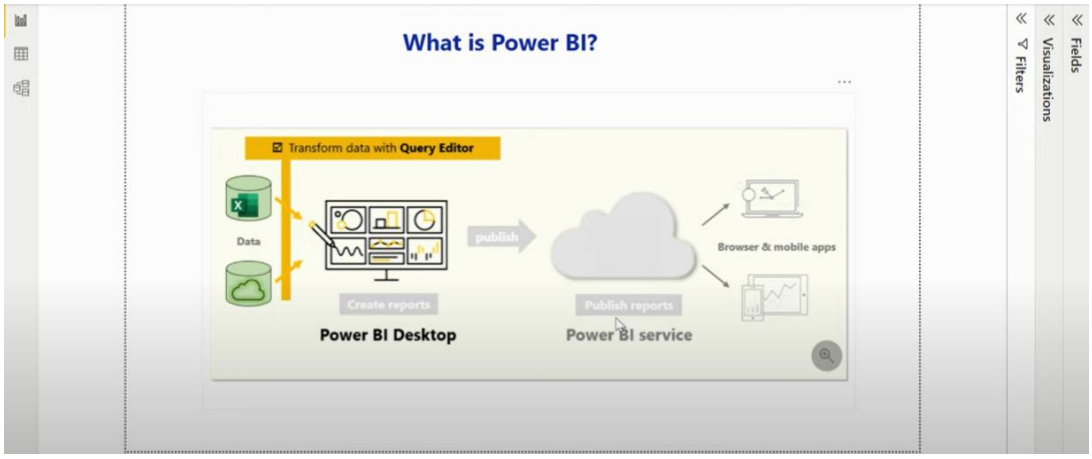
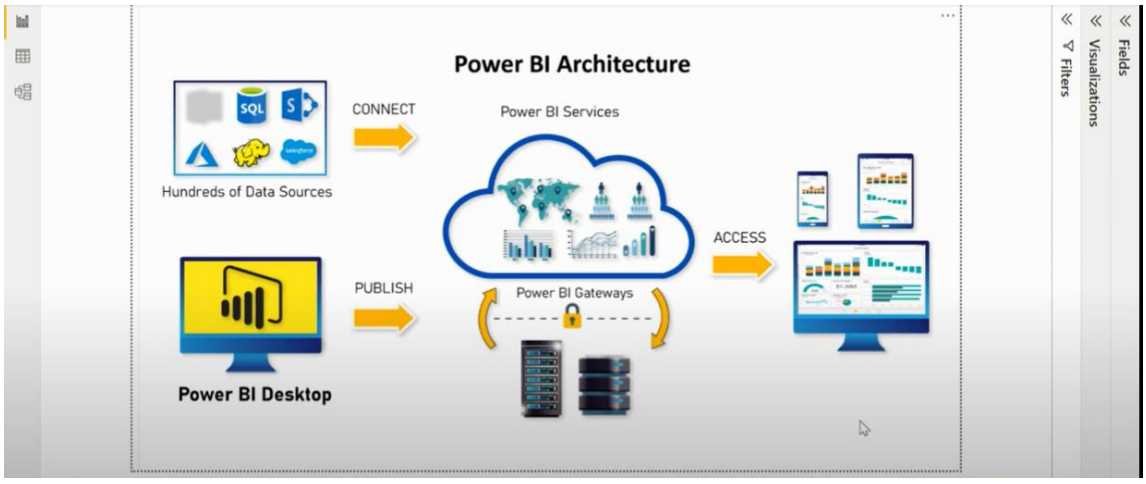
https://docs.microsoft.com/en-us/dax/

What is Power BI?





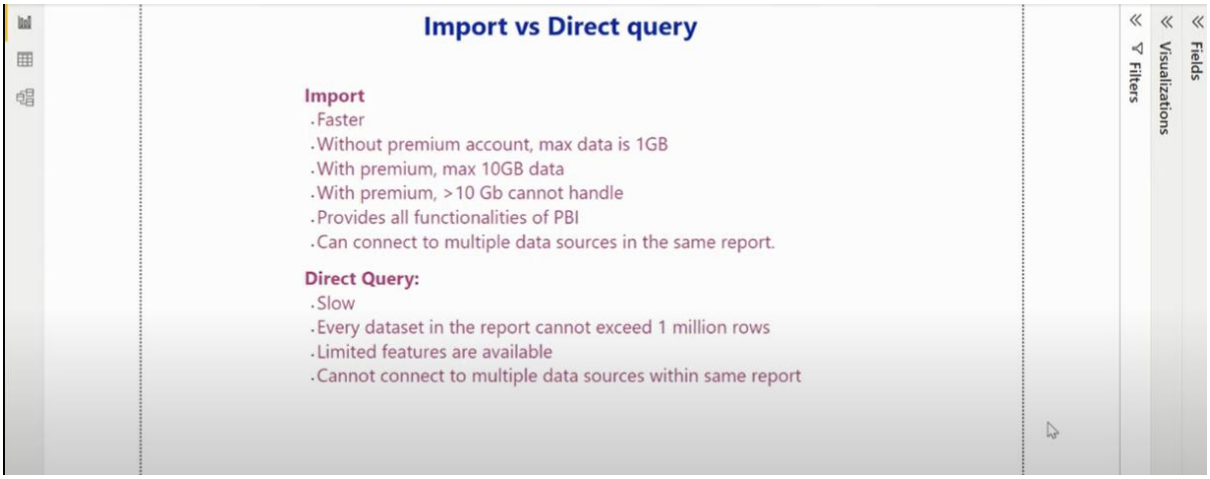
Power BI Architecture



Choose the right data connectivity mode in Power BI

Import option create a copy of the data (pbix file)

Direct Query option creates a connection to the data source



Different parts of Power BI:

1) Power Query - Change Datatype, Renaming the column, deleting the column, new calculated column (M Language)

2) Power Pivot - To model the data, define relationship between multiple tables (DAX Language)

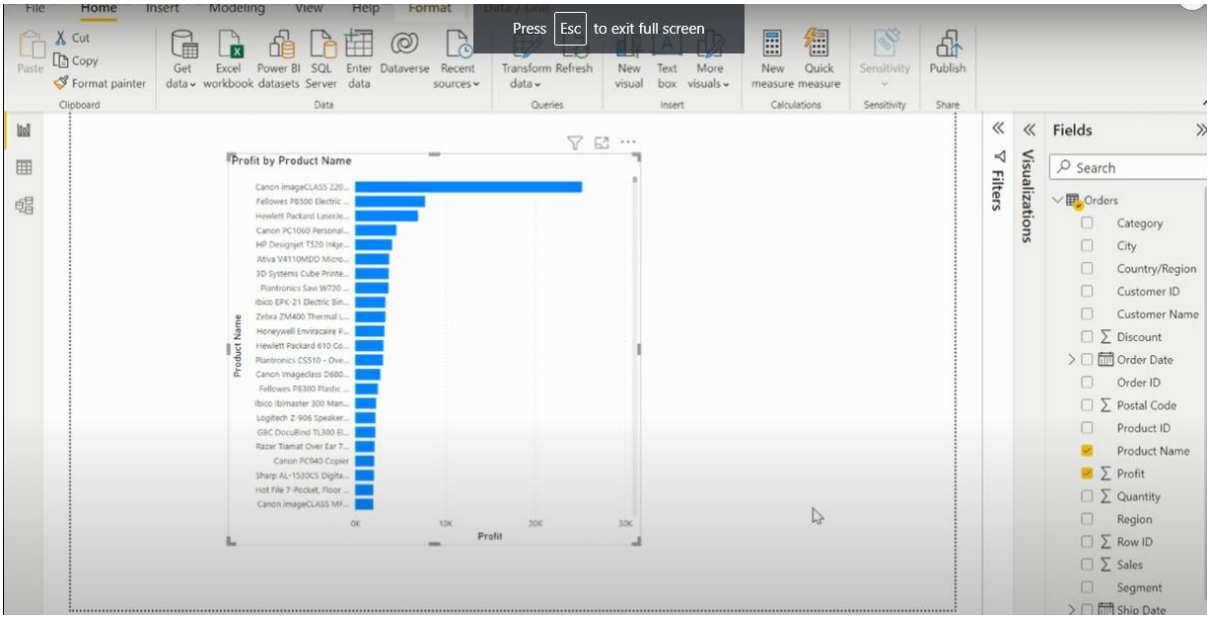
3) Power View - To build the visualization, where you can see the data visually

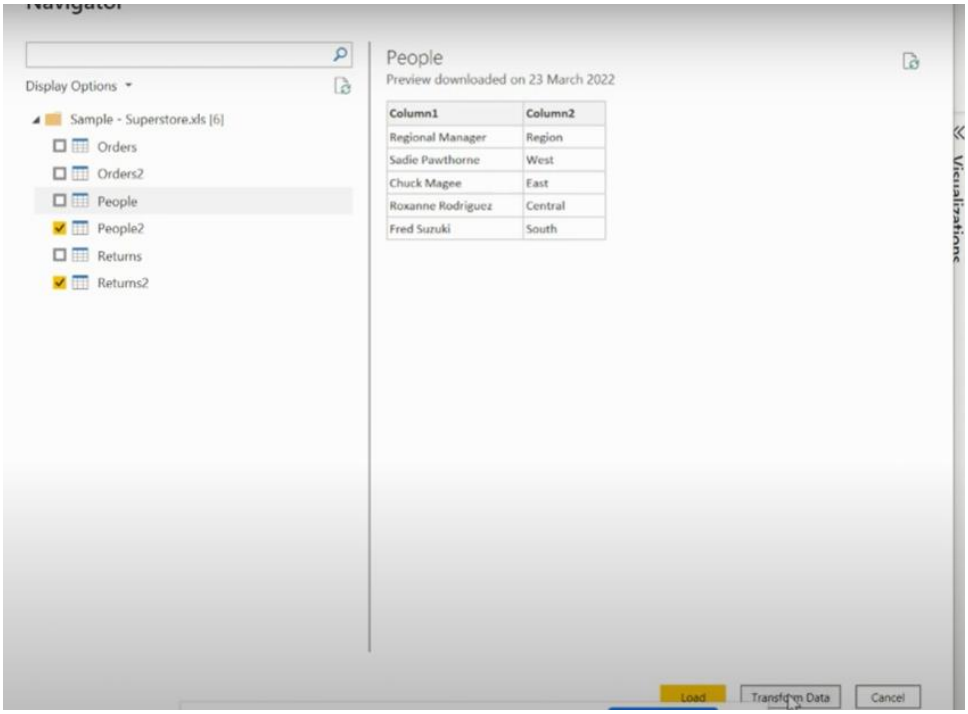
Power Query Editor - Inbuild ETL (Extract, Transform, Load) Tool, used for data transformations

Data Transformations in Power BI:

Interpret the missing value

Get Data -> Search & open the file -> Transform data





Transformations Options Available:

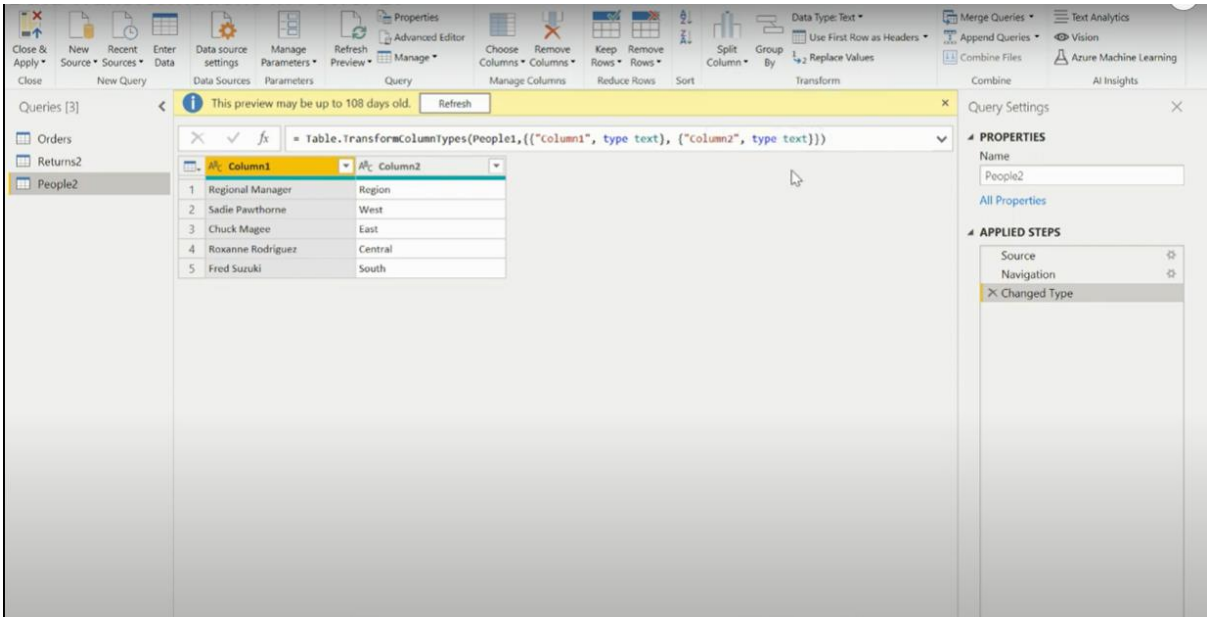
Choose columns/rows

remove columns/rows

split column

groupby operation

use first row as headers



Query Settings

Table Names can be changed

Also shows applied steps till now, non relevant steps can be removed, removing steps may undo the work

Merge Queries – same as SQL merge (to join the multiple tables)

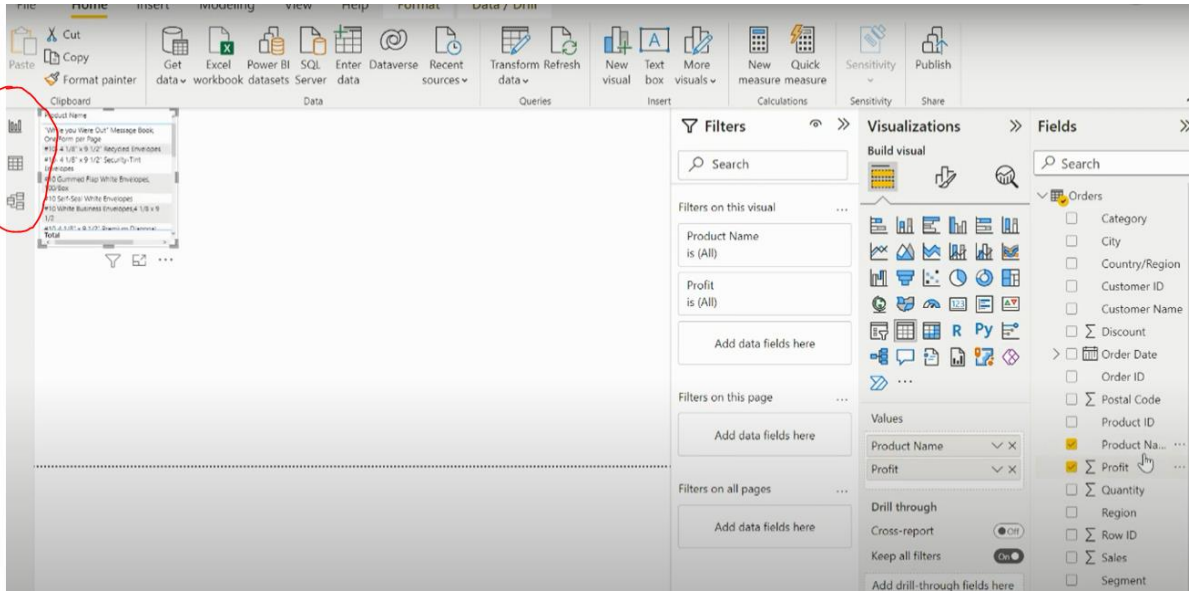
Append Queries – same as union in SQL (to append similar tables together)

Power BI Basic Building Blocks

Report Section – shows the visualizations

Data Section – shows the data in form of rows & columns

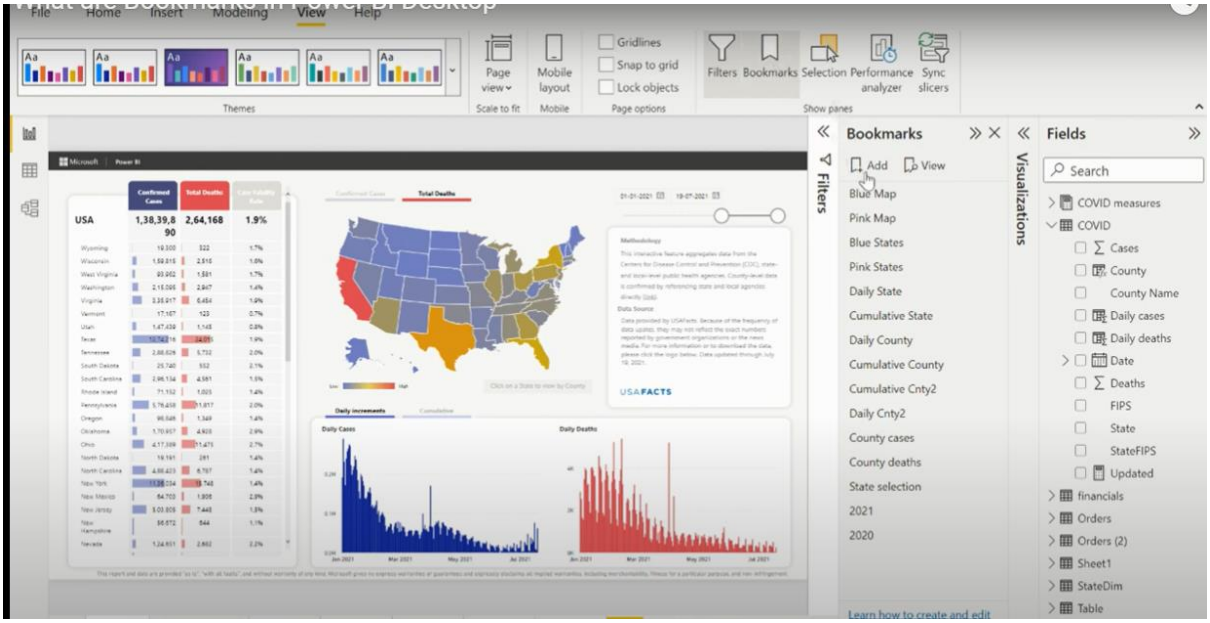
Model Section – allows to define relationships between multiple tables



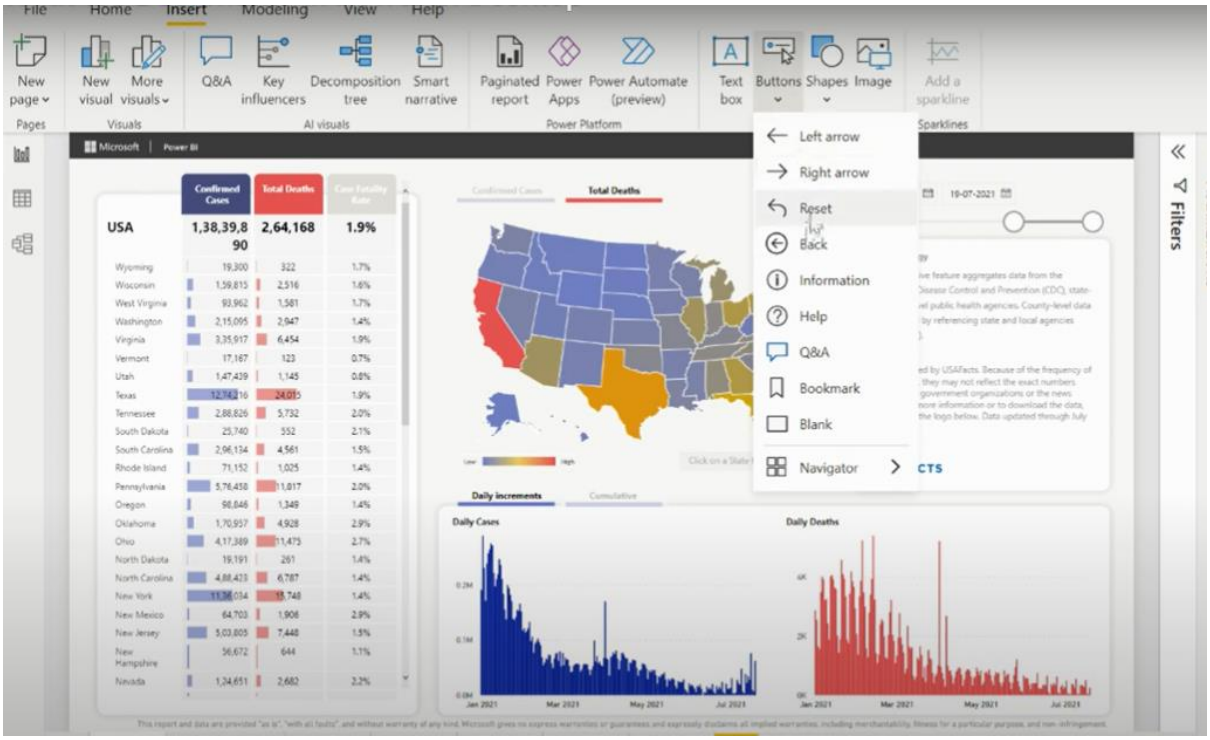
Bookmarks in Power BI?

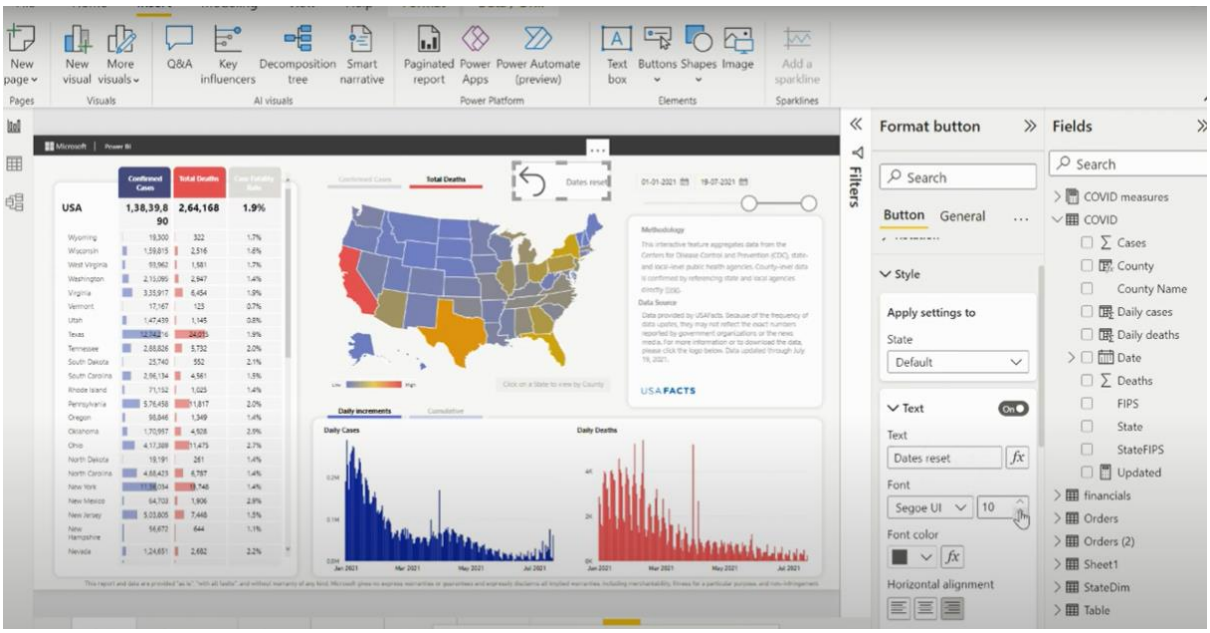
Bookmark reset the data in the form it is created

View -> Bookmarks -> Add -> Rename



Insert -> Button -> Reset -> place it on the report view -> format button ->style -> text on -> rename text

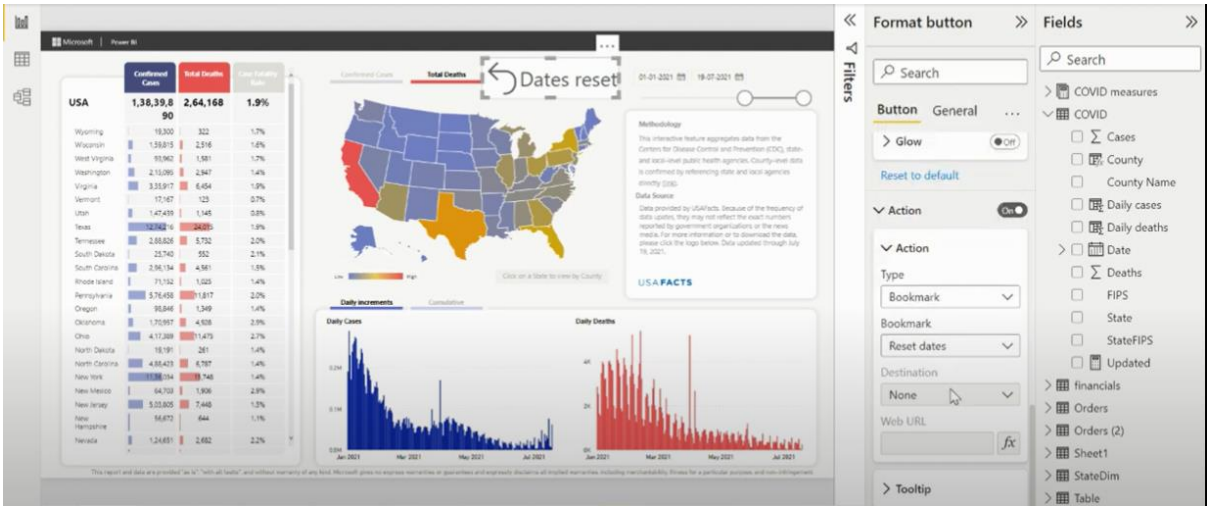




To link the button with the bookmark created

Click on created button -> Action -> enable it -> type (bookmark) -> bookmark (bookmark name)

Ctrl + click : Bookmark will be activated

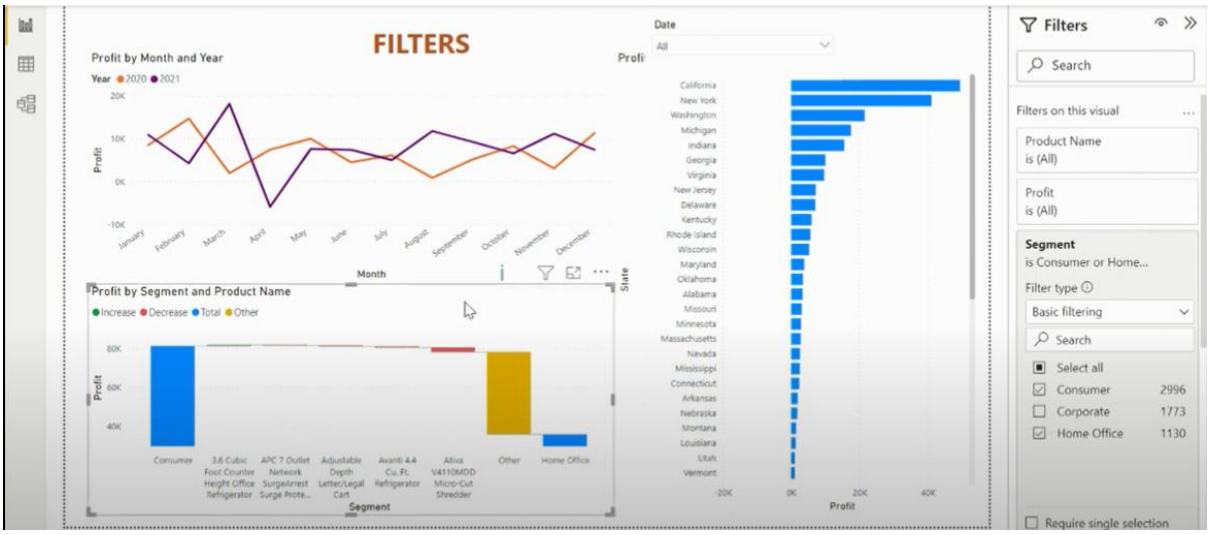


Filters and Slicers :

Both are used to filter the data

Filter :

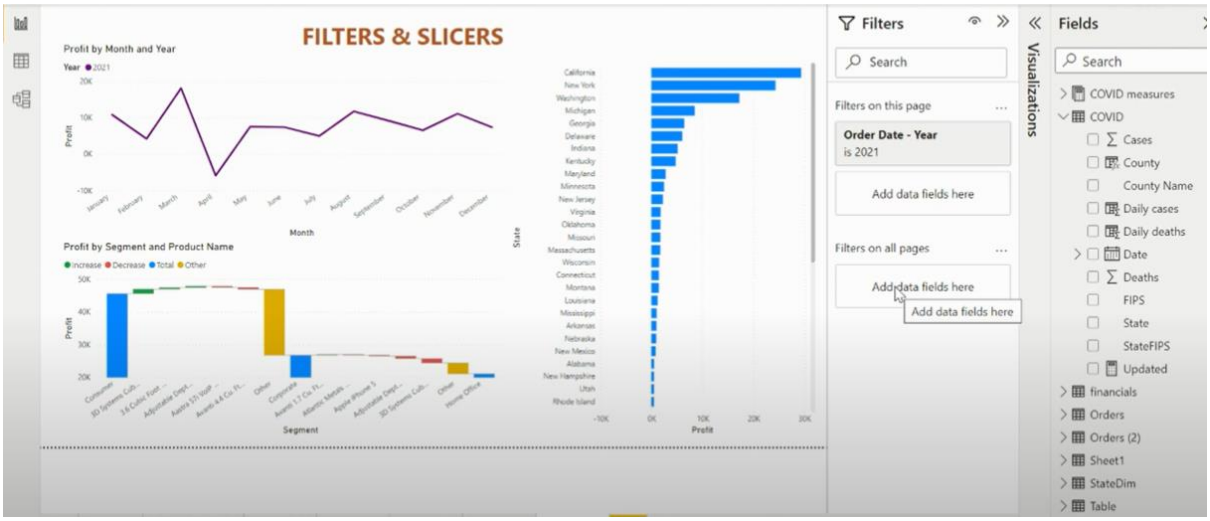
Filter on Visualization: to be applied on the visualization in report view



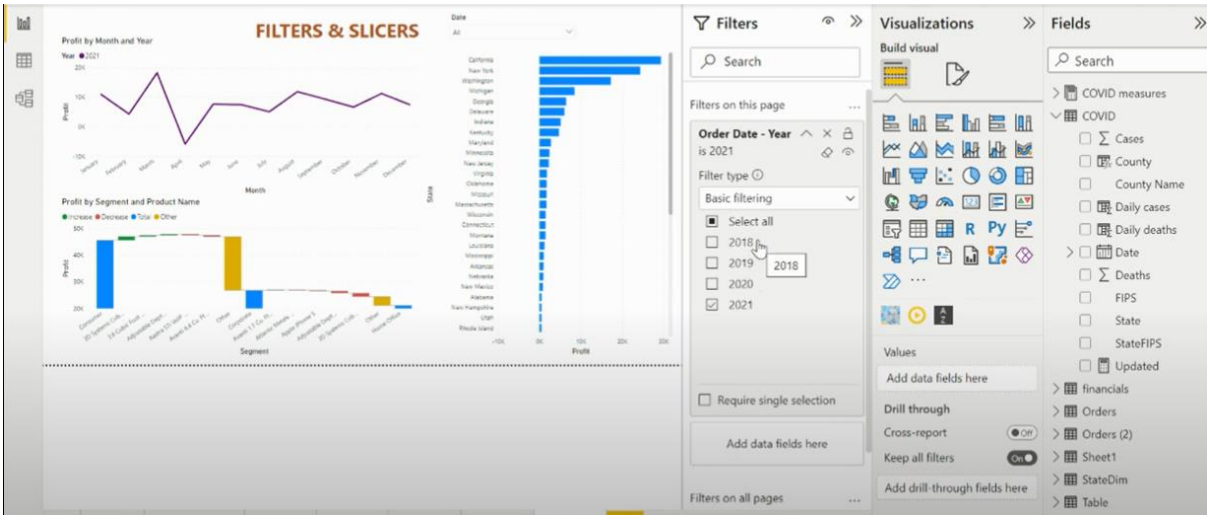
Filter on this page: will filter the current page only

Filter on all pages: all pages will be filtered in one go

Drag & drop the field on required filter type

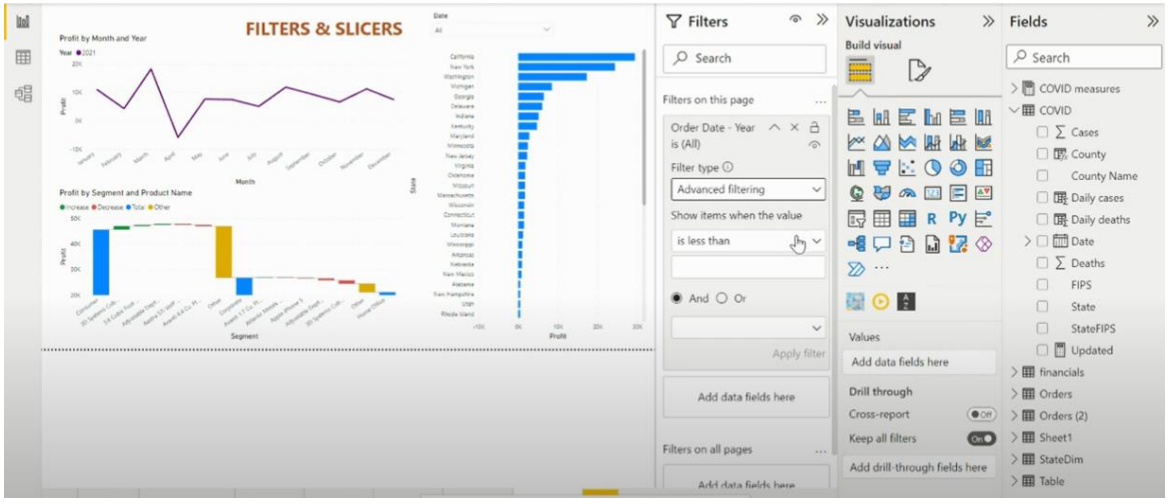


Basic filtering:



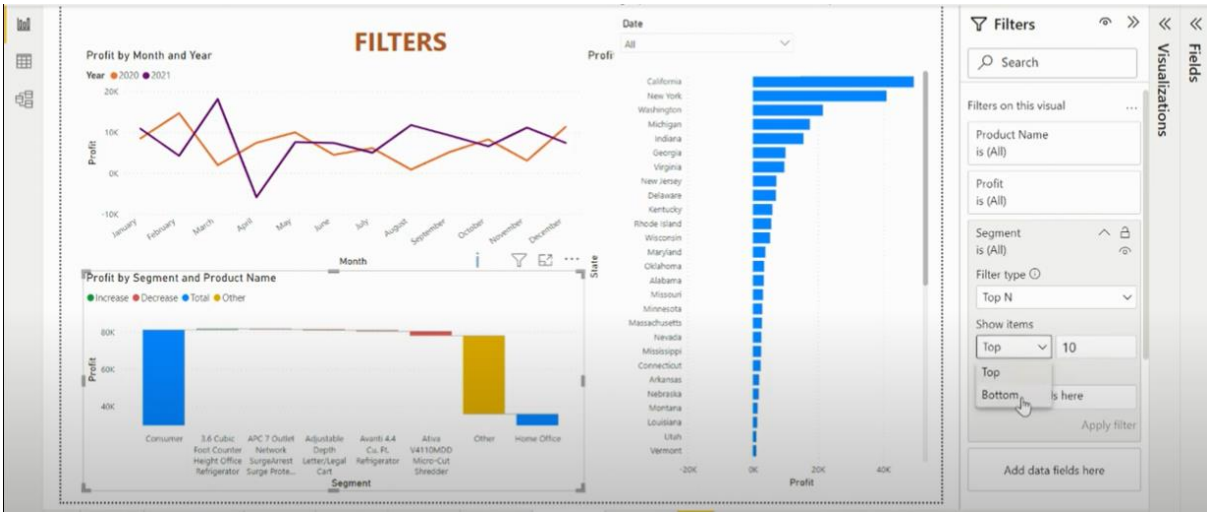
Advanced filtering:

Filtering based on conditions (same as excel)



TOP N filtering:

To filter top/bottom contributors



Slicer:

Slicer is a Visual

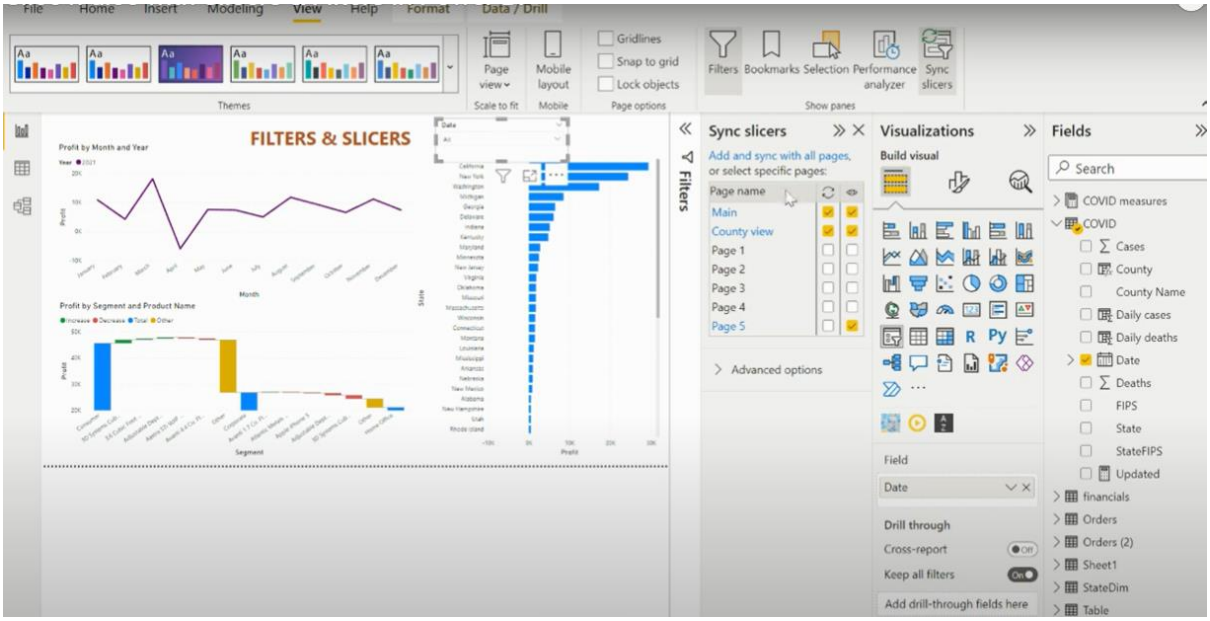
Click on slicer -> place it on report view -> add field -> right top corner (select the type)

Slicer can be applied on all the pages / selected pages

View -> sync slicers

Sync option : data will be filtered on all the selected pages

Display option : slicer will be displayed on selected pages



Slicer vs filter: Slicer can be applied on selected pages while filtering can be done on either current or all pages

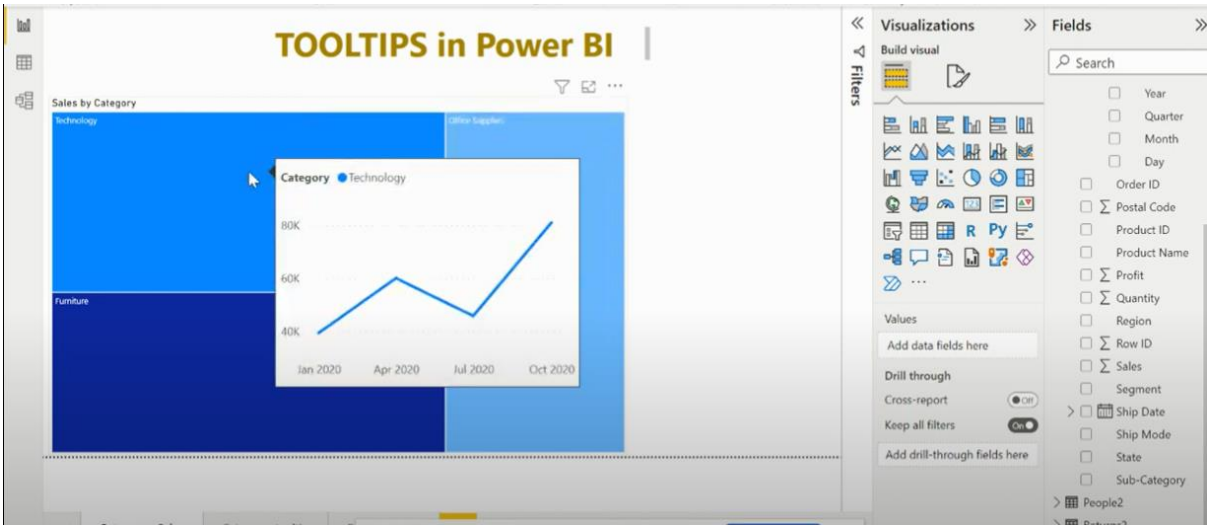
Small Multiples in Power BI:

Drag & drop field in small multiples

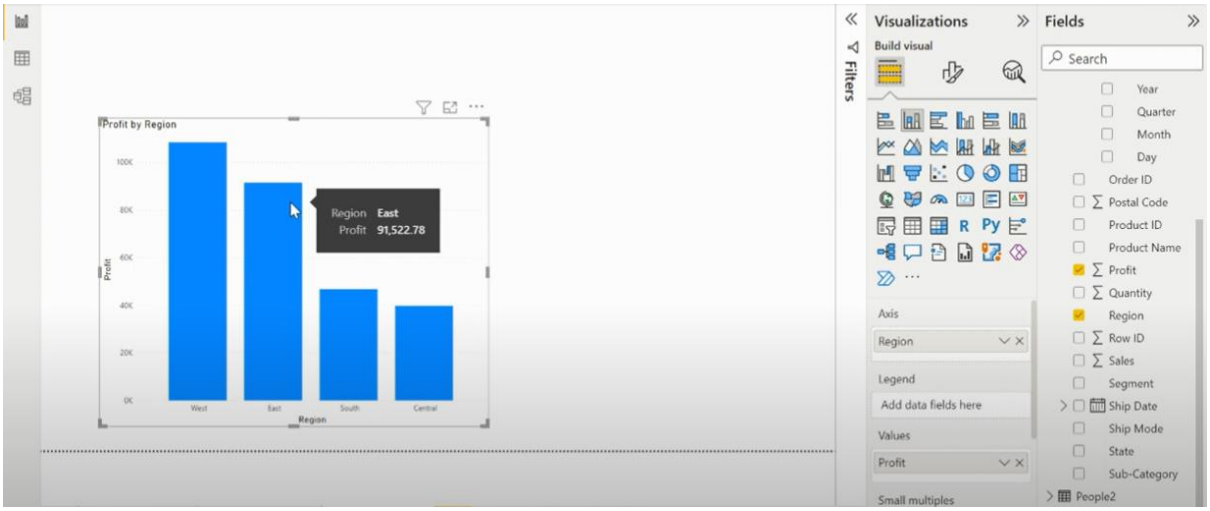
Customized Tooltips in Power BI:

Helps to display the detailed information inside the visual

Customized Tooltip



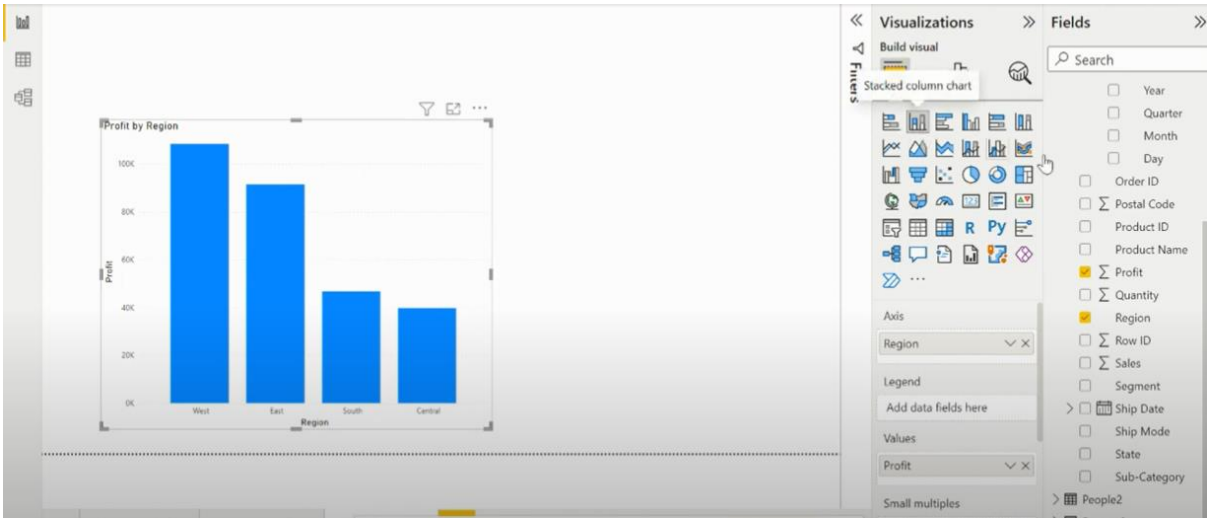
Basic Tooltip

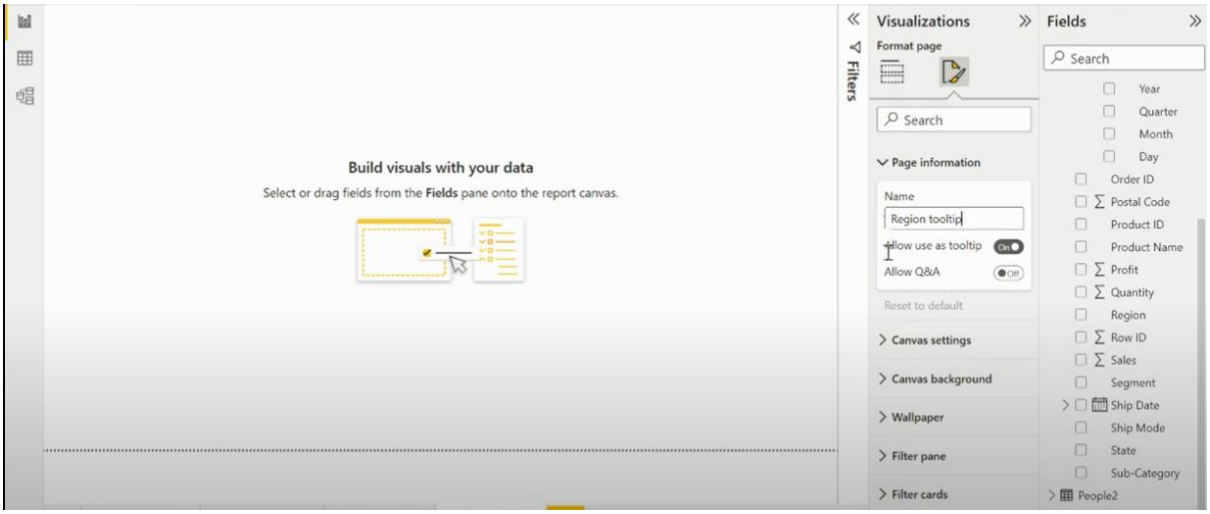


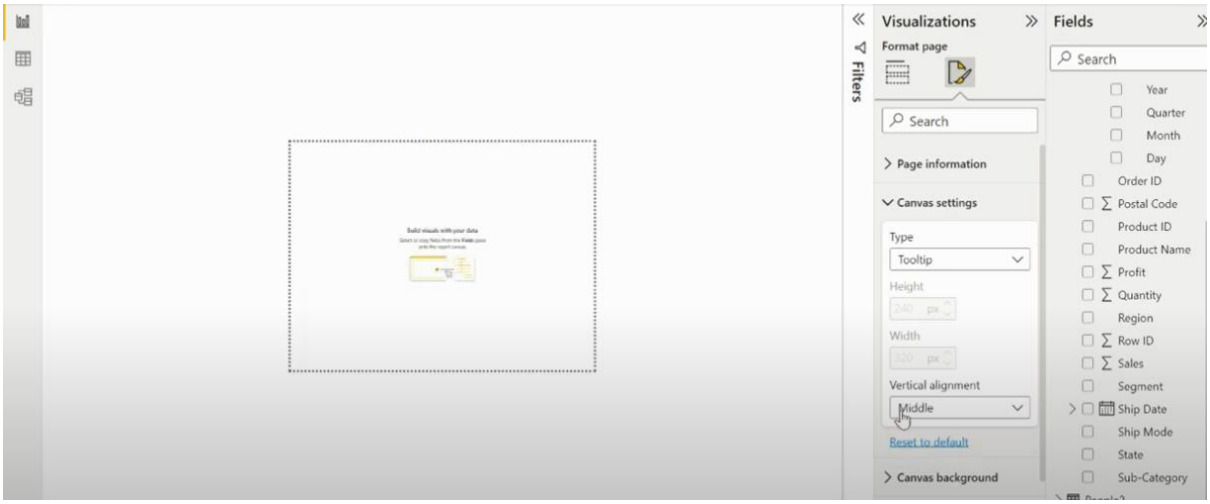
How to create the customized tooltip?

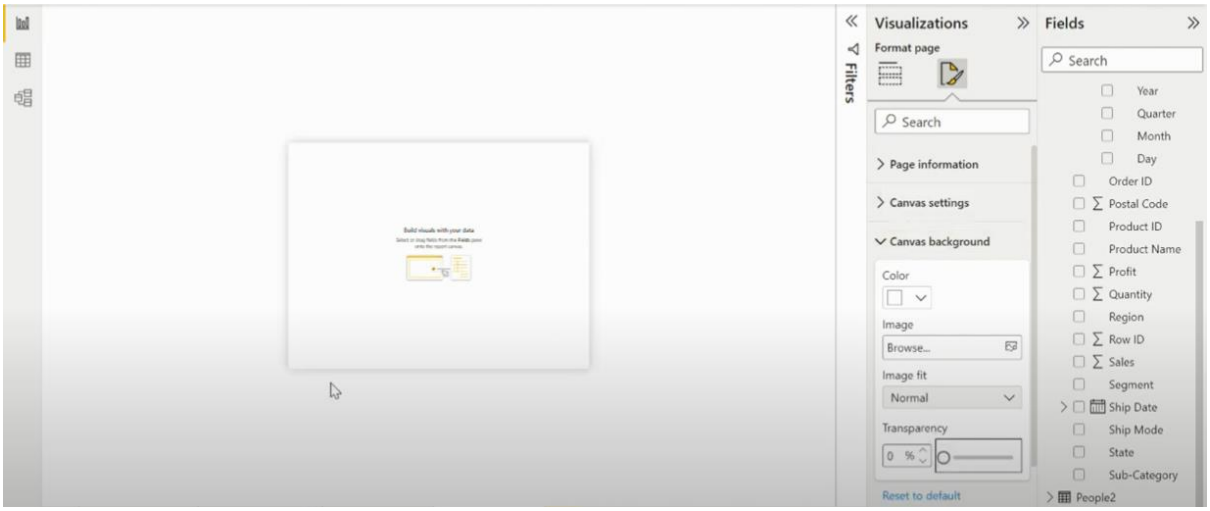
Create primary visualization -> Add new page -> format page -> page information -> allow use as tooltip on -> name it -> canvas settings -> type (tooltip) -> vertical alignment (middle) -> canvas background -> transparency (0%) -> go to primary visualization page -> format visual -> general -> tooltips -> page (select created tooltip name)

Change of visualization in tooltip will change the same in primary visualization as well.

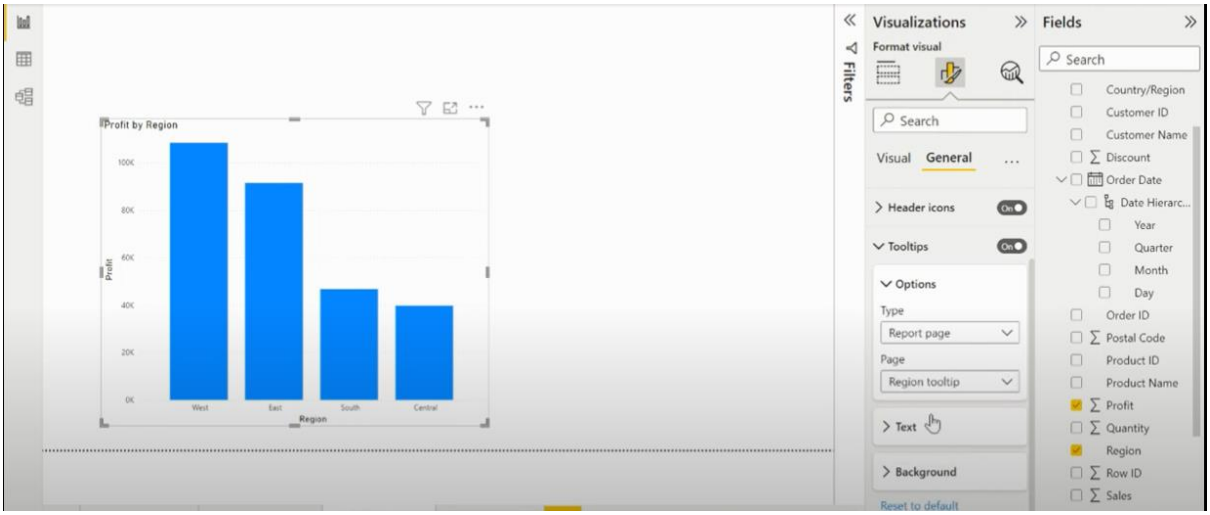

Profit by Region
Profit
100K
80K
60K
40K
20K
0K
West
East
South
Central
Region
Visualizations
Build visual
Stacked column chart
Axis
Region
Legend
Add data fields here
Values
Profit
Small multiples
Fields
Search
Year
Quarter
Month
Day
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date
Ship Mode
State
Sub-Category
People2

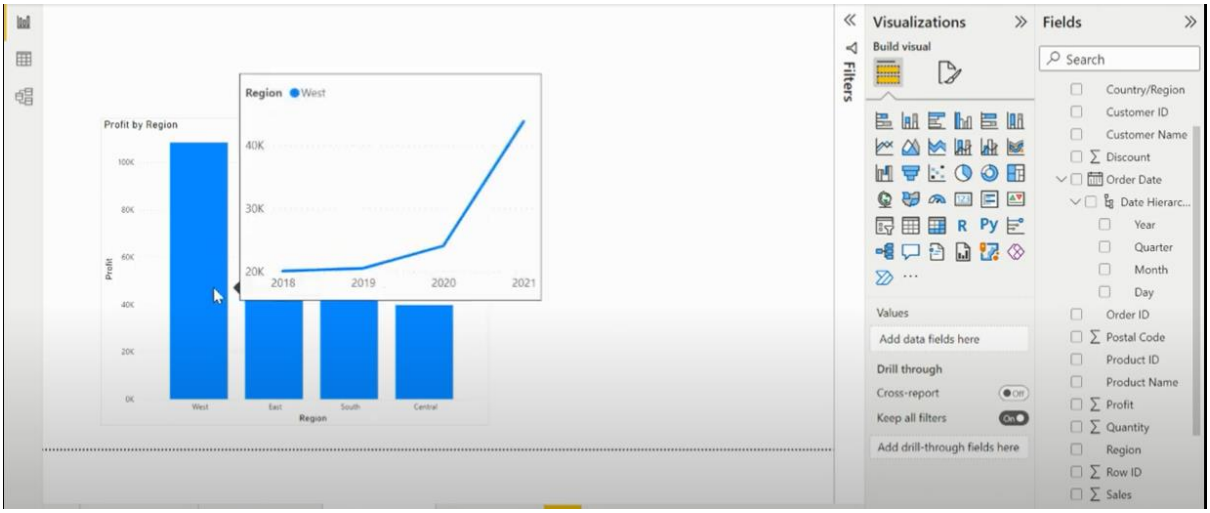

Build visuals with your data
Select or drag fields from the Fields pane onto the report canvas.
Visualizations
Format page
Search
Page information
Name
Region tooltip
Allow use as tooltip
On
Allow Q&A
Off
Reset to default
Canvas settings
Canvas background
Wallpaper
Filter pane
Filter cards
Fields
Search
Year
Quarter
Month
Day
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date
Ship Mode
State
Sub-Category
People2


Visualizations
Format page
Search
Page information
Canvas settings
Type
Tooltip
Height
Width
Vertical alignment
Middle
Reset to default
Canvas background
Fields
Search
Year
Quarter
Month
Day
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date
Ship Mode
State
Sub-Category


Visualizations
Format page
Search
Page information
Canvas settings
Canvas background
Color
Image
Browse...
Image fit
Normal
Transparency
0 %
Reset to default
Filters
Fields
Search
Year
Quarter
Month
Day
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date
Ship Mode
State
Sub-Category
People2


Profit by Year a
Region Central East
2019
Central 11,716.80
East 21,091.01
South 8,318.59
West 20,492.19
50K
0K
Profit
2018
2019
2020
2021
Year
Visualizations
Build visual
Fields
Search
Country/Region
Customer ID
Customer Name
Discount
Order Date
Date Hierarc...
Year
Quarter
Month
Day
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Order Date
Year
Quarter
Month
Day
Legend
Region
Values
Profit
Filters


Profit by Region
100K
80K
60K
40K
20K
0K
Profit
West
East
South
Central
Region
Visualizations
Format visual
Search
Visual
General
Header icons
On
Tooltips
On
Options
Type
Report page
Page
Region tooltip
Text
Background
Reset to default
Fields
Search
Country/Region
Customer ID
Customer Name
Discount
Order Date
Date Hierarc...
Year
Quarter
Month
Day
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Filters

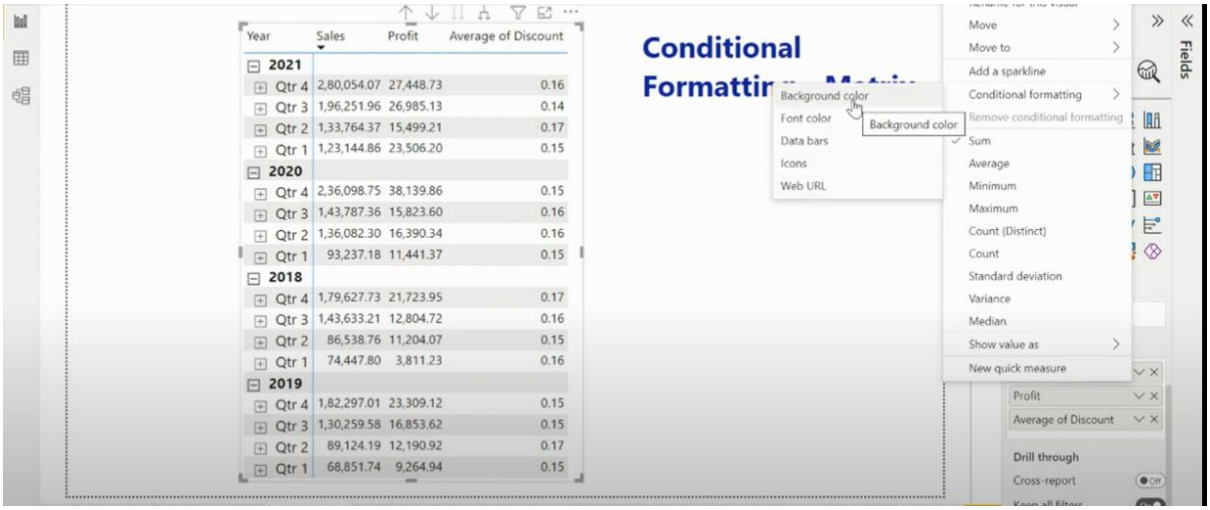


Conditional Formatting

Conditional Formatting – Matrix

Select the matrix visualization -> visualization tab -> select dropdown for any of the values ->

Conditional formatting -> select the type of conditional formatting (background colour, font colour, data bars, icons, web url)



Background Colour – cells will be distinguished from each other based on background colour

Font Colour – cells will be distinguished from each other based on font colour

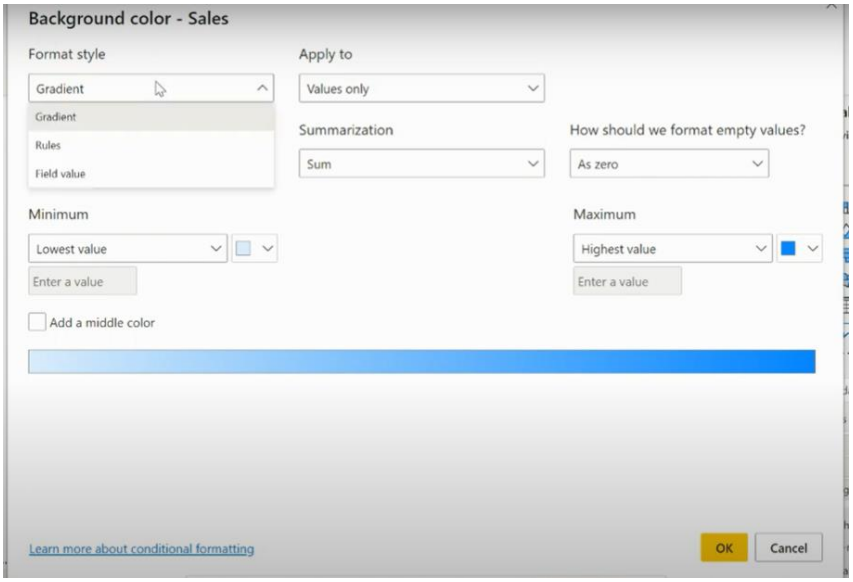
Data Bars –

Icons – cells will be distinguished from each other based on the selected icons from the options,

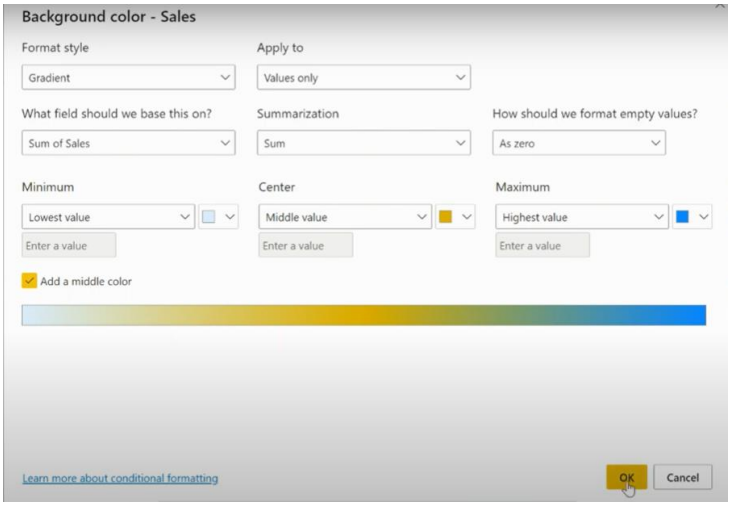
Icons will be displayed alongside the cell values

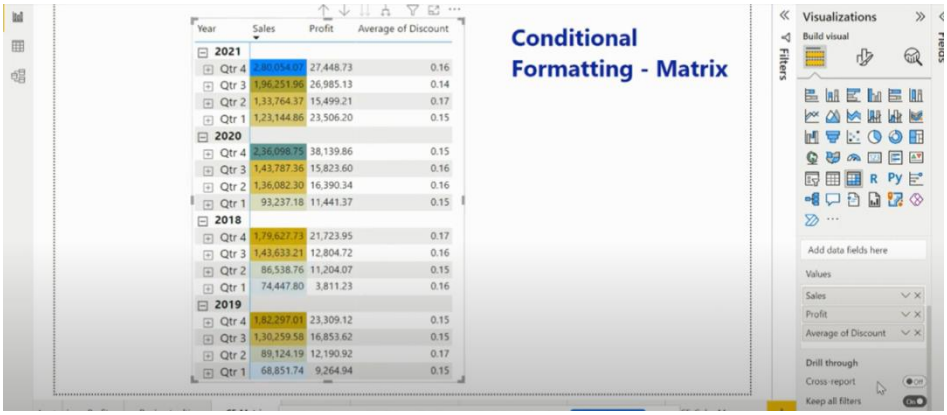
Format Style – Gradient

Cells will be distinguished by shades of two chosen colours

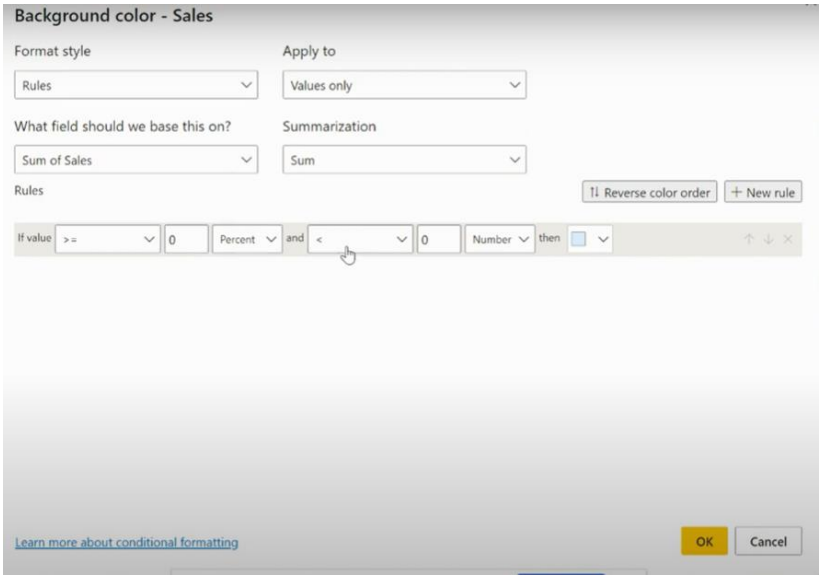


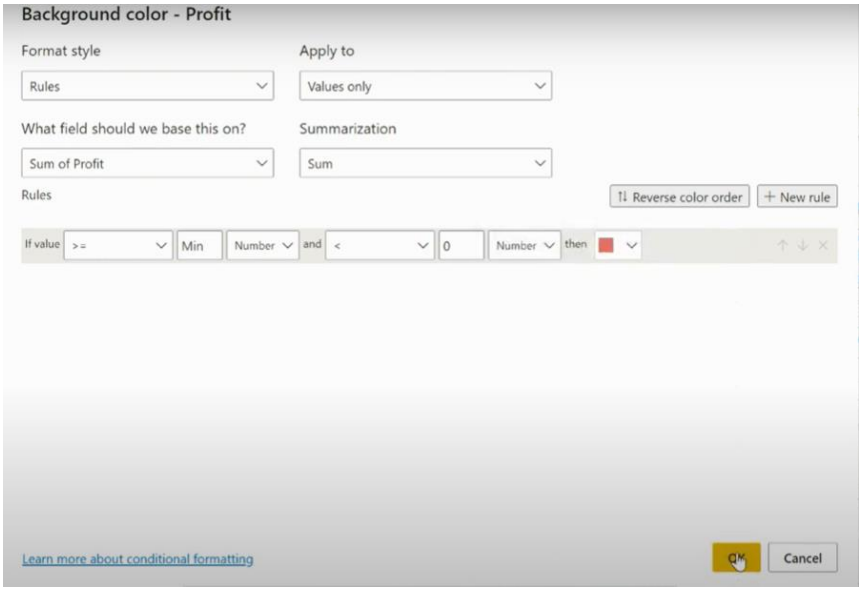
Cells will be distinguished by shades of three chosen colours by selecting the option to add middle colour

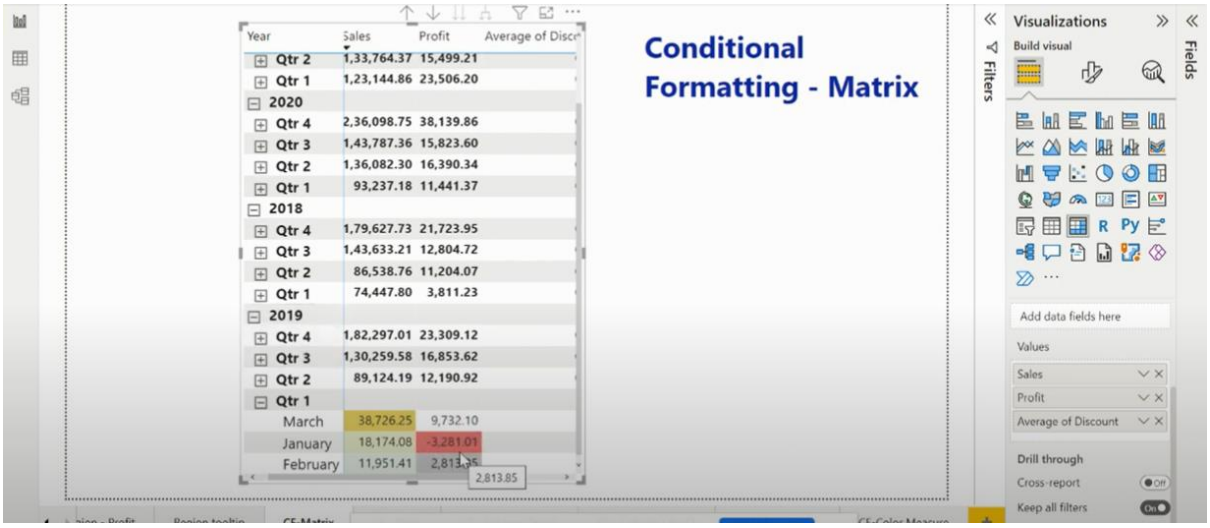




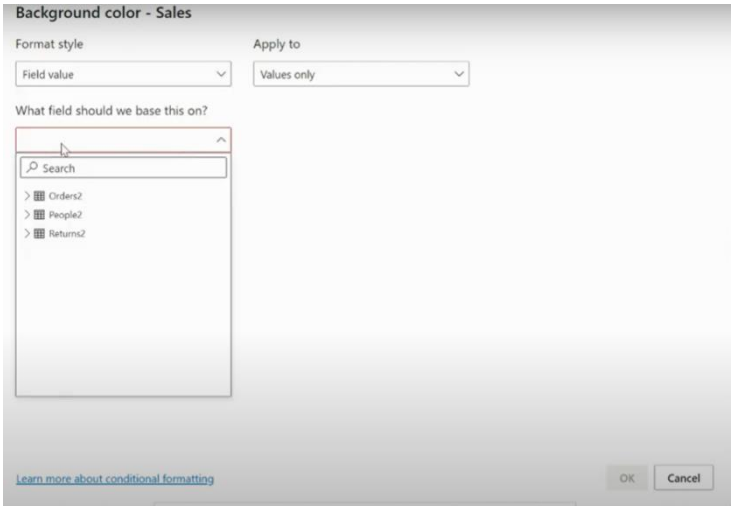
Format Style – Rules



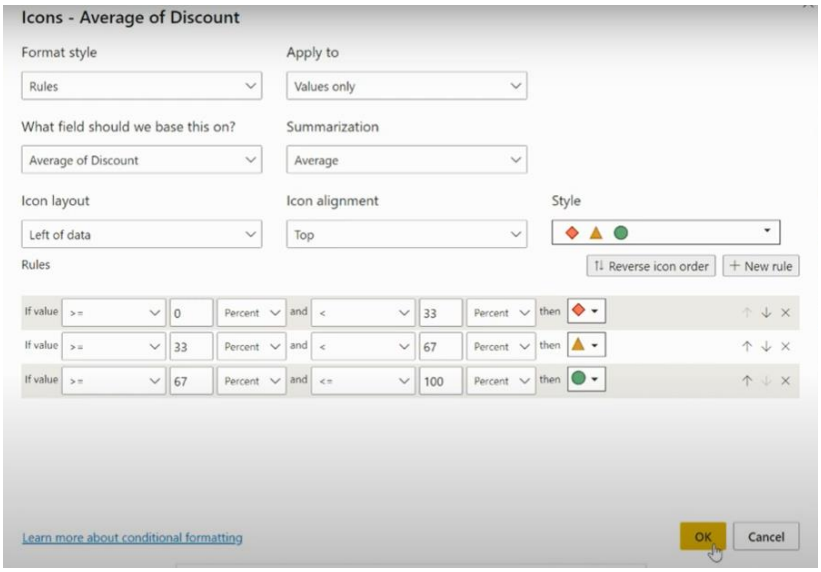


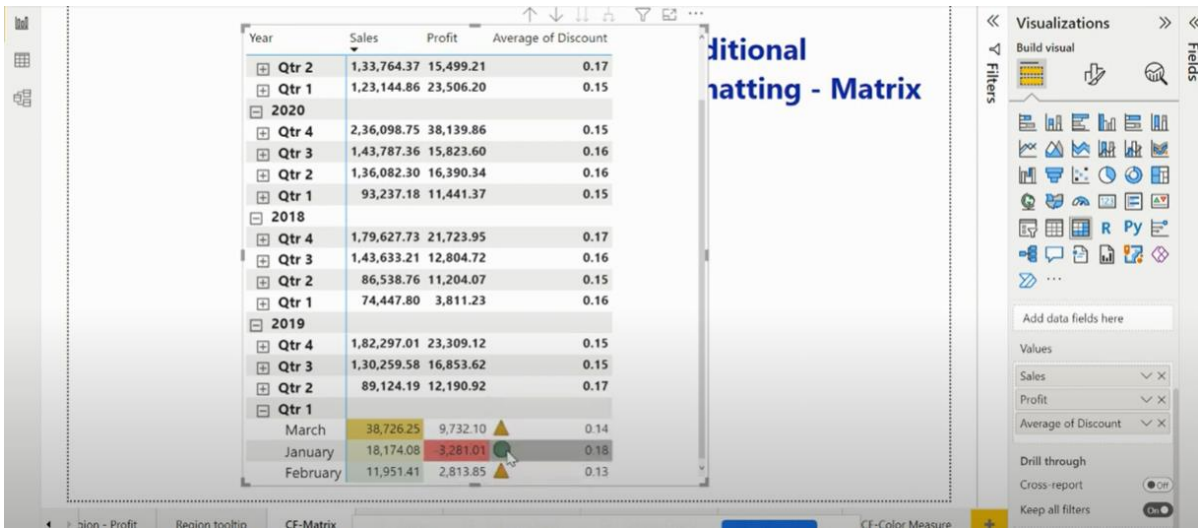


Format Style – Fields



Conditional formatting based on icons

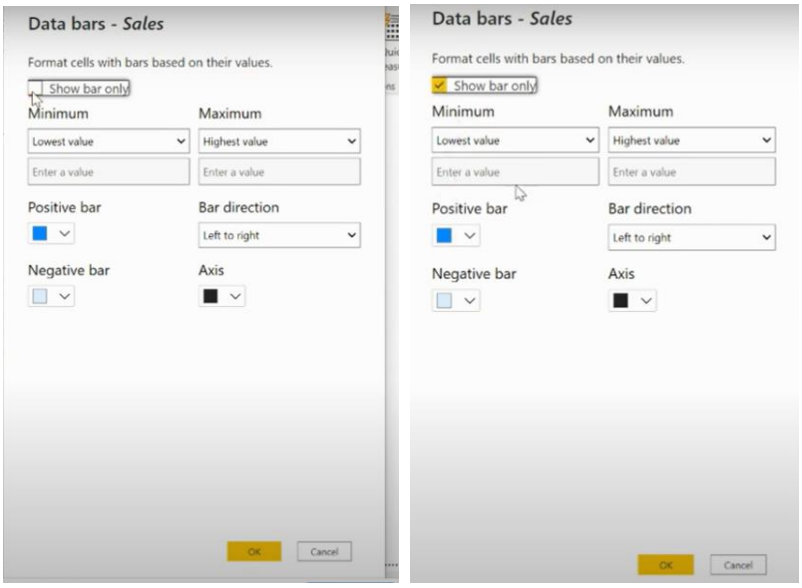


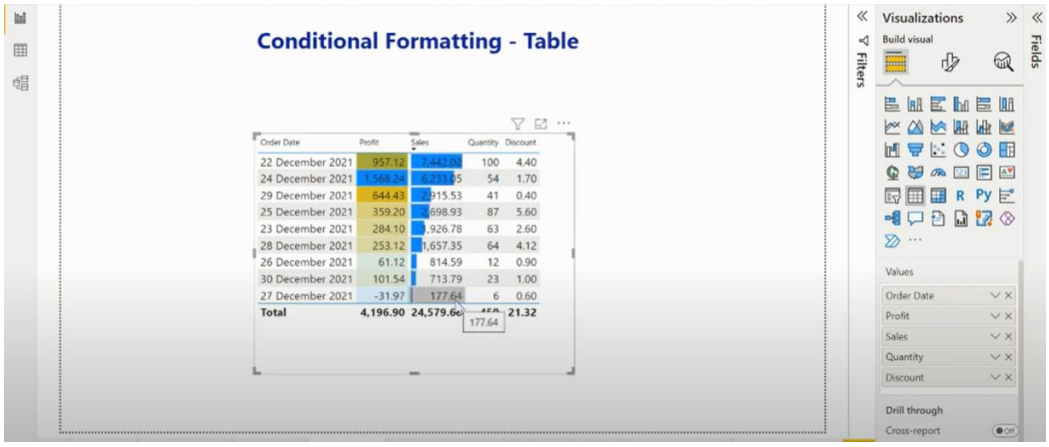


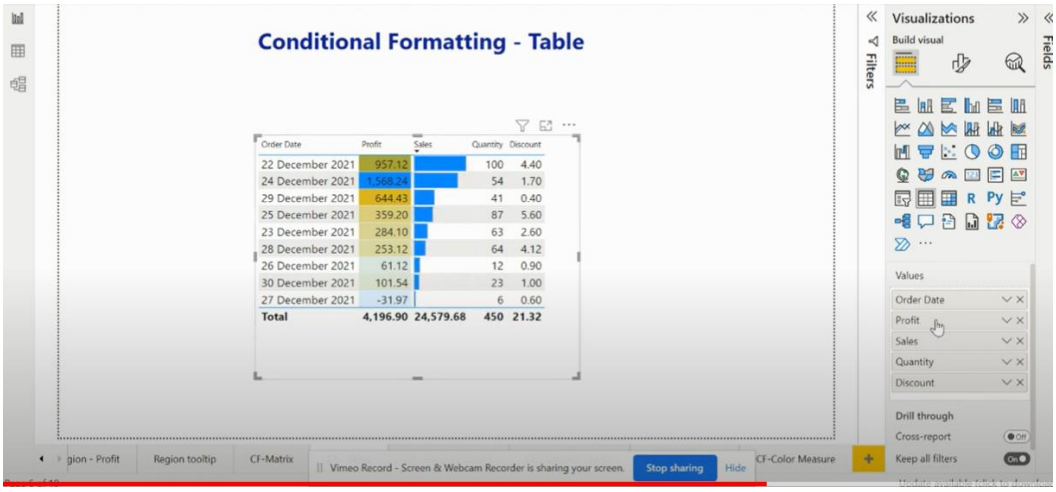
Conditional Formatting – Table

In table-based data, conditional formatting can be applied on categorical data as well whereas in matrix-based data conditional formatting can only be applied on measures.

Conditional formatting based on data bars







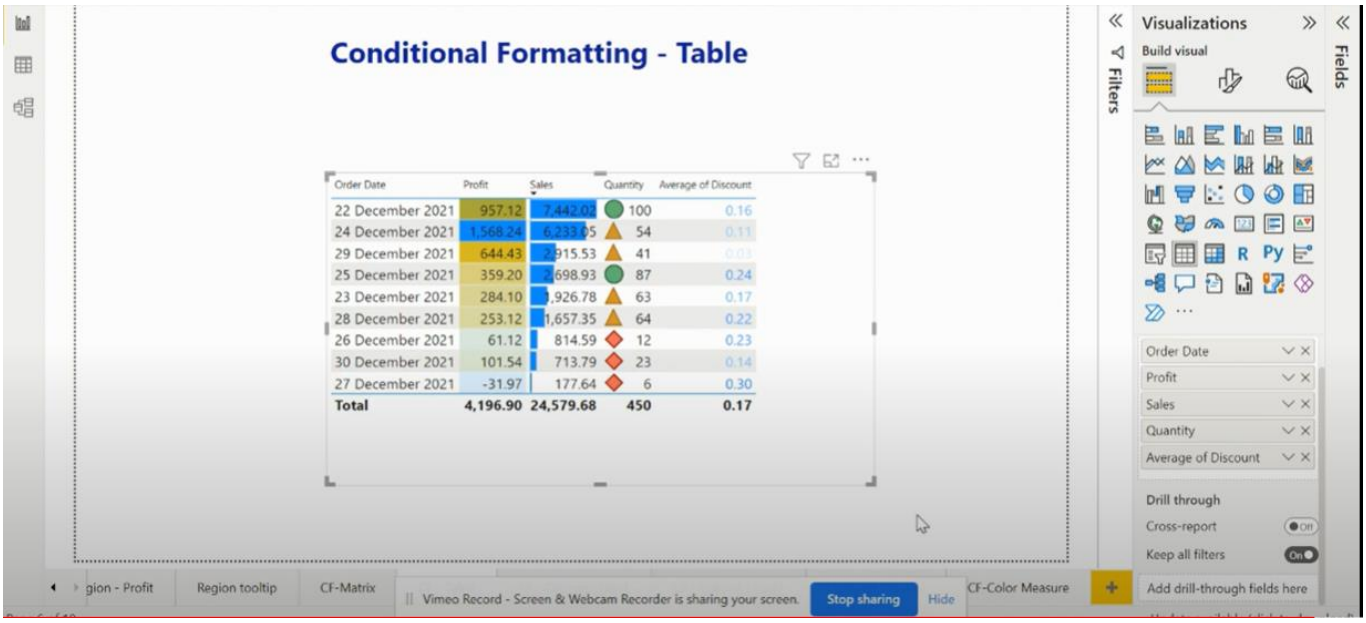
Different Types of Conditional Formatting

Profit – Based on Background Colour

Sales– Based on Data bars

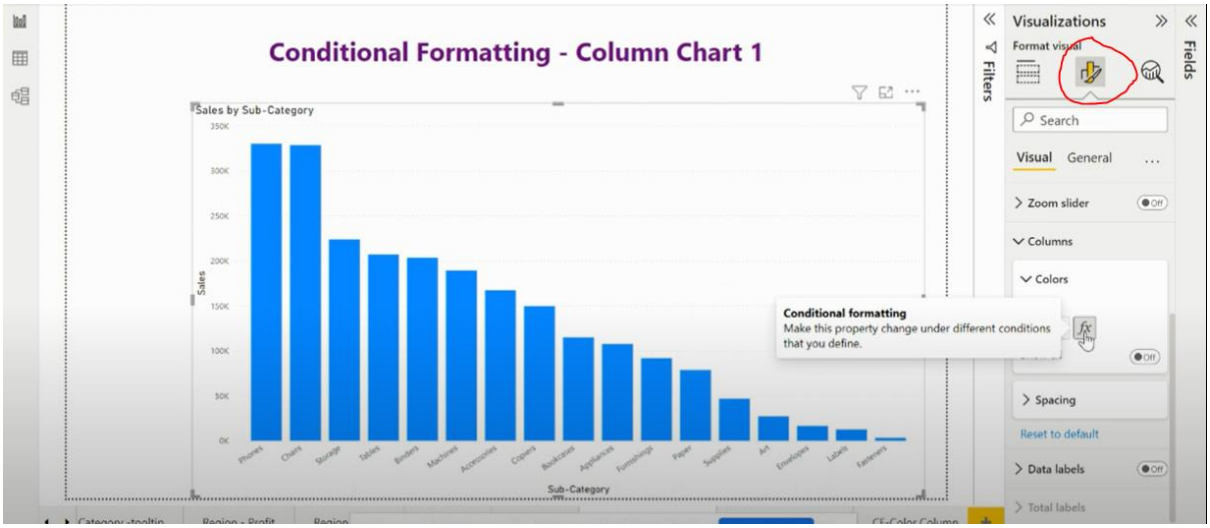
Quantity – Based on icons

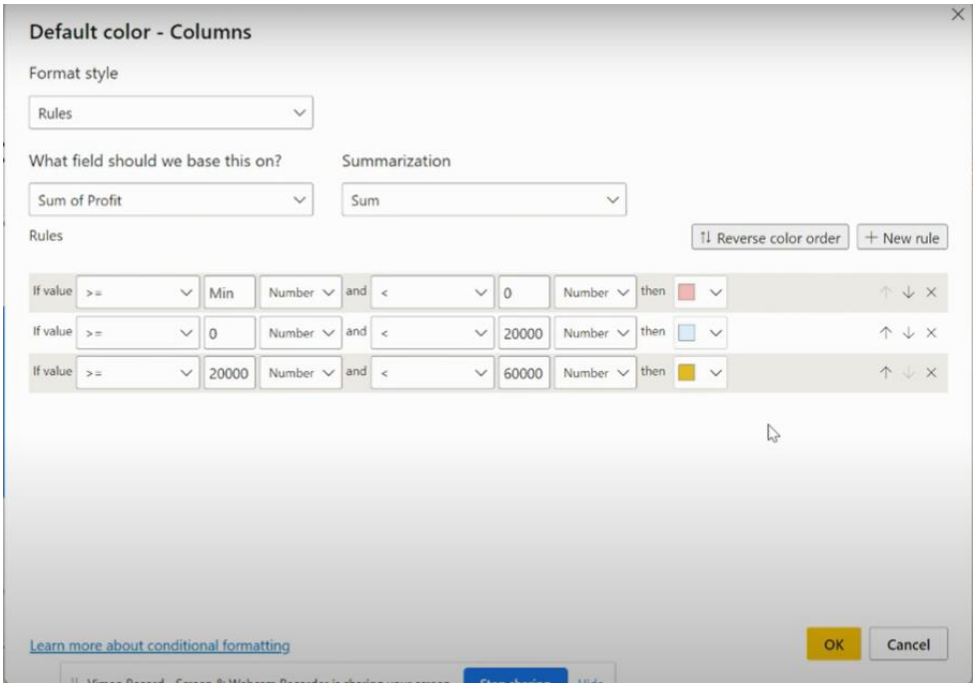
Avg. Discount – Based on font colour

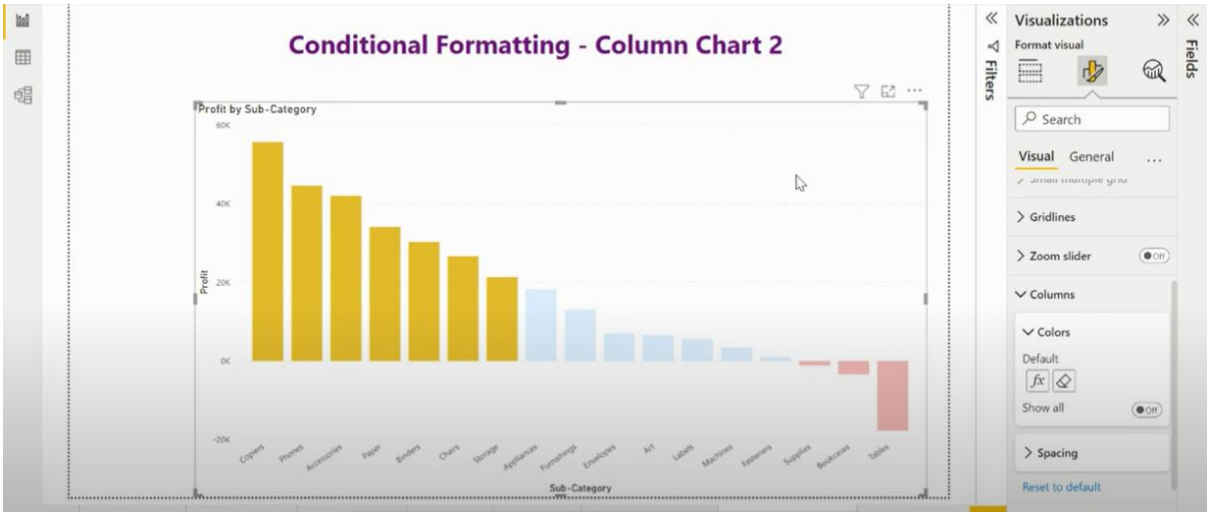


Conditional Formatting – Column Chart

Select visualization -> format visual -> columns -> colours -> conditional formatting (fx) -> rest same





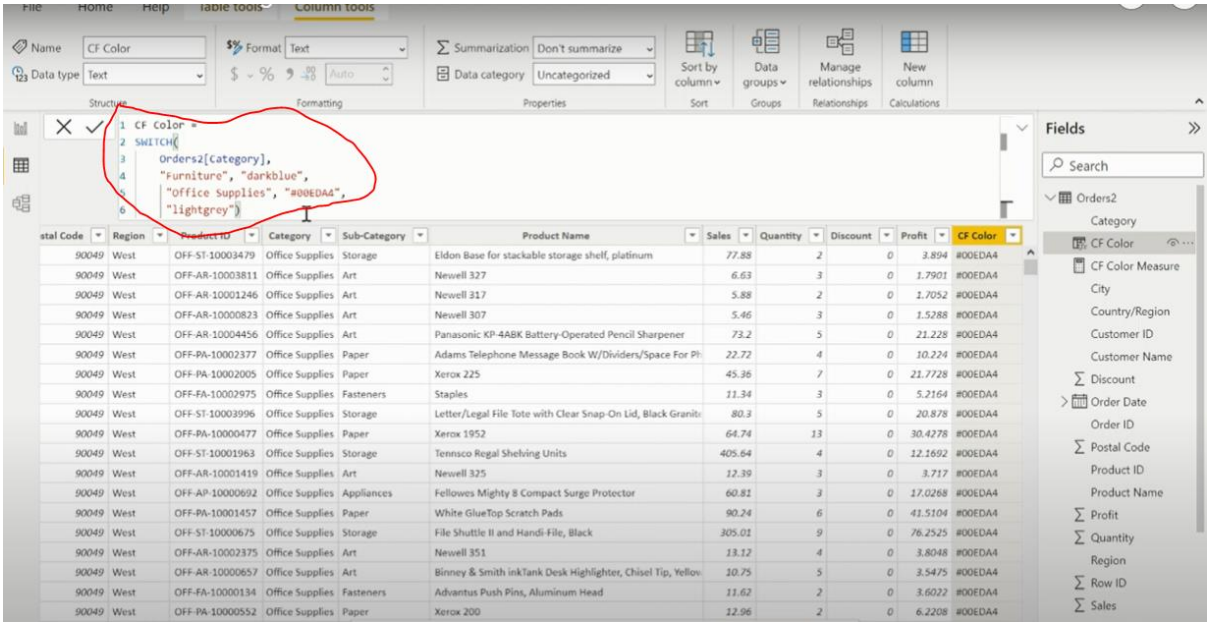


Conditional Formatting – based on Calculated Column

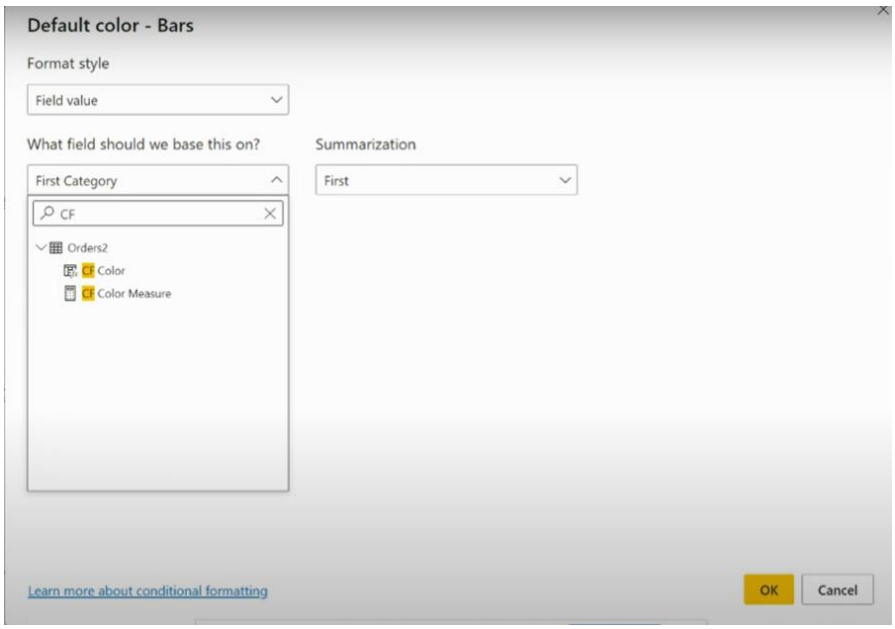
Go to data section -> create calculated column using DAX expression (switch is dax expression)

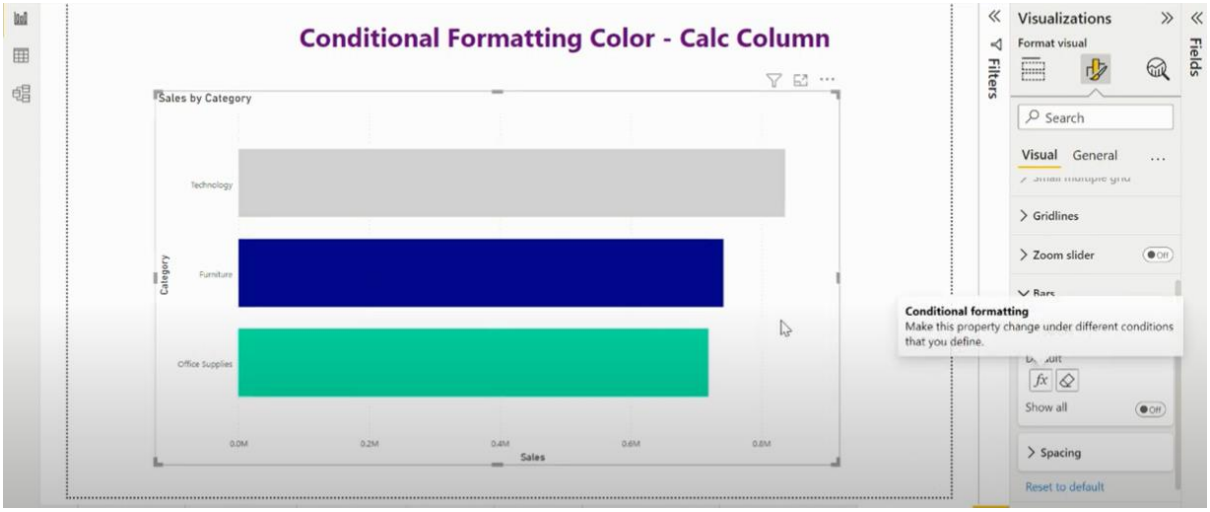
Select visualization -> format visual -> bars -> colours -> conditional formatting (fx) ->

format style (field value) -> first category (select calculated column)



stal Code	Region	Product ID	Category	Sub-Category	Product Name	Sales	Quantity	Discount	Profit	CF Color
90049	West	OFF-ST-10003479	Office Supplies	Storage	Eldon Base for stackable storage shelf, platinum	77.88	2	0	3.894	#00EDA4
90049	West	OFF-AR-10003811	Office Supplies	Art	Newell 327	6.63	3	0	1.7901	#00EDA4
90049	West	OFF-AR-10001246	Office Supplies	Art	Newell 317	5.88	2	0	1.7052	#00EDA4
90049	West	OFF-AR-10000823	Office Supplies	Art	Newell 307	5.46	3	0	1.5288	#00EDA4
90049	West	OFF-AR-10004456	Office Supplies	Art	Panasonic KP-4ABK Battery-Operated Pencil Sharpener	73.2	5	0	21.228	#00EDA4
90049	West	OFF-PA-10002377	Office Supplies	Paper	Adams Telephone Message Book W/Dividers/Space For Ph	22.72	4	0	10.224	#00EDA4
90049	West	OFF-PA-10002005	Office Supplies	Paper	Xerox 225	45.36	7	0	21.7728	#00EDA4
90049	West	OFF-FA-10002975	Office Supplies	Fasteners	Staples	11.34	3	0	5.2164	#00EDA4
90049	West	OFF-ST-10003996	Office Supplies	Storage	Letter/Legal File Tote with Clear Snap-On Lid, Black Granit	80.3	5	0	20.878	#00EDA4
90049	West	OFF-PA-10000477	Office Supplies	Paper	Xerox 1952	64.74	13	0	30.4278	#00EDA4
90049	West	OFF-ST-10001963	Office Supplies	Storage	Tennsco Regal Shelving Units	405.64	4	0	12.1692	#00EDA4
90049	West	OFF-AR-10001419	Office Supplies	Art	Newell 325	12.39	3	0	3.717	#00EDA4
90049	West	OFF-AP-10000692	Office Supplies	Appliances	Fellowes Mighty 8 Compact Surge Protector	60.81	3	0	17.0268	#00EDA4
90049	West	OFF-PA-10001457	Office Supplies	Paper	White GlueTop Scratch Pads	90.24	6	0	41.5104	#00EDA4
90049	West	OFF-ST-10000675	Office Supplies	Storage	File Shuttle II and Handi-File, Black	305.01	9	0	76.2525	#00EDA4
90049	West	OFF-AR-10002375	Office Supplies	Art	Newell 351	13.12	4	0	3.8048	#00EDA4
90049	West	OFF-AR-10000657	Office Supplies	Art	Binney & Smith inkTank Desk Highlighter, Chisel Tip, Yellow	10.75	5	0	3.5475	#00EDA4
90049	West	OFF-FA-10000134	Office Supplies	Fasteners	Advantus Push Pins, Aluminum Head	11.62	2	0	3.6022	#00EDA4
90049	West	OFF-PA-10000552	Office Supplies	Paper	Xerox 200	12.96	2	0	6.2208	#00EDA4



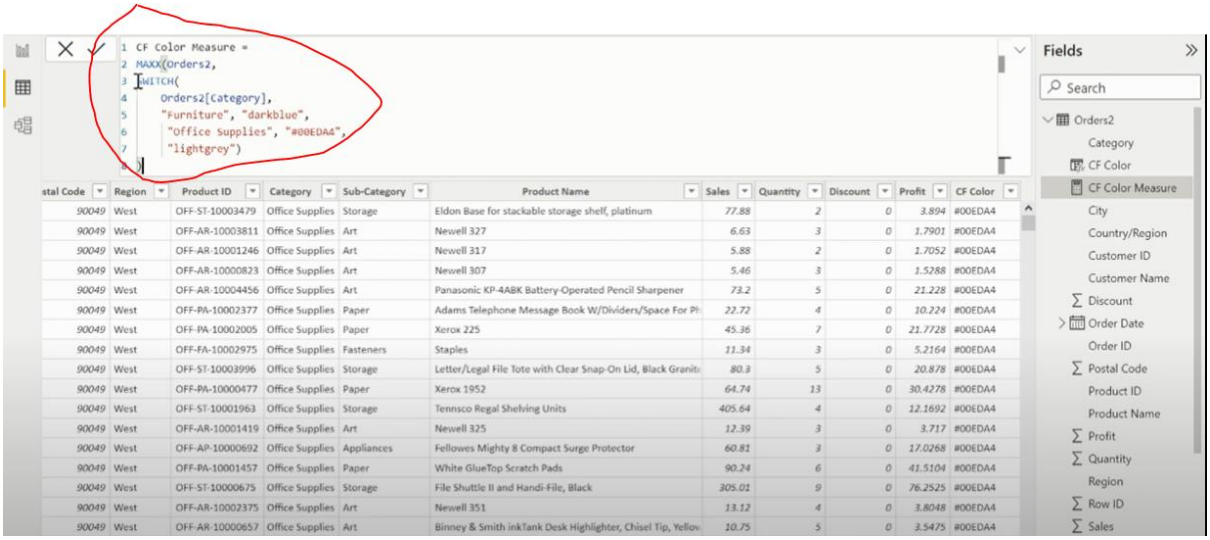


Conditional Formatting – based on Measure

Go to data section -> create calculated measure using DAX expression (switch is dax expression) (maxx aggregation function is used on top of switch bec. Measures are aggregated values so we need to aggregation function)

Select visualization -> format visual -> bars -> colours -> conditional formatting (fx) ->

format style (field value) -> first category (select calculated column)

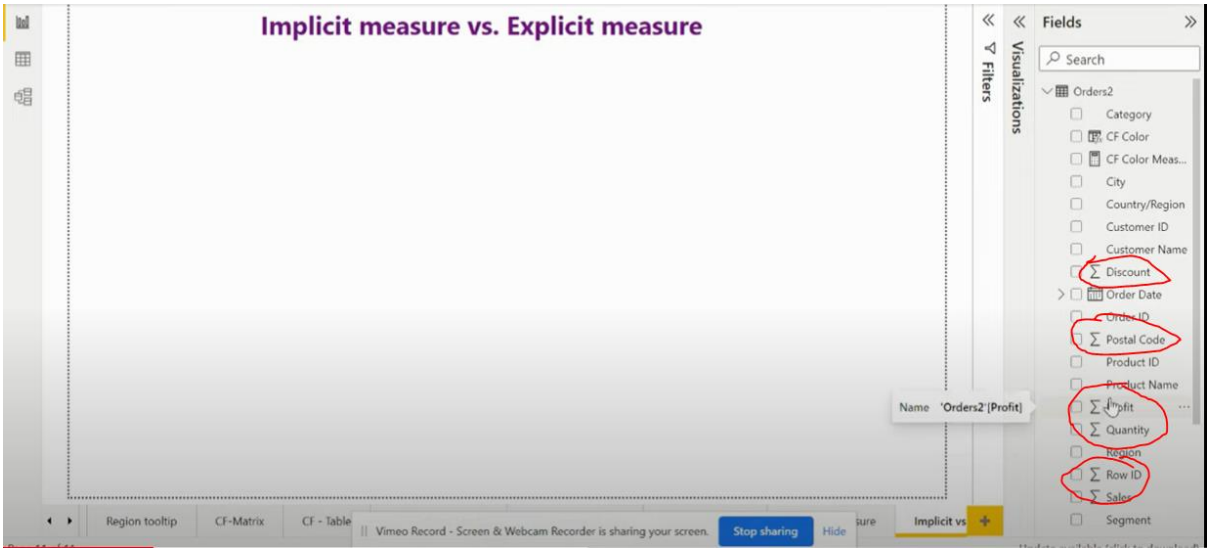


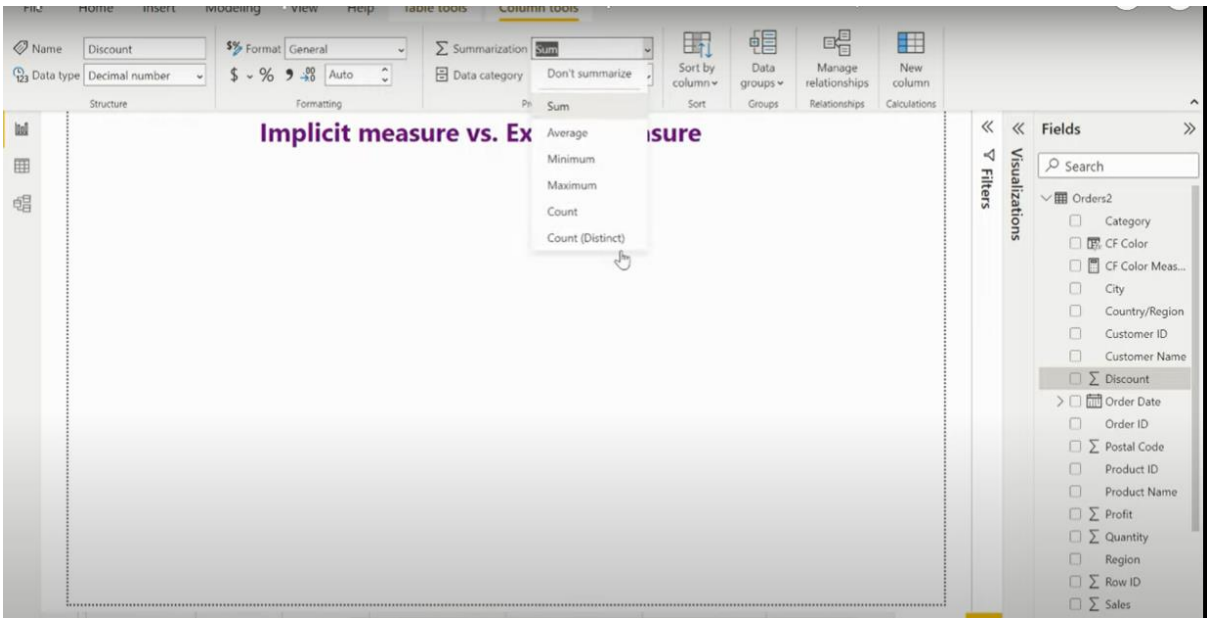
stal Code	Region	Product ID	Category	Sub-Category	Product Name	Sales	Quantity	Discount	Profit	CF Color
90049	West	OFF-ST-10003479	Office Supplies	Storage	Eldon Base for stackable storage shelf, platinum	77.88	2	0	3.894	#00EDA4
90049	West	OFF-AR-10003811	Office Supplies	Art	Newell 327	6.63	3	0	1.7901	#00EDA4
90049	West	OFF-AR-10001246	Office Supplies	Art	Newell 317	5.88	2	0	1.7052	#00EDA4
90049	West	OFF-AR-10000823	Office Supplies	Art	Newell 307	5.46	3	0	1.5288	#00EDA4
90049	West	OFF-AR-10004456	Office Supplies	Art	Panasonic KP-4ABK Battery-Operated Pencil Sharpener	73.2	5	0	21.228	#00EDA4
90049	West	OFF-PA-10002377	Office Supplies	Paper	Adams Telephone Message Book W/Dividers/Space For Ph	22.72	4	0	10.224	#00EDA4
90049	West	OFF-PA-10002005	Office Supplies	Paper	Xerox 225	45.36	7	0	21.7728	#00EDA4
90049	West	OFF-FA-10002975	Office Supplies	Fasteners	Staples	11.34	3	0	5.2164	#00EDA4
90049	West	OFF-ST-10003996	Office Supplies	Storage	Letter/Legal File Tote with Clear Snap-On Lid, Black Granit	80.3	5	0	20.878	#00EDA4
90049	West	OFF-PA-10000477	Office Supplies	Paper	Xerox 1952	64.74	13	0	30.4278	#00EDA4
90049	West	OFF-ST-10001963	Office Supplies	Storage	Tennsco Regal Shelving Units	405.64	4	0	12.1692	#00EDA4
90049	West	OFF-AR-10001419	Office Supplies	Art	Newell 325	12.39	3	0	3.717	#00EDA4
90049	West	OFF-AP-10000692	Office Supplies	Appliances	Fellowes Mighty 8 Compact Surge Protector	60.81	3	0	17.0268	#00EDA4
90049	West	OFF-PA-10001457	Office Supplies	Paper	White GlueTop Scratch Pads	90.24	6	0	41.5104	#00EDA4
90049	West	OFF-ST-10000675	Office Supplies	Storage	File Shuttle II and Handi-File, Black	305.01	9	0	76.2525	#00EDA4
90049	West	OFF-AR-10002375	Office Supplies	Art	Newell 351	13.12	4	0	3.8048	#00EDA4
90049	West	OFF-AR-10000657	Office Supplies	Art	Binney & Smith inkTank Desk Highlighter, Chisel Tip, Yellow	10.75	5	0	3.5475	#00EDA4

Implicit Measure v/s Explicit Measure

Implicit Measure

Whenever we load any dataset into power Bi, it identifies the numerical columns automatically and it allows us to do summarization on that column by default and it is indicated by the summarization icon(∑) next to it. It means power bi has identified them as measure. We can change the measure as per our need. This is called as implicit measure.

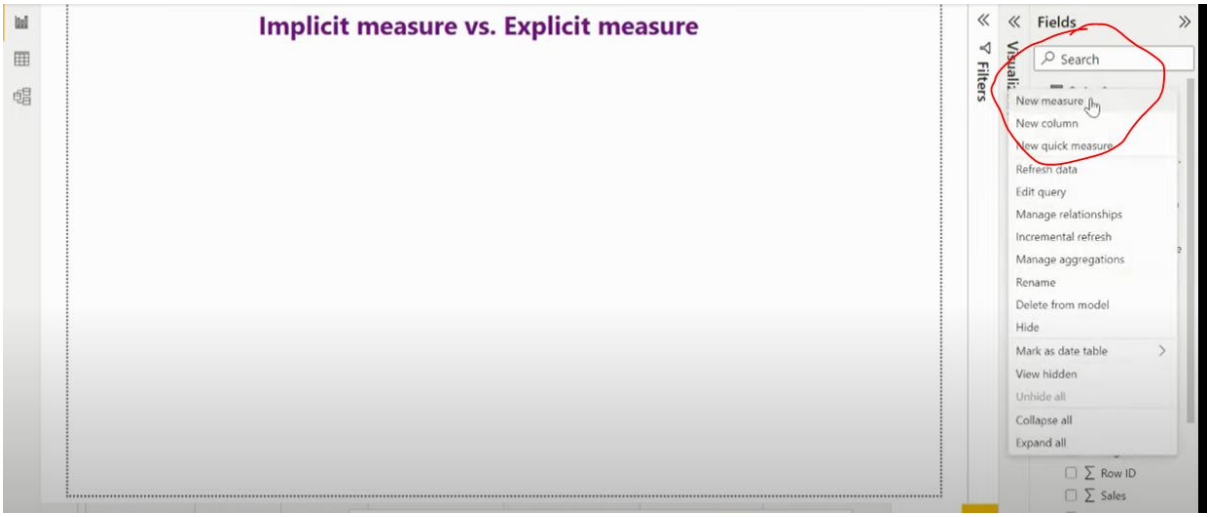


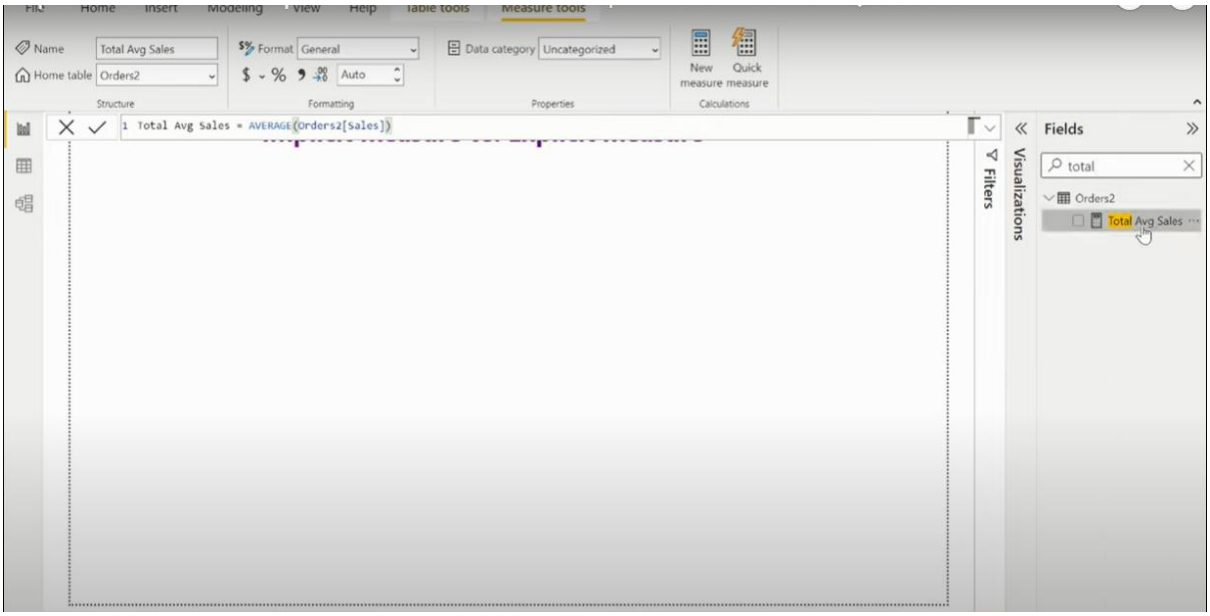


Explicit Measure

Explicit measure can be created by writing the formula. We specify the aggregation to be used explicitly.

Implicit measure are not reusable whereas we can reuse the explicit measure inside other calculations.





Variables in Power BI

Use of variable makes it easier to read

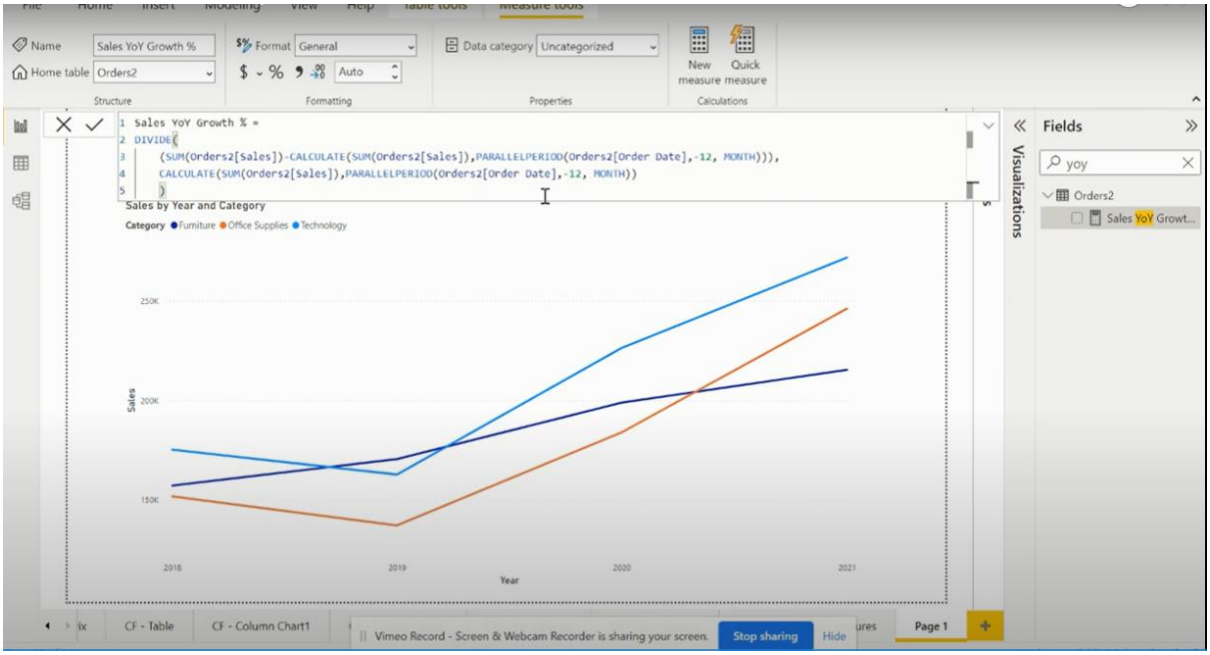
Makes it simpler to debug in case of error

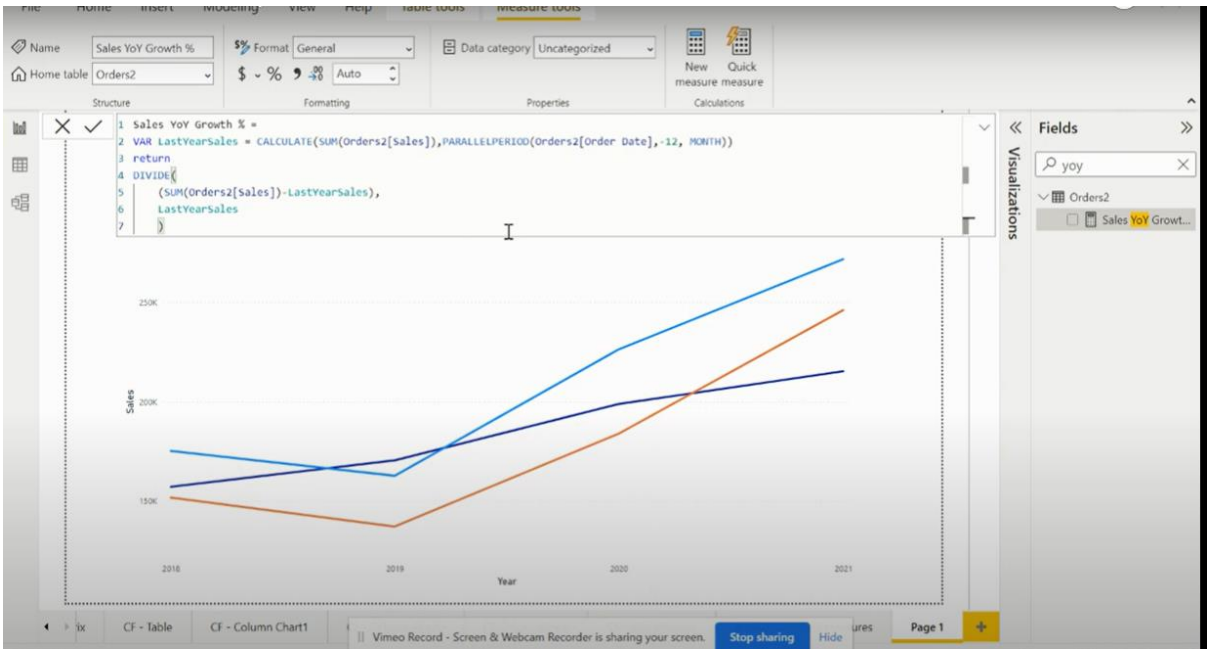
Reduces the complexity of calculation

Improvised the overall performance

“VAR” function is used to define the variable

“Parallelperiod” function is used to calculate sales for previous 12 months





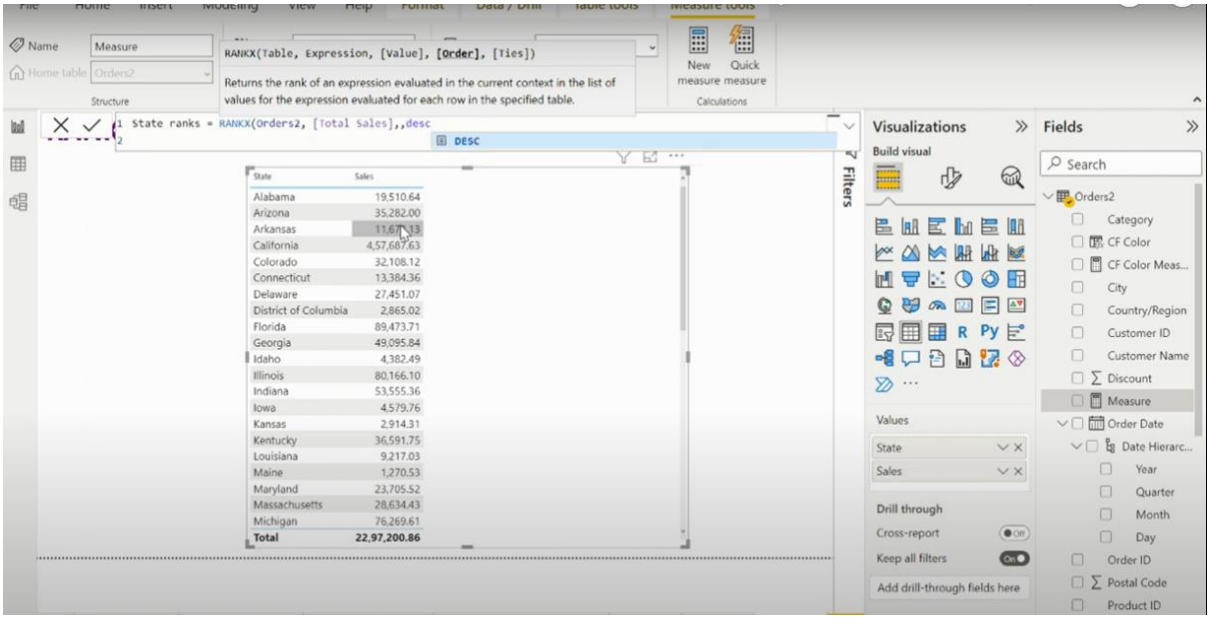
DAX (Data Analysis Expression) in Power BI?

It is used in power bi analysis services and power pivot

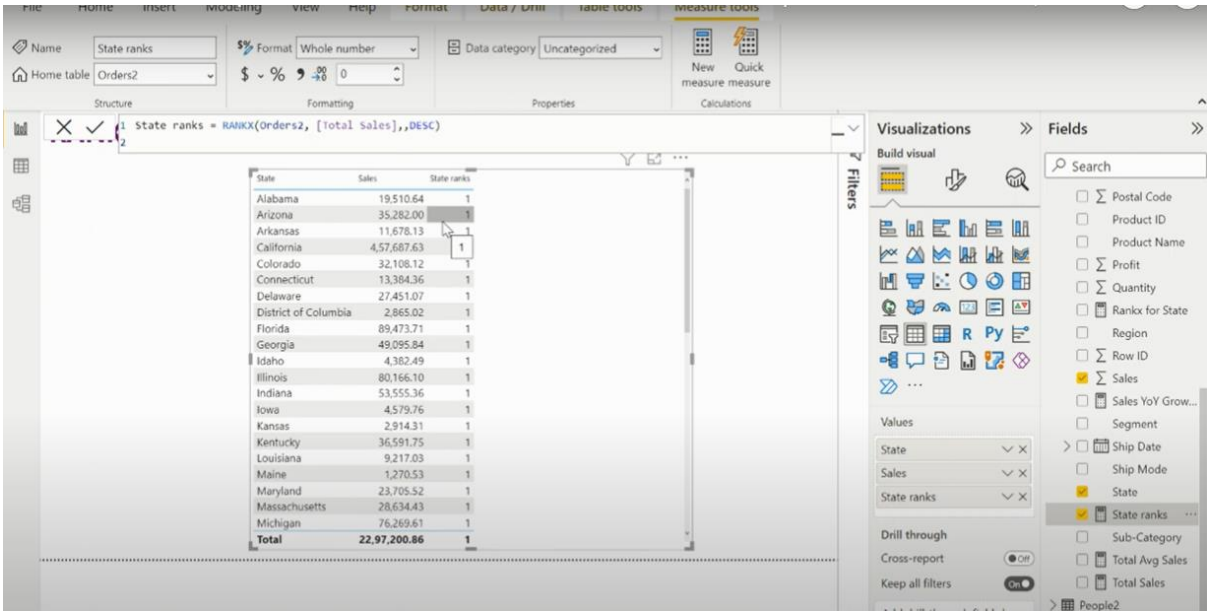
It is collection of functions, operators and constants that can be used in formulas/expression in order to calculate or return one or more values.

RankX function in Power BI

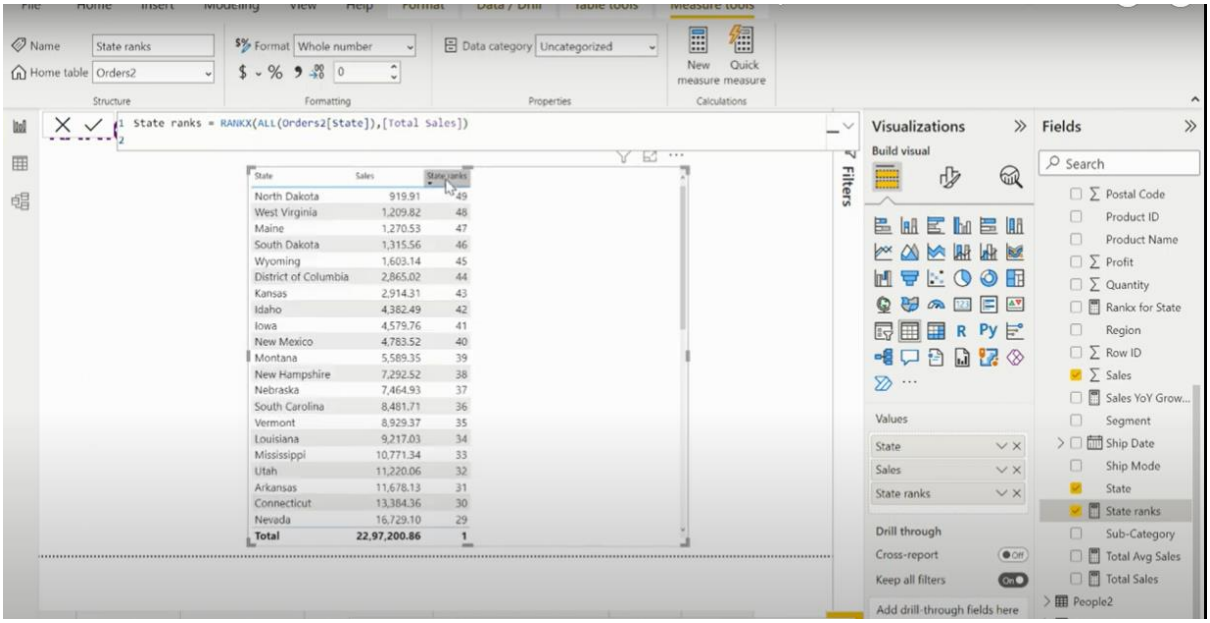
Can be created using a new measure



Adding newly created **RankX** dax to values. But this is not the result we wanted. Here ranks are calculated at each row (data is filtered at each row)

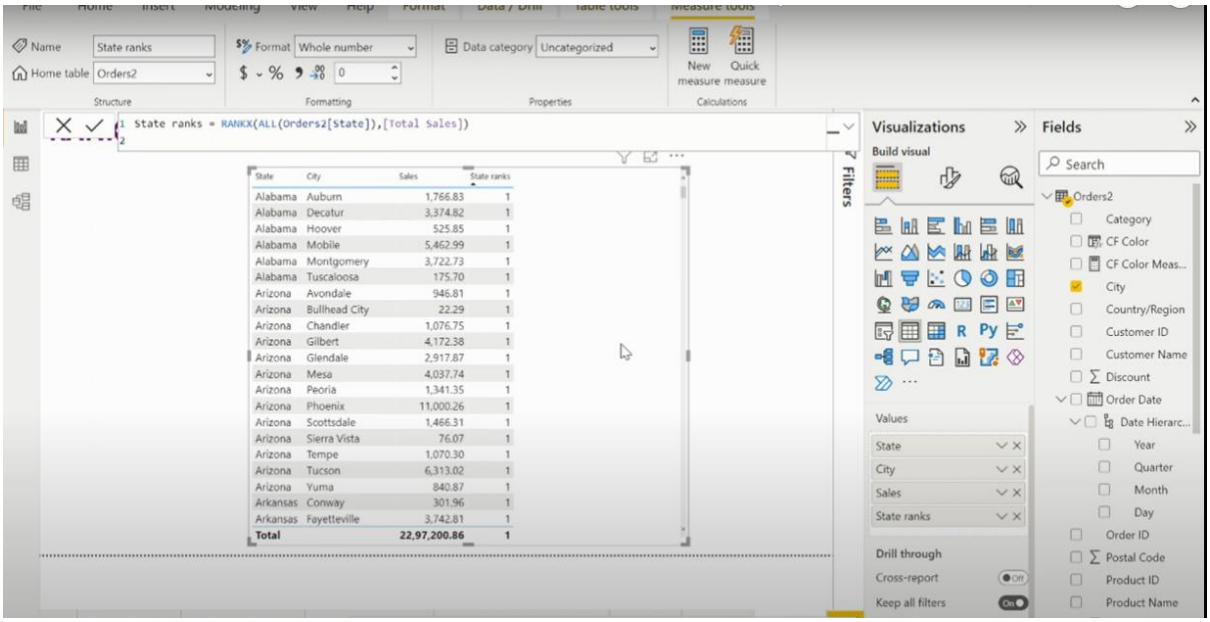


We will use **ALL** function inside **RankX** function to solve this issue.



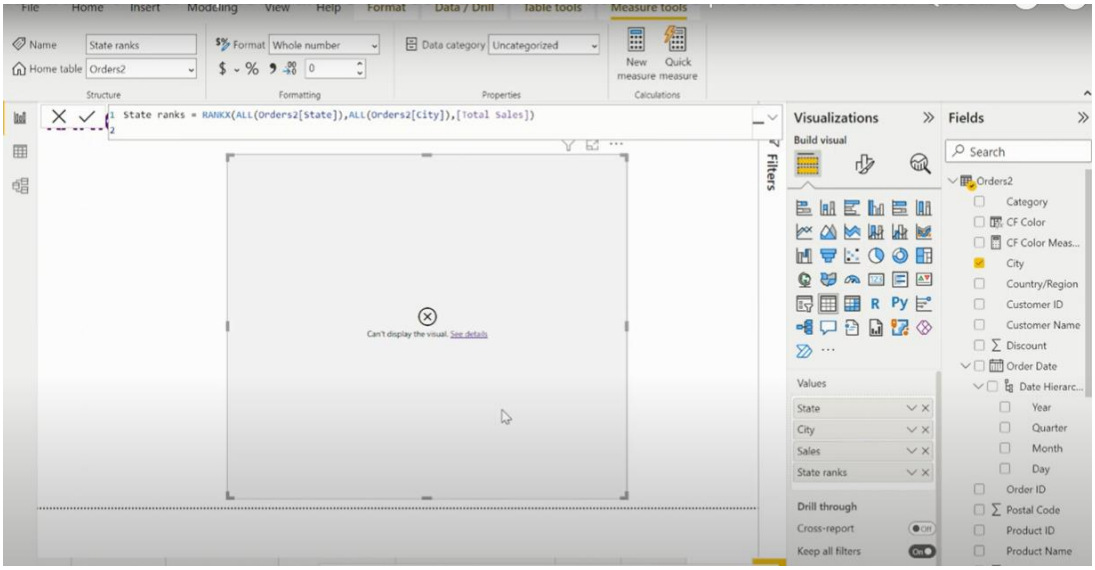
State	Sales	State ranks
North Dakota	919.91	49
West Virginia	1,209.82	48
Maine	1,270.53	47
South Dakota	1,315.56	46
Wyoming	1,603.14	45
District of Columbia	2,865.02	44
Kansas	2,914.31	43
Idaho	4,382.49	42
Iowa	4,579.76	41
New Mexico	4,783.52	40
Montana	5,589.35	39
New Hampshire	7,292.52	38
Nebraska	7,464.93	37
South Carolina	8,481.71	36
Vermont	8,929.37	35
Louisiana	9,217.03	34
Mississippi	10,771.34	33
Utah	11,220.06	32
Arkansas	11,678.13	31
Connecticut	13,384.36	30
Nevada	16,729.10	29
Total	**22,97,200.86**	**1**

Adding another column inside the visualization. Again filtering is done at row level.

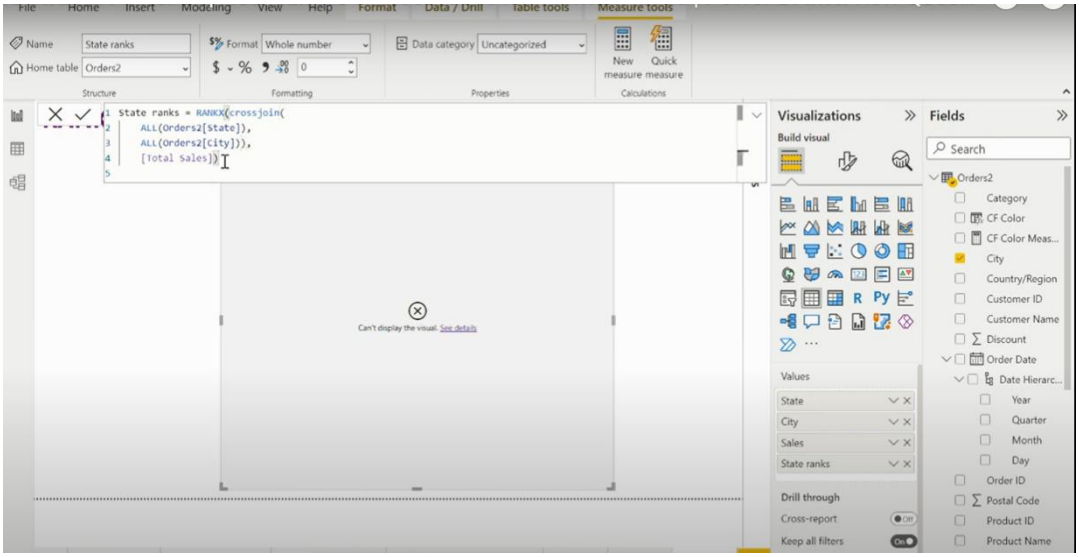


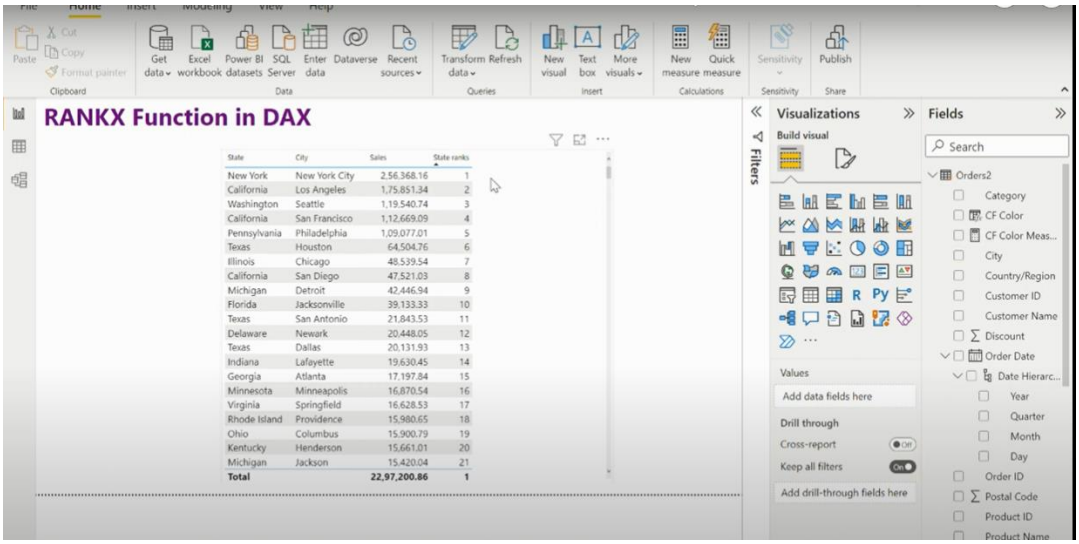
State	City	Sales	State ranks
Alabama	Auburn	1,766.83	1
Alabama	Decatur	3,374.82	1
Alabama	Hoover	525.85	1
Alabama	Mobile	5,462.99	1
Alabama	Montgomery	3,722.73	1
Alabama	Tuscaloosa	175.70	1
Arizona	Avondale	946.81	1
Arizona	Bullhead City	22.29	1
Arizona	Chandler	1,076.75	1
Arizona	Gilbert	4,172.38	1
Arizona	Glendale	2,917.87	1
Arizona	Mesa	4,037.74	1
Arizona	Peoria	1,341.35	1
Arizona	Phoenix	11,000.26	1
Arizona	Scottsdale	1,466.31	1
Arizona	Sierra Vista	76.07	1
Arizona	Tempe	1,070.30	1
Arizona	Tucson	6,313.02	1
Arizona	Yuma	840.87	1
Arkansas	Conway	301.96	1
Arkansas	Fayetteville	3,742.81	1
Total		**22,97,200.86**	**1**

Inserting **2 ALL** functions inside **RankX** is not an option.



2 ALL functions needs to be defined inside **crssjoin** function.





State	City	Sales	State ranks
New York	New York City	2,56,368.16	1
California	Los Angeles	1,75,851.34	2
Washington	Seattle	1,19,540.74	3
California	San Francisco	1,12,669.09	4
Pennsylvania	Philadelphia	1,09,077.01	5
Texas	Houston	64,504.76	6
Illinois	Chicago	48,539.54	7
California	San Diego	47,521.03	8
Michigan	Detroit	42,446.94	9
Florida	Jacksonville	39,133.33	10
Texas	San Antonio	21,843.53	11
Delaware	Newark	20,448.05	12
Texas	Dallas	20,131.93	13
Indiana	Lafayette	19,630.45	14
Georgia	Atlanta	17,197.84	15
Minnesota	Minneapolis	16,870.54	16
Virginia	Springfield	16,628.53	17
Rhode Island	Providence	15,980.65	18
Ohio	Columbus	15,900.79	19
Kentucky	Henderson	15,661.01	20
Michigan	Jackson	15,420.04	21
Total		**22,97,200.86**	**1**

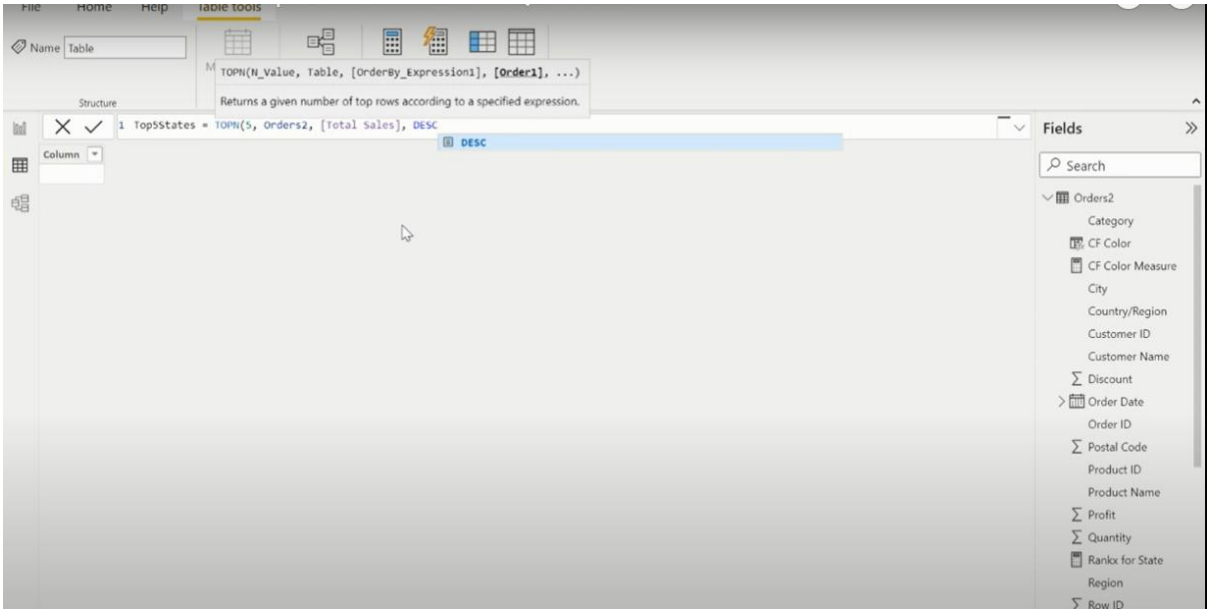
TOPN function in Power BI

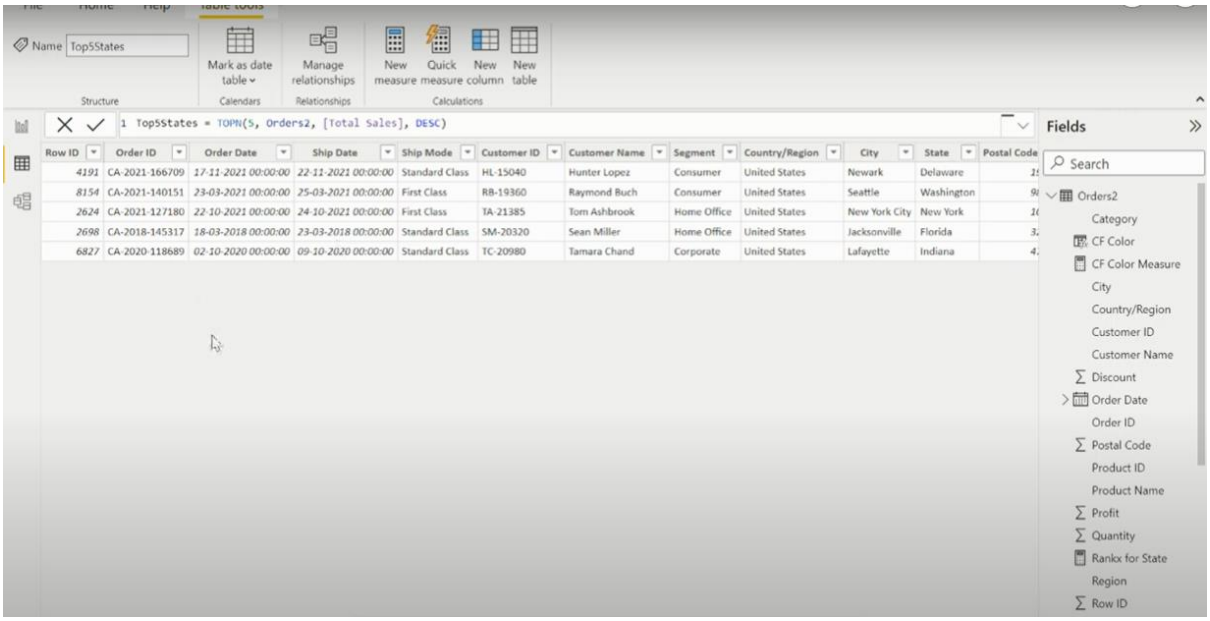
Used to get top and bottom N values from the data.

Can be created using a new table **(data section -> new table)**

Desc – will give top n values

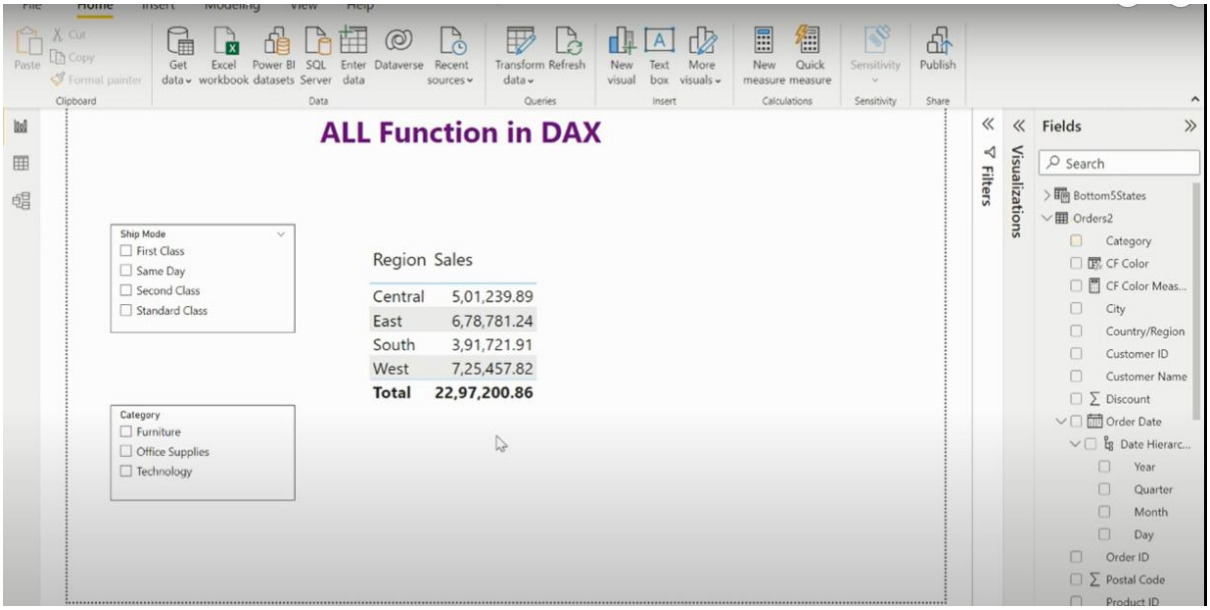
Asc – will give bottom n values



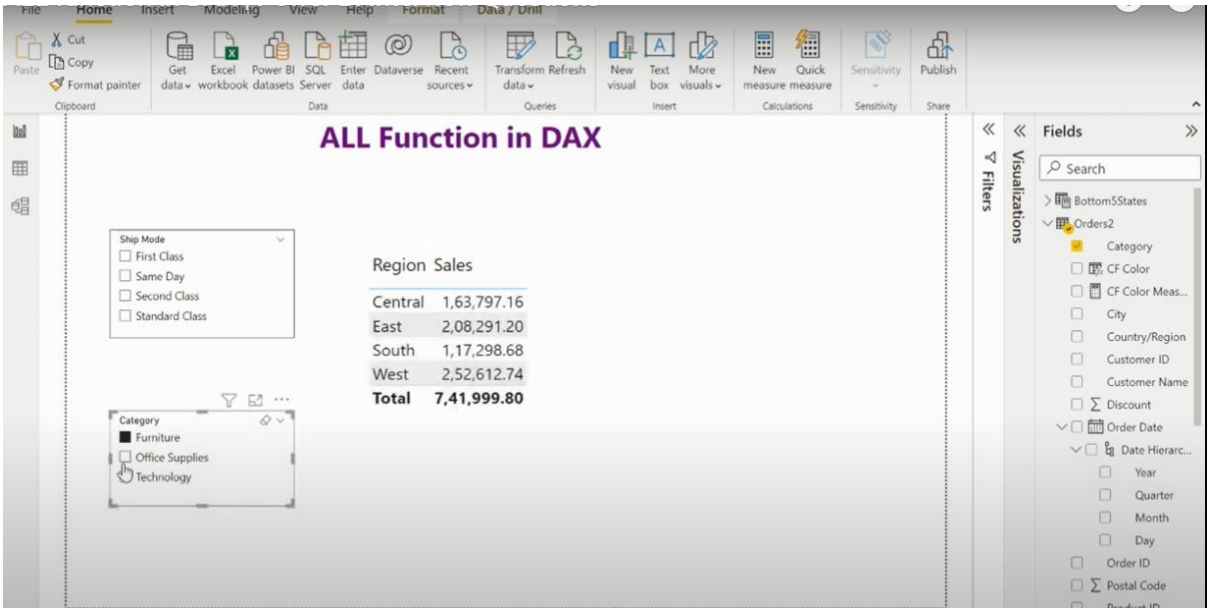


ALL function in Power BI

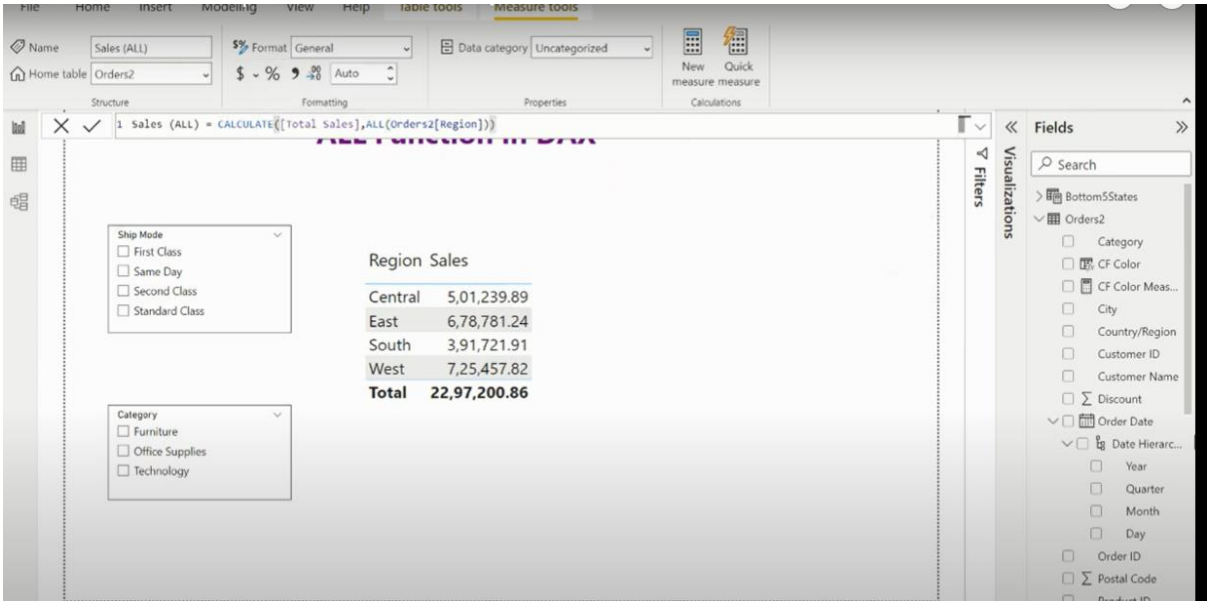
ALL function is used to ignore any filter being applied on the data



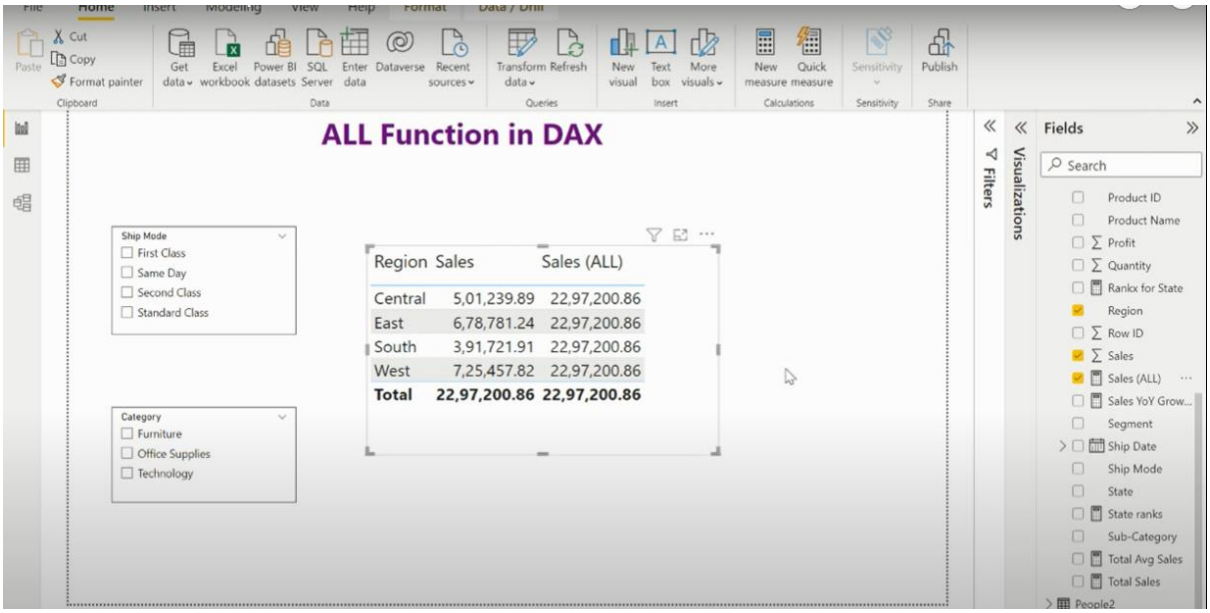
After applying filter (from category slicer) sales values are getting updated. But I want to see all sales value for each region alongside filtered value.



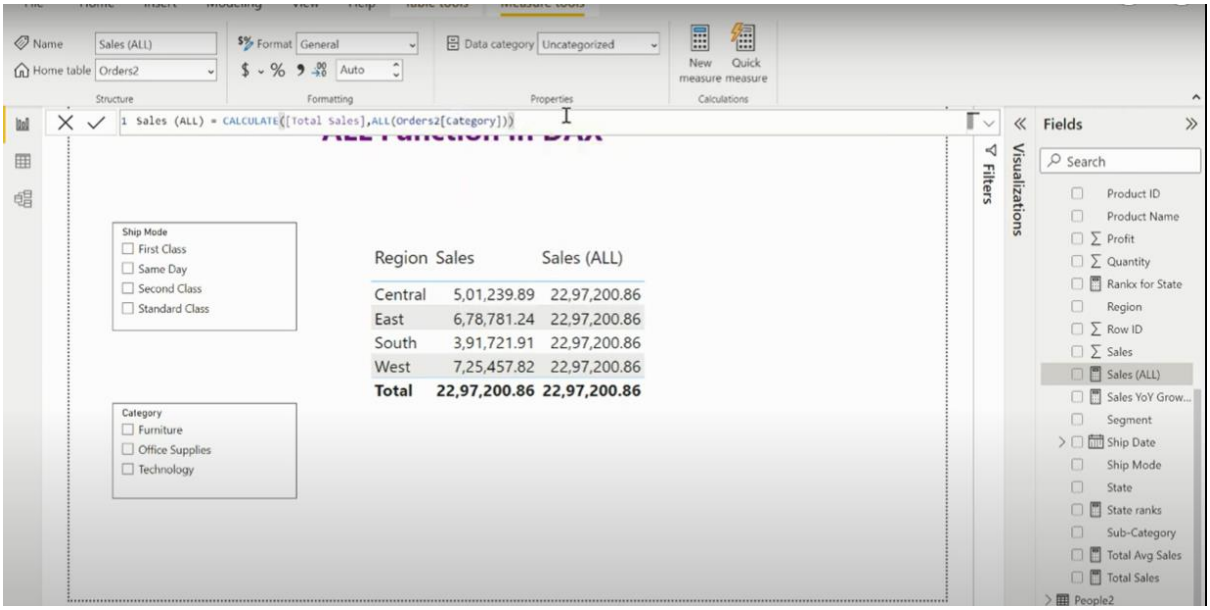
Let’s create new dax function with **ALL** function (on region column).



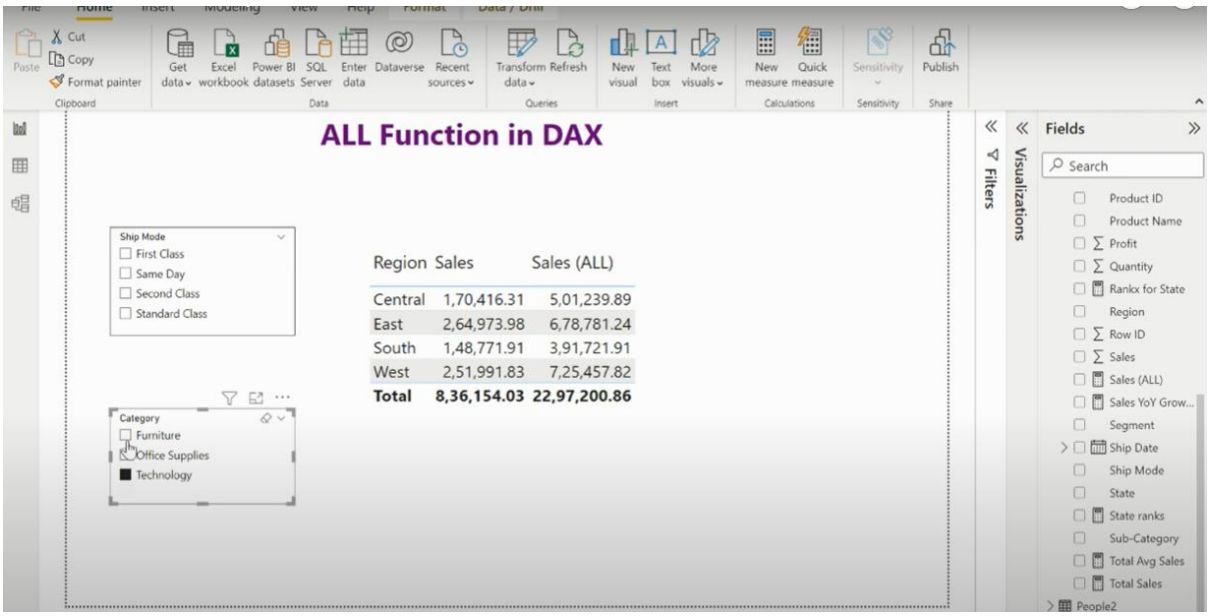
But it is giving total sales value for each region.



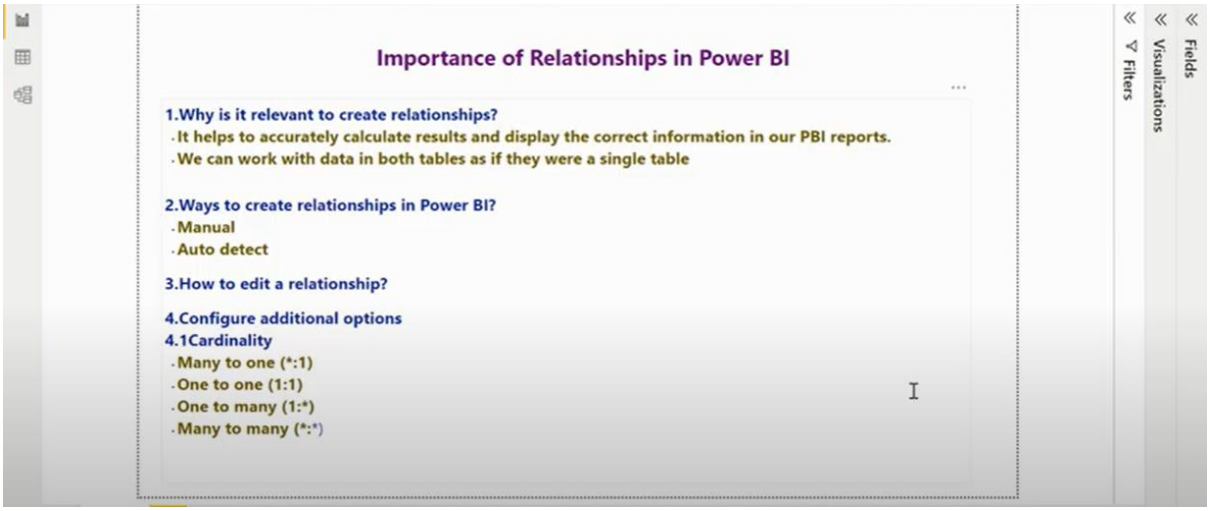
Lets use **ALL** function (on category column).



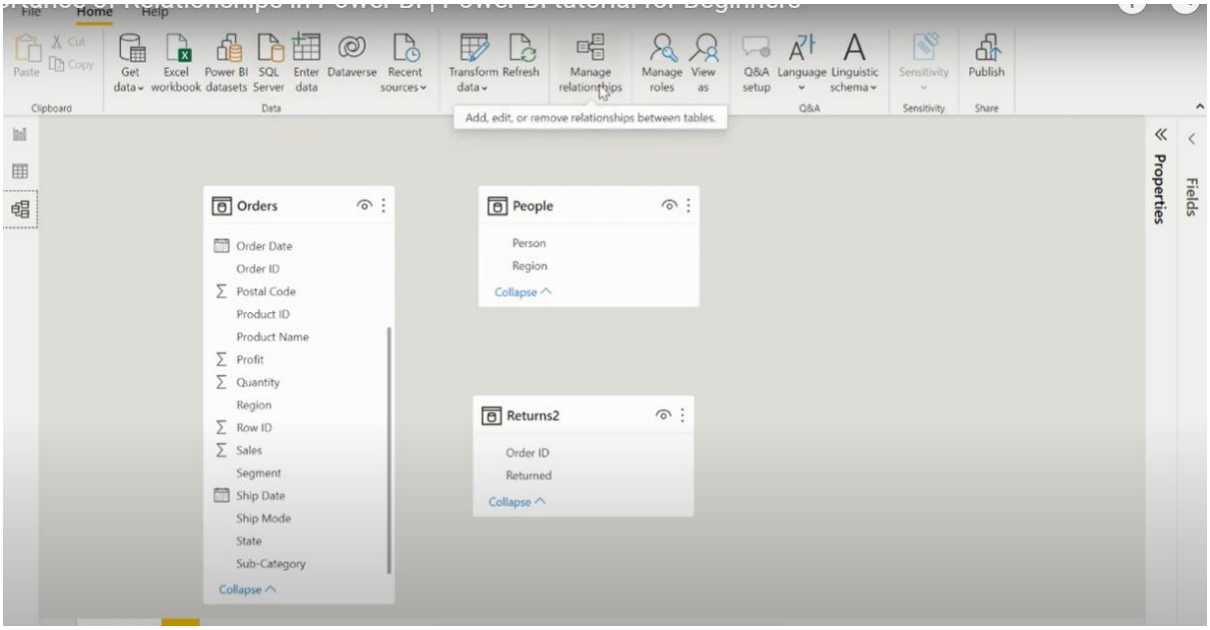
This is the way…

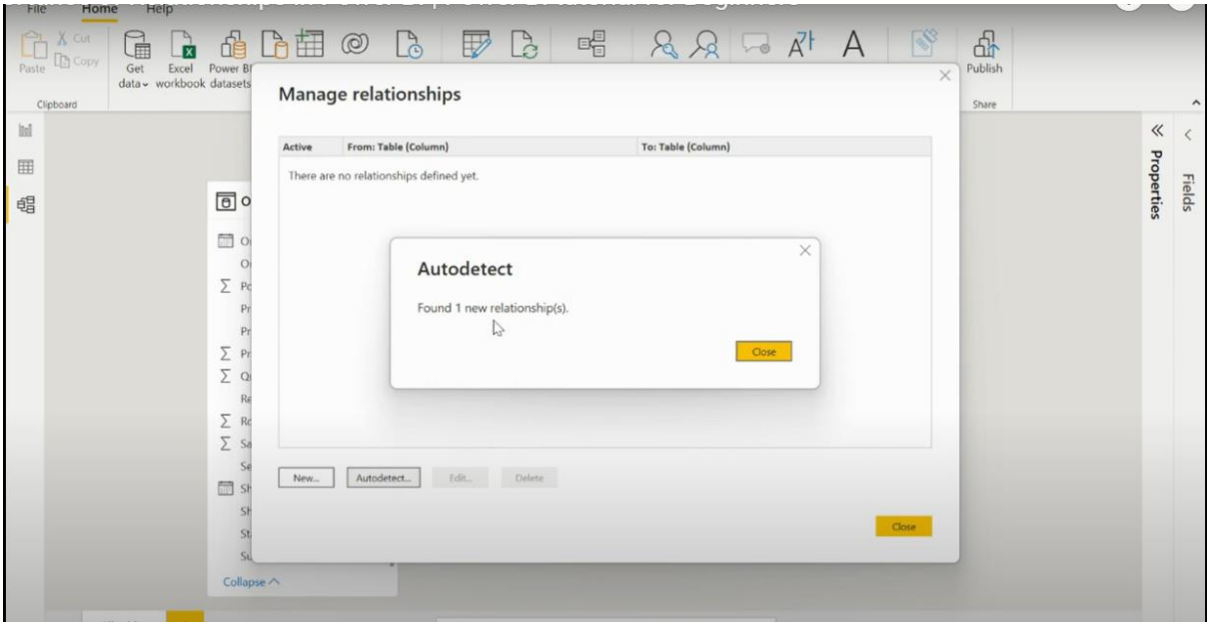


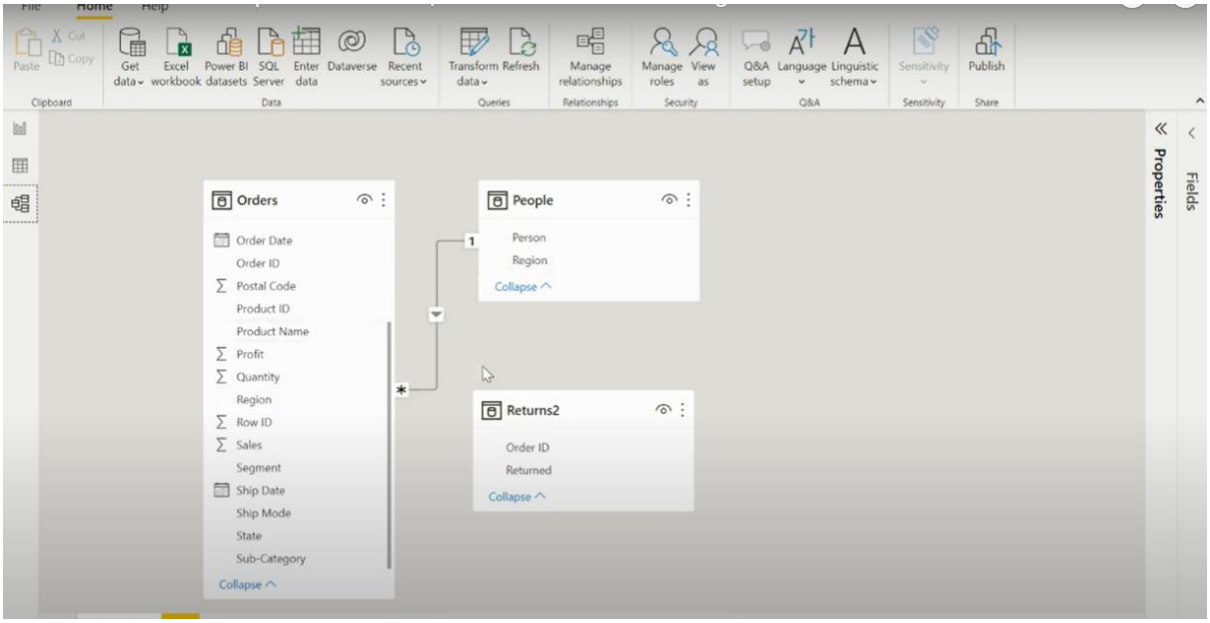
Relationships in Power BI



How to create relationship?



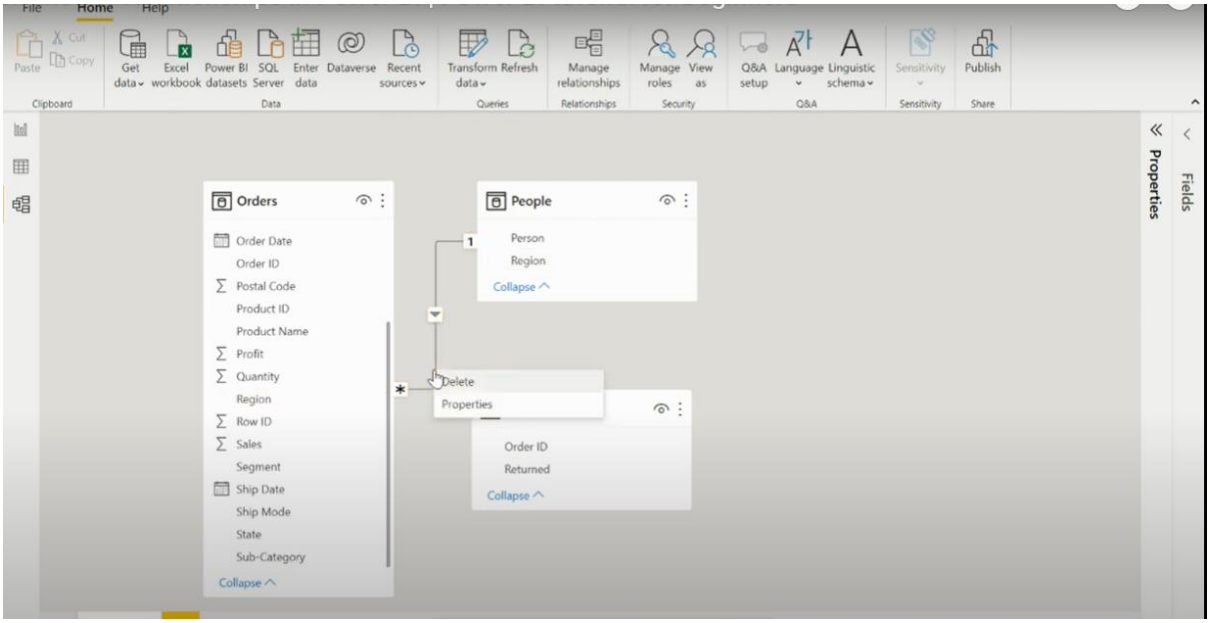


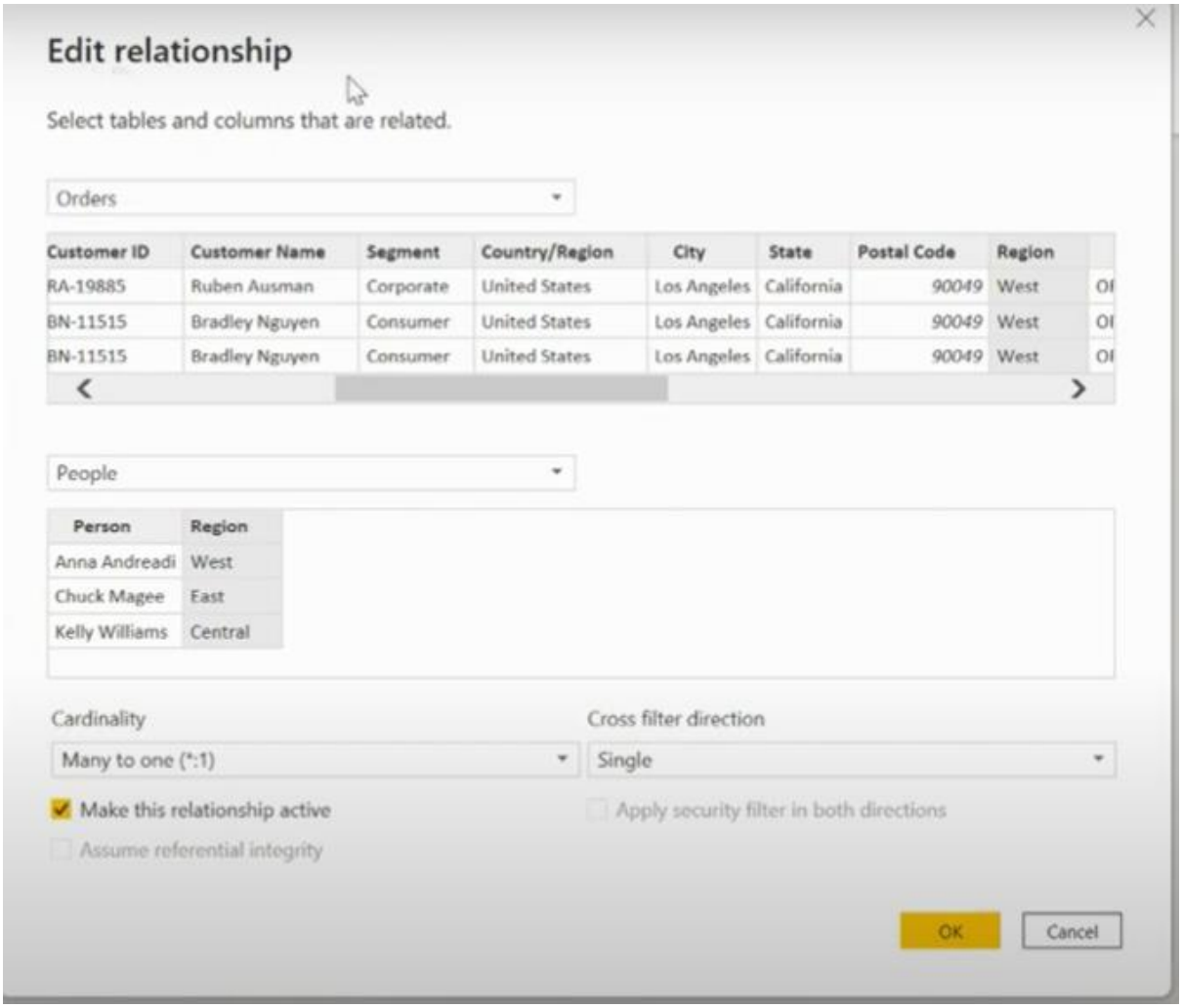


To define relationship manually, just drag and drop the field from one table to another table and that will create the relationship between two tables.

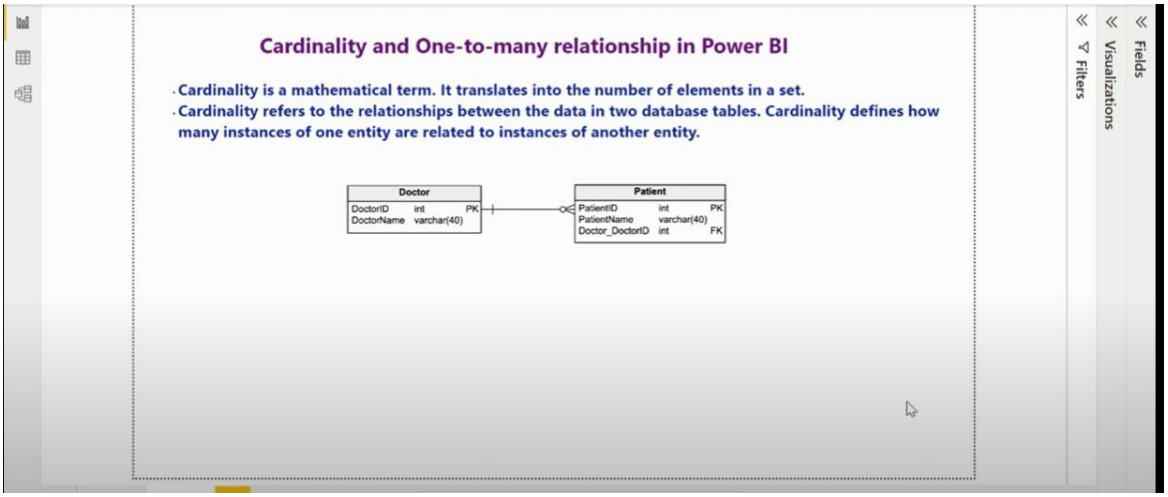
How to edit relationship?

Select relationship line -> it will turn yellow upon selecting -> right click -> properties


File
Home
Help
Paste
Cut
Copy
Clipboard
Get data
Excel workbook
Power BI datasets
SQL Server
Enter data
Dataverse
Recent sources
Data
Transform data
Refresh
Queries
Manage relationships
Relationships
Manage roles
View as
Security
Q&A setup
Language
Linguistic schema
Q&A
Sensitivity
Sensitivity
Publish
Share
Properties
Fields
Orders
Order Date
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date
Ship Mode
State
Sub-Category
Collapse
People
Person
Region
Collapse
1
*
Delete
Properties
Order ID
Returned
Collapse


Edit relationship
Select tables and columns that are related.
Orders
Customer ID
Customer Name
Segment
Country/Region
City
State
Postal Code
Region
RA-19885
Ruben Ausman
Corporate
United States
Los Angeles
California
90049
West
BN-11515
Bradley Nguyen
Consumer
United States
Los Angeles
California
90049
West
BN-11515
Bradley Nguyen
Consumer
United States
Los Angeles
California
90049
West
People
Person
Region
Anna Andreadi
West
Chuck Magee
East
Kelly Williams
Central
Cardinality
Many to one (*:1)
Cross filter direction
Single
Make this relationship active
Apply security filter in both directions
Assume referential integrity
OK
Cancel

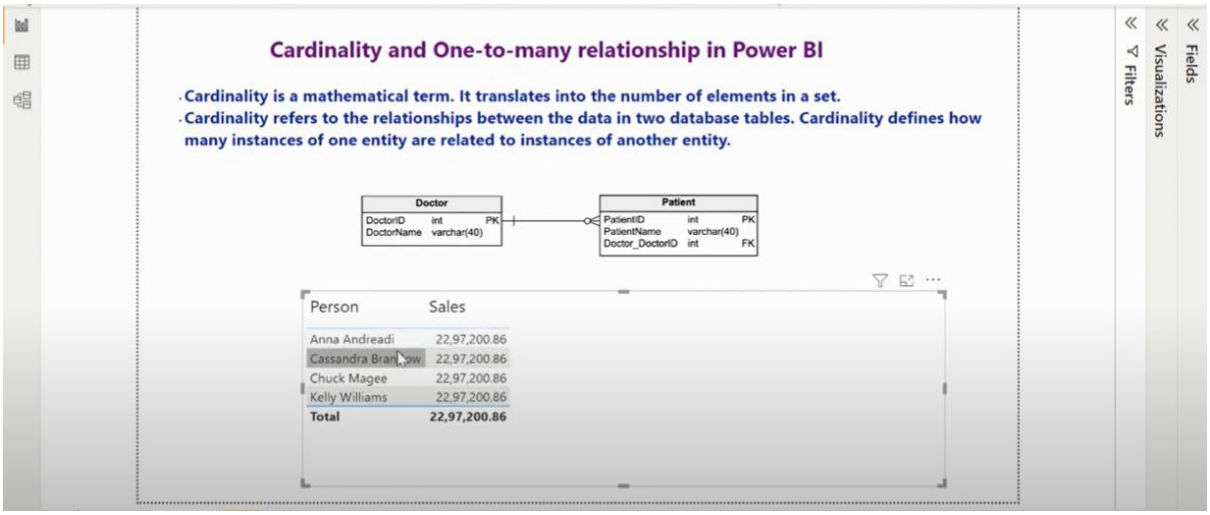
Cardinality



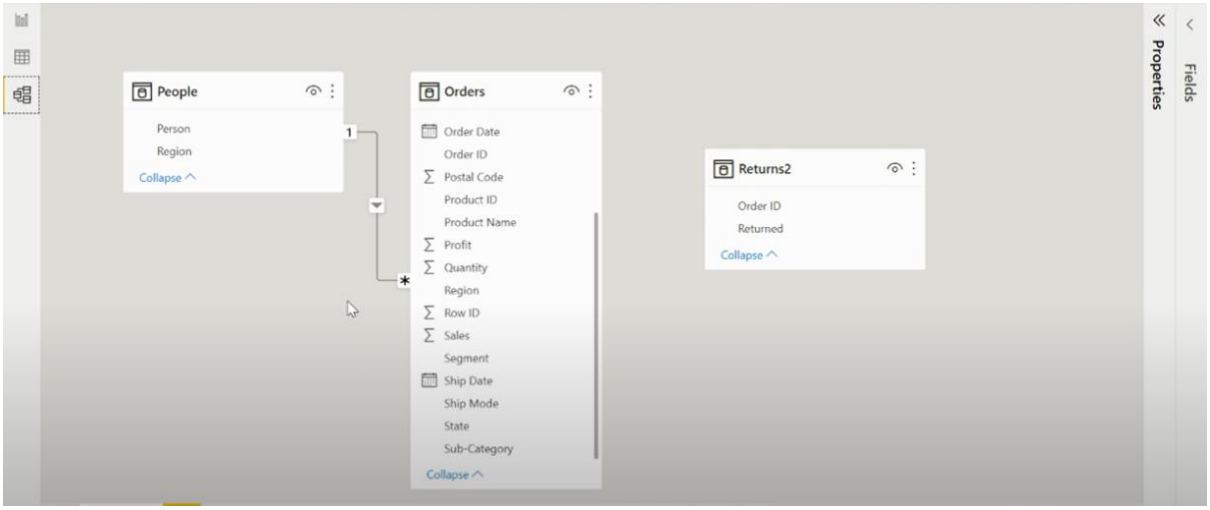
One to many: Doctor can have many patients on a given day

One to one: A patient can have one doctor

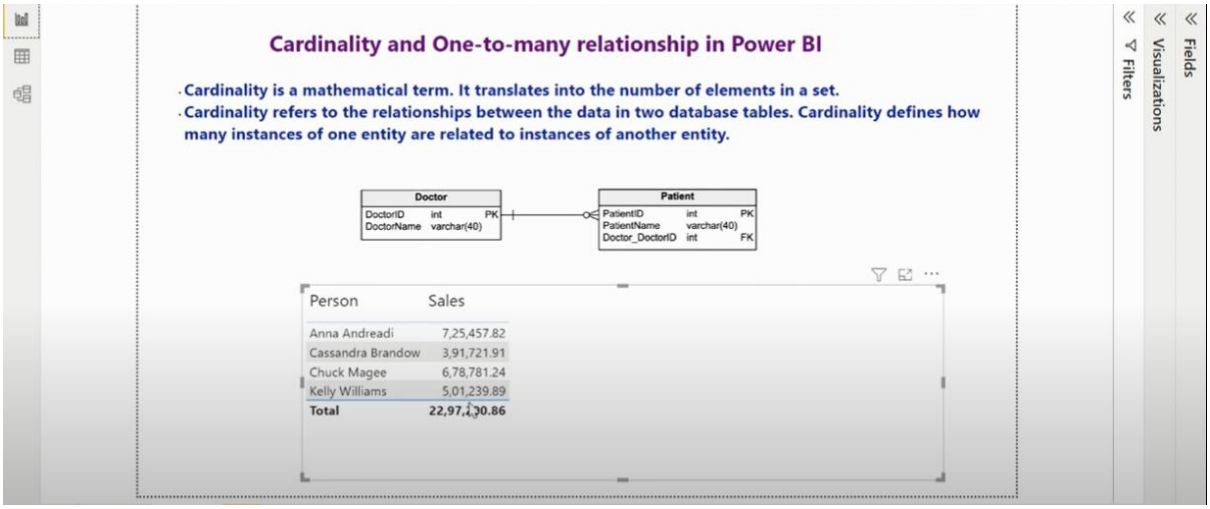
Person (from peoples table) and sales (from orders table) – same



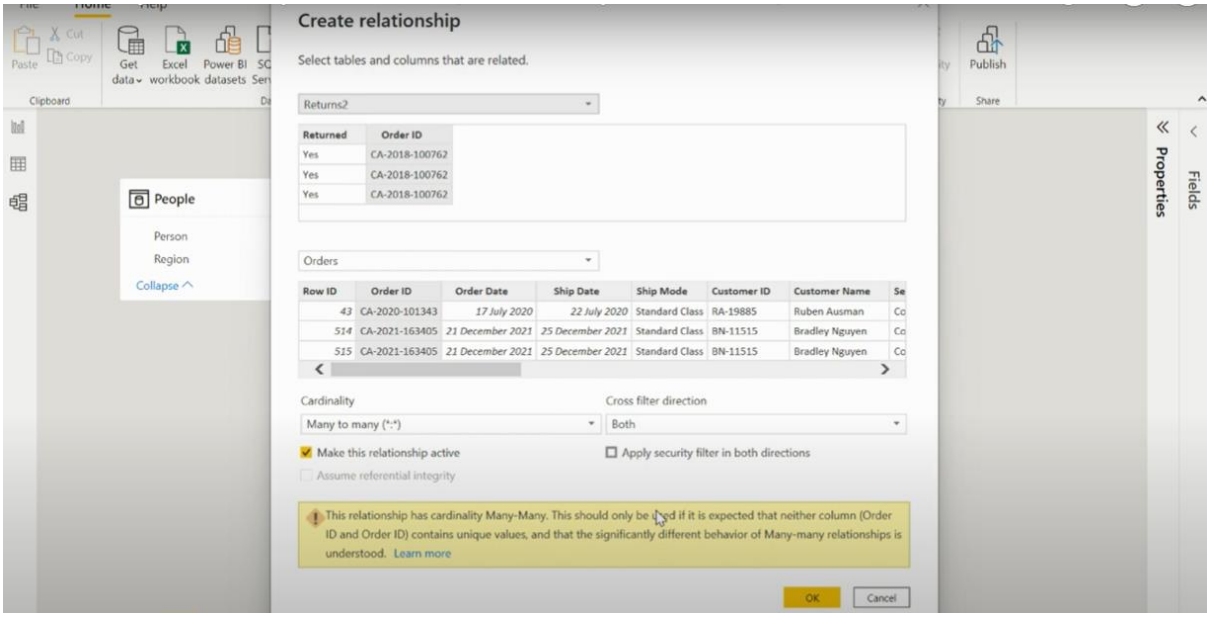
Let’s define the relationship between this two tables



After defining the relationship, the sales values are updated

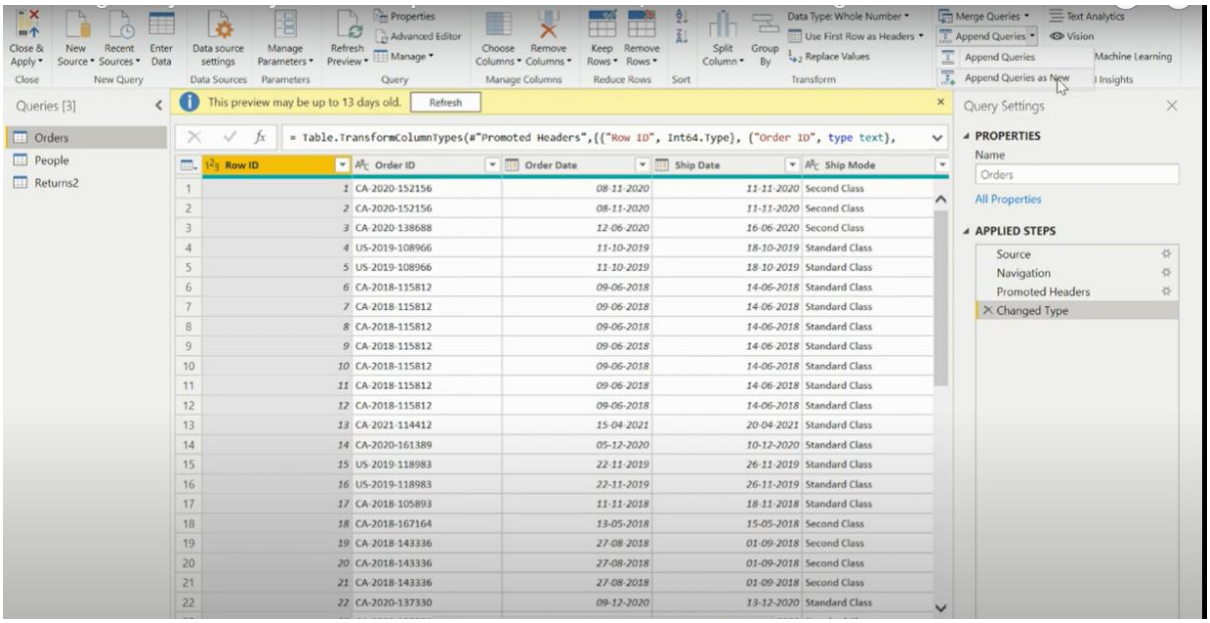


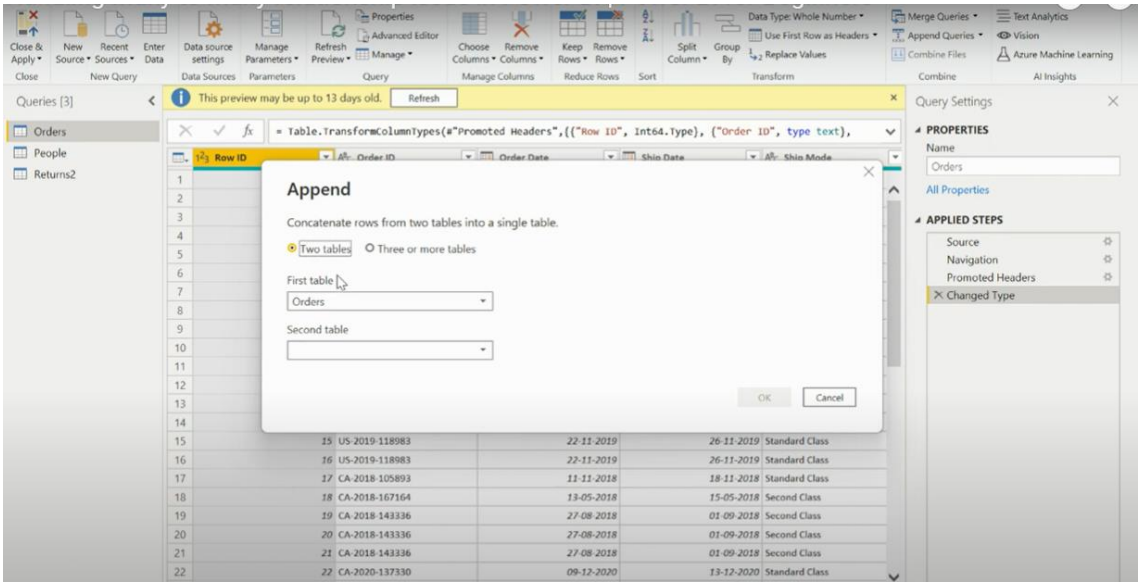
Let’s define relationship between orders table and returns table. The relationship is having many to many cardinality. So, we cannot create the relationship between this to tables. This is because these two tables are having duplicate order ids in them.

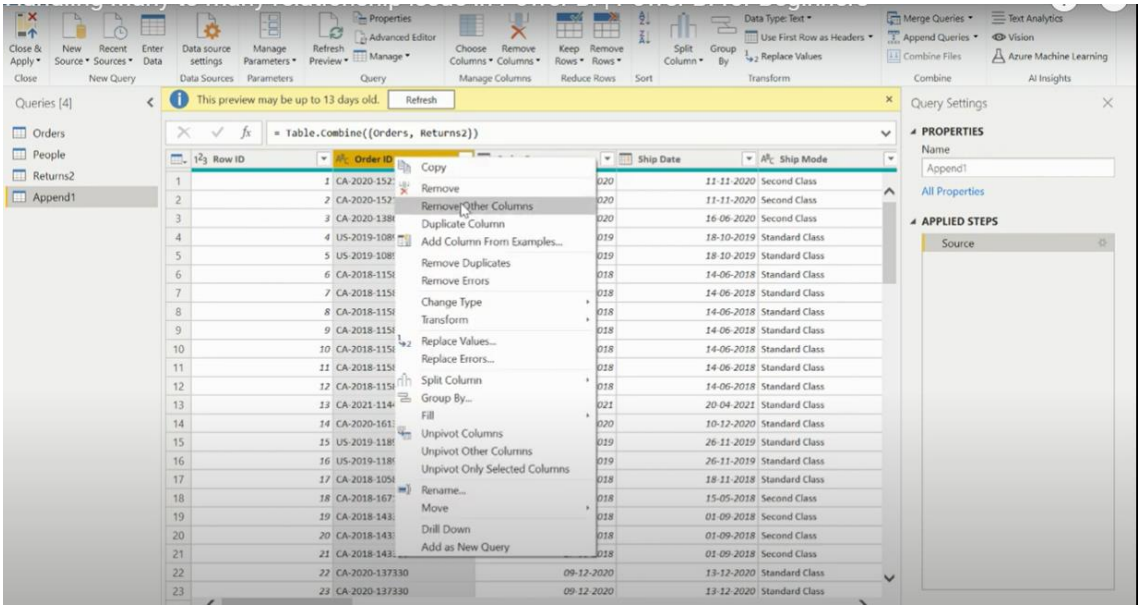


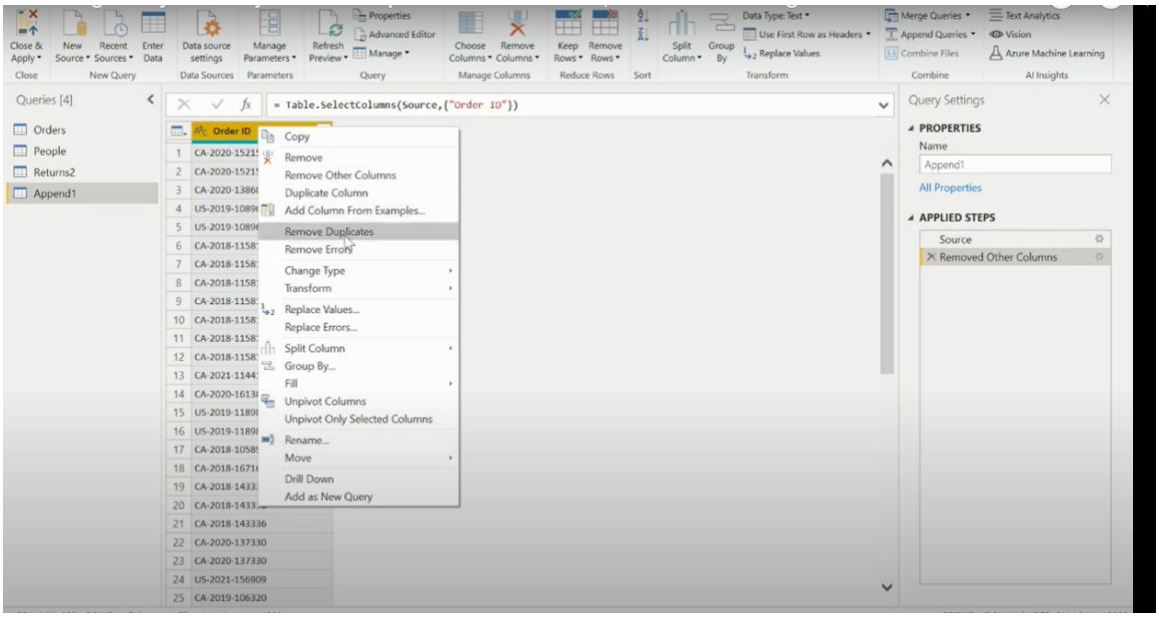
How to overcome this?

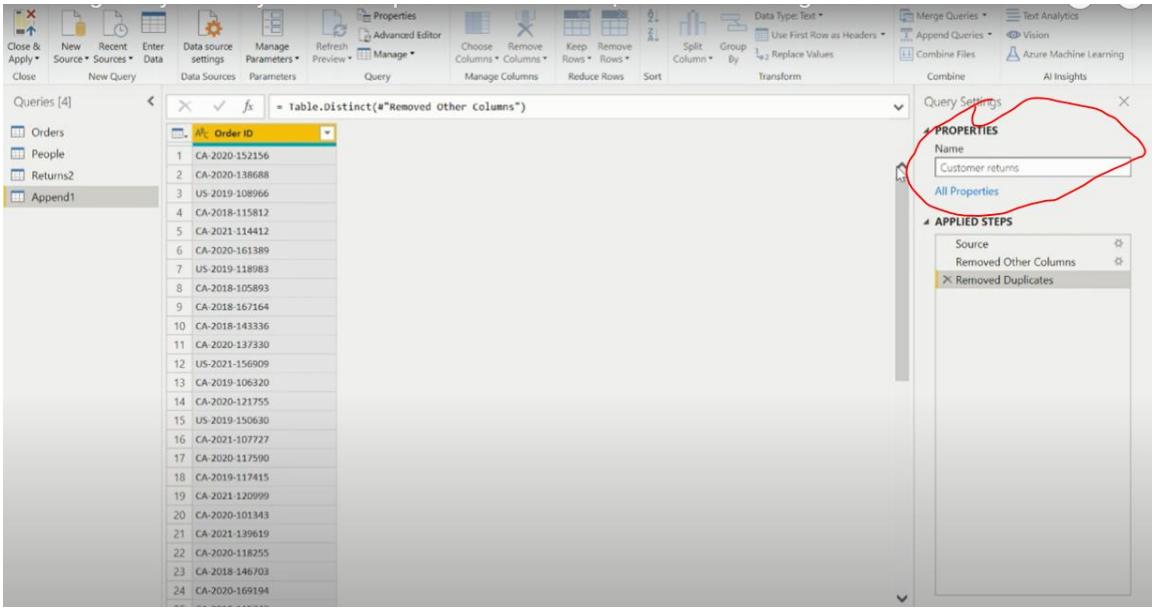
Model view -> home -> Transform data -> transform data -> it will take to power query editor -> append queries -> append queries as new -> select two tables option -> first table (orders) -> second table (returns) -> right click on order id column -> remove other columns -> right click on order id column -> remove duplicates ->rename the table -> close & apply -> close & apply

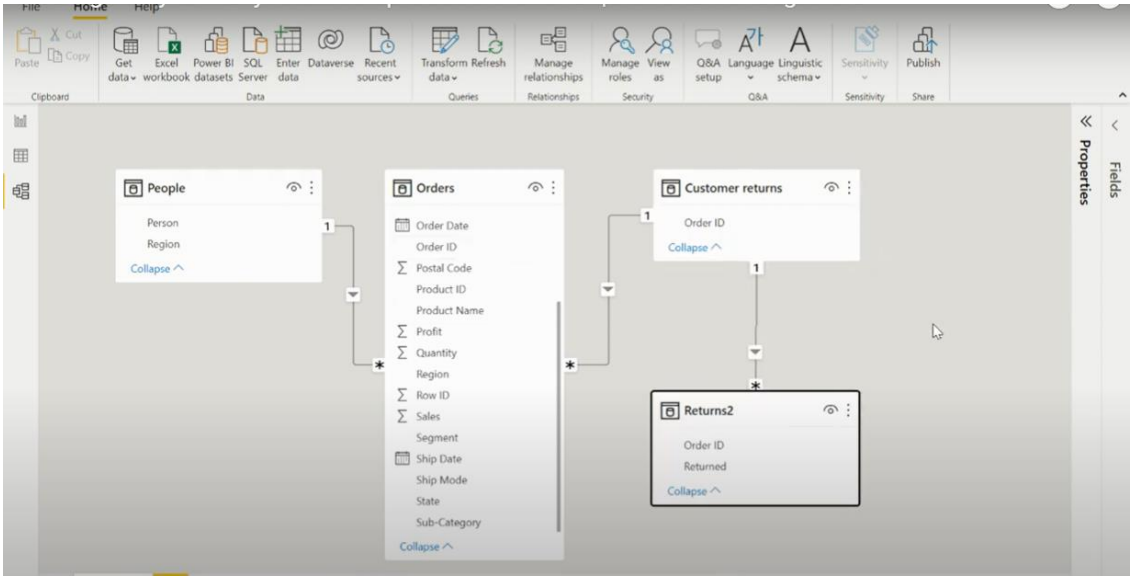


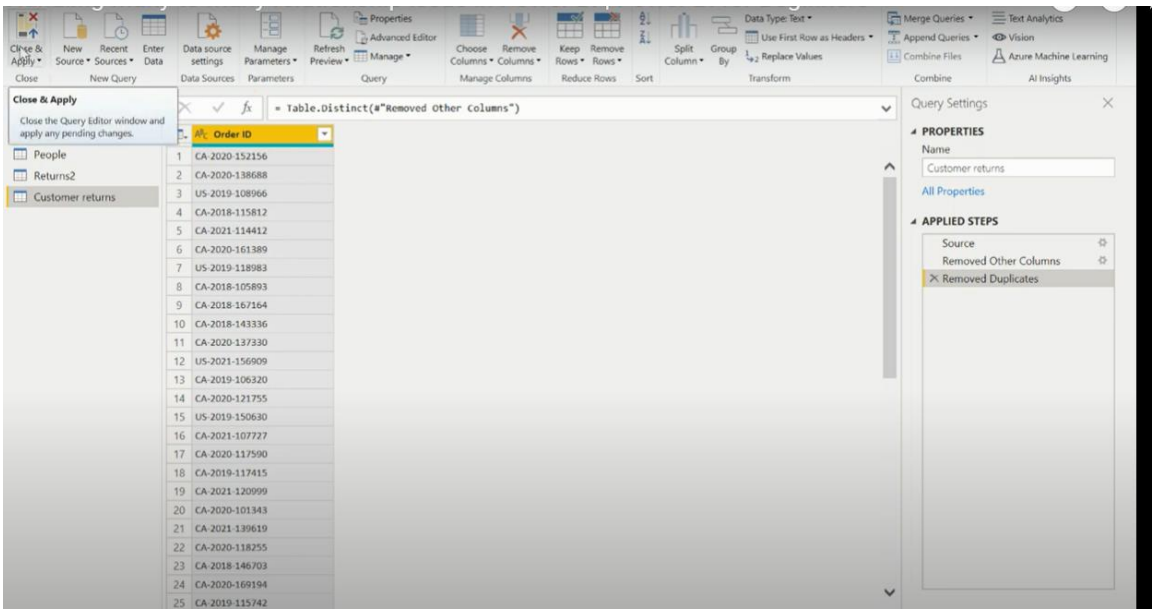

Append
Concatenate rows from two tables into a single table.
Two tables
Three or more tables
First table
Orders
Second table
OK
Cancel
Queries [3]
Orders
People
Returns2
= Table.TransformColumnTypes(#"Promoted Headers",{{"Row ID", Int64.Type}, {"Order ID", type text},
Query Settings
PROPERTIES
Name
Orders
All Properties
APPLIED STEPS
Source
Navigation
Promoted Headers
Changed Type


Queries [4]
Orders
People
Returns2
Append1
= Table.Combine({Orders, Returns2})
Copy
Remove
Remove Other Columns
Duplicate Column
Add Column From Examples...
Remove Duplicates
Remove Errors
Change Type
Transform
Replace Values...
Replace Errors...
Split Column
Group By...
Fill
Unpivot Columns
Unpivot Other Columns
Unpivot Only Selected Columns
Rename...
Move
Drill Down
Add as New Query
Query Settings
PROPERTIES
Name
Append1
All Properties
APPLIED STEPS
Source

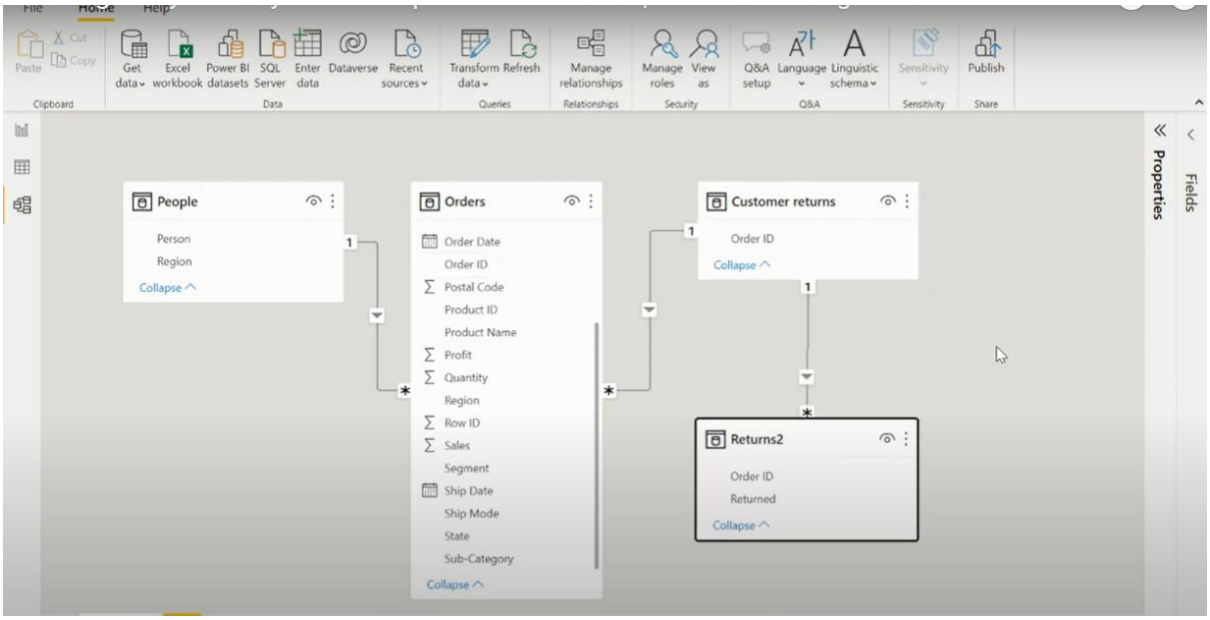

Queries [4]
Orders
People
Returns2
Append1
= Table.SelectColumns(Source,{"Order ID"})
Copy
Remove
Remove Other Columns
Duplicate Column
Add Column From Examples...
Remove Duplicates
Remove Errors
Change Type
Transform
Replace Values...
Replace Errors...
Split Column
Group By...
Fill
Unpivot Columns
Unpivot Only Selected Columns
Rename...
Move
Drill Down
Add as New Query
Query Settings
PROPERTIES
Name
Append1
All Properties
APPLIED STEPS
Source
Removed Other Columns


Queries [4]
Orders
People
Returns2
Append1
= Table.Distinct(#"Removed Other Columns")
Order ID
CA-2020-152156
CA-2020-138688
US-2019-108966
CA-2018-115812
CA-2021-114412
CA-2020-161389
US-2019-118983
CA-2018-105893
CA-2018-167164
CA-2018-143336
CA-2020-137330
US-2021-156909
CA-2019-106320
CA-2020-121755
US-2019-150630
CA-2021-107727
CA-2020-117590
CA-2019-117415
CA-2021-120999
CA-2020-101343
CA-2021-139619
CA-2020-118255
CA-2018-146703
CA-2020-169194
Query Settings
PROPERTIES
Name
Customer returns
All Properties
APPLIED STEPS
Source
Removed Other Columns
Removed Duplicates

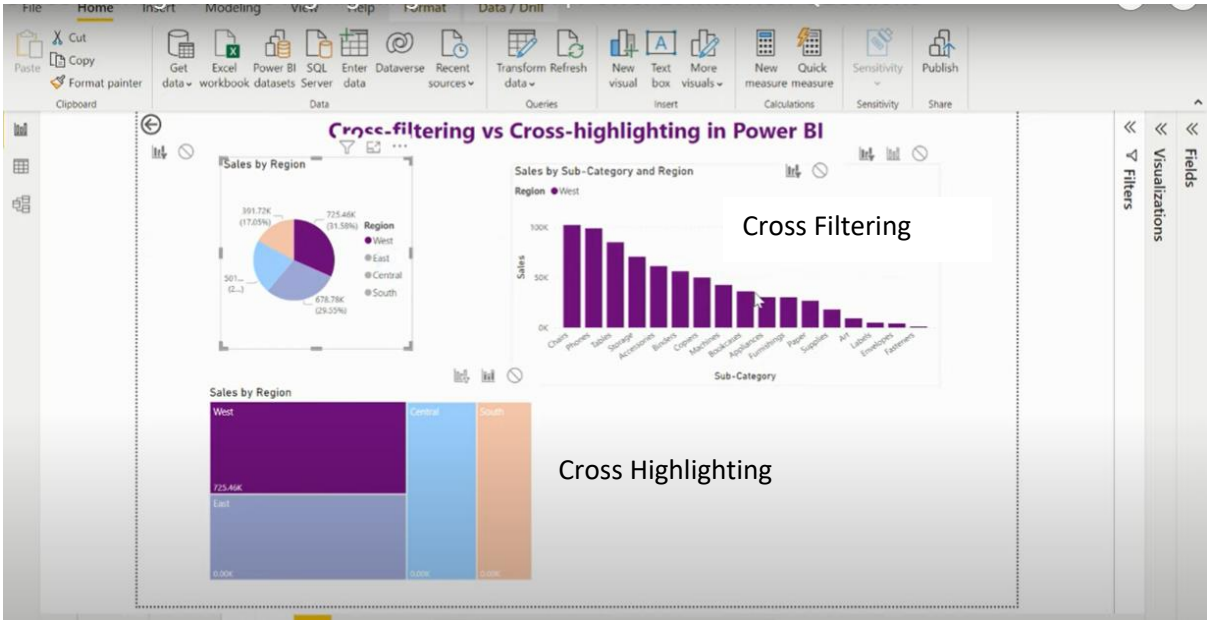

People
Person
Region
Collapse
Orders
Order Date
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date
Ship Mode
State
Sub-Category
Collapse
Customer returns
Order ID
Collapse
Returns2
Order ID
Returned
Collapse
Properties
Fields


Close & Apply
Close the Query Editor window and apply any pending changes.
People
Returns2
Customer returns
= Table.Distinct(#"Removed Other Columns")
Order ID
CA-2020-152156
CA-2020-138688
US-2019-108966
CA-2018-115812
CA-2021-114412
CA-2020-161389
US-2019-118983
CA-2018-105893
CA-2018-167164
CA-2018-143336
CA-2020-137330
US-2021-156909
CA-2019-106320
CA-2020-121755
US-2019-150630
CA-2021-107727
CA-2020-117590
CA-2019-117415
CA-2021-120999
CA-2020-101343
CA-2021-139619
CA-2020-118255
CA-2018-146703
CA-2020-169194
CA-2019-115742
Query Settings
PROPERTIES
Name
Customer returns
All Properties
APPLIED STEPS
Source
Removed Other Columns
Removed Duplicates

Now the relationship is created between newly created customer returns table & orders table as one to many and also customer returns table & returns table as one to many.

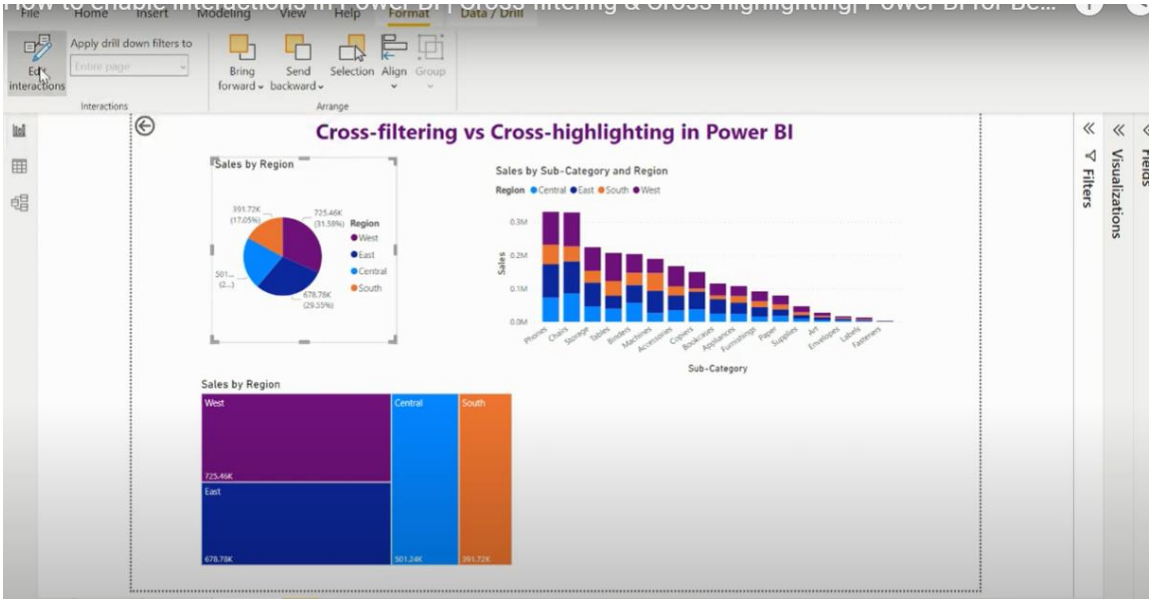


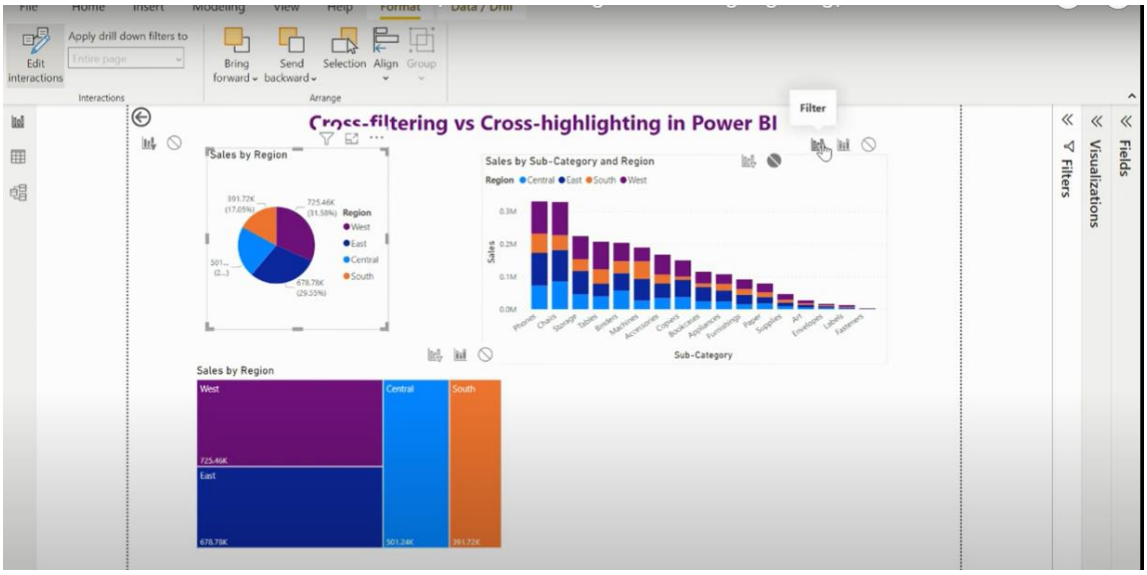
Cross filtering v/s cross highlighting

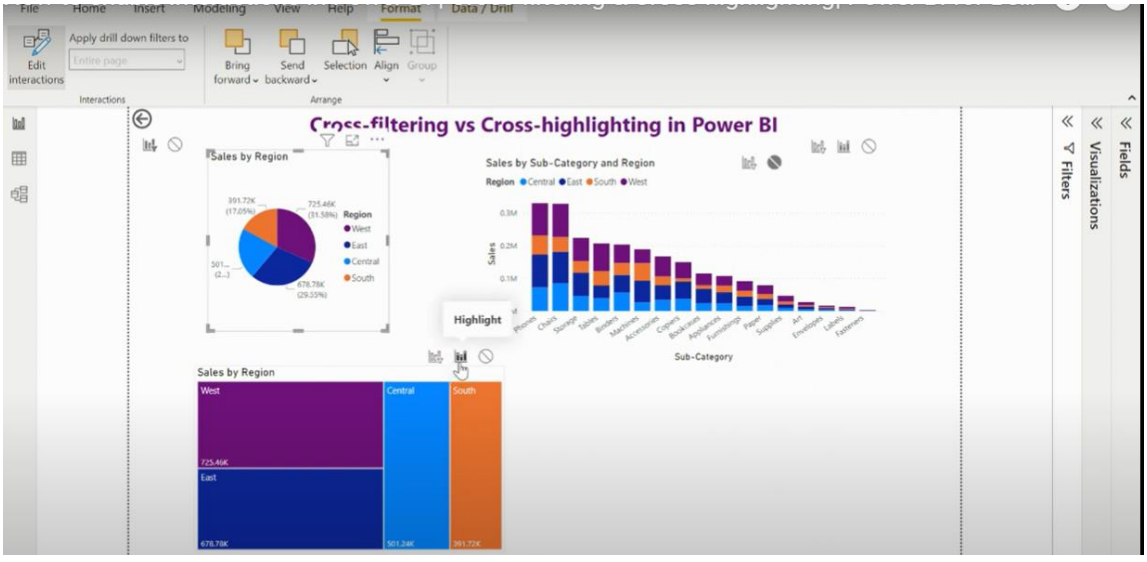


How to enable interactions (Cross filtering & cross highlighting) in Power BI ?

Select the visualization -> go to format -> edit interactions -> select filter/highlight option


File
Home
Insert
Modeling
View
Help
Format
Data / Drill
Edit interactions
Apply drill down filters to
Entire page
Bring forward
Send backward
Selection
Align
Group
Interactions
Arrange
Cross-filtering vs Cross-highlighting in Power BI
Sales by Region
Region
West
East
Central
South
Sales by Sub-Category and Region
Region Central East South West
Sales
Sub-Category
Sales by Region
West
Central
South
East
Filters
Visualizations
Fields


Edit interactions
Apply drill down filters to
Entire page
Bring forward
Send backward
Selection
Align
Group
Interactions
Arrange
Filter
Cross-filtering vs Cross-highlighting in Power BI
Sales by Region
Region
West
East
Central
South
Sales by Sub-Category and Region
Region Central East South West
Sales
Sub-Category
Sales by Region
West
Central
South
East
Filters
Visualizations
Fields


Edit interactions
Apply drill down filters to
Entire page
Bring forward
Send backward
Selection
Align
Group
Interactions
Arrange
Cross-filtering vs Cross-highlighting in Power BI
Sales by Region
Region
West
East
Central
South
Sales by Sub-Category and Region
Region Central East South West
Sales
Sub-Category
Highlight
Sales by Region
West
Central
South
East
Filters
Visualizations
Fields

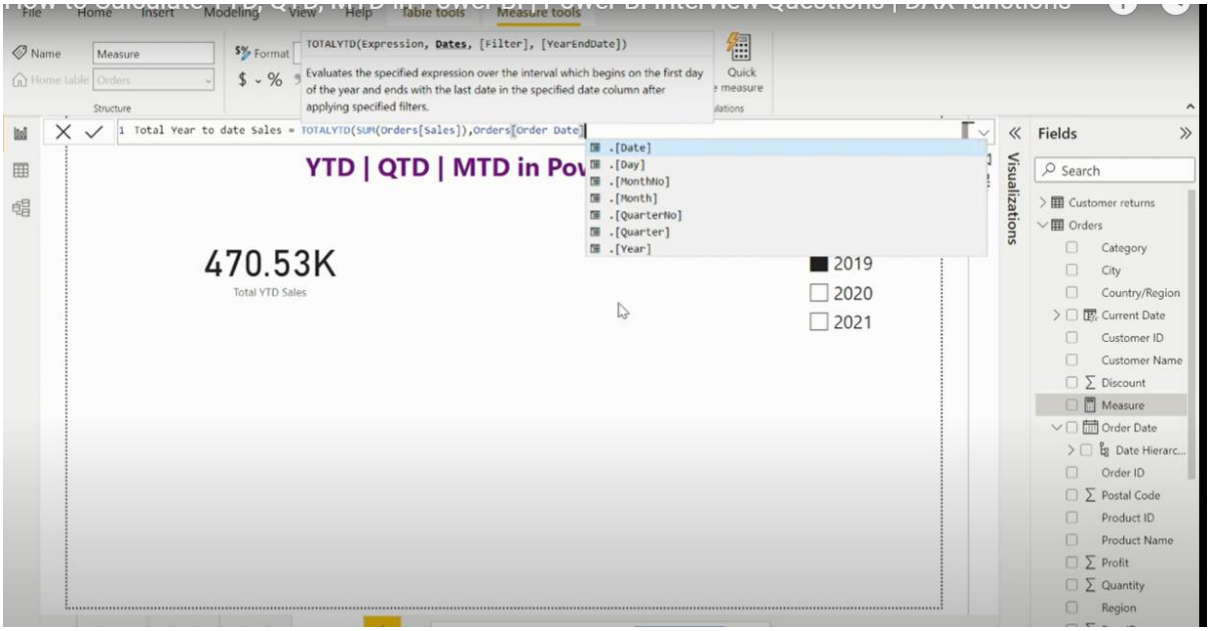
How to calculate YTD, QTD and MTD in Power BI?

YTD – Start of current year to today's date

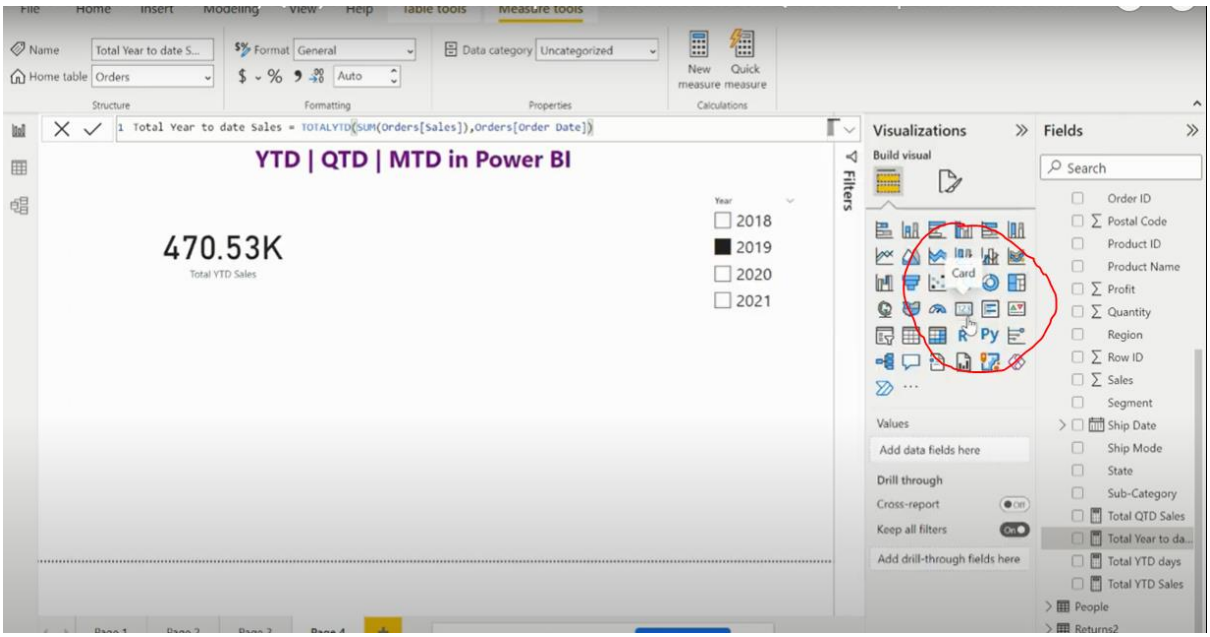
QTD – Start of current quarter to today's date

MTD – Start of current month to today's date

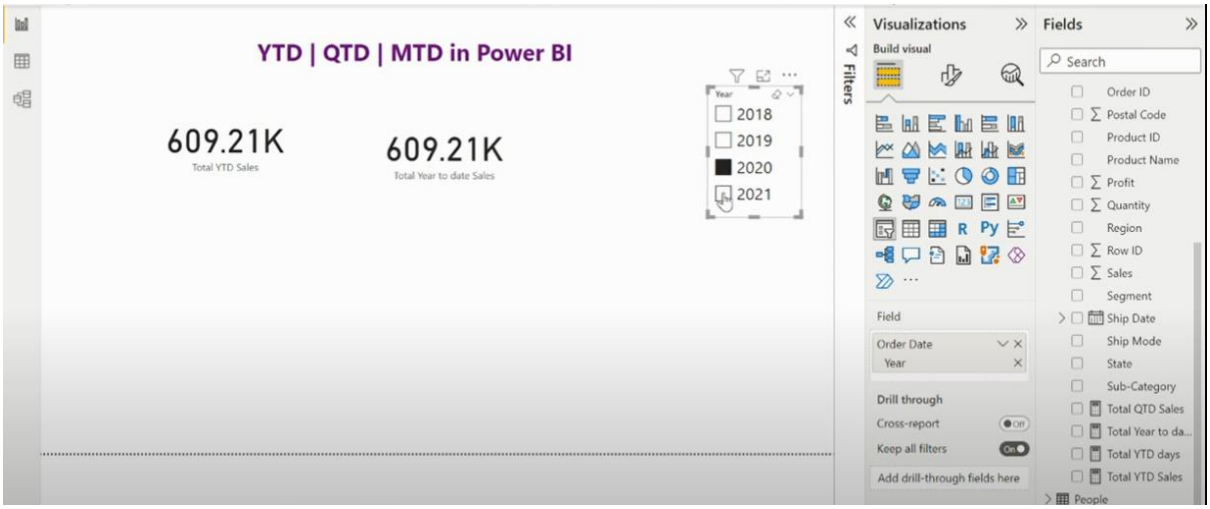
Create a new measure

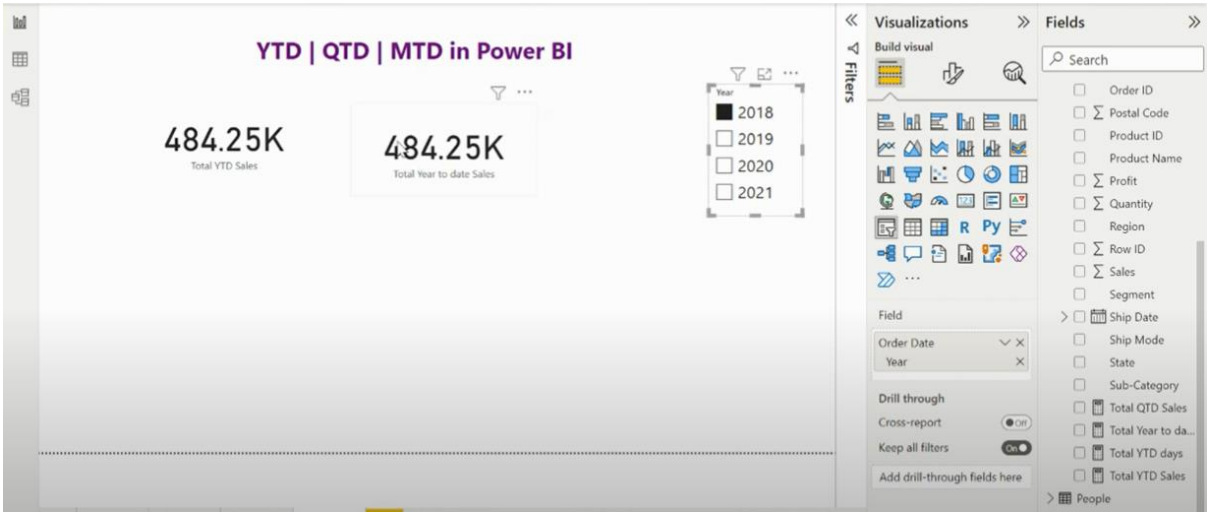


Add Card visualization -> select newly created measure



If we want to see values for the previous years we can select the slicer accordingly.

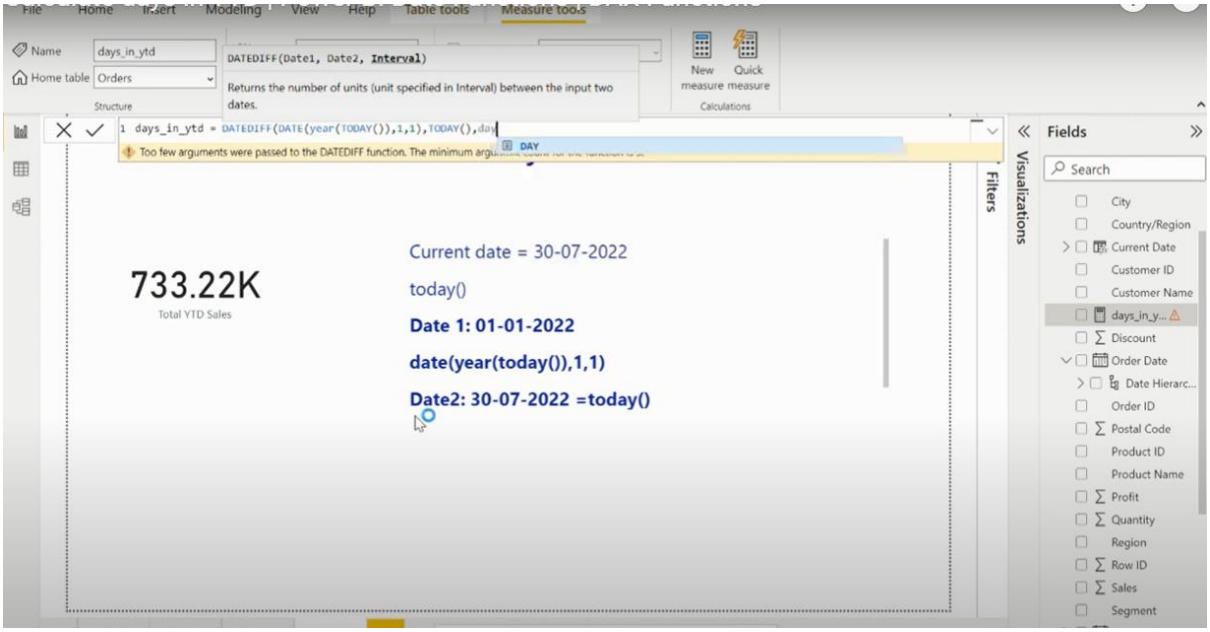




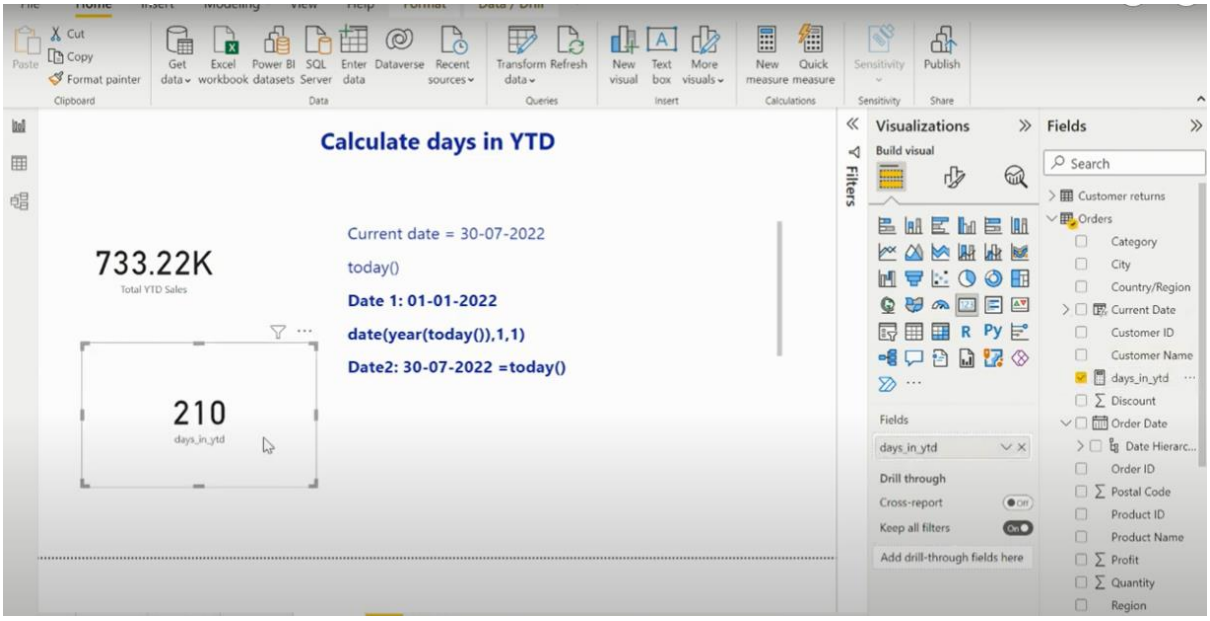
Similarly, QTD and MTD measures can be created.

Calculate days in YTD (Calculating no of days elapsed between start of year and current date)

Create a new measure



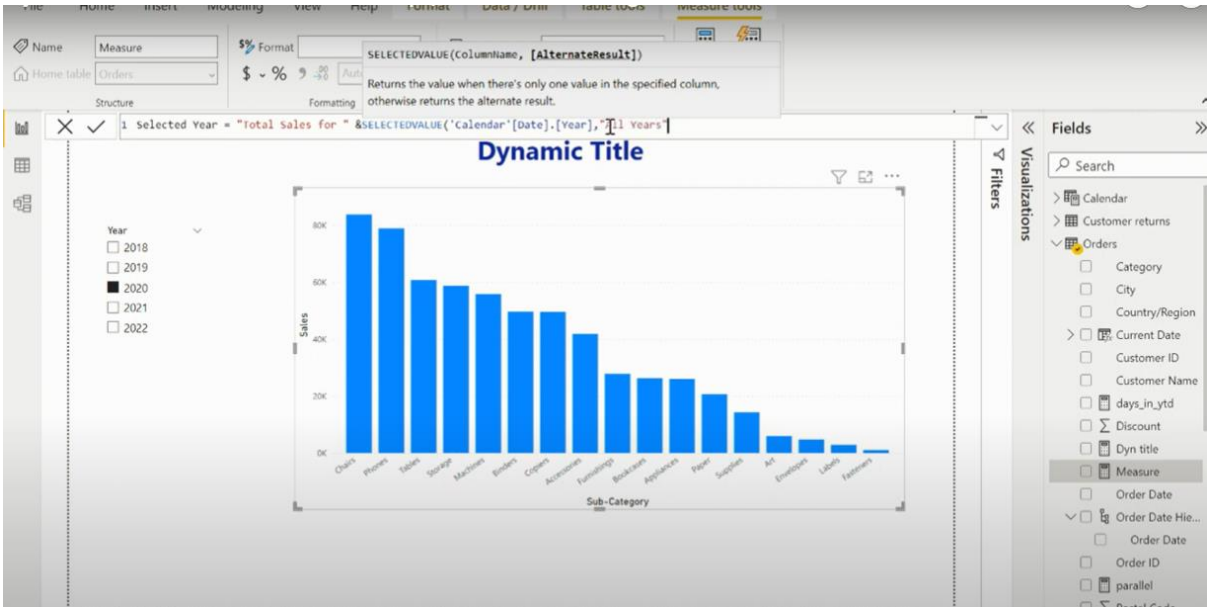
Add Card visualization -> select newly created measure



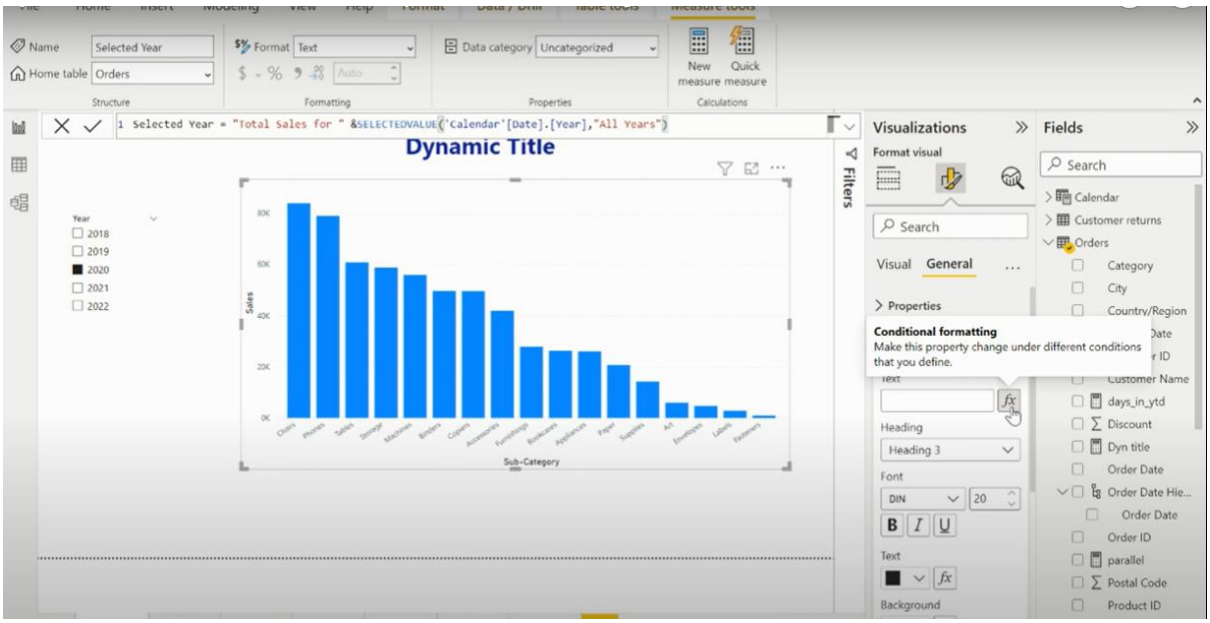
Dynamic Titles in Power BI?

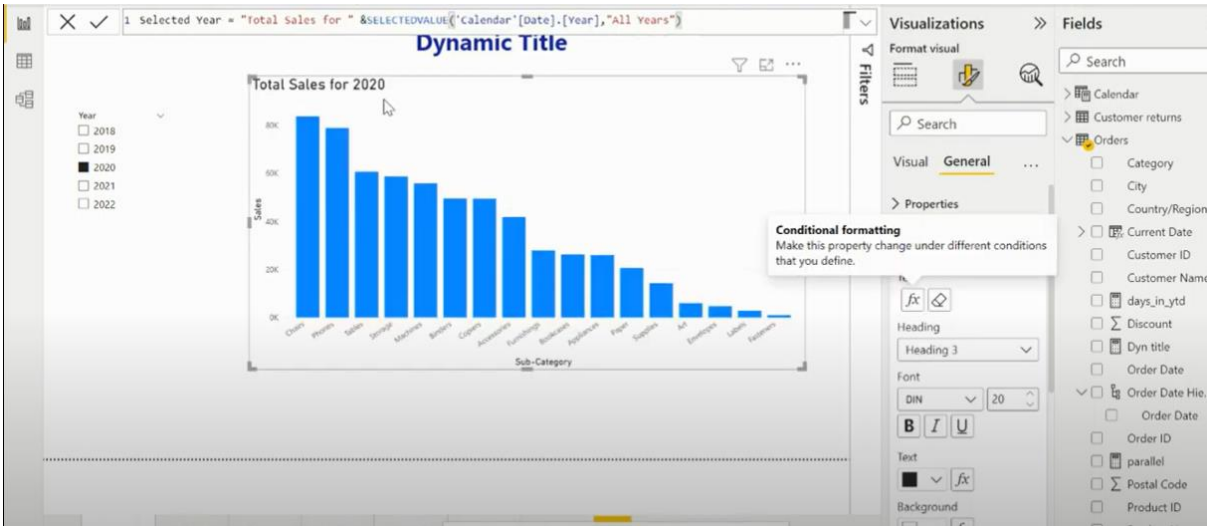
We want to update the visualization table, according to the slicer year selection.

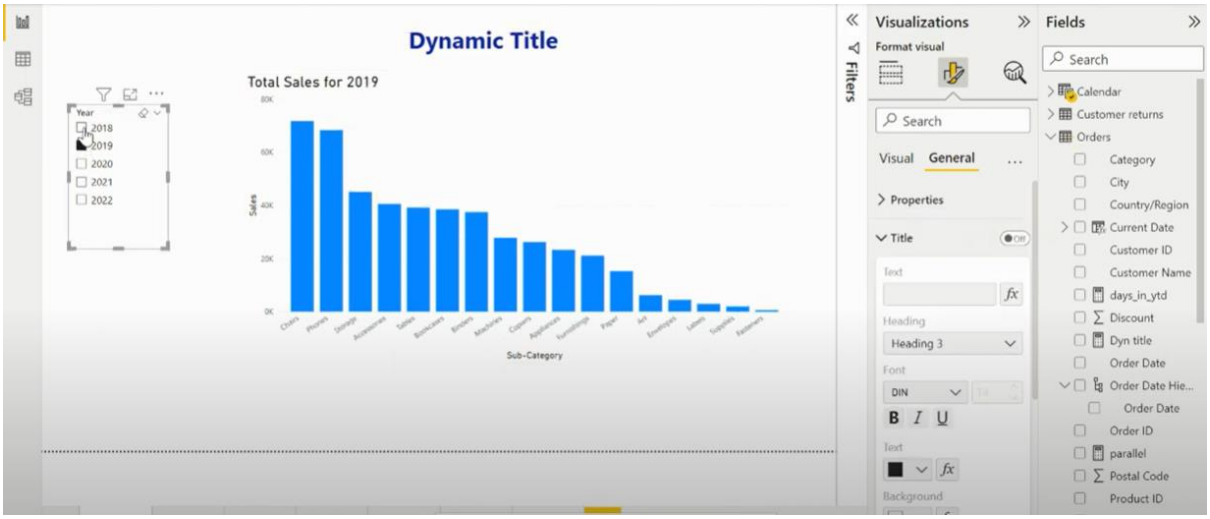
Create a new measure



Go To Report Section ->format visual -> general -> title -> text -> conditional formatting -> format style (field value) ->sub-category (newly created measure)




1 Selected Year = "Total Sales for " &SELECTEDVALUE('Calendar'[Date].[Year],"All Years")
Dynamic Title
Total Sales for 2020
Year
2018
2019
2020
2021
2022
Sales
Sub-Category
Visualizations
Format visual
Search
Visual
General
Properties
Conditional formatting
Make this property change under different conditions that you define.
Heading
Heading 3
Font
DIN
20
Text
Background
Filters
Fields
Calendar
Customer returns
Orders
Category
City
Country/Region
Current Date
Customer ID
Customer Name
days_in_ytd
Discount
Dyn title
Order Date
Order Date Hie...
Order ID
parallel
Postal Code
Product ID

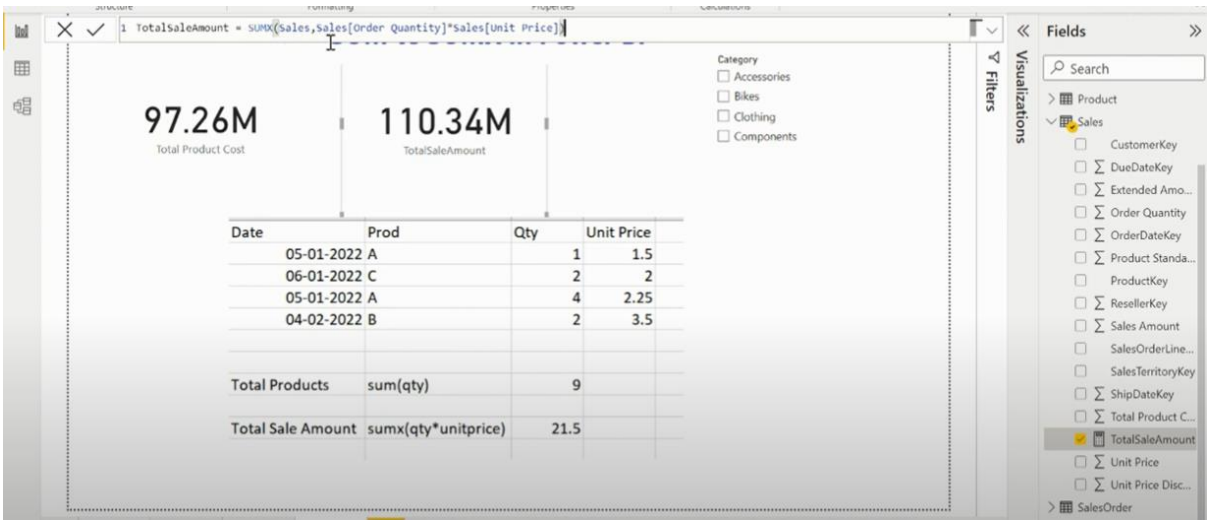

Dynamic Title
Total Sales for 2019
Year
2018
2019
2020
2021
2022
Sales
Sub-Category
Visualizations
Format visual
Search
Visual
General
Properties
Title
Text
Heading
Heading 3
Font
DIN
Text
Background
Filters
Fields
Calendar
Customer returns
Orders
Category
City
Country/Region
Current Date
Customer ID
Customer Name
days_in_ytd
Discount
Dyn title
Order Date
Order Date Hie...
Order ID
parallel
Postal Code
Product ID

Sum v/s SumX in Power BI

Sum : same as sum function in excel

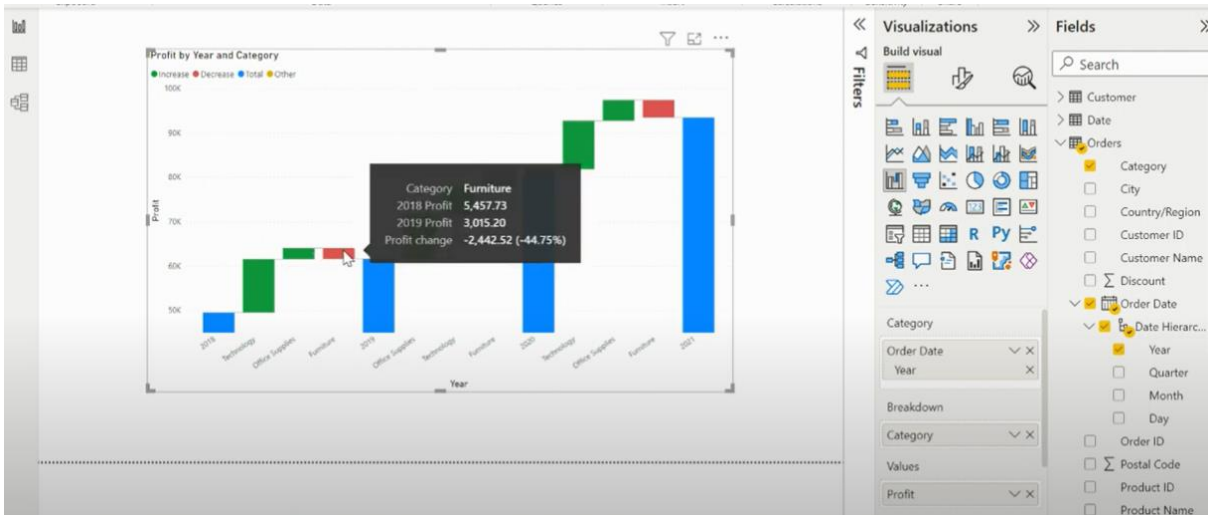
SumX : same as sumproduct function in excel

SumX Syntax : (Table Name, value1 * value2)



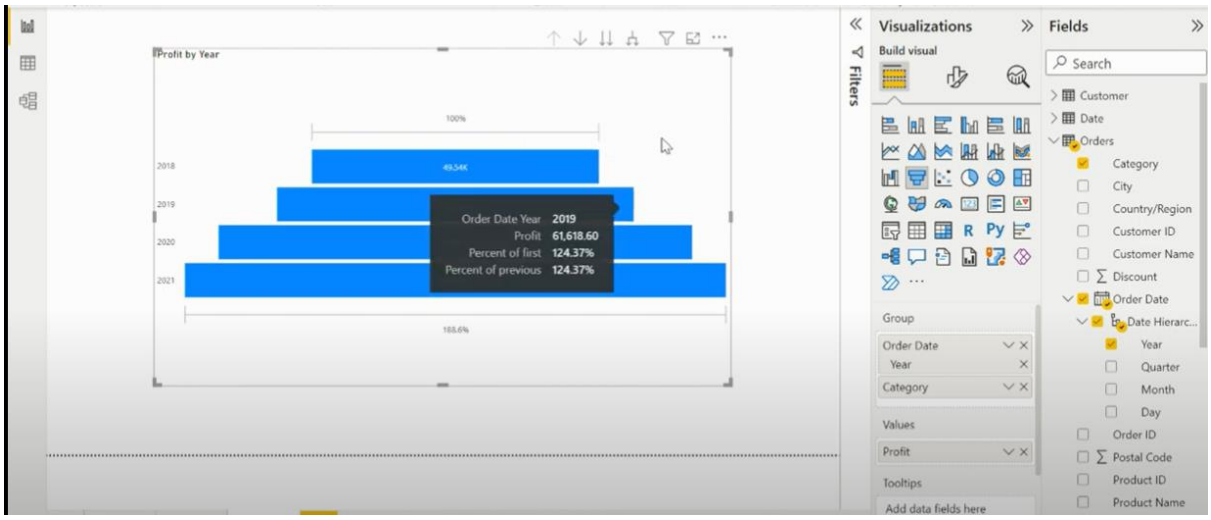
Waterfall Chart

Helps to visualize the change in value over a time period



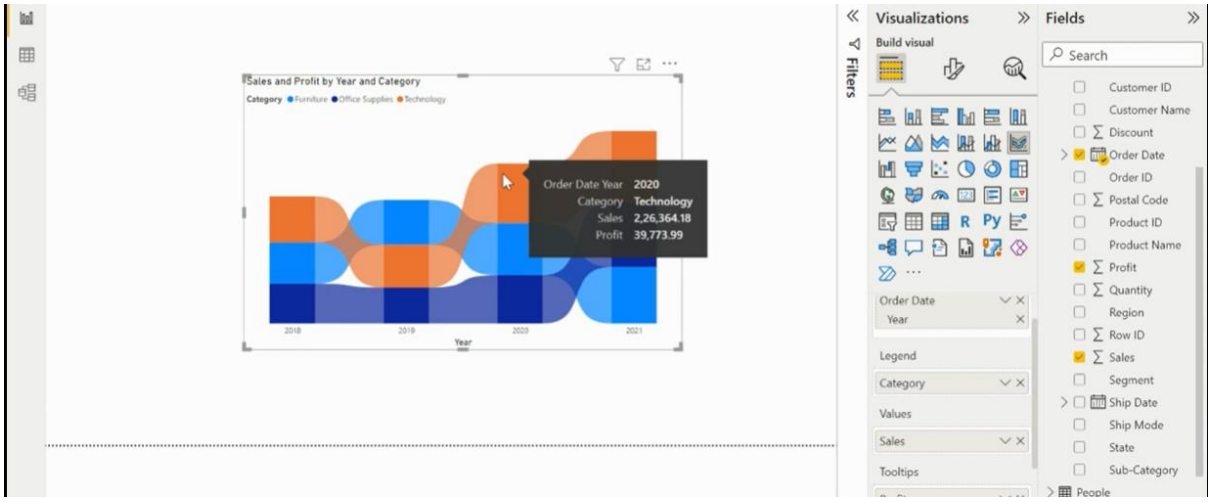
Funnel Chart

Helps to visualize the value over a time period



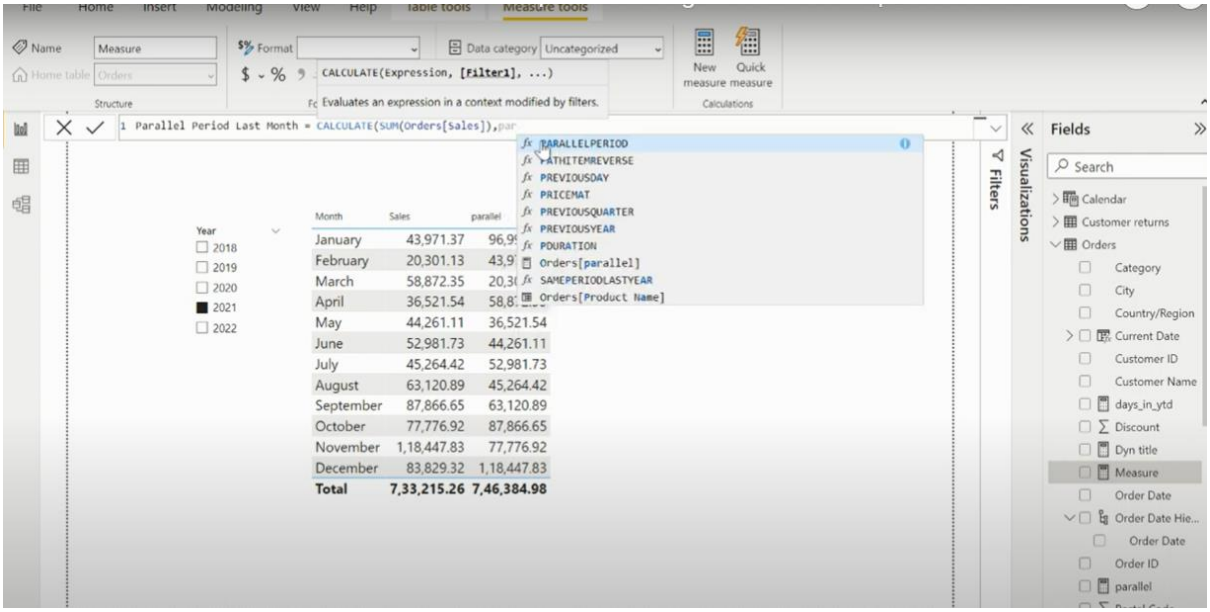
Ribbon Chart

Helps to visualize the ranks of the categories based on a value



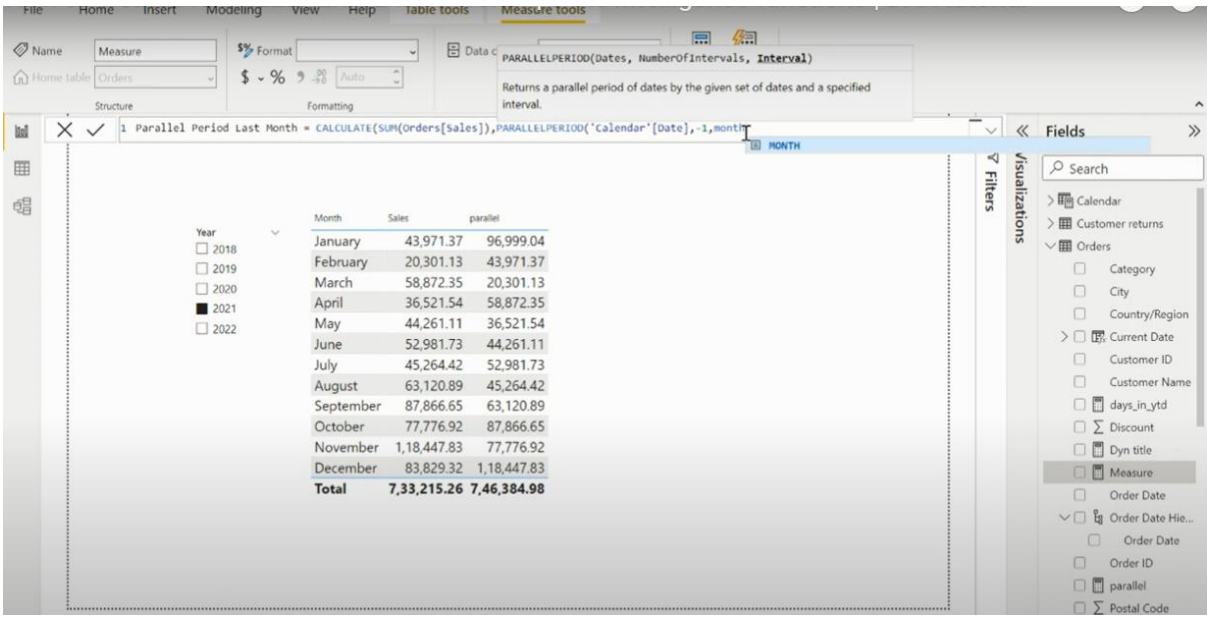
Parallelperiod DAX function in Power BI:

Create a new measure



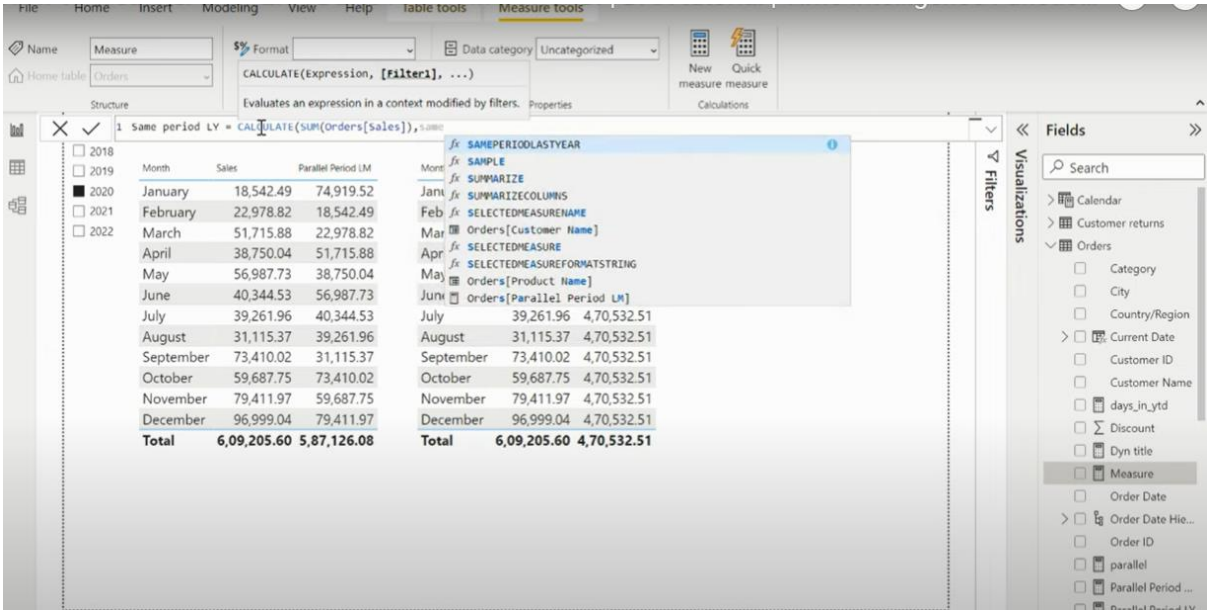
,-1, month will compare current month sales with last month sales.

For e.g. it will compare aug'22 sales with jul'22 sales



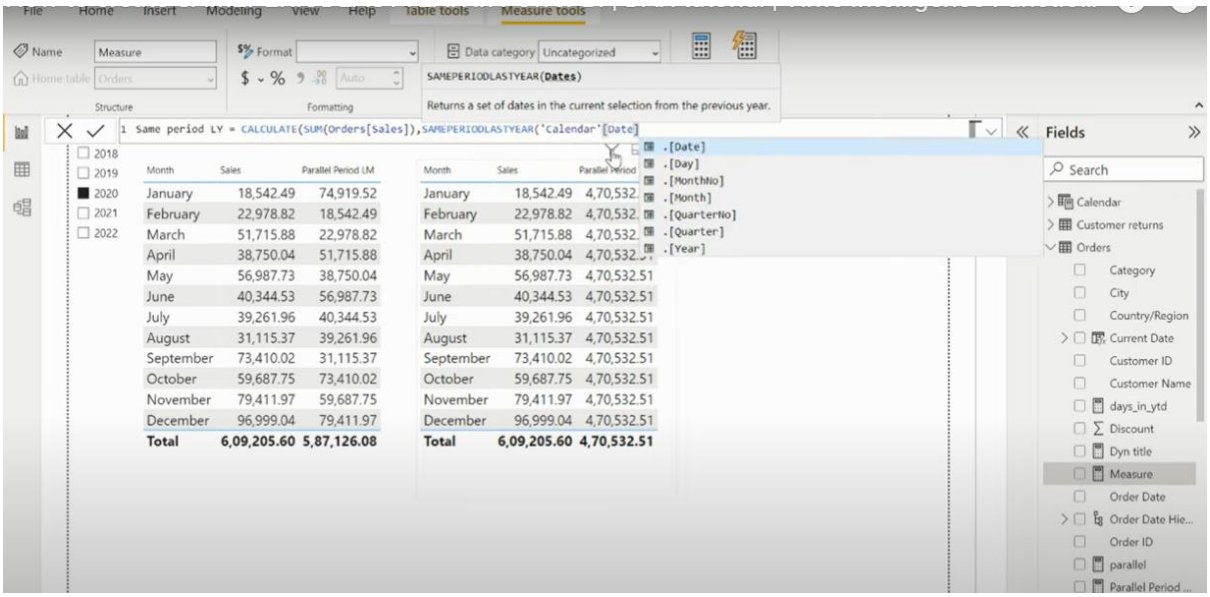
Sameperiod DAX function in Power BI:

Create a new measure

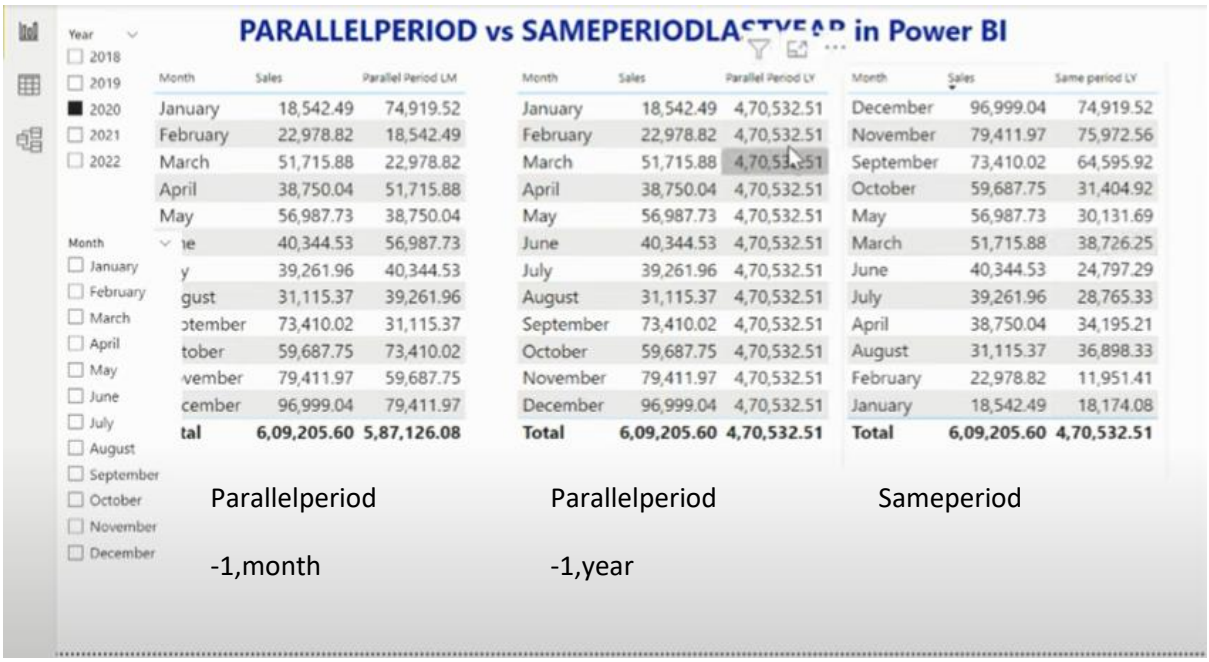


sameperiod will compare current month sales with same month last year sales.

For e.g. it will compare aug'22 sales with aug'21 sales



Parallelperiod (-12,month) will also give same result as same period but sameperiod is more reliable function in case of data for some months are missing

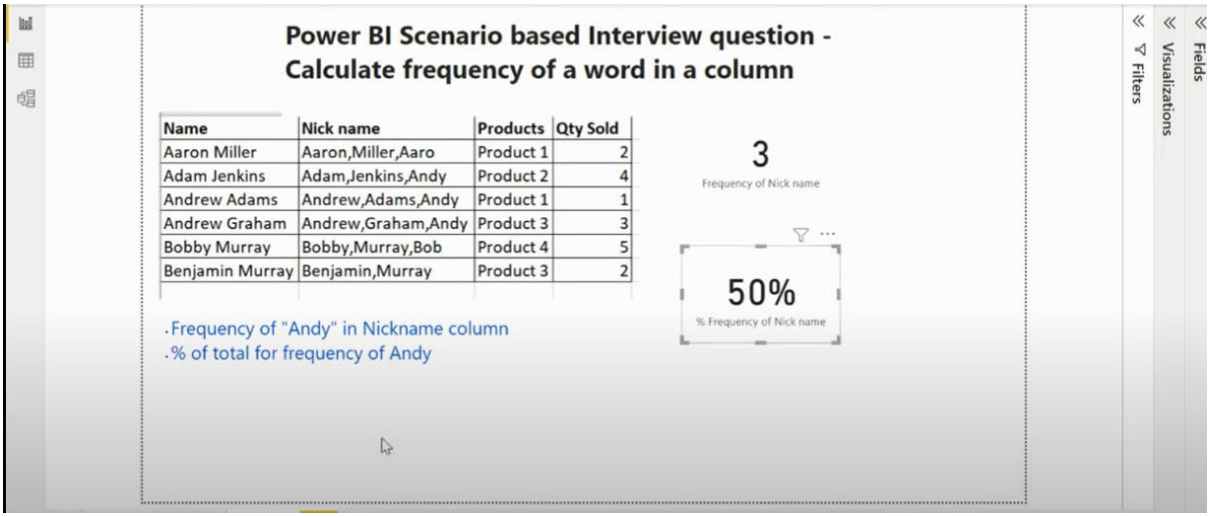


Month	Sales	Parallel Period LM
January	18,542.49	74,919.52
February	22,978.82	18,542.49
March	51,715.88	22,978.82
April	38,750.04	51,715.88
May	56,987.73	38,750.04
ıe	40,344.53	56,987.73
y	39,261.96	40,344.53
gust	31,115.37	39,261.96
ɔtember	73,410.02	31,115.37
tober	59,687.75	73,410.02
vember	79,411.97	59,687.75
cember	96,999.04	79,411.97
tal	6,09,205.60	5,87,126.08

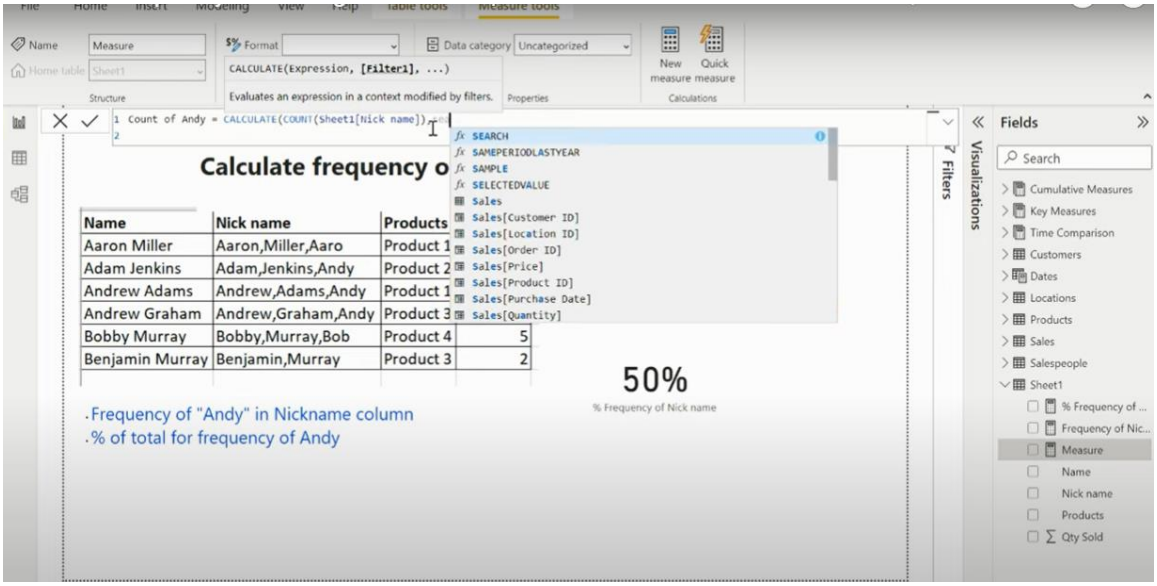
Month	Sales	Parallel Period LY
January	18,542.49	4,70,532.51
February	22,978.82	4,70,532.51
March	51,715.88	4,70,532.51
April	38,750.04	4,70,532.51
May	56,987.73	4,70,532.51
June	40,344.53	4,70,532.51
July	39,261.96	4,70,532.51
August	31,115.37	4,70,532.51
September	73,410.02	4,70,532.51
October	59,687.75	4,70,532.51
November	79,411.97	4,70,532.51
December	96,999.04	4,70,532.51
Total	6,09,205.60	4,70,532.51

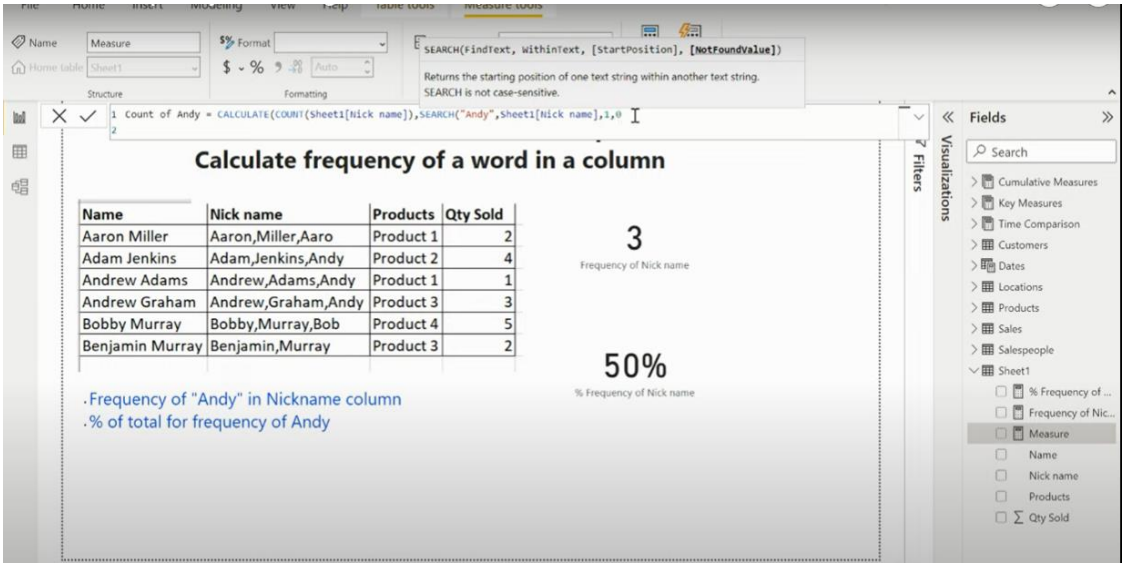
Month	Sales	Same period LY
December	96,999.04	74,919.52
November	79,411.97	75,972.56
September	73,410.02	64,595.92
October	59,687.75	31,404.92
May	56,987.73	30,131.69
March	51,715.88	38,726.25
June	40,344.53	24,797.29
July	39,261.96	28,765.33
April	38,750.04	34,195.21
August	31,115.37	36,898.33
February	22,978.82	11,951.41
January	18,542.49	18,174.08
Total	6,09,205.60	4,70,532.51

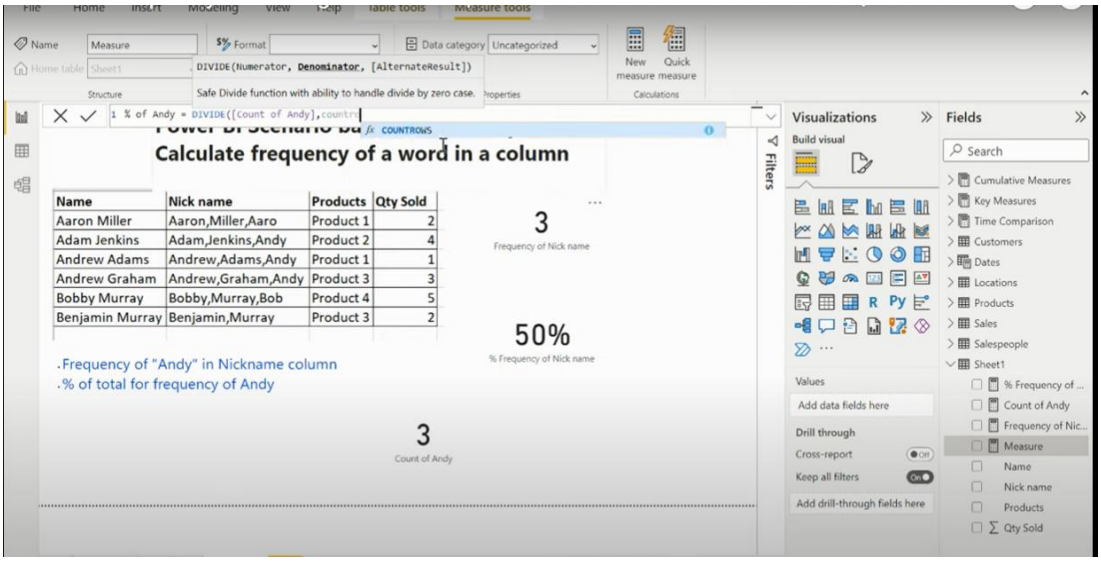
Calculate frequency of a word in a column in Power BI

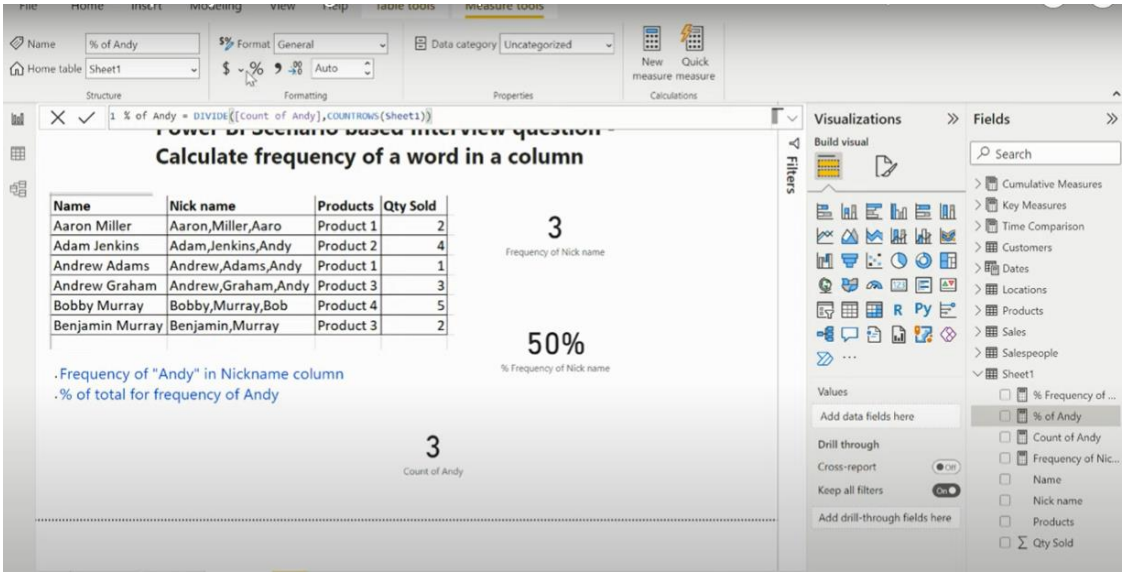


Create a measure

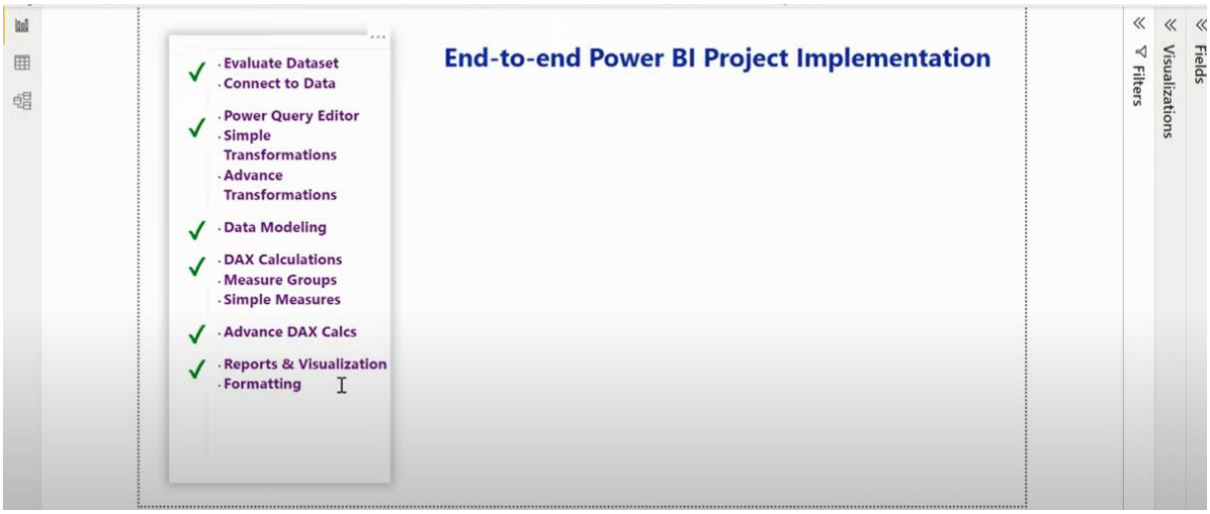




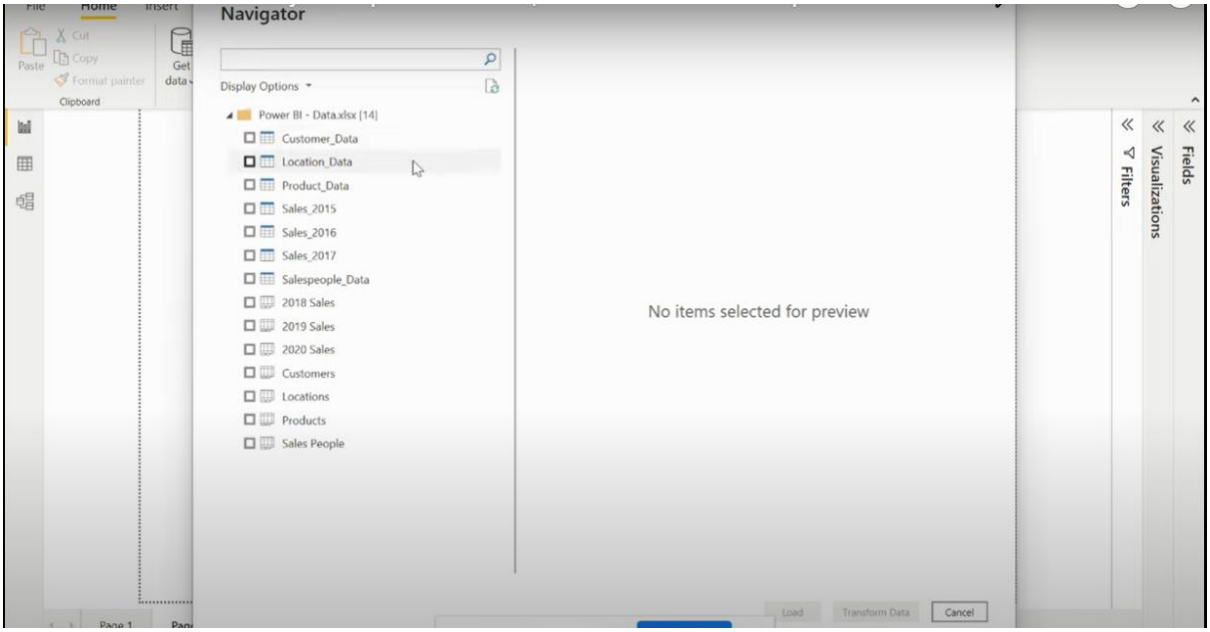


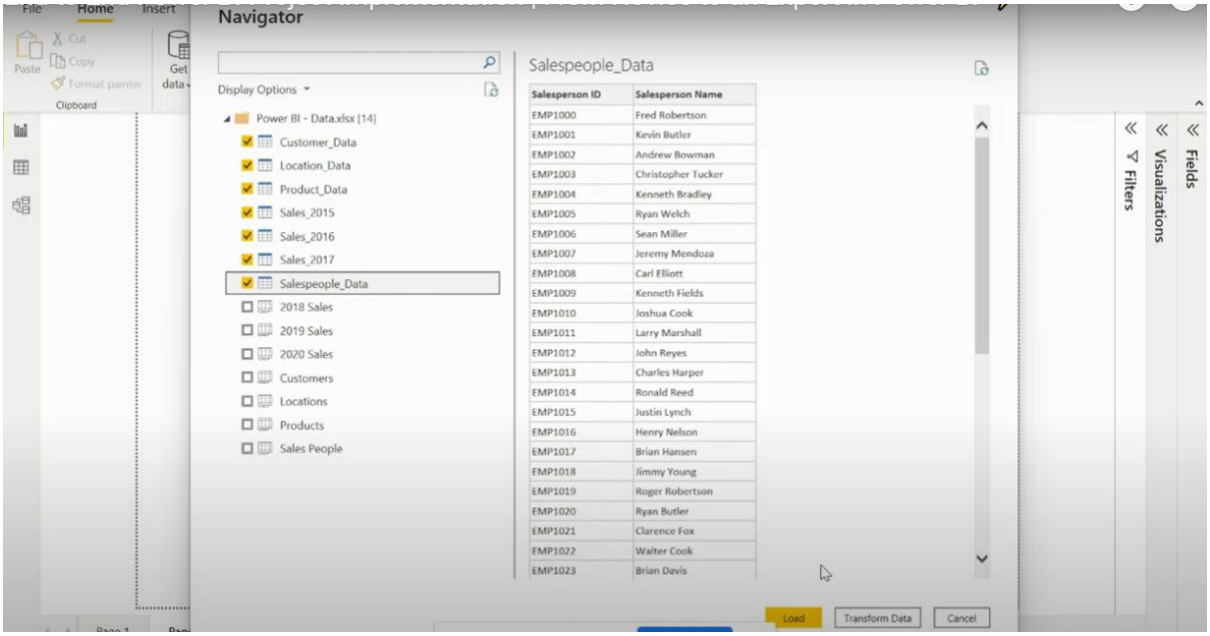

Name
% of Andy
Home table
Sheet1
Structure
Format
General
Auto
Formatting
Data category
Uncategorized
Properties
New measure
Quick measure
Calculations
1 % of Andy = DIVIDE([Count of Andy],COUNTROWS(Sheet1))
Calculate frequency of a word in a column
Name
Nick name
Products
Qty Sold
Aaron Miller
Aaron,Miller,Aaro
Product 1
2
Adam Jenkins
Adam,Jenkins,Andy
Product 2
4
Andrew Adams
Andrew,Adams,Andy
Product 1
1
Andrew Graham
Andrew,Graham,Andy
Product 3
3
Bobby Murray
Bobby,Murray,Bob
Product 4
5
Benjamin Murray
Benjamin,Murray
Product 3
2
3
Frequency of Nick name
50%
% Frequency of Nick name
.Frequency of "Andy" in Nickname column
.% of total for frequency of Andy
3
Count of Andy
Filters
Visualizations
Build visual
Values
Add data fields here
Drill through
Cross-report
Keep all filters
Add drill-through fields here
Fields
Search
Cumulative Measures
Key Measures
Time Comparison
Customers
Dates
Locations
Products
Sales
Salespeople
Sheet1
% Frequency of ...
% of Andy
Count of Andy
Frequency of Nic...
Name
Nick name
Products
Qty Sold

End to End Power BI Project Implementation

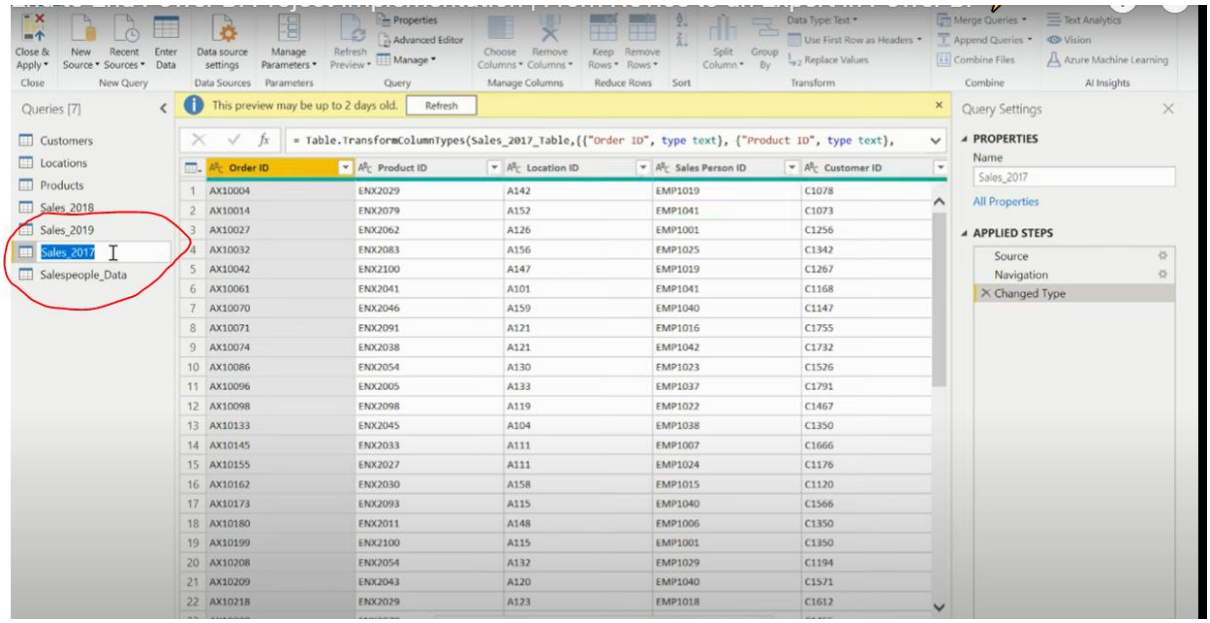


Get Data -> Excel Workbook -> go to location -> select all the tables to load -> transform data

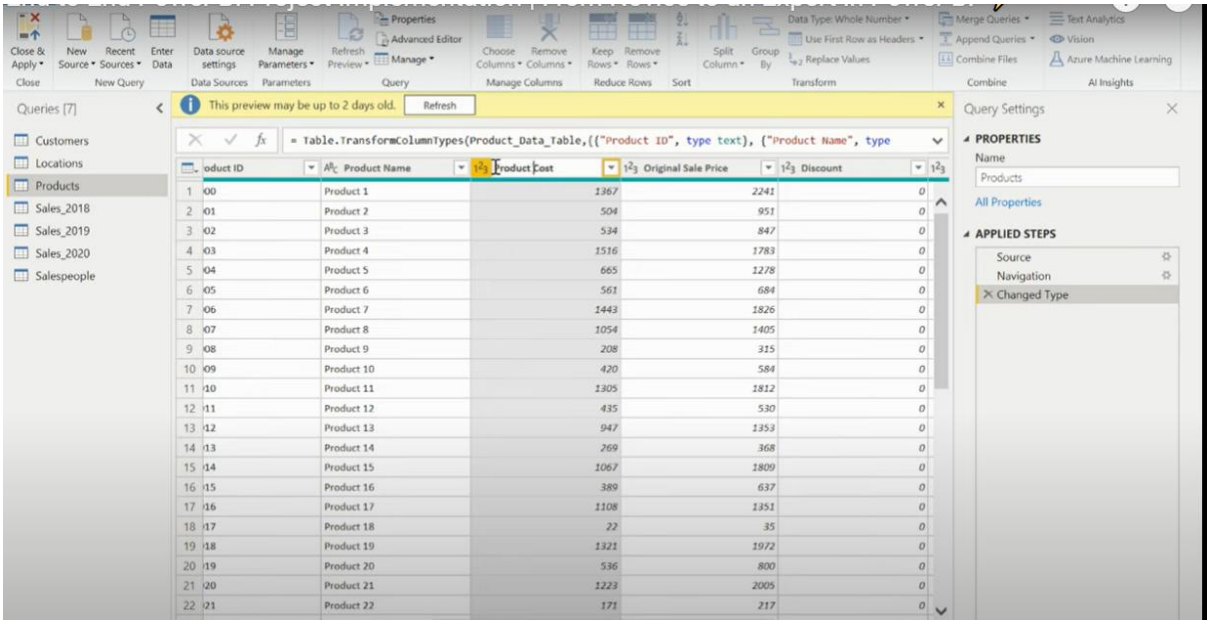




Rename table names if required

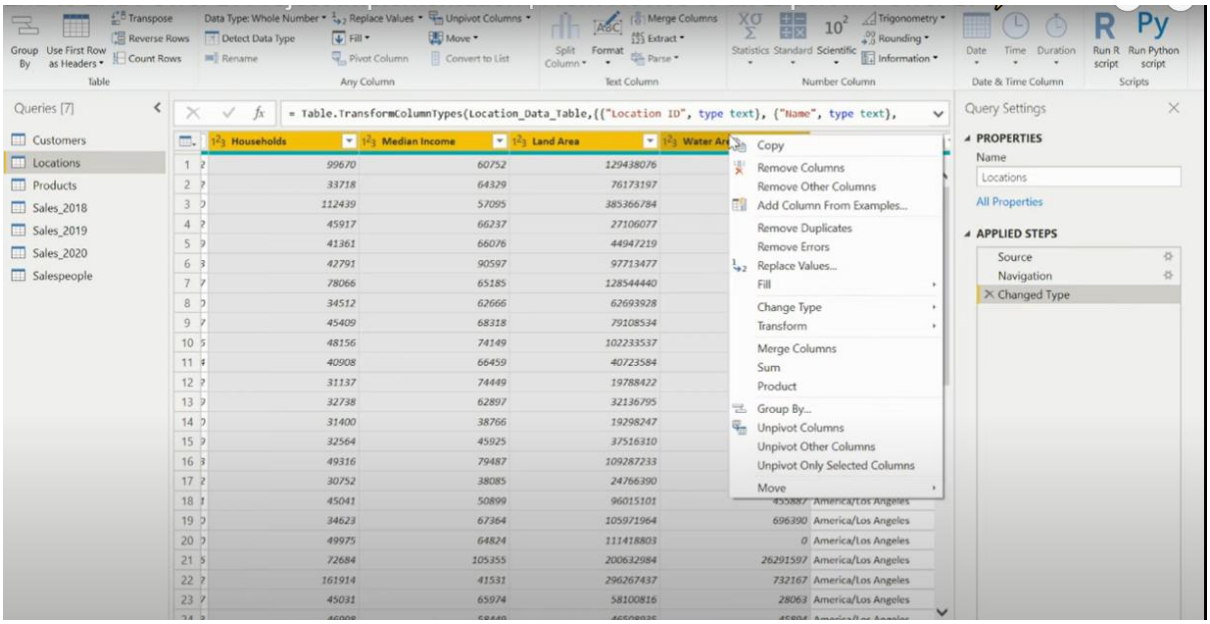


Rename columns if required



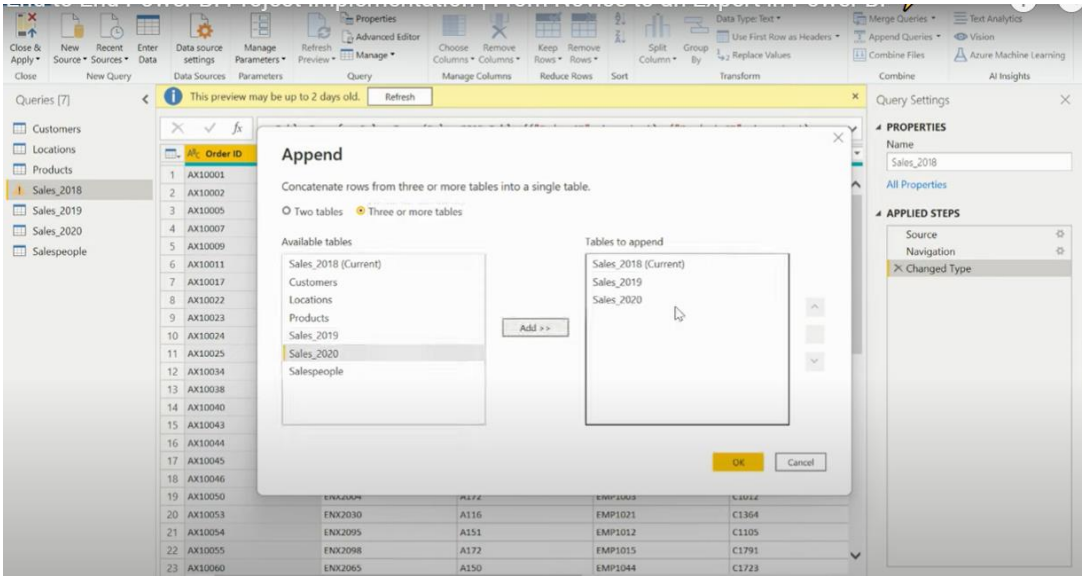
To remove unrequired columns

Select the unrequired columns with ctrl + select -> right click -> remove columns

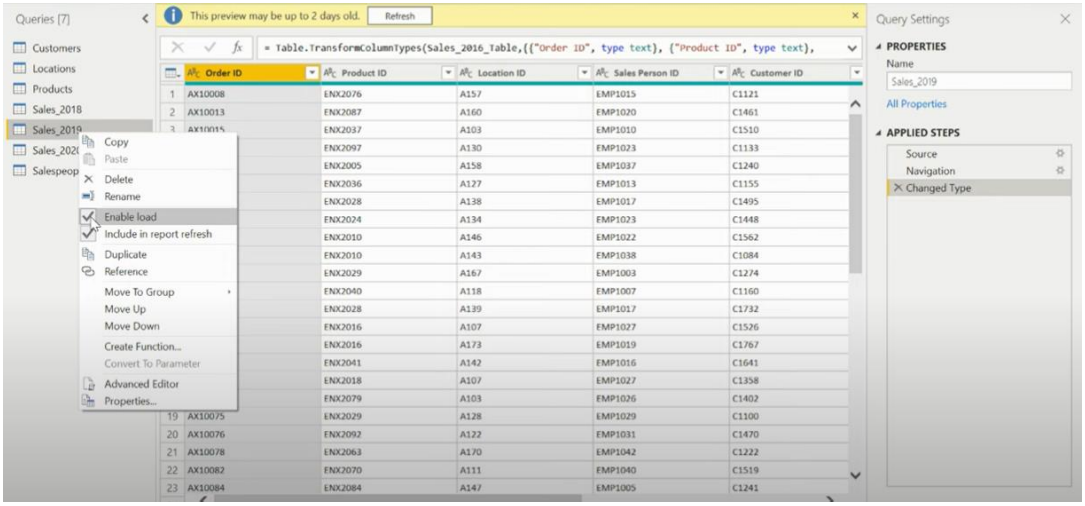


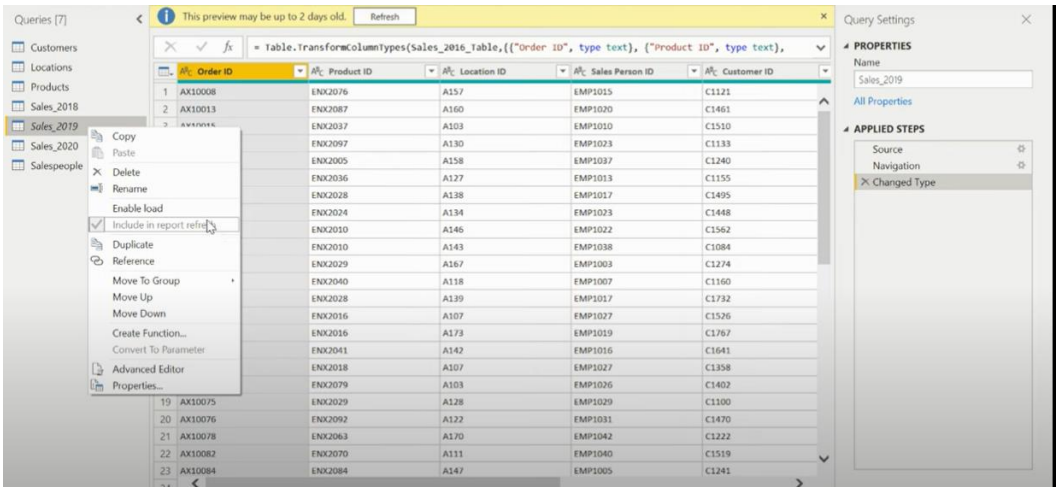
To merge tables with similar columns

Home -> append queries -> three or more tables -> select table -> click add -> click ok (once all tables are added)



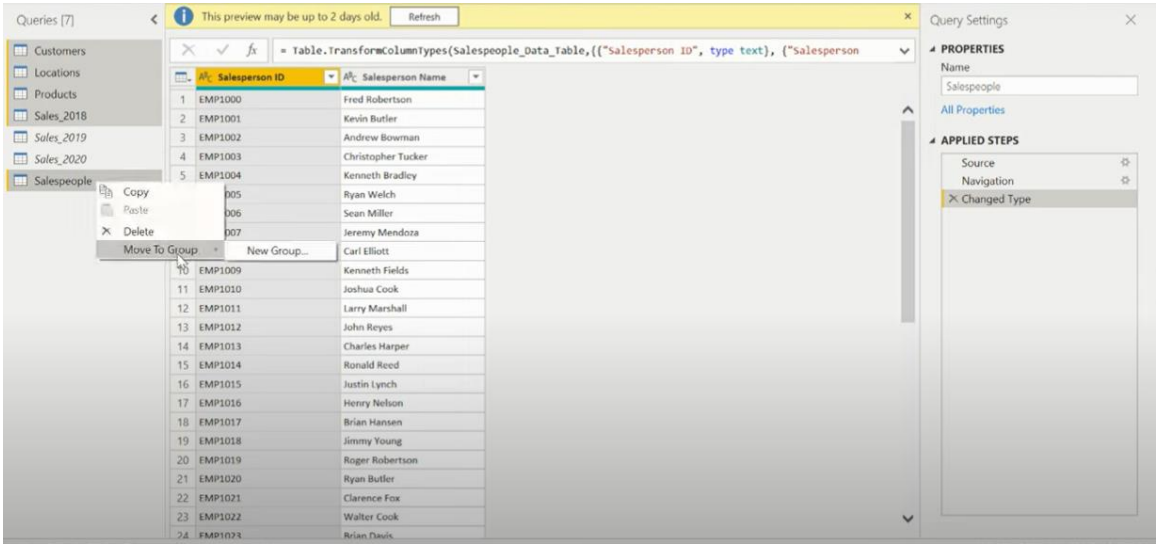
Once table appended , right click on unrequired tables and **deselect Enable Load**

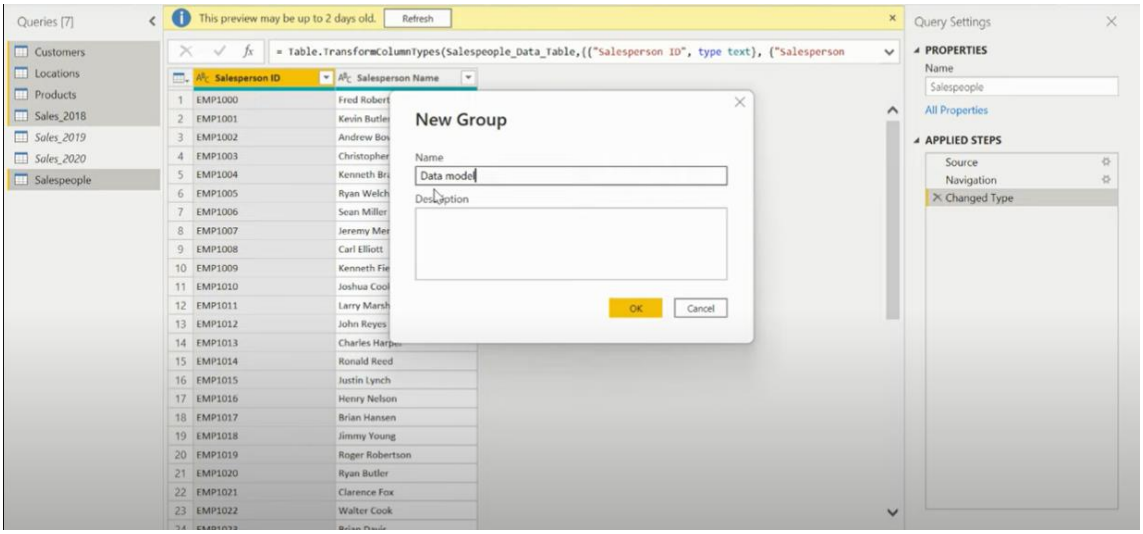




To Group the columns

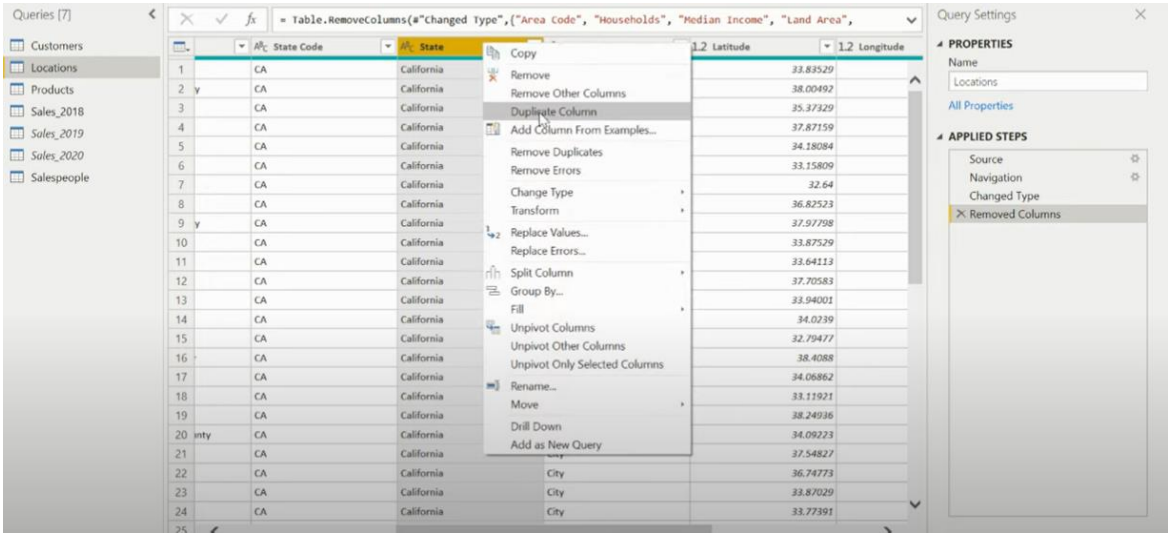
Select the tables -> right click -> move to group -> new group -> rename group -> click ok -> two groups are created (1. Created by us 2. other queries)

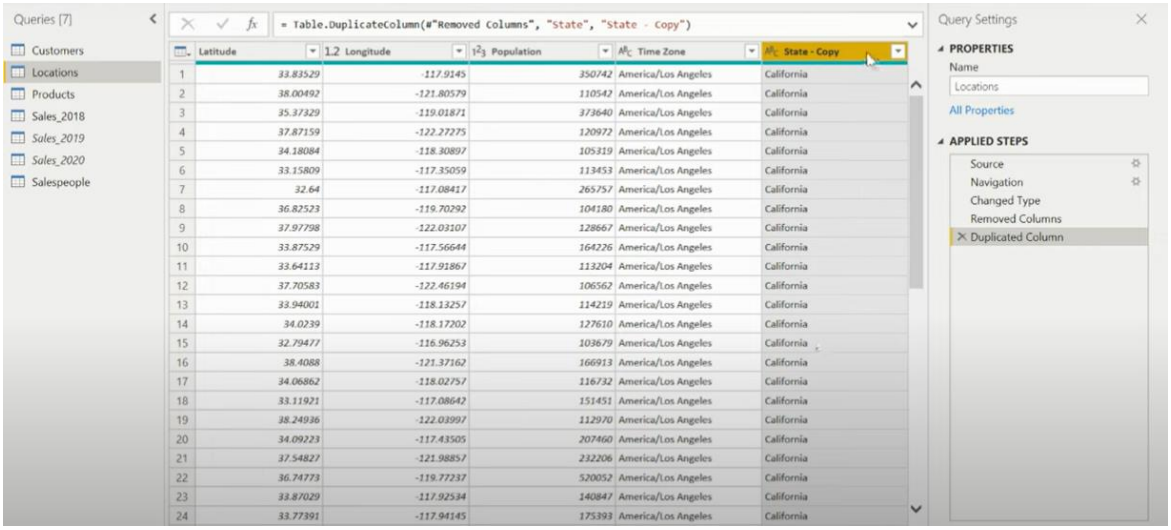


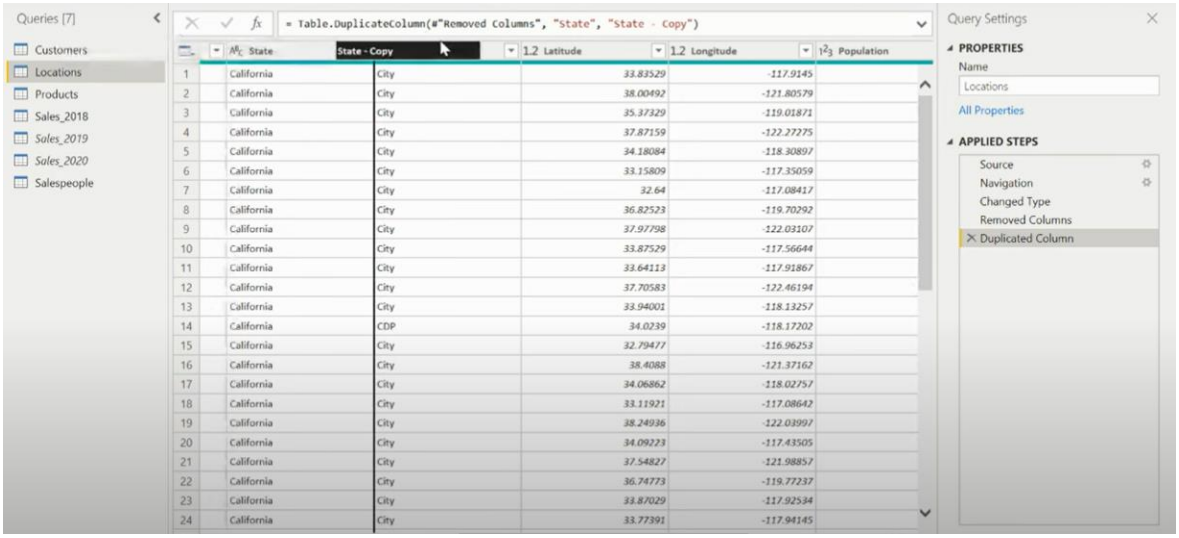


To Duplicate Columns

Select column -> right click -> duplicate column -> it will be duplicated at the end -> drag and drop to wherever you want

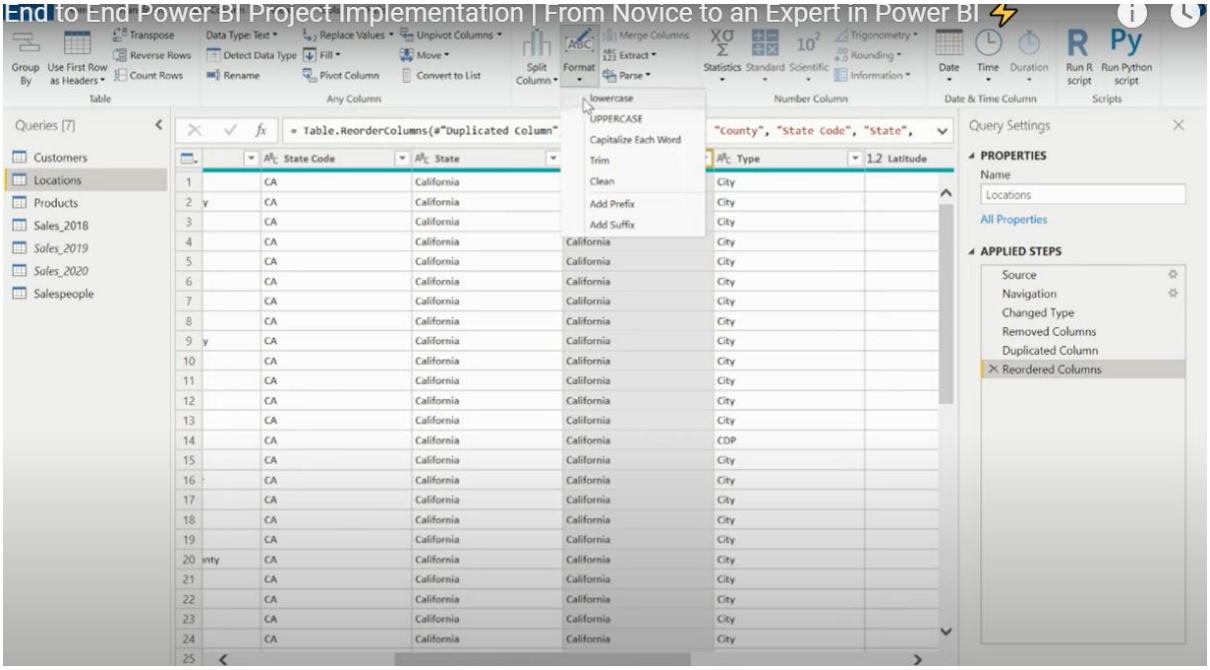






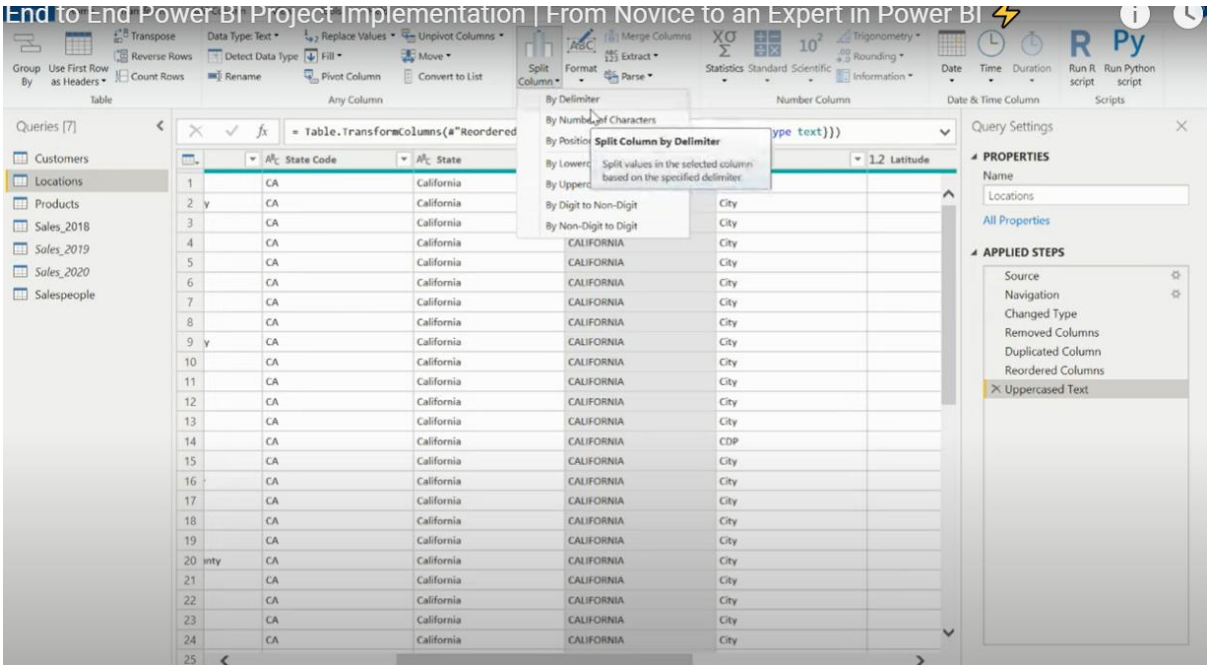
To format the column (lowercase/uppercase/proper/trim/clean/add prefix/add suffix)

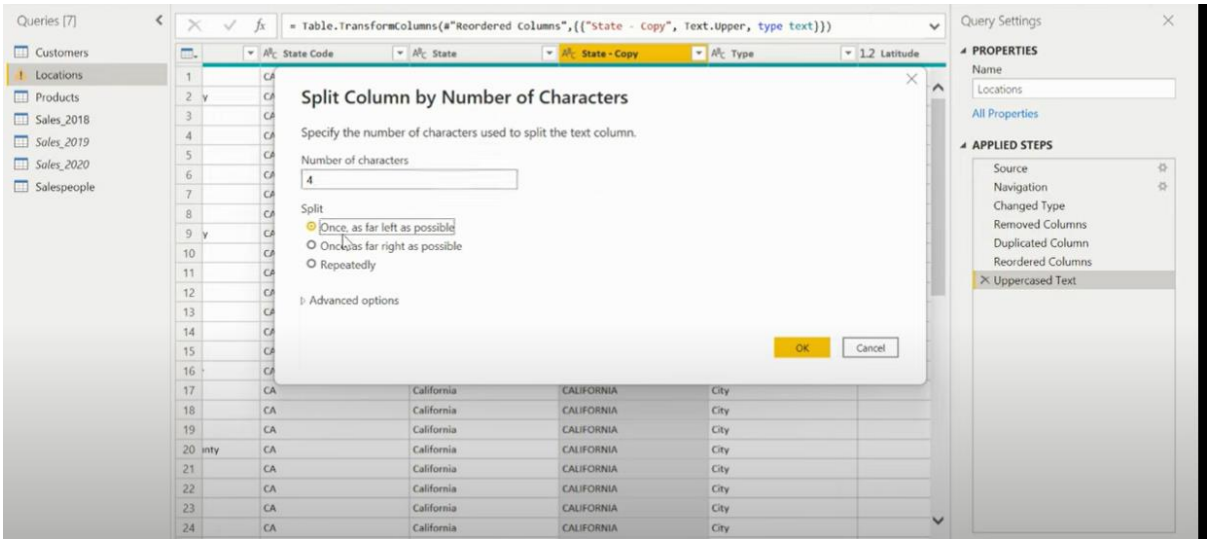
Transform -> format -> uppercase

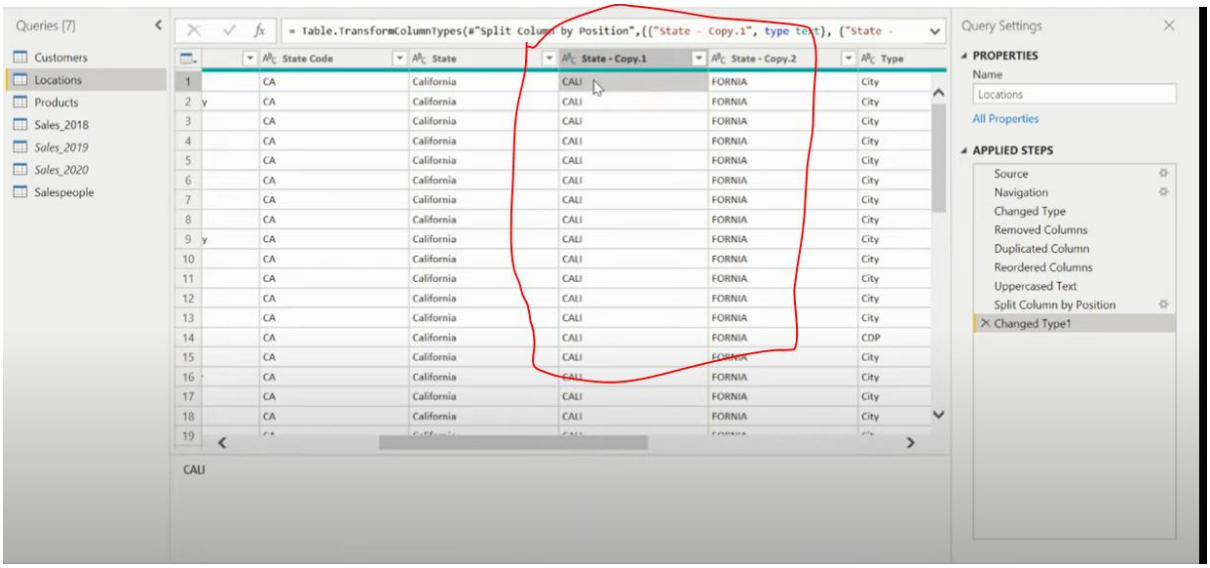


To split the column (by delimiter/no of characters/positions/lowercase to uppercase/uppercase to lowercase/digit to non-digit/ non-digit to digit)

Transform -> split column -> by no of characters -> specify no of characters -> select appropriate option -> click ok







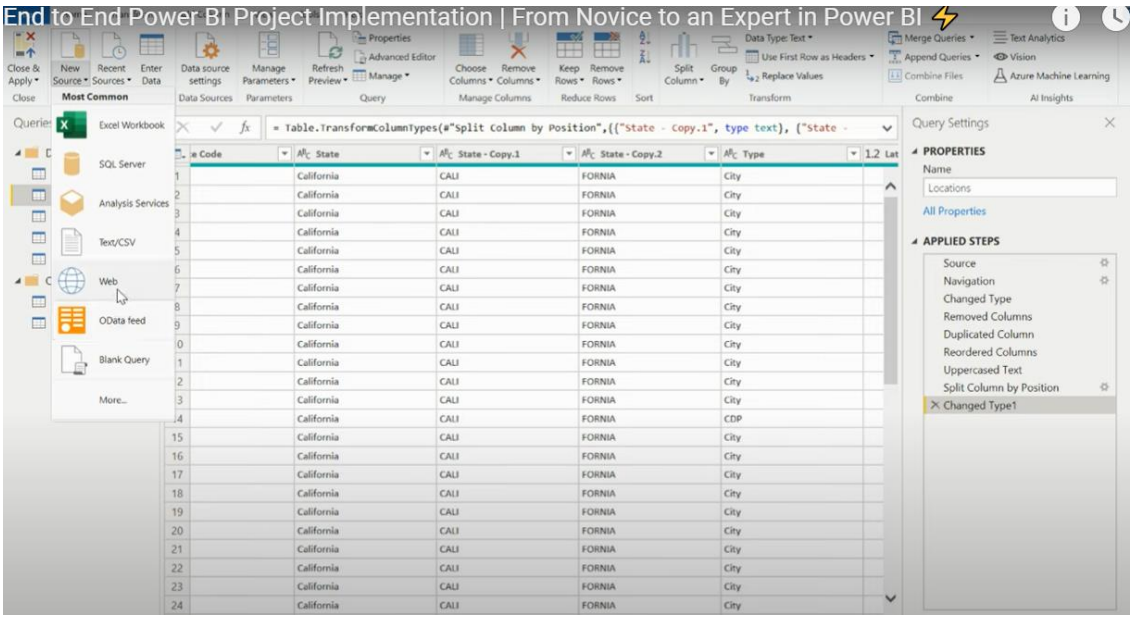
How to bring in data from web in table

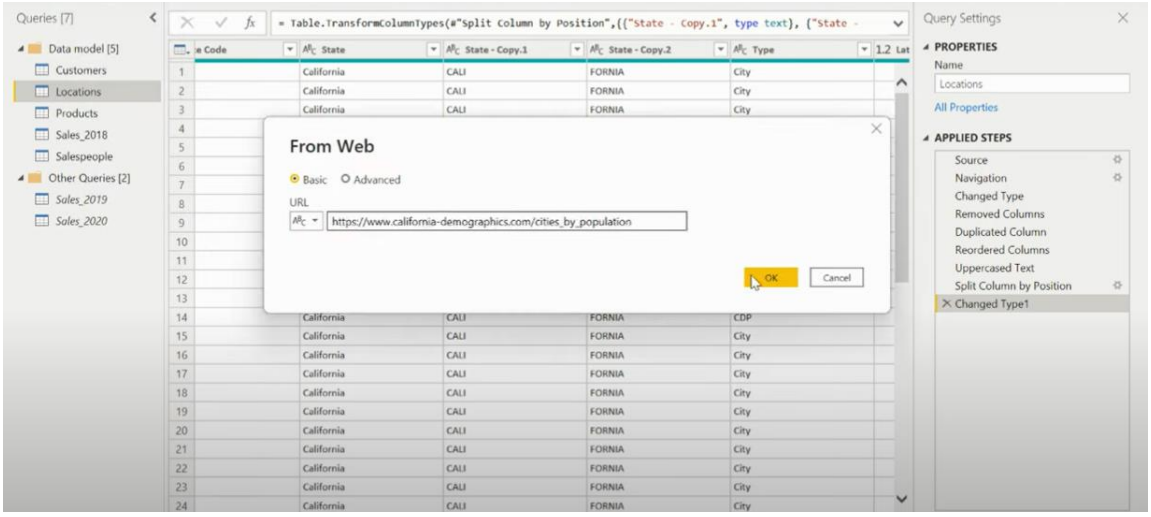
We want the California population data by city in the table

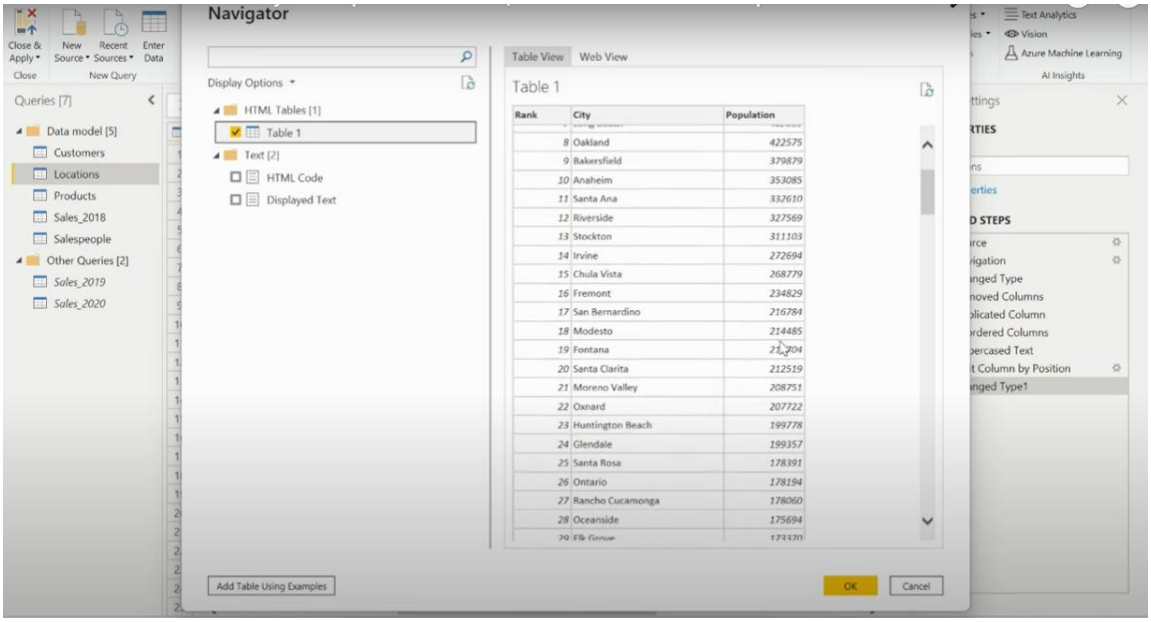
Home -> New source -> web -> paste the url -> click ok -> In the navigator we can see options such as table/html code/displayed text -> select table -> click ok -> new table is added to the dataset

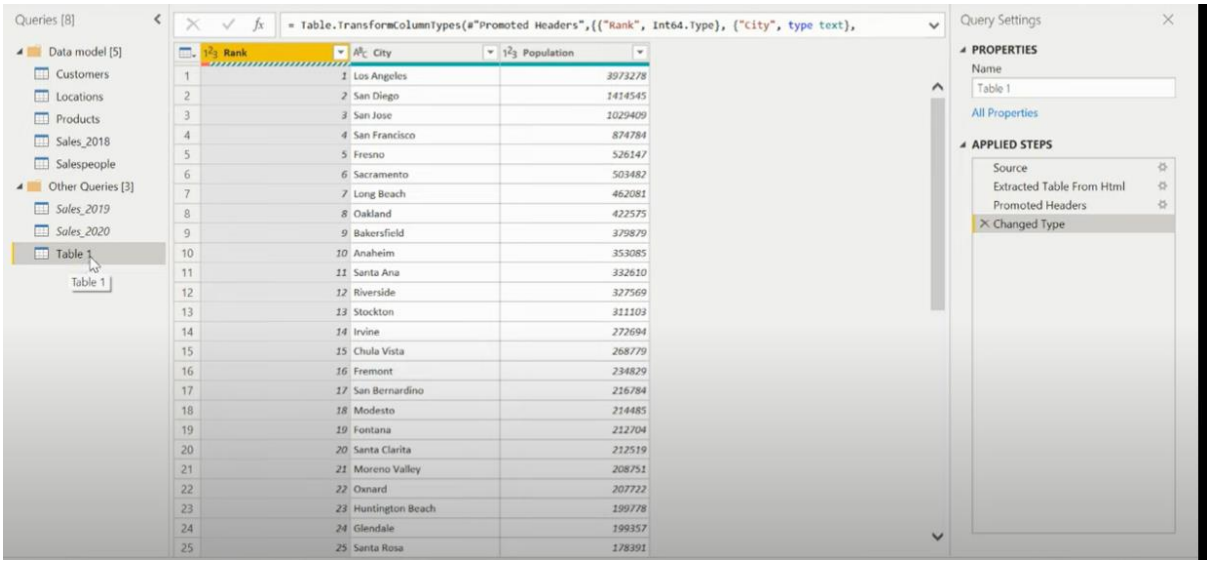
Rename the new table -> right click -> move to required group

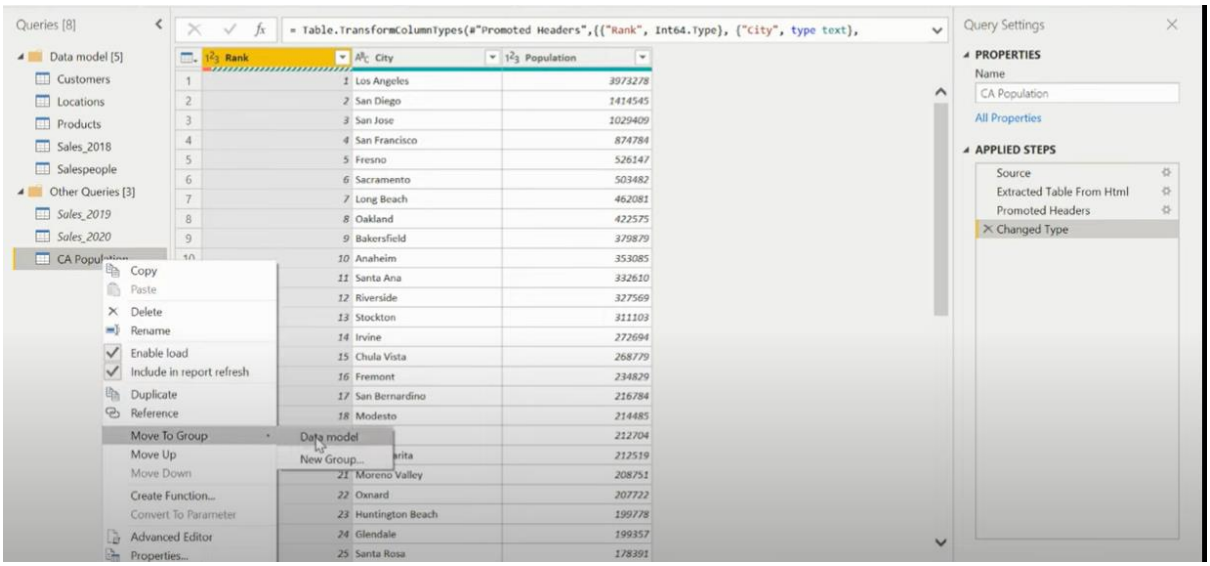
End to End Power BI Project Implementation | From Novice to an Expert in Power BI ⚡





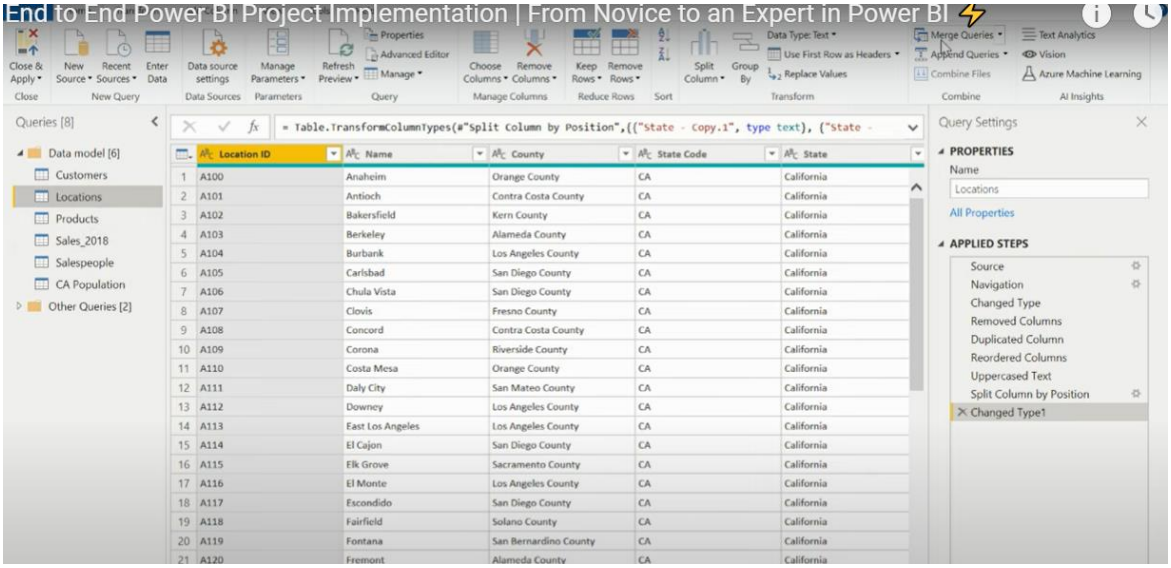


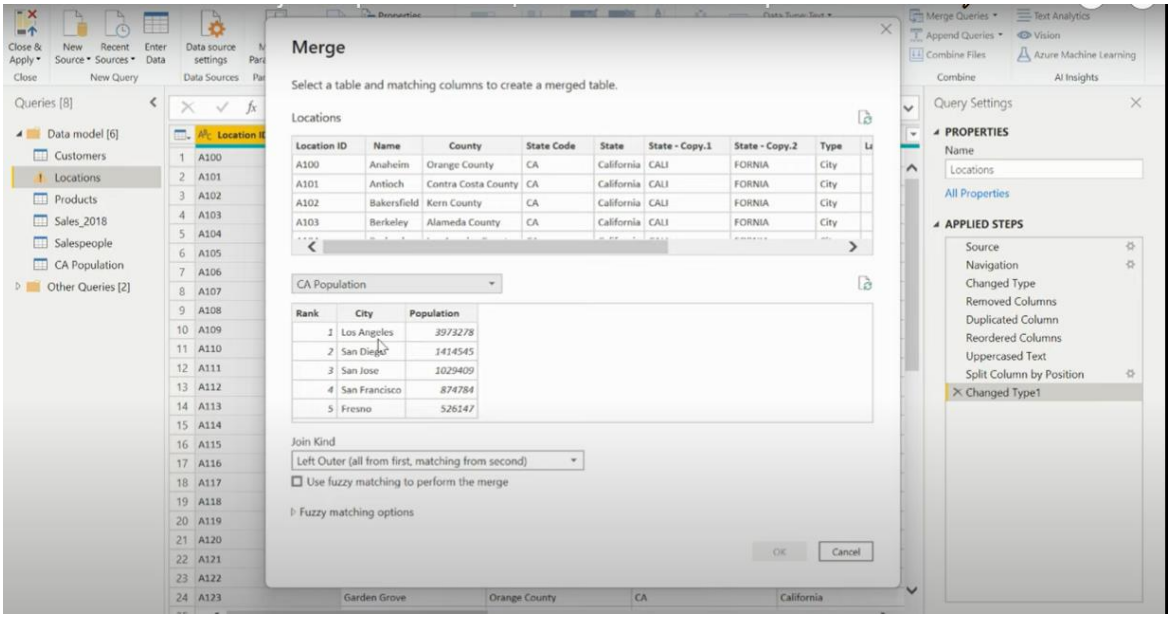


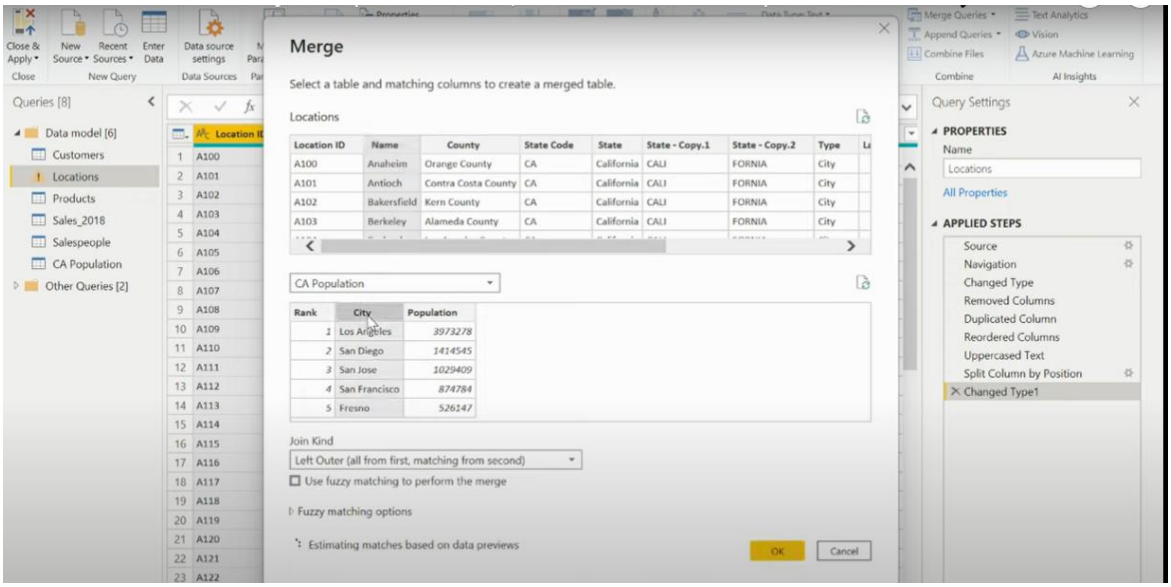


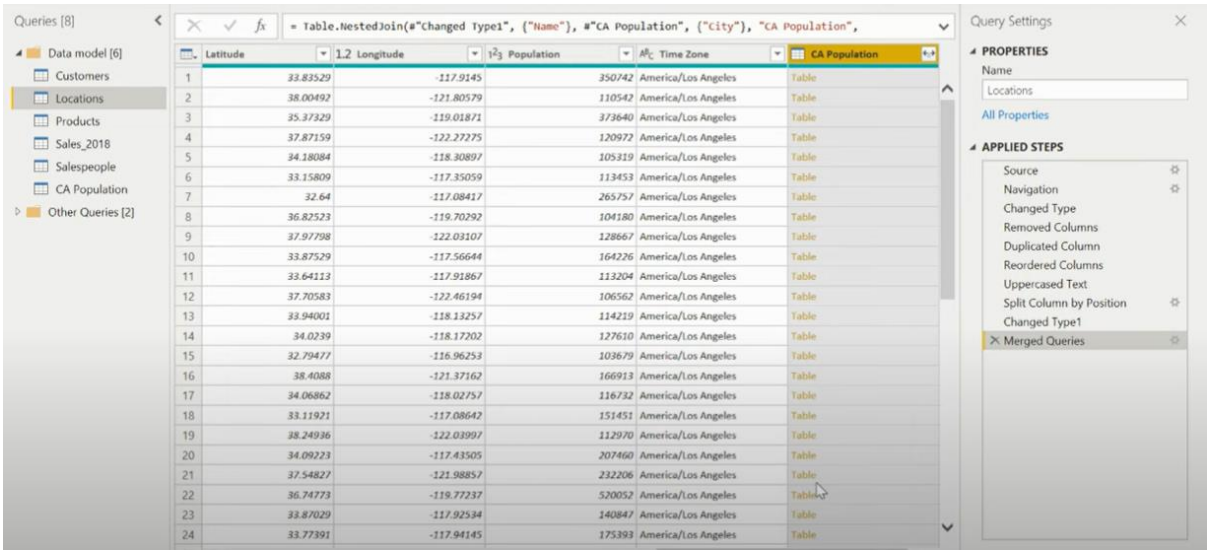
To combine different tables

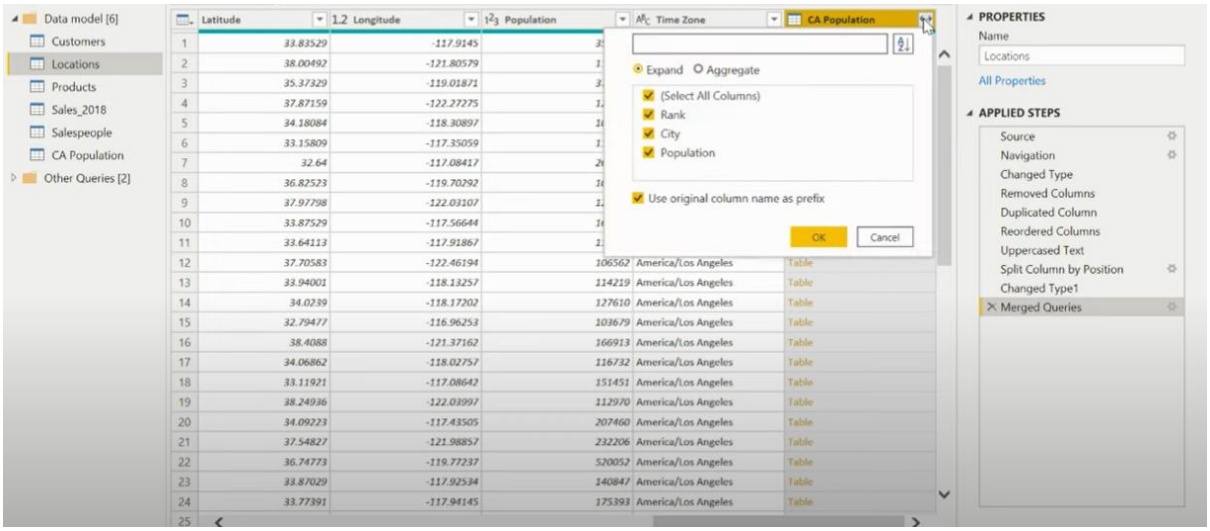
Select Primary table -> Home -> merge queries -> select other table ->select common columns -> specify join condition -> column is merged into primary table (but it is in the form of a table) -> click expand -> select required columns -> click ok -> rename the column -> select the unrequired table -> right click -> unselect enable load -> right click -> move to group -> other queries

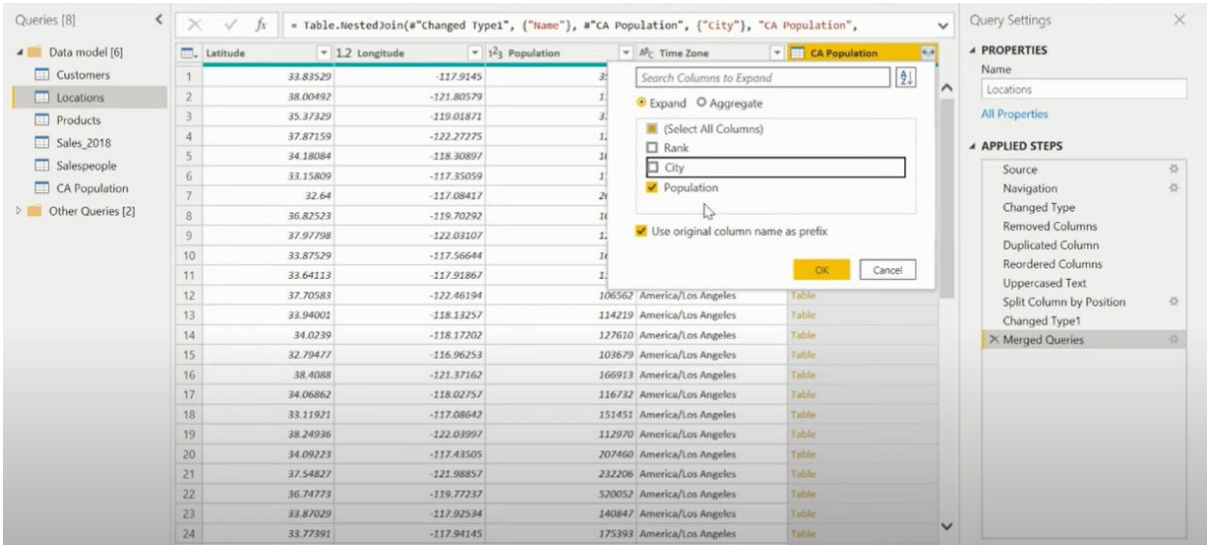

End to End Power BI Project Implementation | From Novice to an Expert in Power BI
Queries [8]
Data model [6]
Customers
Locations
Products
Sales_2018
Salespeople
CA Population
Other Queries [2]
= Table.TransformColumnTypes(#"Split Column by Position",{{"State - Copy.1", type text}, {"State -
Location ID
Name
County
State Code
State
Query Settings
PROPERTIES
Name
Locations
All Properties
APPLIED STEPS
Source
Navigation
Changed Type
Removed Columns
Duplicated Column
Reordered Columns
Uppercased Text
Split Column by Position
Changed Type1

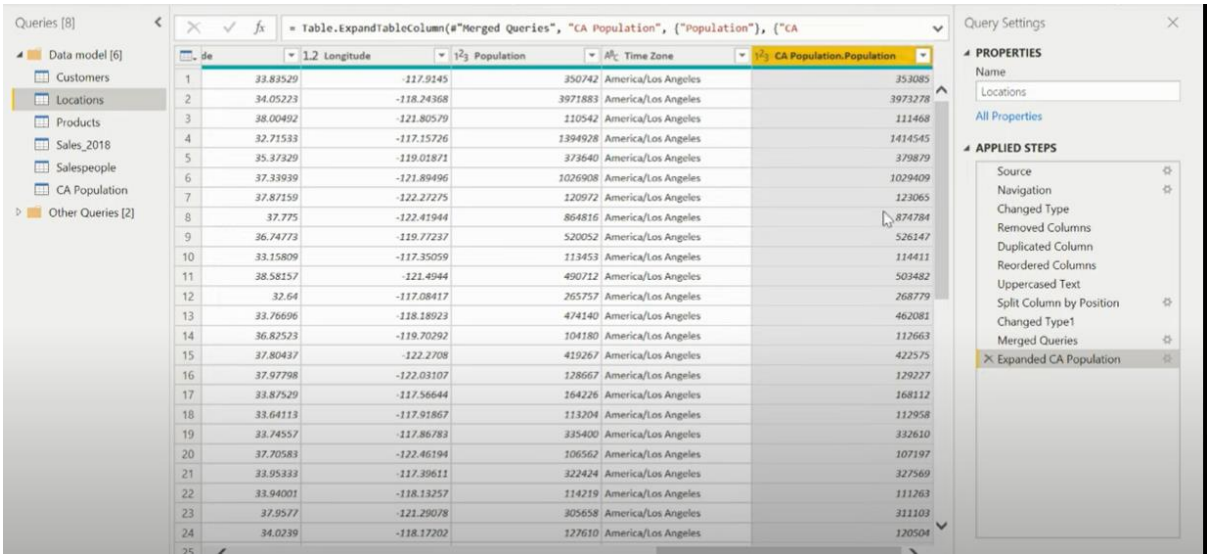

Merge
Select a table and matching columns to create a merged table.
Locations
Location ID
Name
County
State Code
State
State - Copy.1
State - Copy.2
Type
A100
Anaheim
Orange County
CA
California
CALI
FORNIA
City
A101
Antioch
Contra Costa County
A102
Bakersfield
Kern County
A103
Berkeley
Alameda County
CA Population
Rank
City
Population
1
Los Angeles
3973278
2
San Diego
1414545
3
San Jose
1029409
4
San Francisco
874784
5
Fresno
526147
Join Kind
Left Outer (all from first, matching from second)
Use fuzzy matching to perform the merge
Fuzzy matching options
OK
Cancel

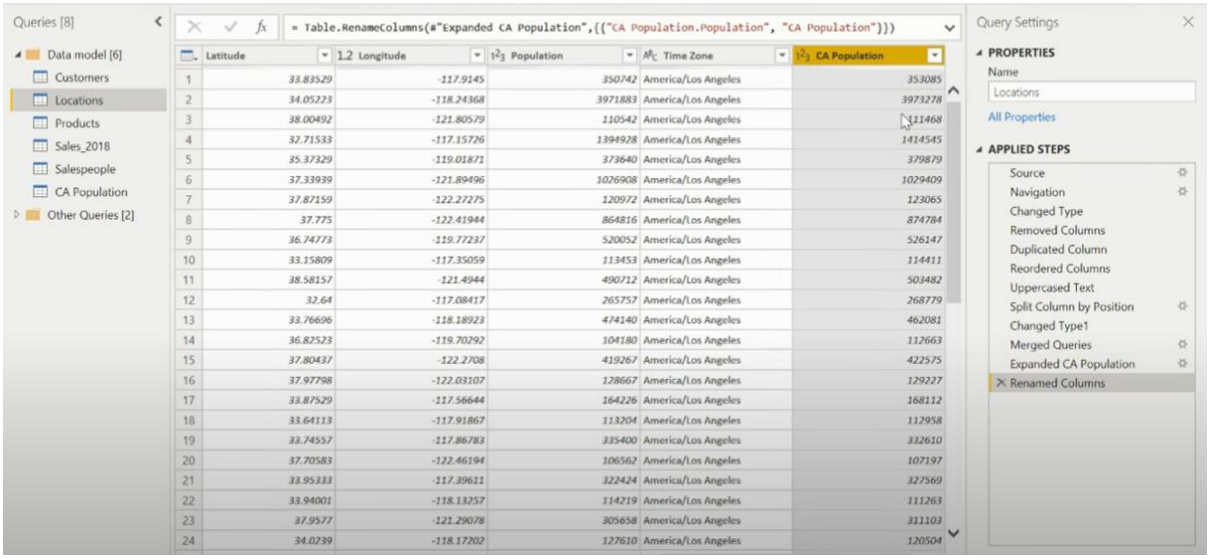

Merge
Select a table and matching columns to create a merged table.
Locations
CA Population
Join Kind
Left Outer (all from first, matching from second)
Use fuzzy matching to perform the merge
Fuzzy matching options
Estimating matches based on data previews
OK
Cancel

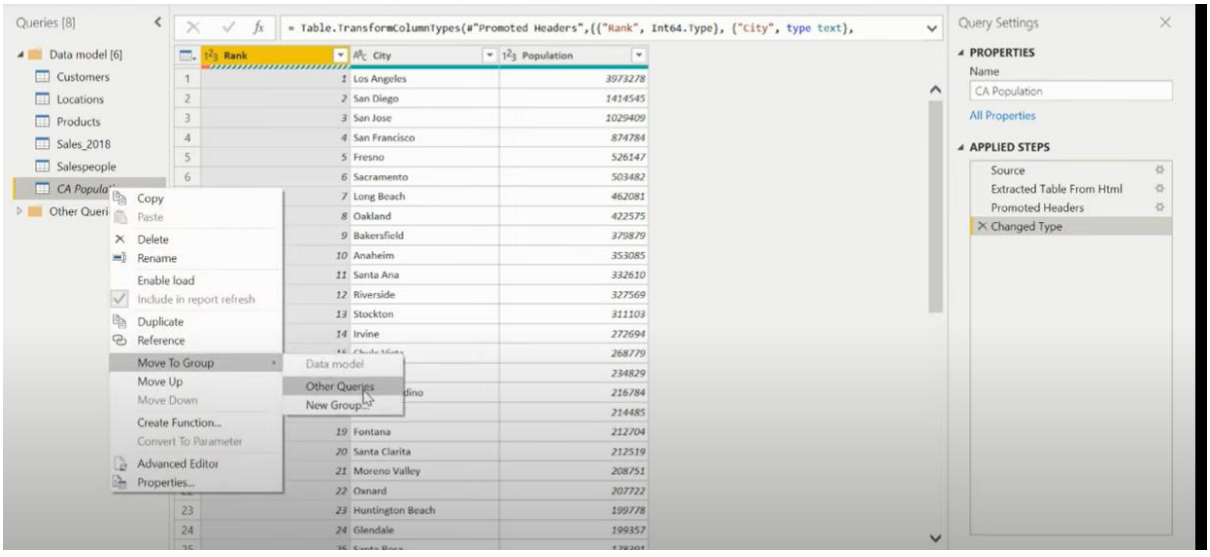

Queries [8]
Data model [6]
Customers
Locations
Products
Sales_2018
Salespeople
CA Population
Other Queries [2]
= Table.NestedJoin(#"Changed Type1", {"Name"}, #"CA Population", {"City"}, "CA Population",
Latitude
Longitude
Population
Time Zone
CA Population
Query Settings
PROPERTIES
Name
Locations
All Properties
APPLIED STEPS
Source
Navigation
Changed Type
Removed Columns
Duplicated Column
Reordered Columns
Uppercased Text
Split Column by Position
Changed Type1
Merged Queries


Expand
Aggregate
(Select All Columns)
Rank
City
Population
Use original column name as prefix
OK
Cancel

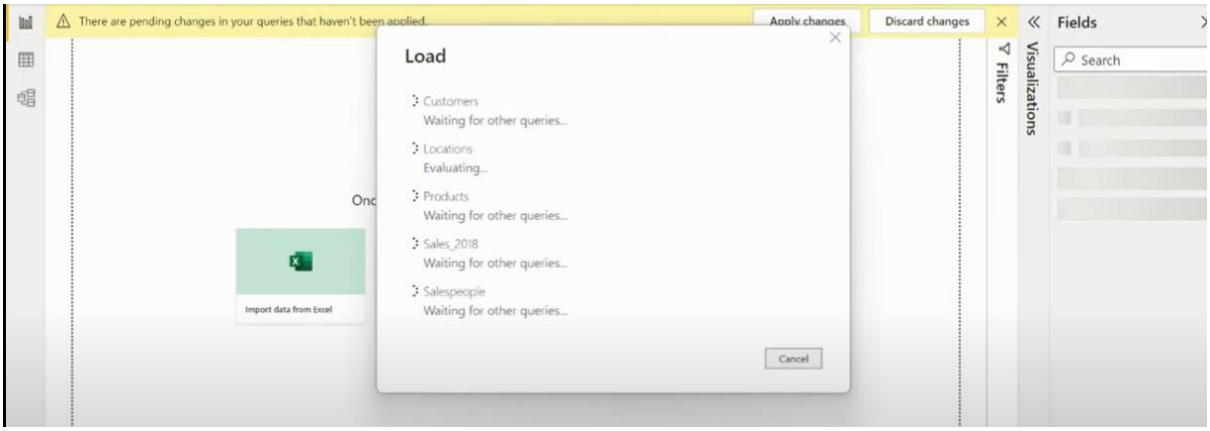

Search Columns to Expand
Expand
Aggregate
(Select All Columns)
Rank
City
Population
Use original column name as prefix
OK
Cancel

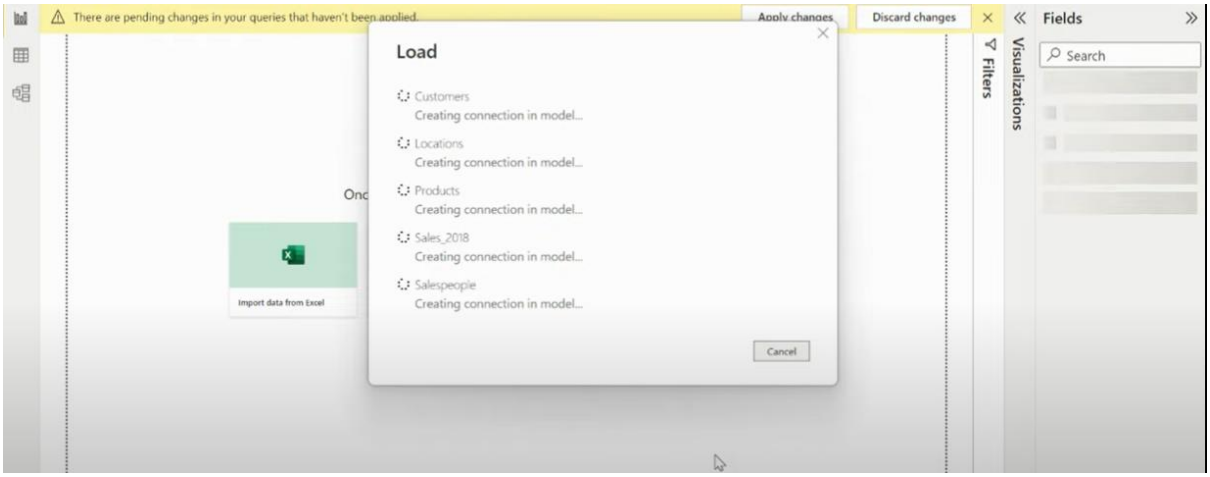


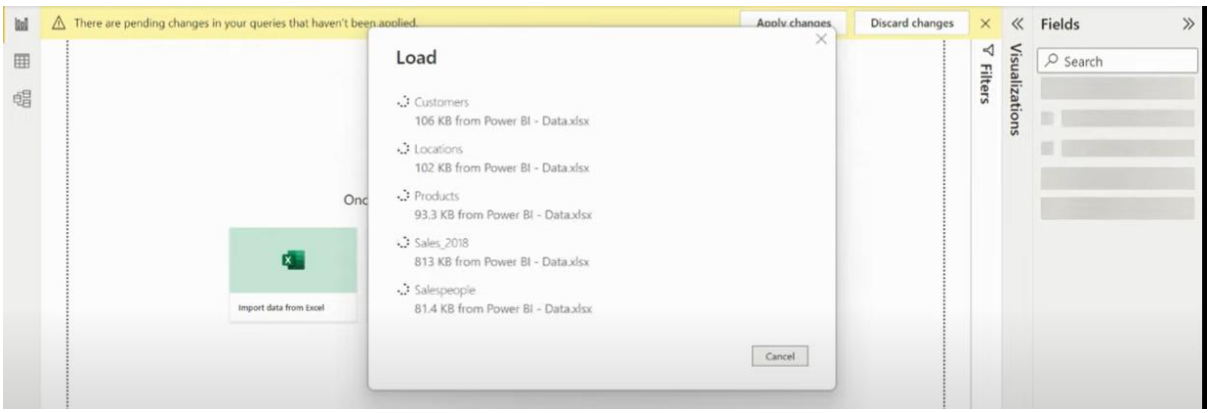


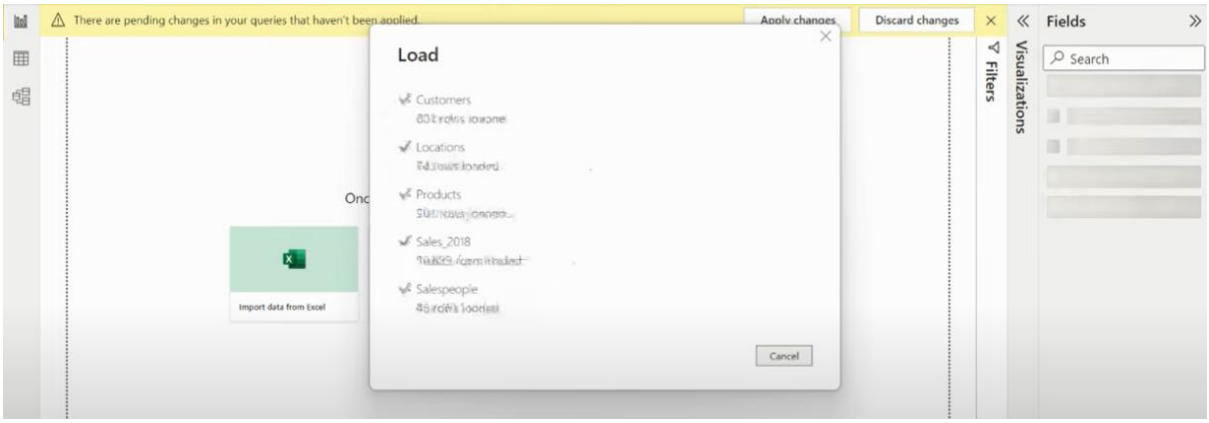


Once transformations are done, click on Close & apply then data will be loaded into Power BI


There are pending changes in your queries that haven't been applied.
Apply changes
Discard changes
Load
Customers
Waiting for other queries...
Locations
Evaluating...
Products
Waiting for other queries...
Sales_2018
Waiting for other queries...
Salespeople
Waiting for other queries...
Cancel
Import data from Excel
Fields
Search
Filters
Visualizations


There are pending changes in your queries that haven't been applied.
Apply changes
Discard changes
Load
Customers
Creating connection in model...
Locations
Creating connection in model...
Products
Creating connection in model...
Sales_2018
Creating connection in model...
Salespeople
Creating connection in model...
Cancel
Import data from Excel
Fields
Search
Filters
Visualizations

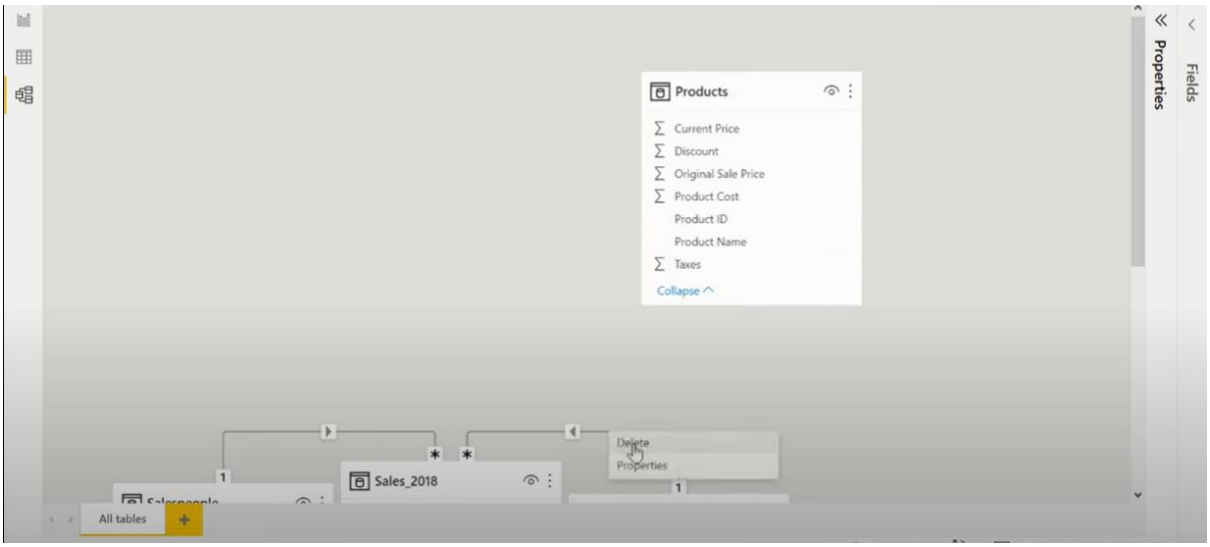

There are pending changes in your queries that haven't been applied.
Apply changes
Discard changes
Load
Customers
106 KB from Power BI - Data.xlsx
Locations
102 KB from Power BI - Data.xlsx
Products
93.3 KB from Power BI - Data.xlsx
Sales_2018
813 KB from Power BI - Data.xlsx
Salespeople
81.4 KB from Power BI - Data.xlsx
Cancel
Import data from Excel
Fields
Search
Filters
Visualizations


There are pending changes in your queries that haven't been applied.
Apply changes
Discard changes
Load
Customers
Locations
Products
Sales_2018
Salespeople
Cancel
Import data from Excel
Fields
Search
Filters
Visualizations

Data Modelling

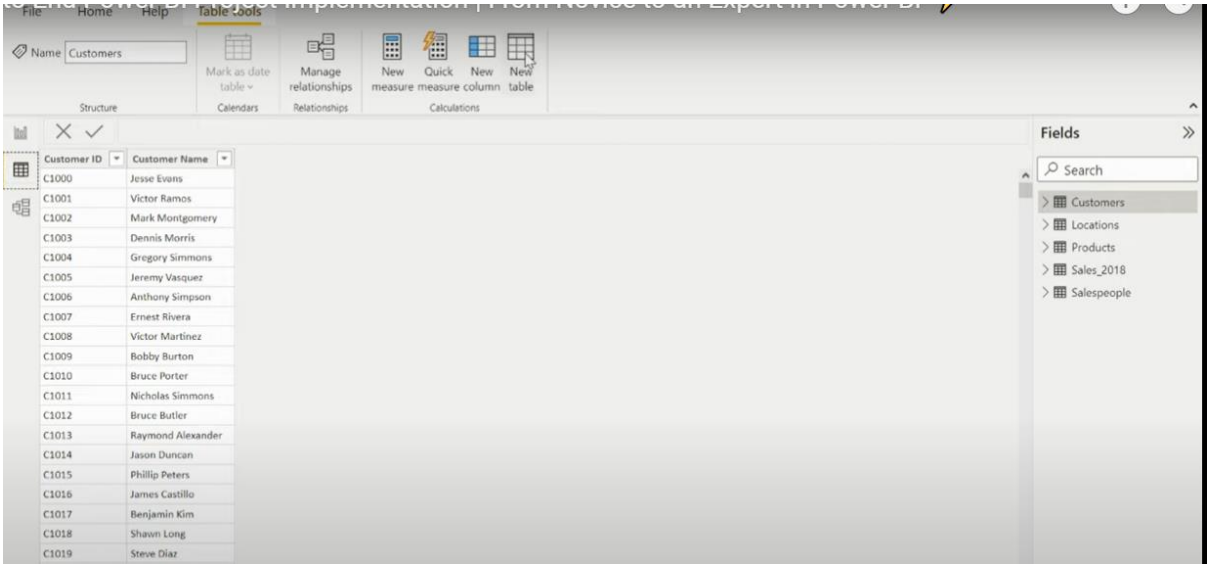
Power BI will create the relations between the tables automatically.

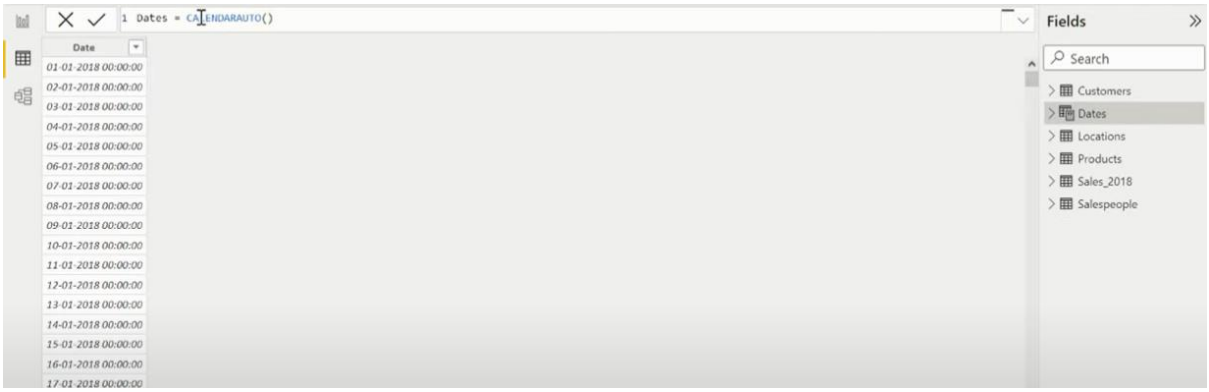
Select the relation line -> right click -> delete



Use separate time-based table to use in time intelligence functions

Go to Data section -> table tools -> new table -> rename as dates -> use **calenderauto()** function to extract dates as new table -< new date table will be created

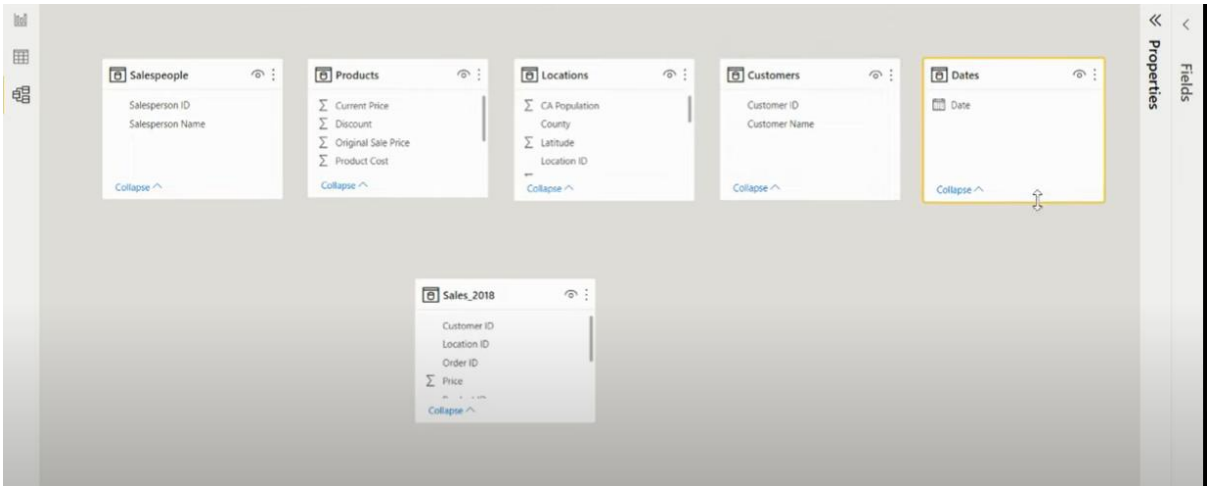




Place the lookup tables on the top and fact table below them

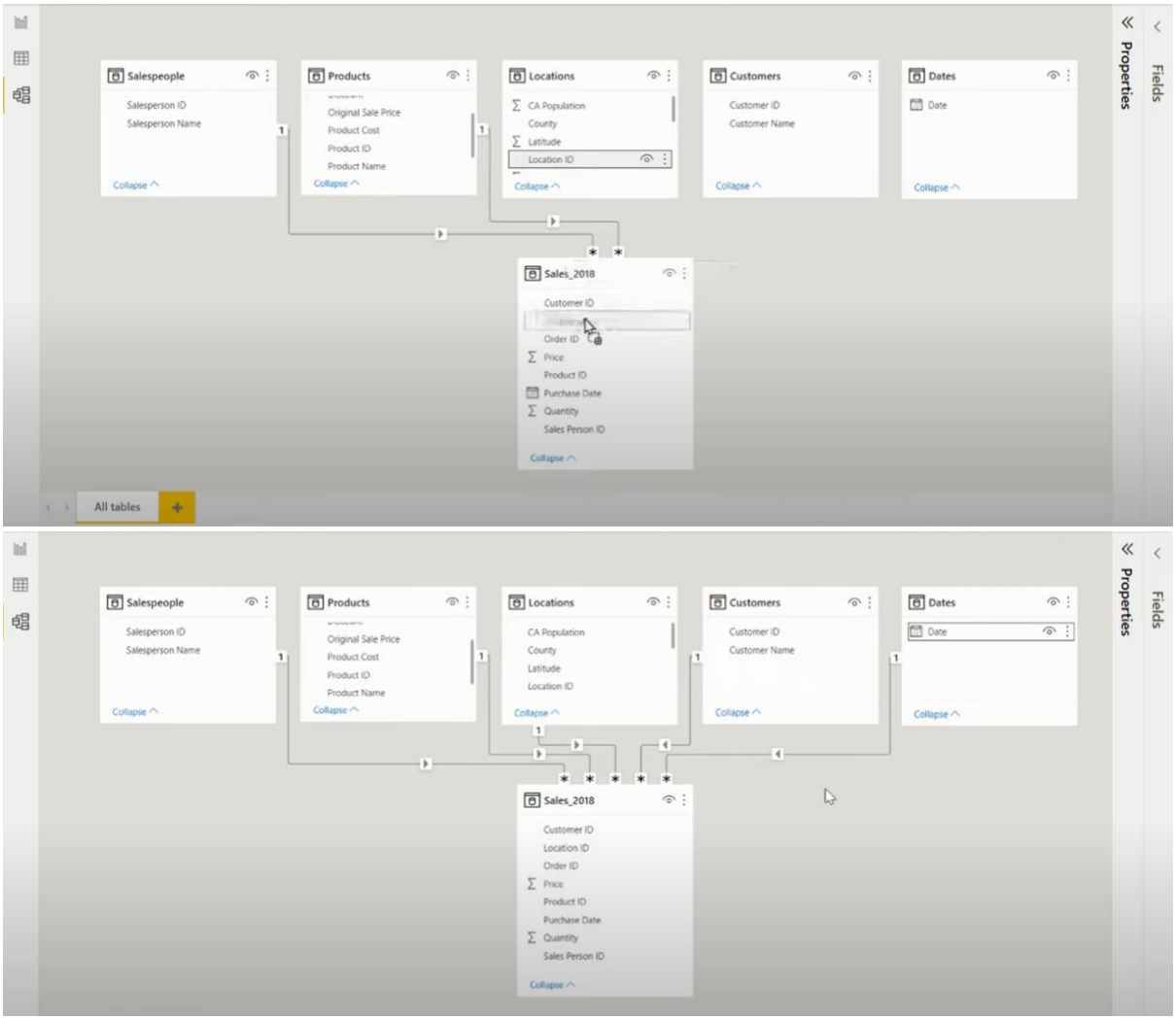
Lookup table (data table) – holds the primary keys

Fact table – holds the transactions of the lookup tables



Create relationships between 2 tables

1. Drag column name from lookup table and drop it on fact table or
2. Go to manage relationships and create it

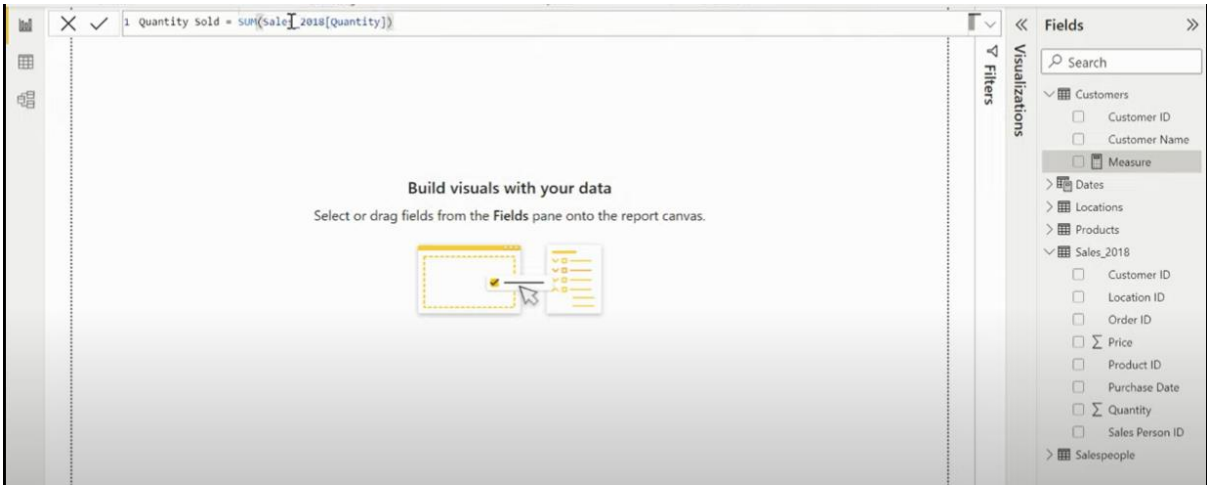


Creating DAX Expressions

New measure v/s new column

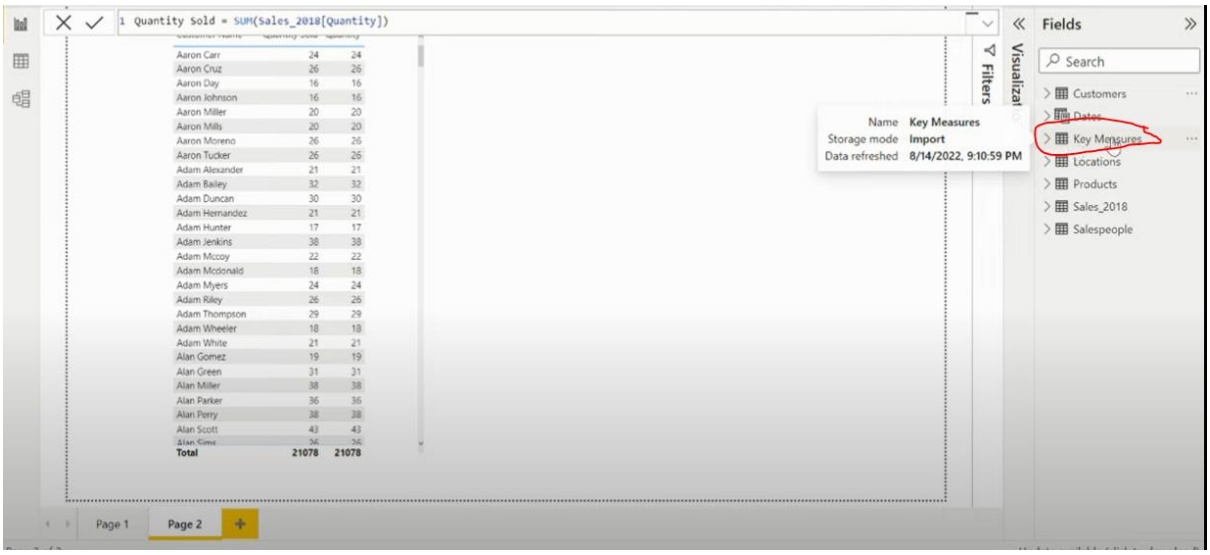
New measure – only logic will be computed in visualization

New column – will be created in the data (shall be created only if it is important)

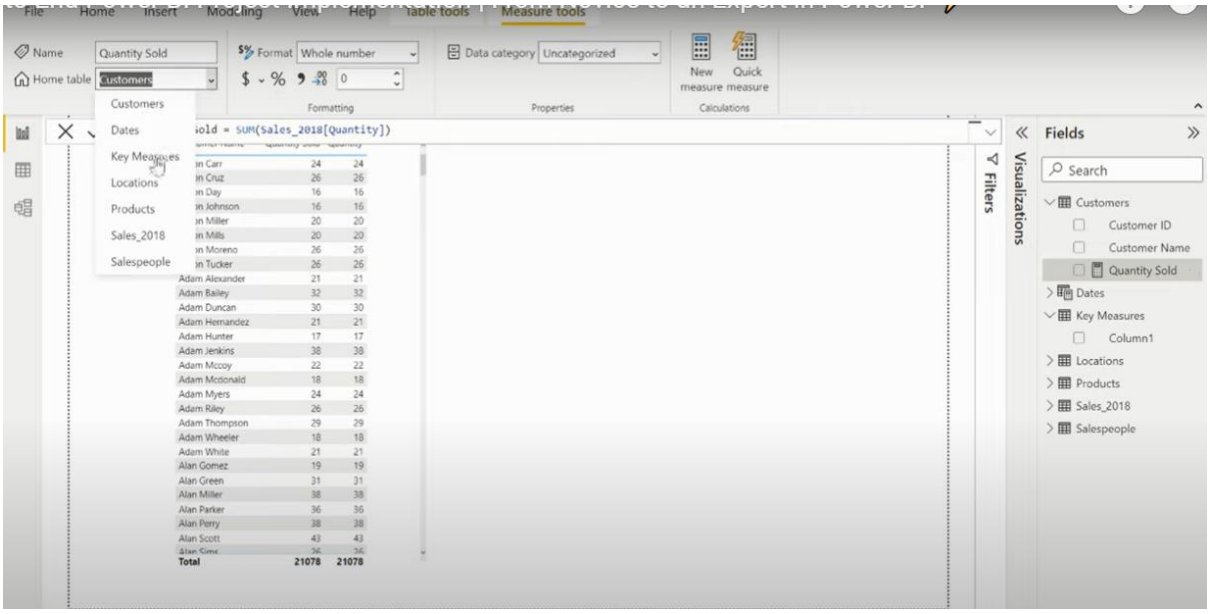


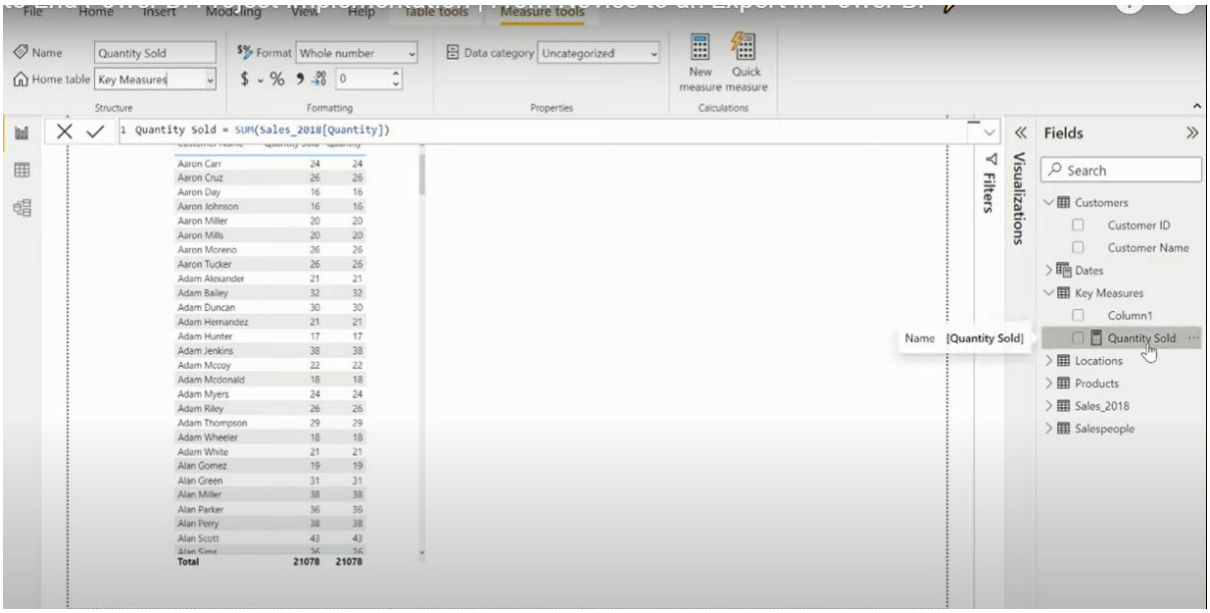
To move new created measures into a group

Go to Home ->enter data -> name the table (key measures) -> click load -> new group is created

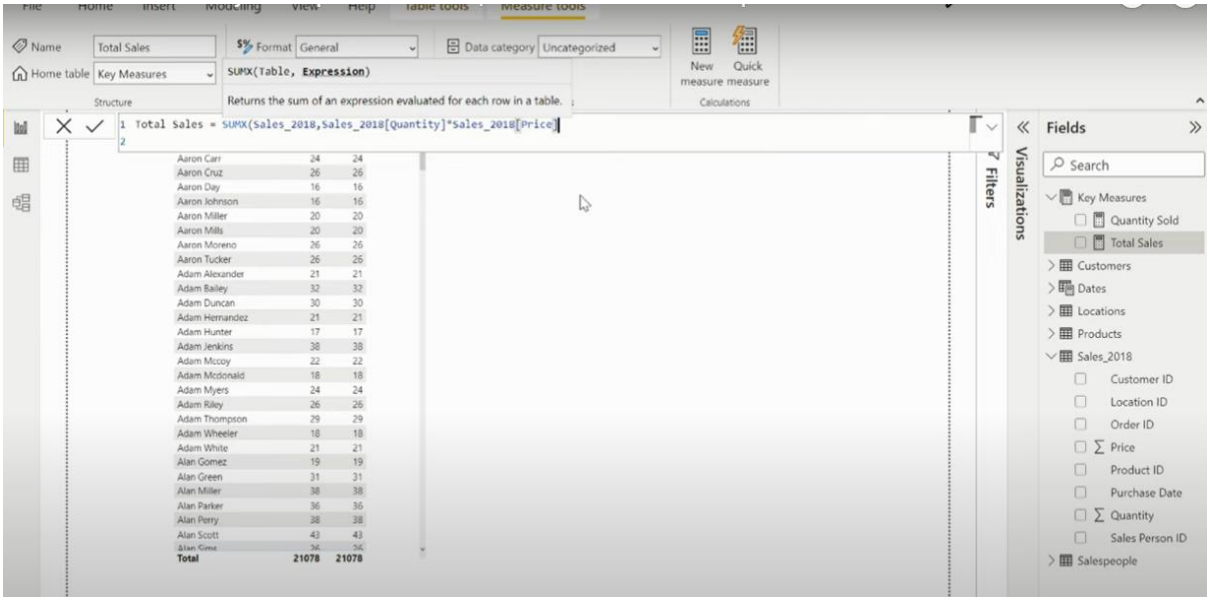


Select new created measure -> measure tools -> home table -> select the group





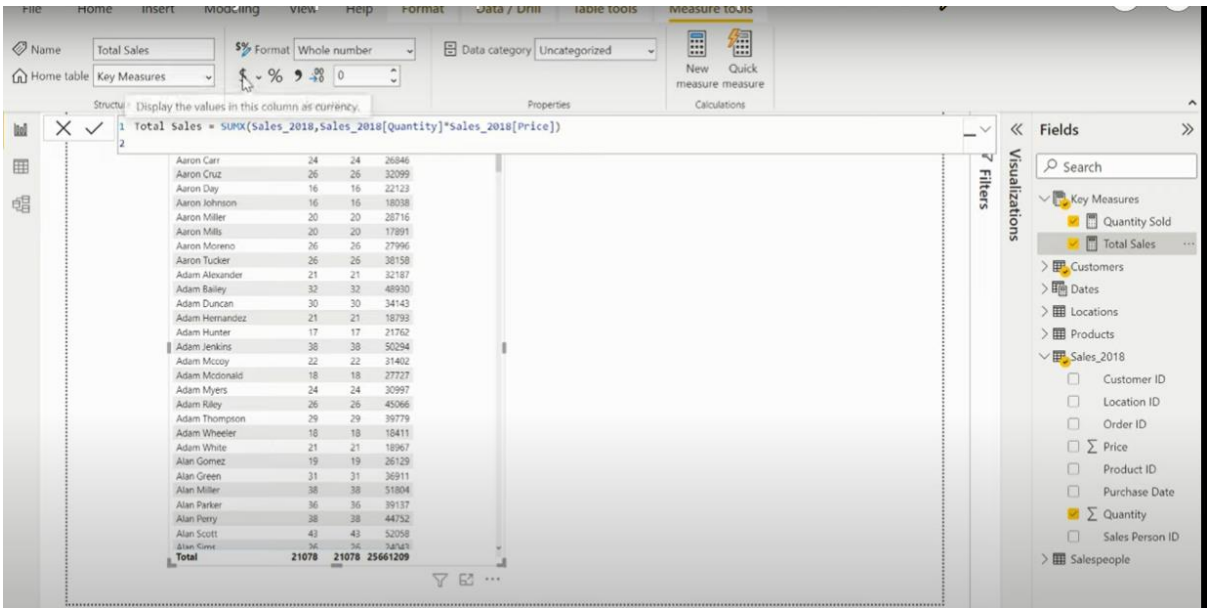
More DAX expressions

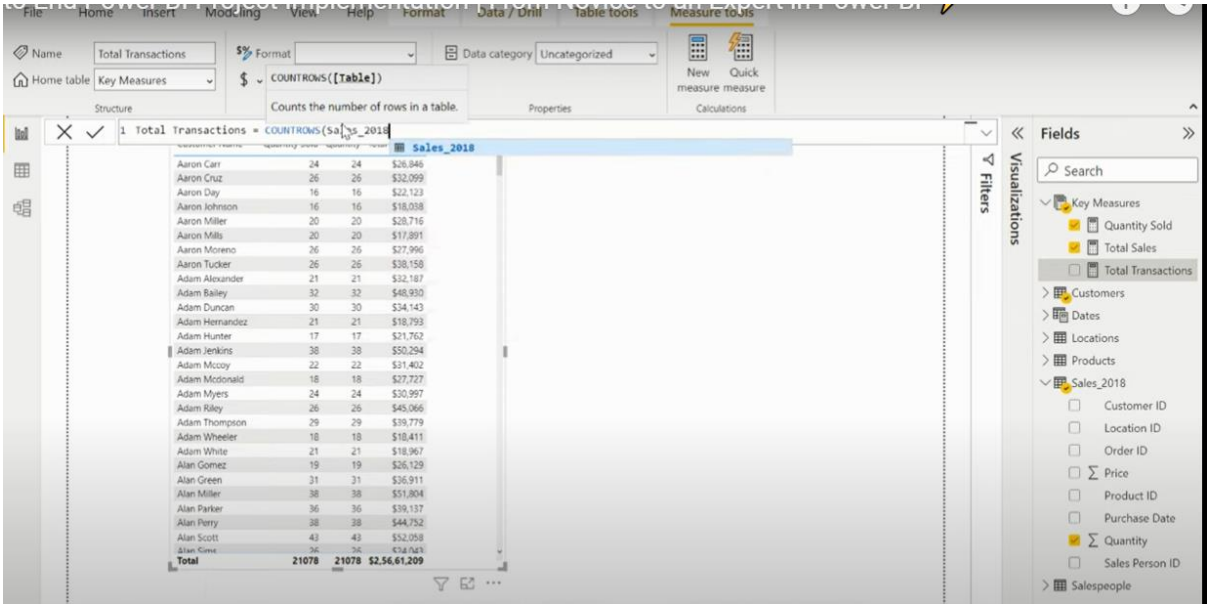


To change the currency

Select measure -> measure tools -> formatting group -> select the currency type

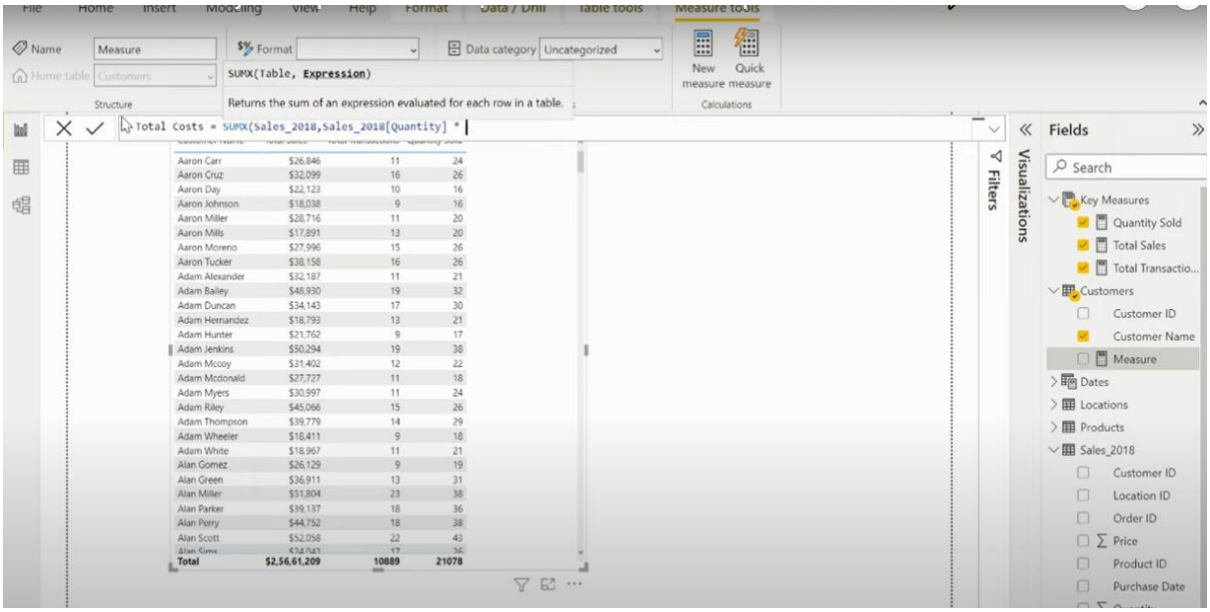
In the same way, measure can be converted into percentage and decimal places can be specified

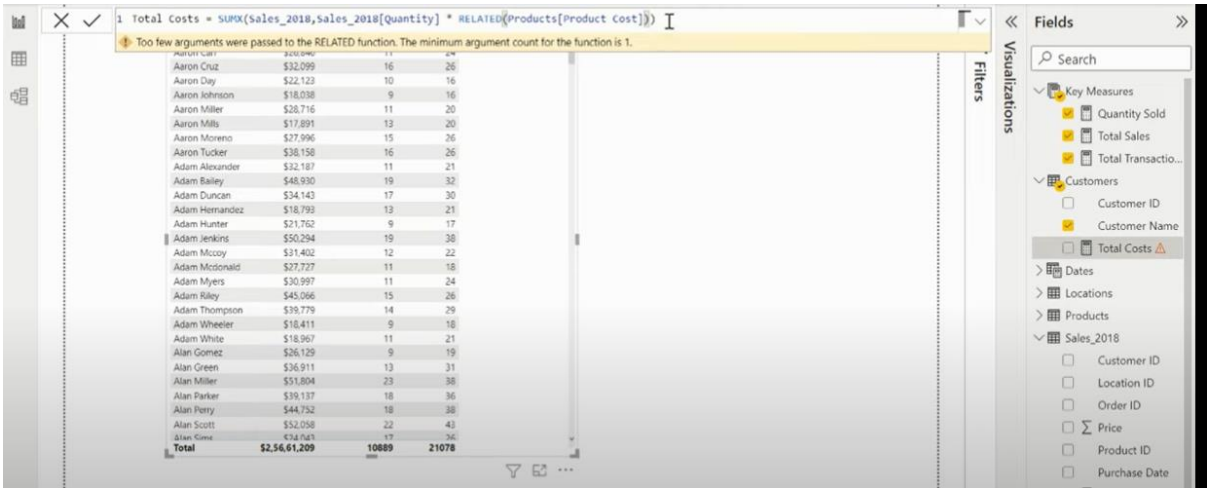




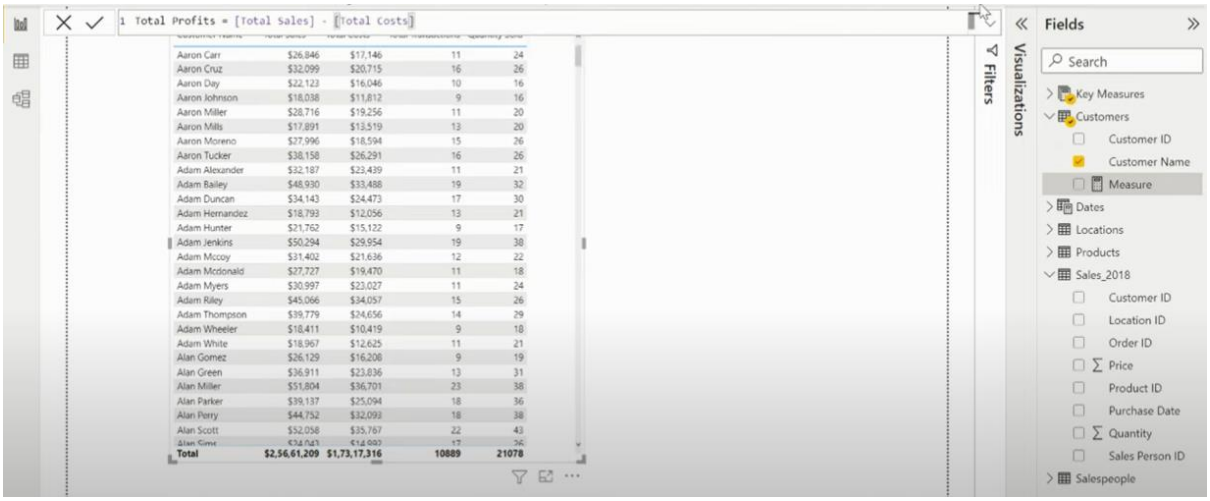
To create DAX expression, two columns located in different tables

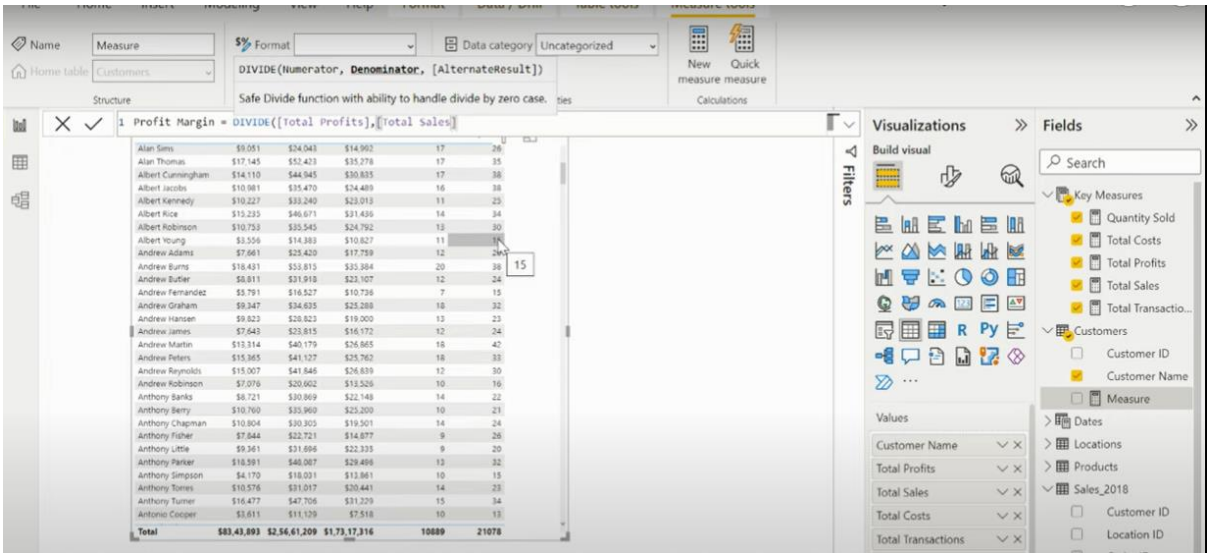
Quantity coming from sales table and product cost coming from products table





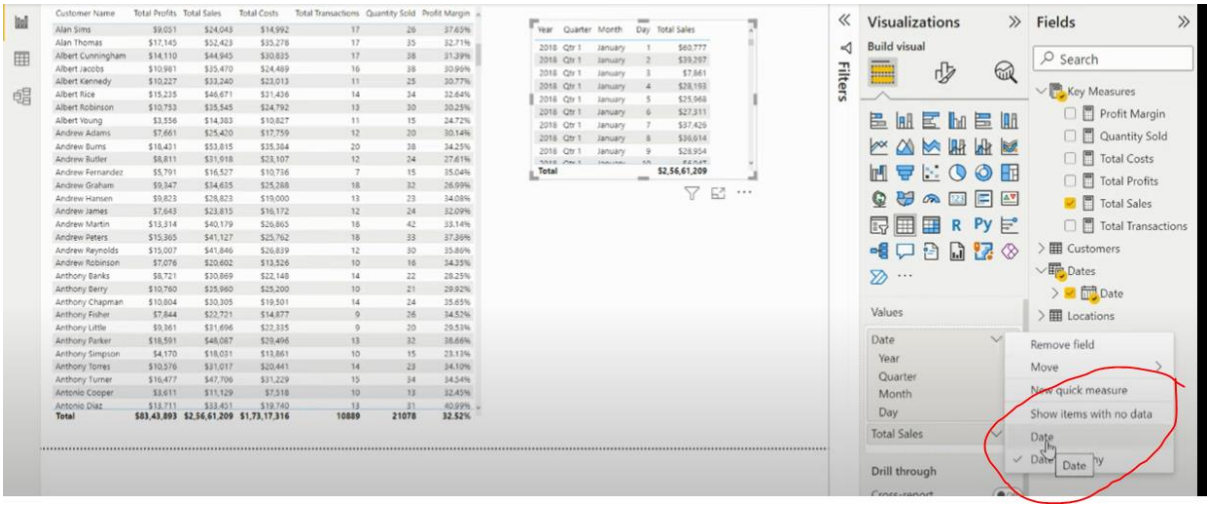
Using 2 measures to create 3rd measure

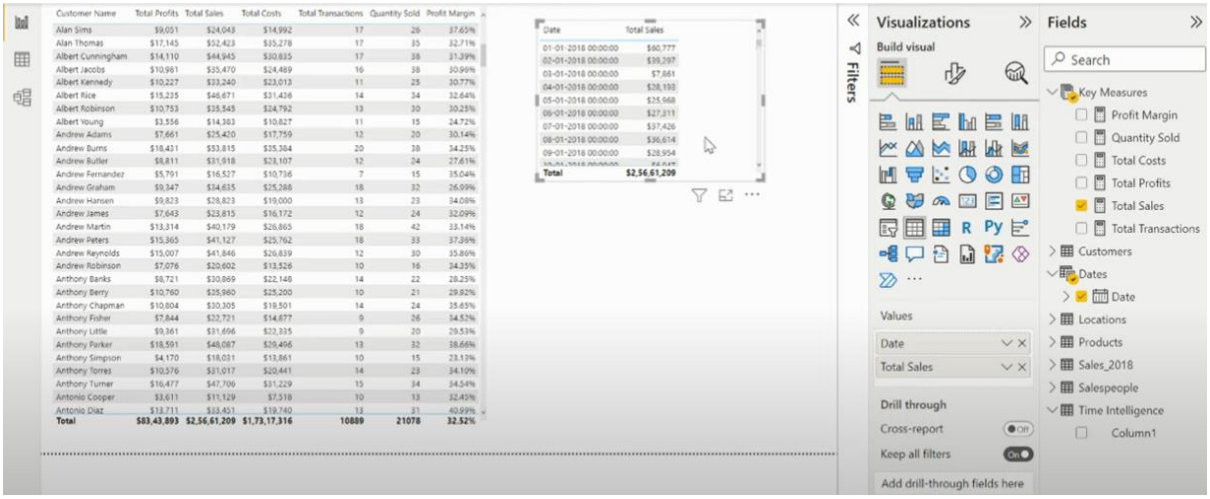




To remove data hierarchy

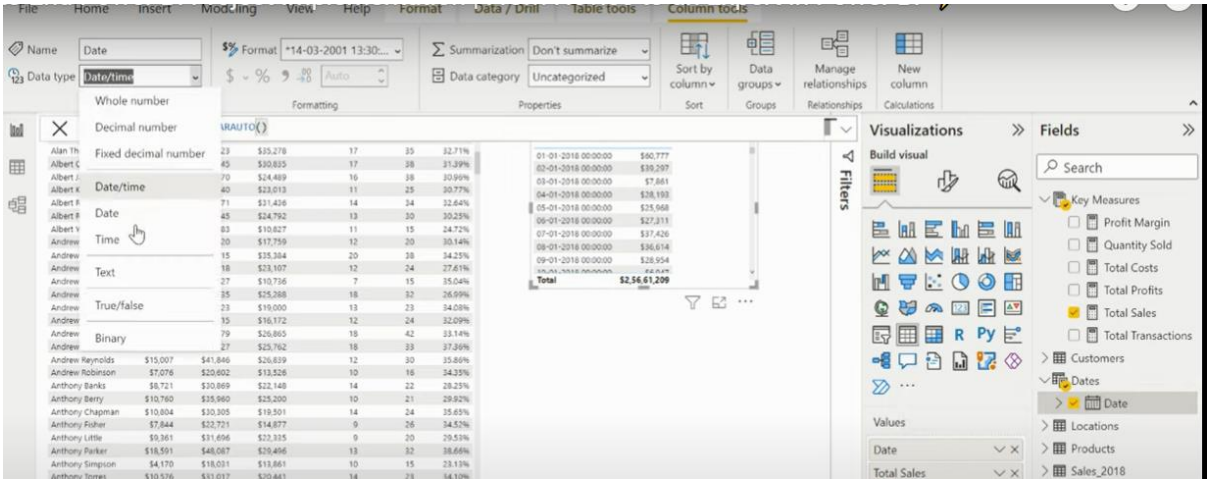
click on values dropdown -> unclick date hierarchy -> and click hierarchy

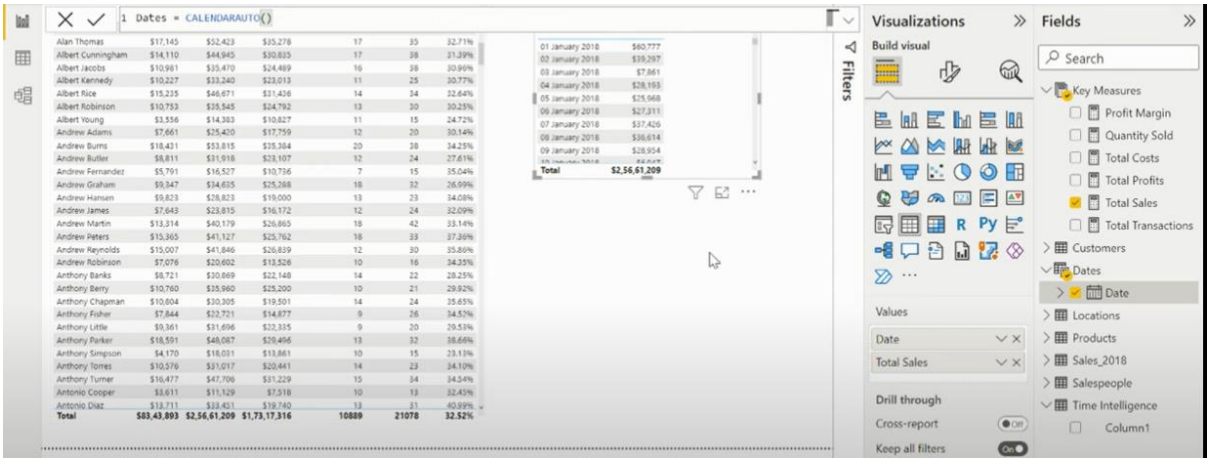




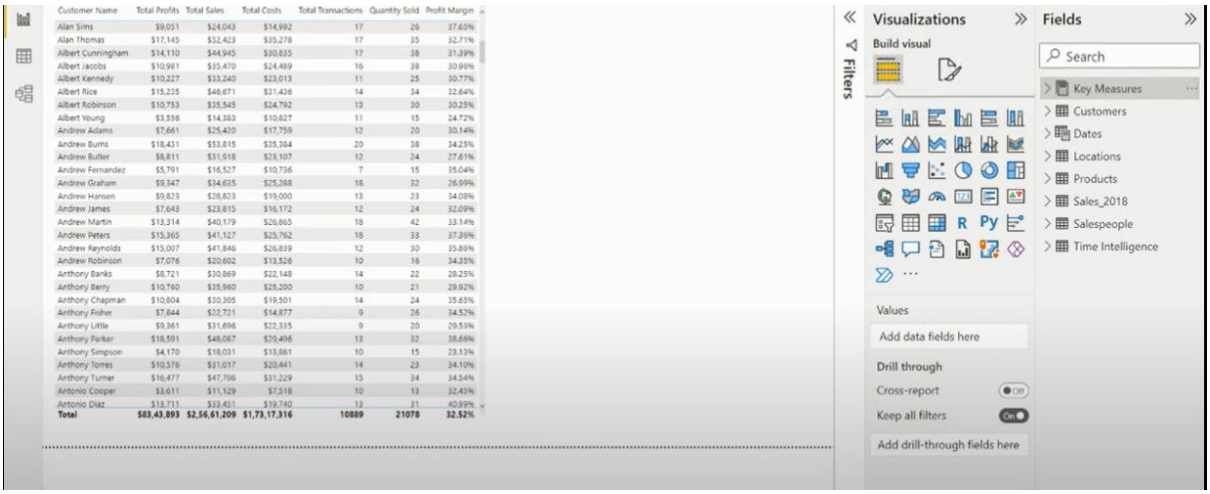
To change datatype of visual

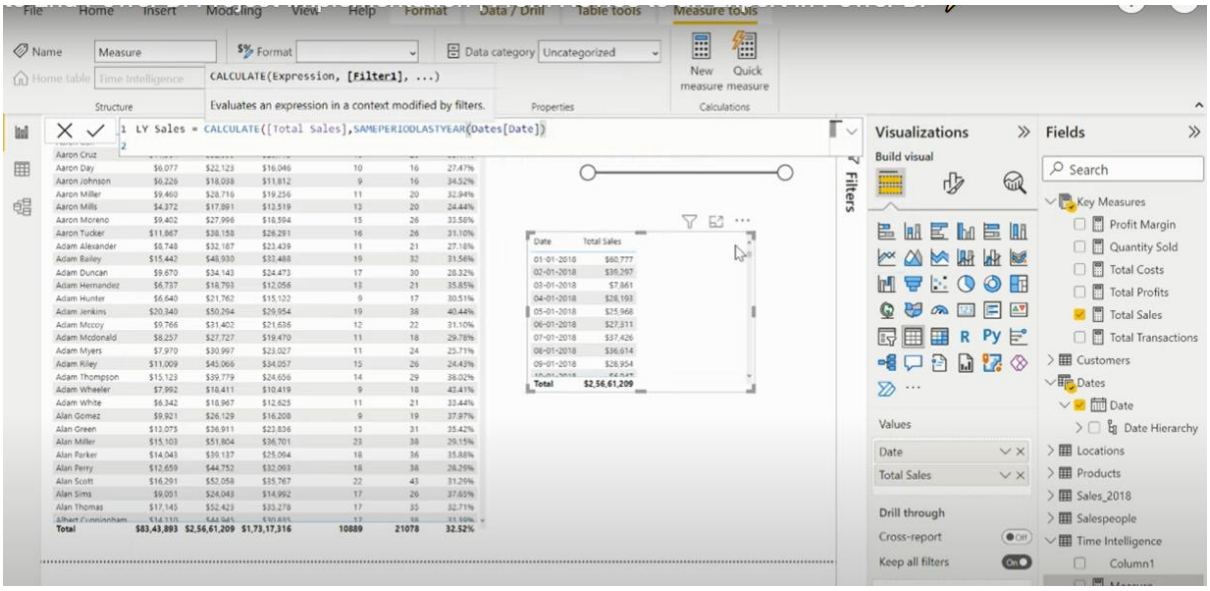
Select visual -> column tools -> change datatype from structure group -> date format from formatting group

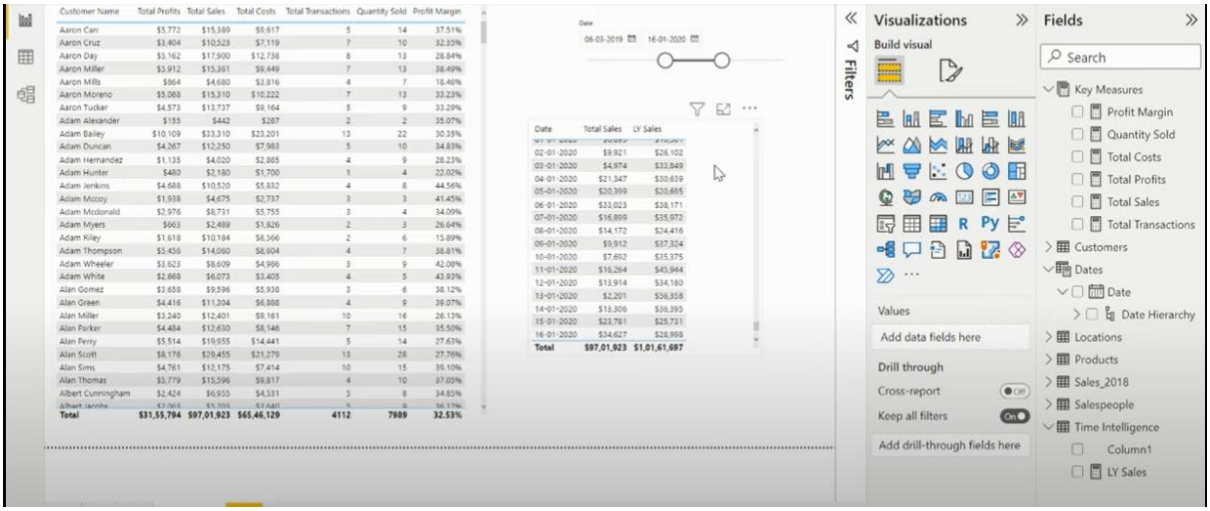




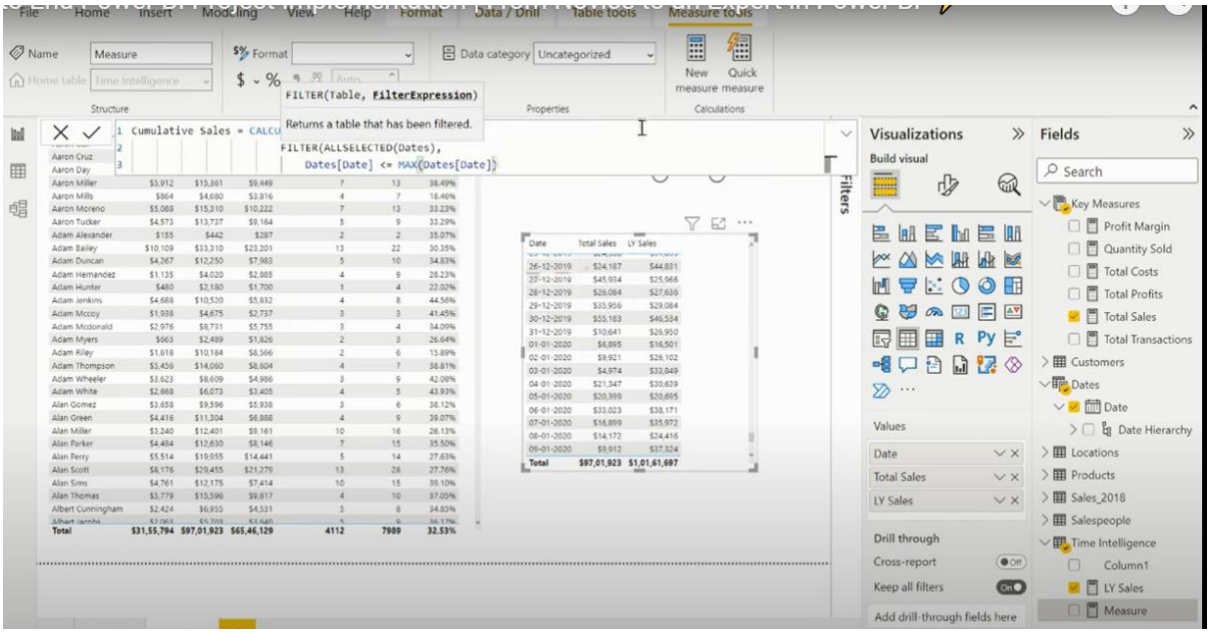
Time Intelligence Calculations







To Calculate Cumulative Sales



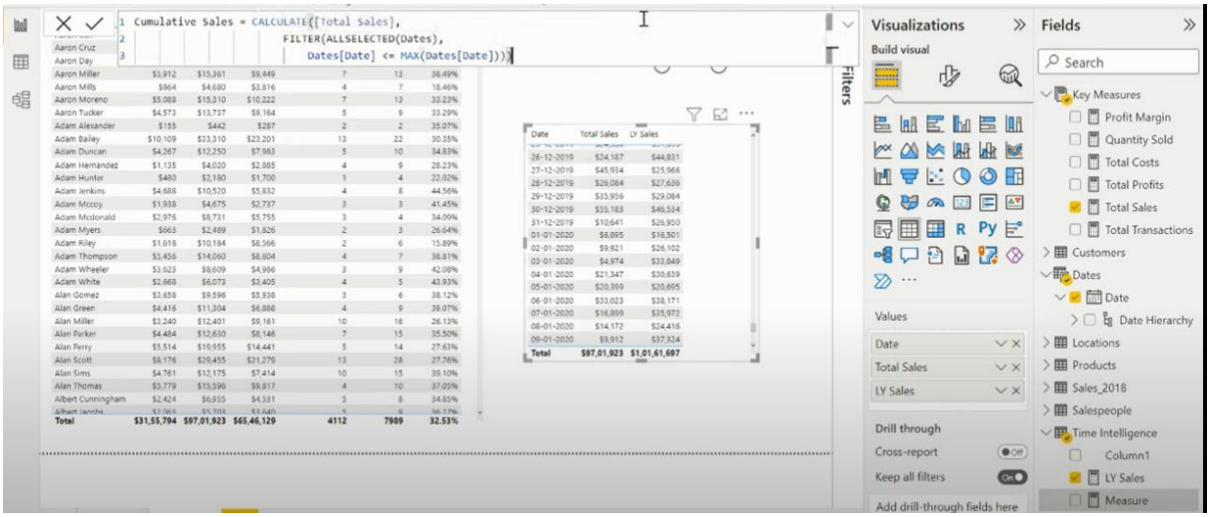
Cumulative Sales:

It will calculate cumulative sales based on Total sales DAX function

Filter function will filtered out the data

Allselected function will ignore all the applied filters

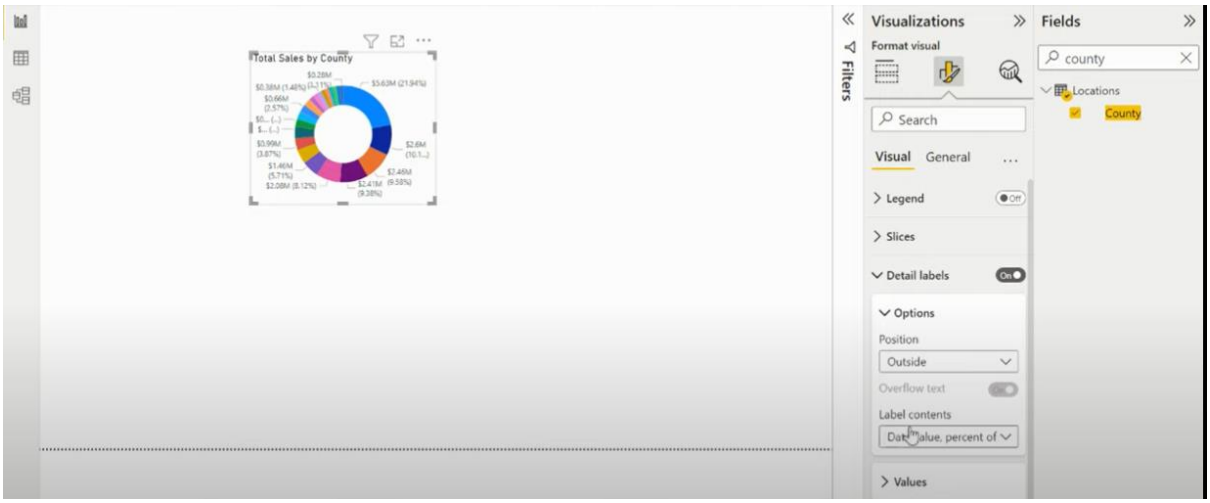
Filter condition: current date <= max date

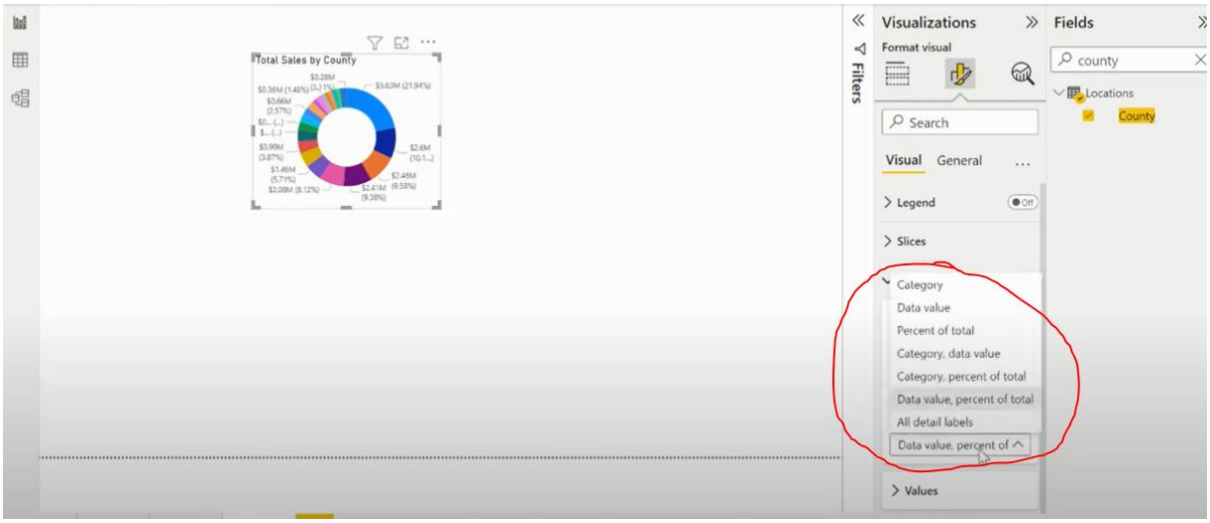


Report Building

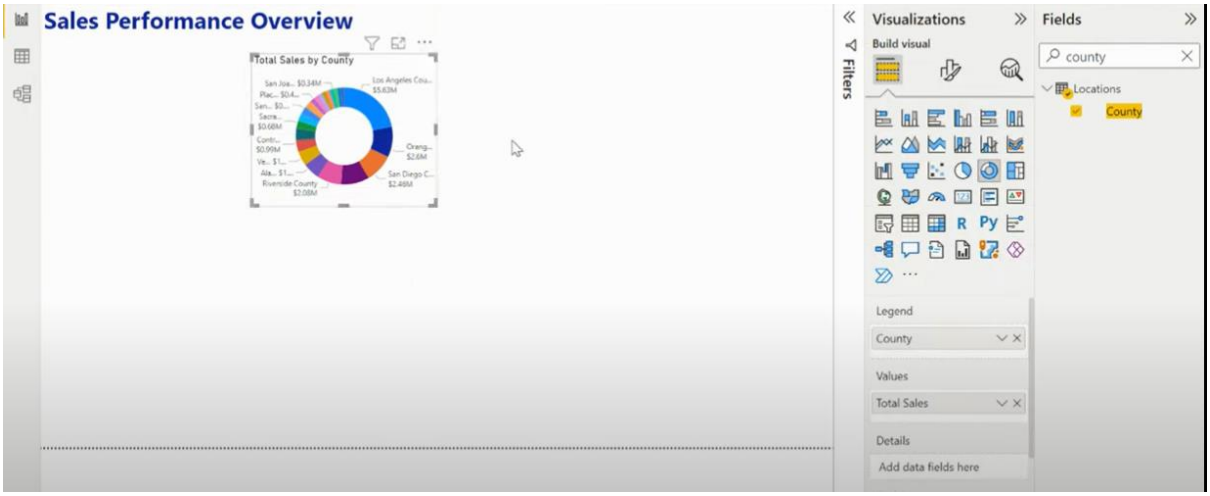
Change the label contents

Select visual -> format visual -> visual -> options -> label contents -> select option

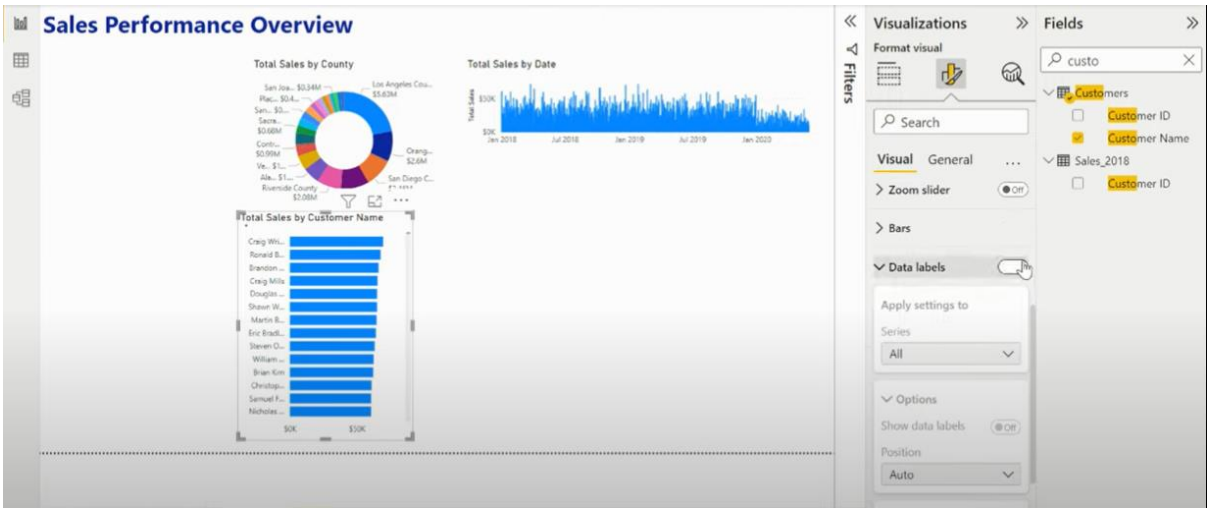




Home -> text box (for report heading)



Select visual -> format visual -> visual -> data labels -> turn on

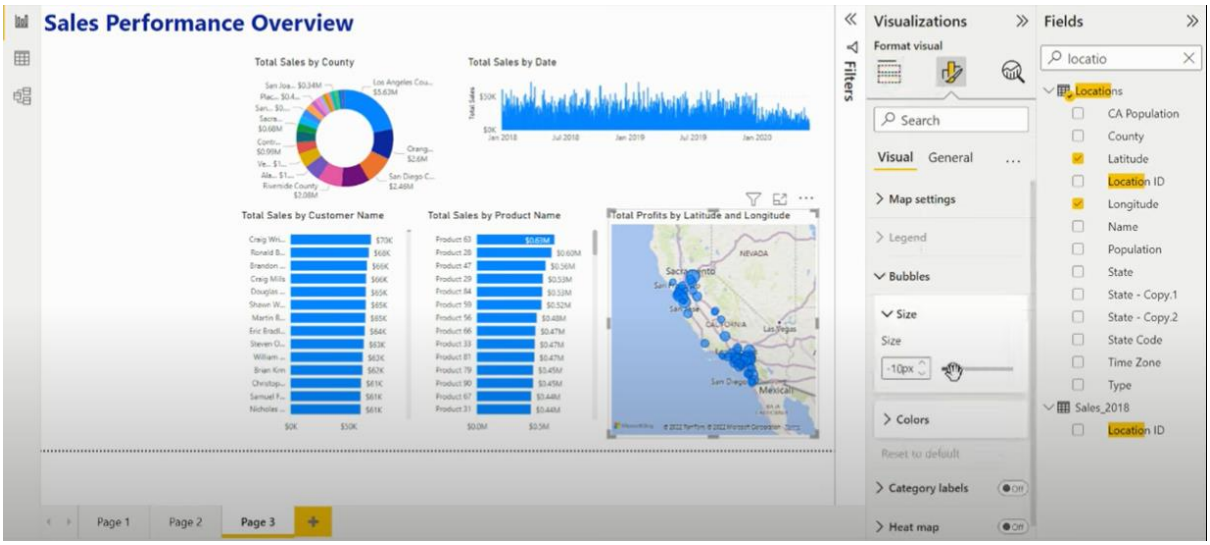


To show map as visual

Use latitude and longitude for location

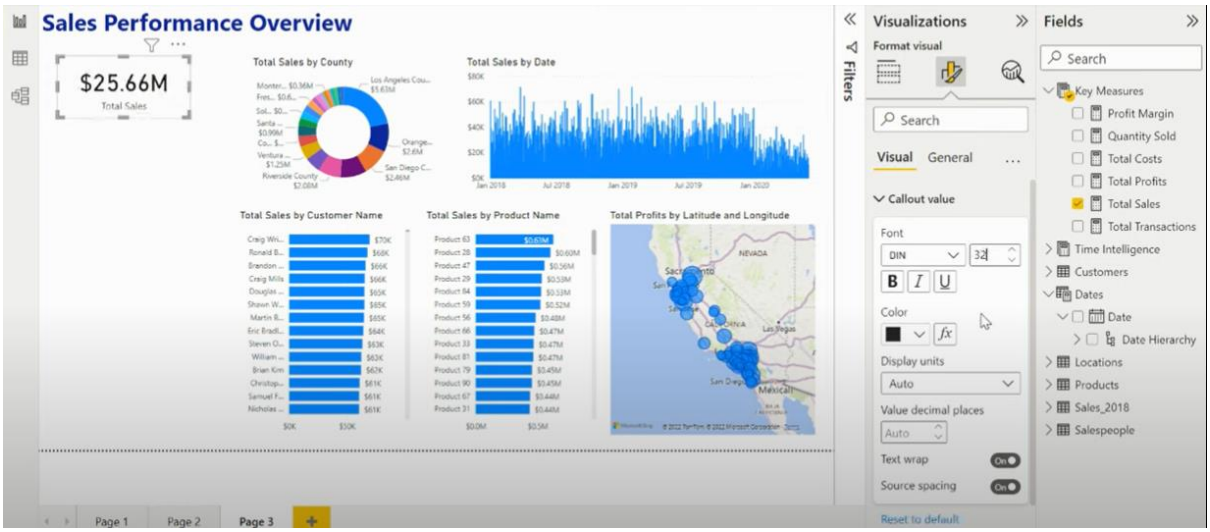
To increase the bubble size

Select visual -> format visual -> visual -> bubbles -> change size



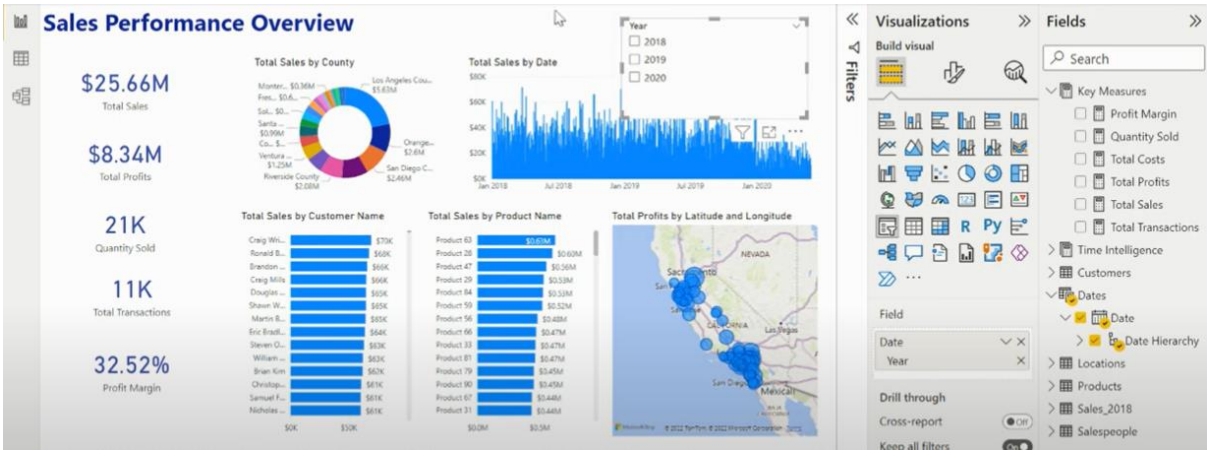
To format the cards

Select visual -> format visual -> visual -> callout value-> change size/colour/font

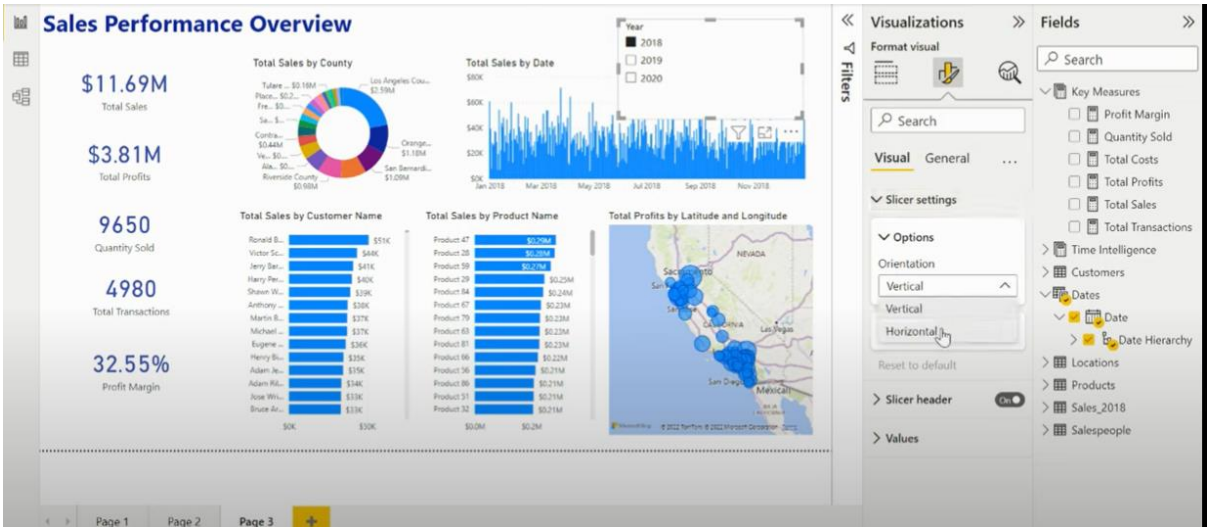


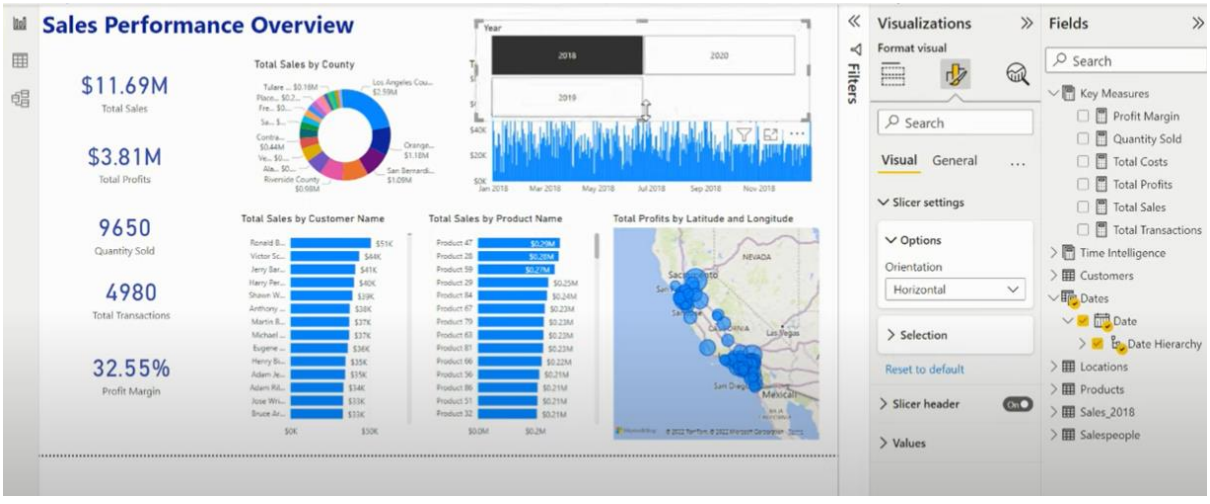
Insert slicer

Select date column -> select slicer -> date hierarchy -> keep year only



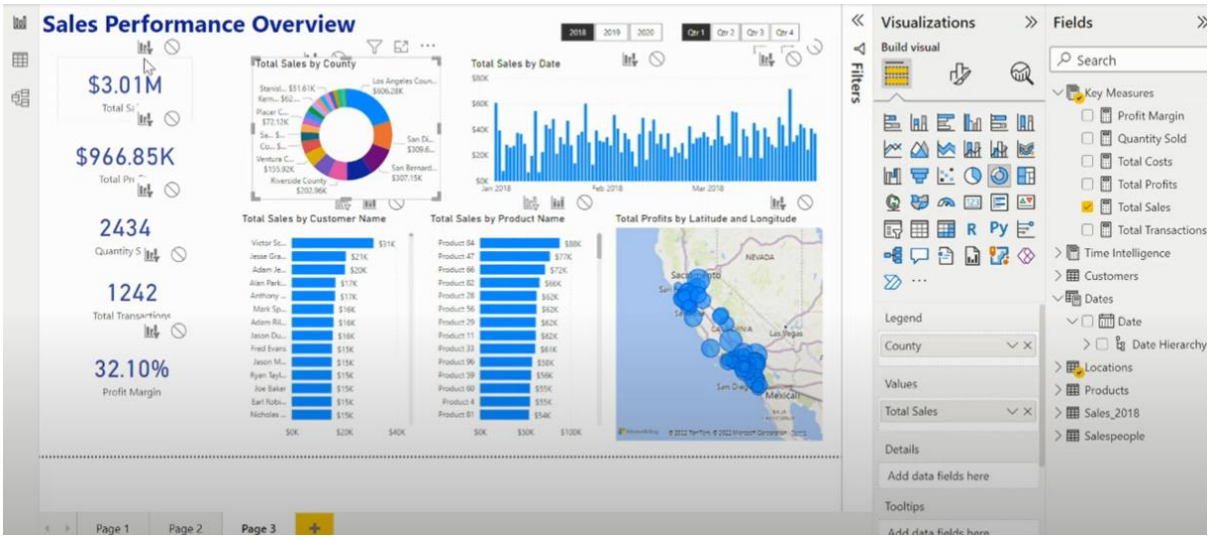
Select visual -> format visual -> visual -> slicer settings->options -> orientation -> horizontal -> adjust the slicer -> turn off slicer header





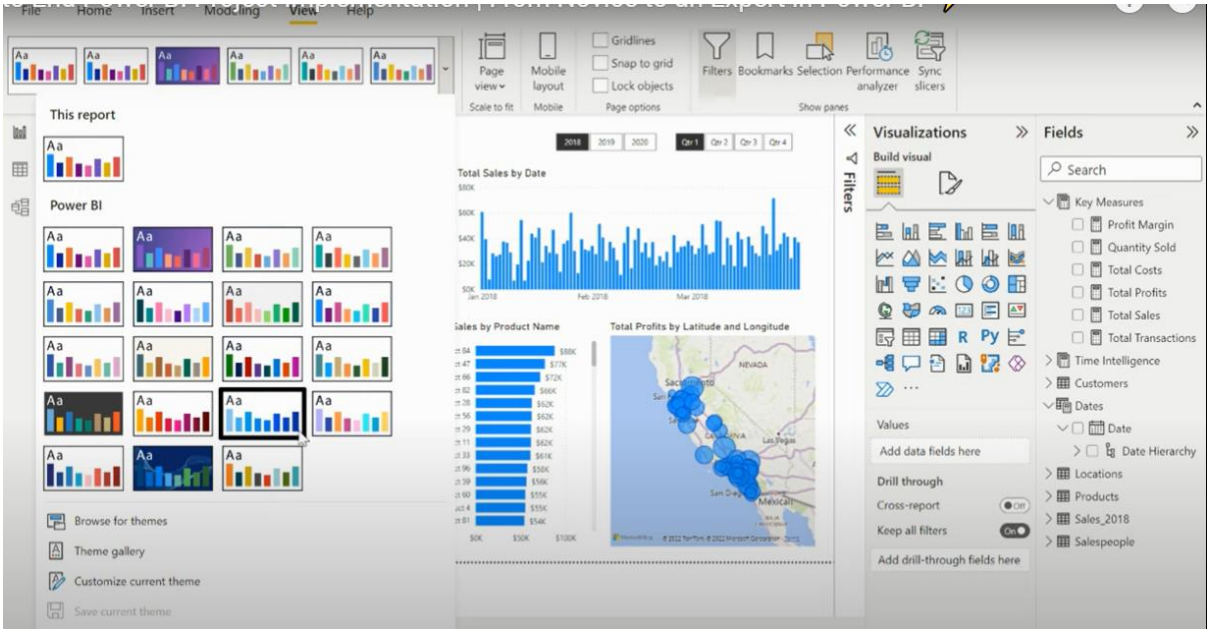
To format/highlight data as per selection in primary visual

Select primary visual -> format -> edit interactions -> select format/highlight for every other visual



To change theme

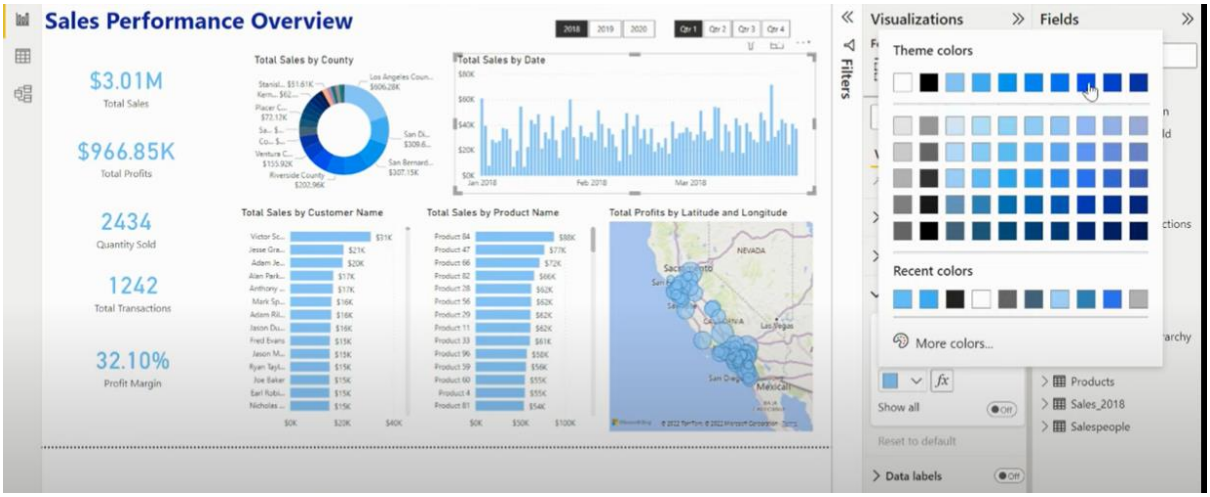
View -> themes group -> select theme



To change colour of visuals

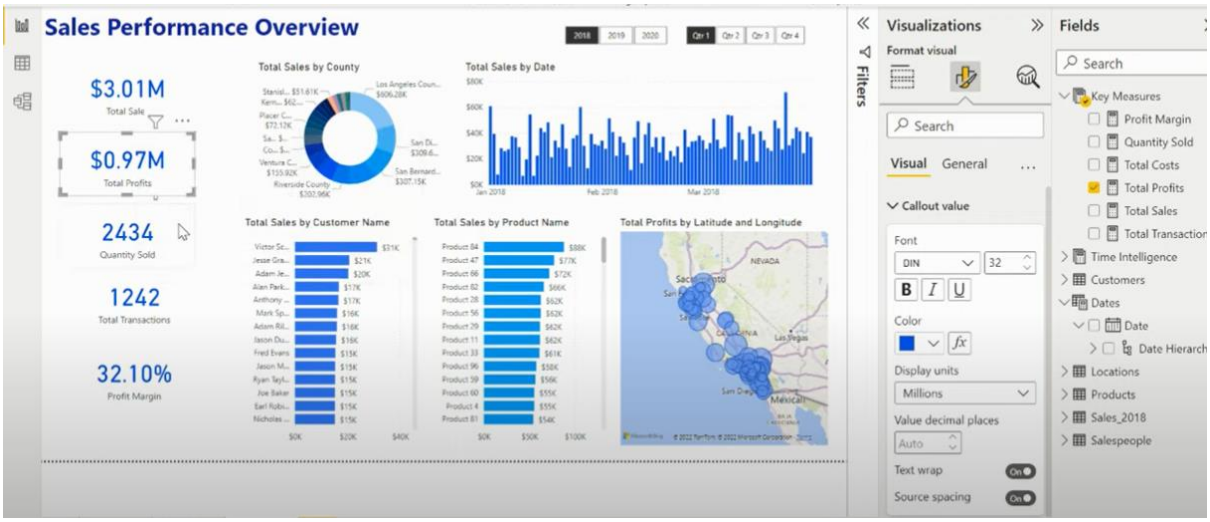
Select visual -> format visual -> visual -> columns -> color-> change colour

Can multi select visuals to give them same colour in one go (for cards)



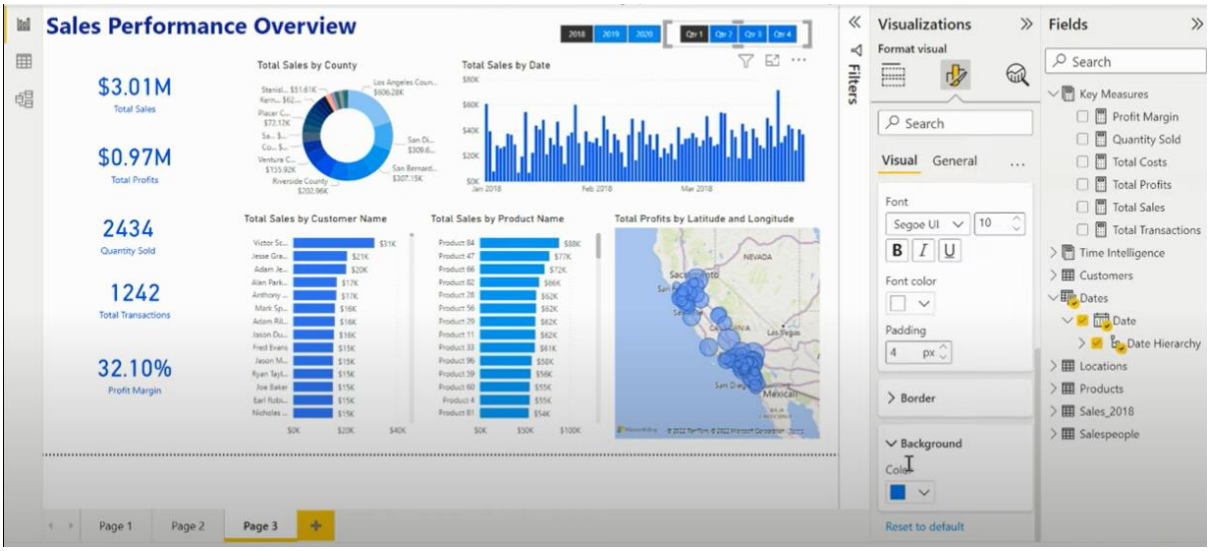
To change units

Select visual -> format visual -> visual -> callout value -> display units -> select unit



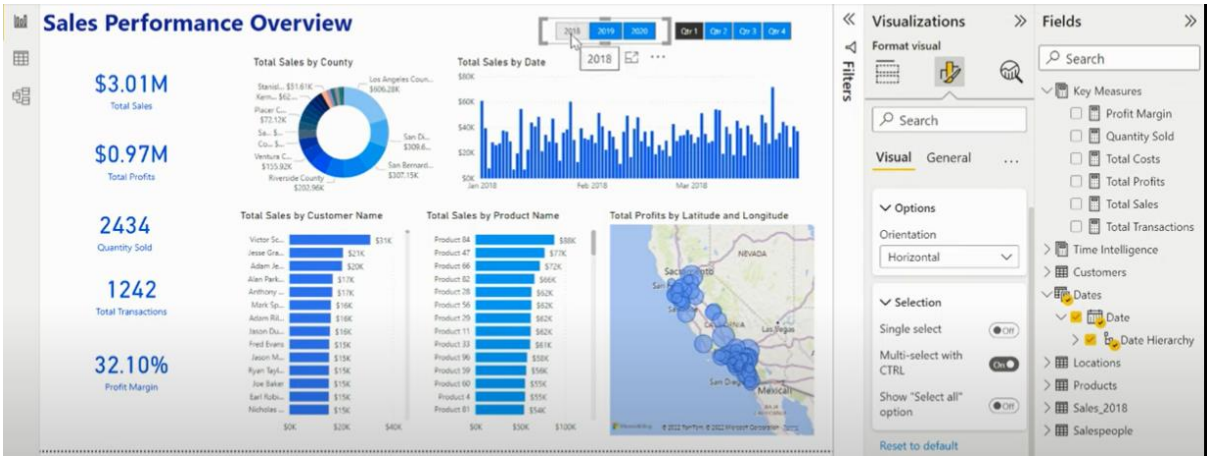
To change slicer colour

Select slicer -> format visual -> visual -> values -> background ->color -> change colour



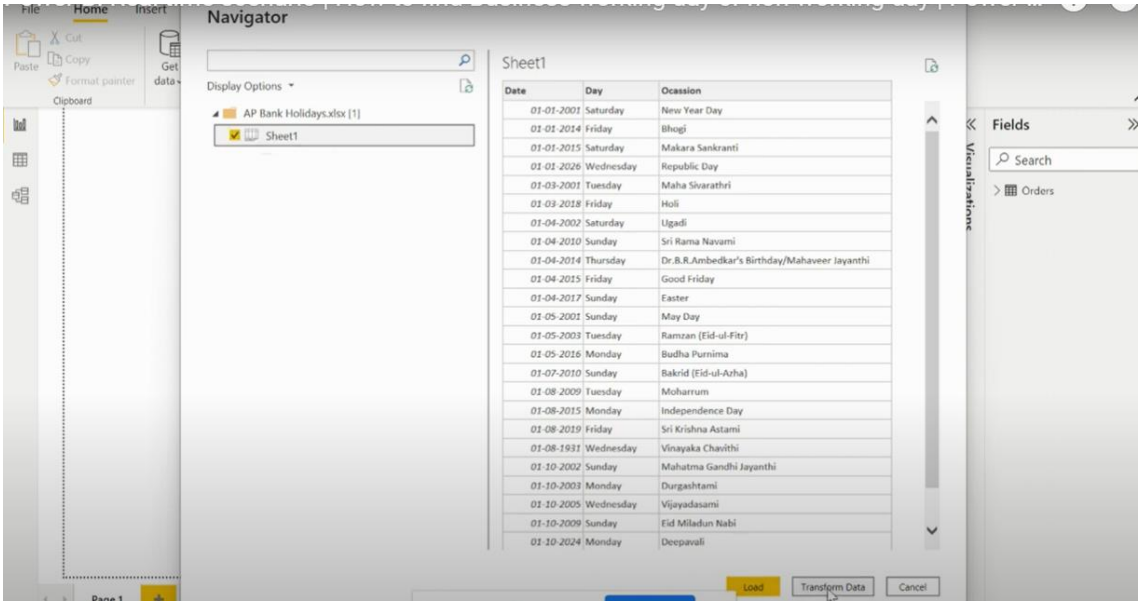
Single / Multi Select Slicer

Select slicer -> format visual -> visual -> slicer settings->options -> selection -> choose selection option

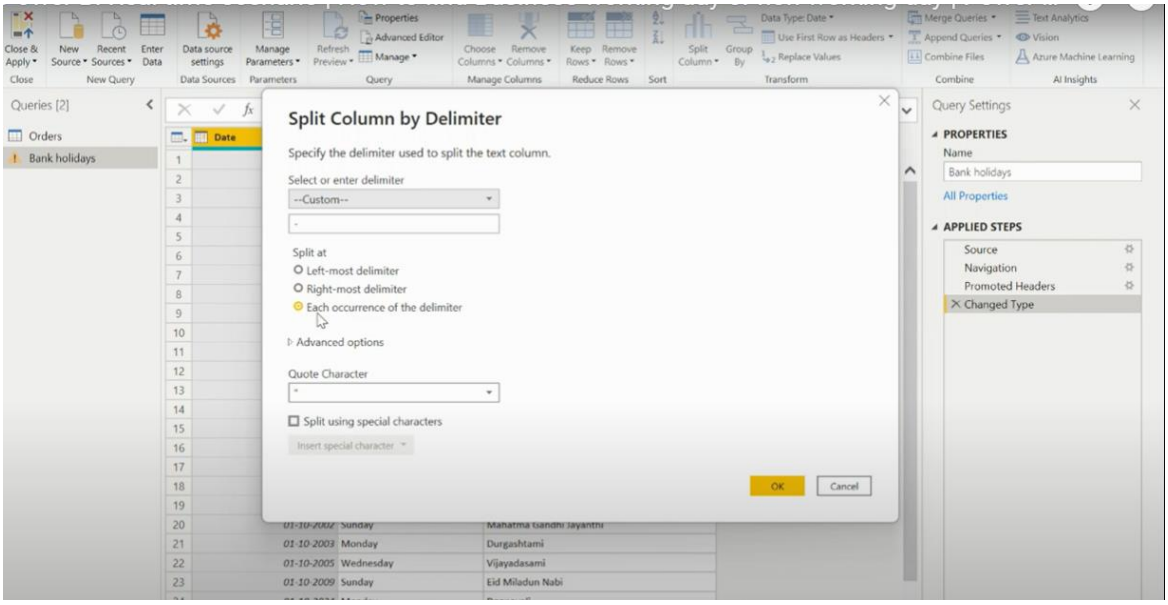


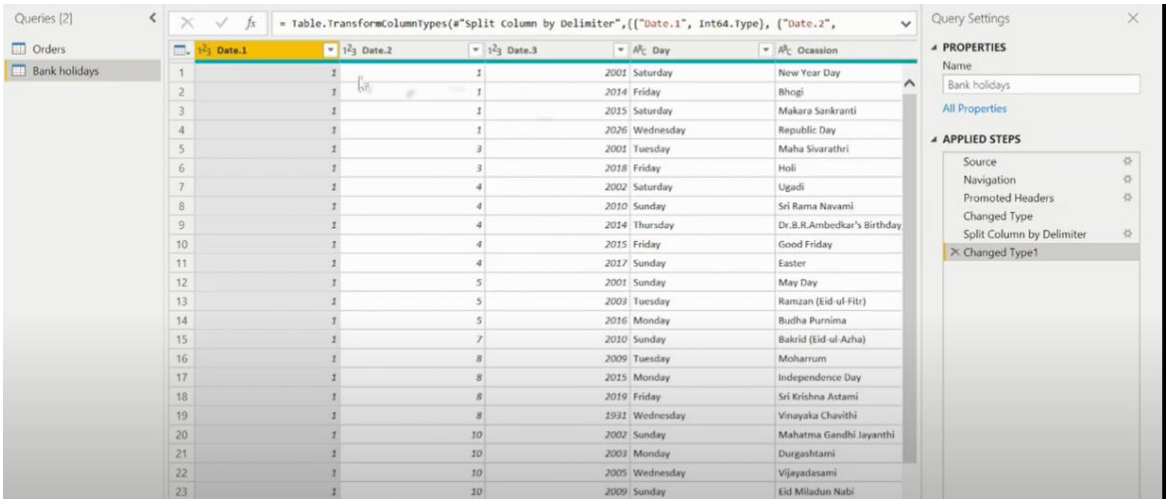
How to find business working day or non-working day?

Load bank holiday list

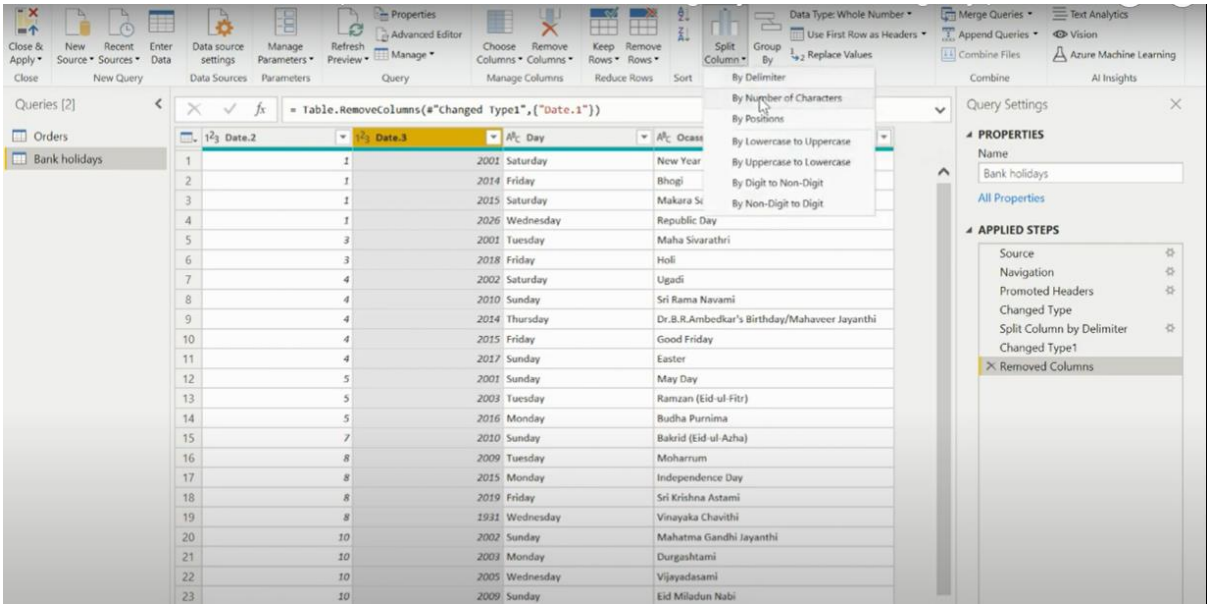


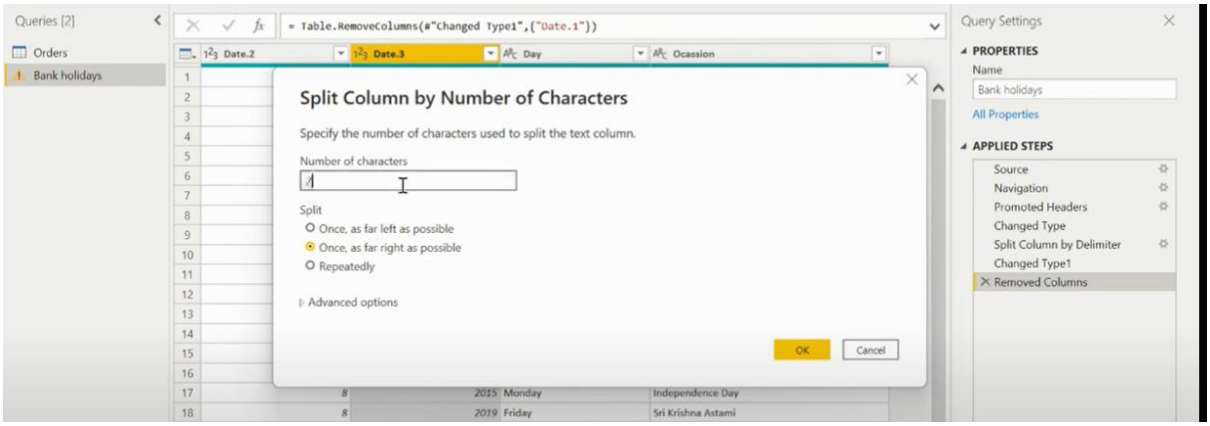
Splitting the column by delimiter

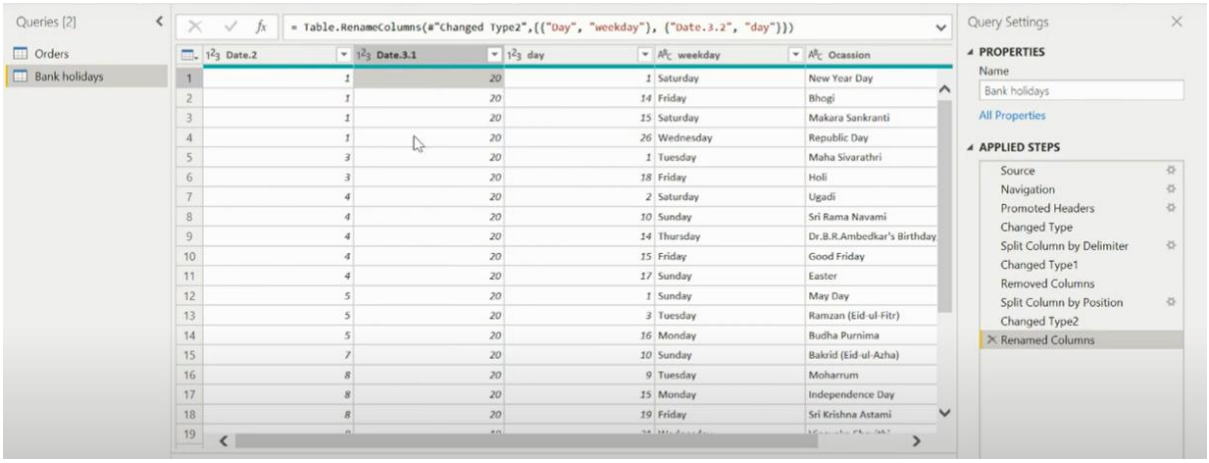




Splitting the incorrect date column



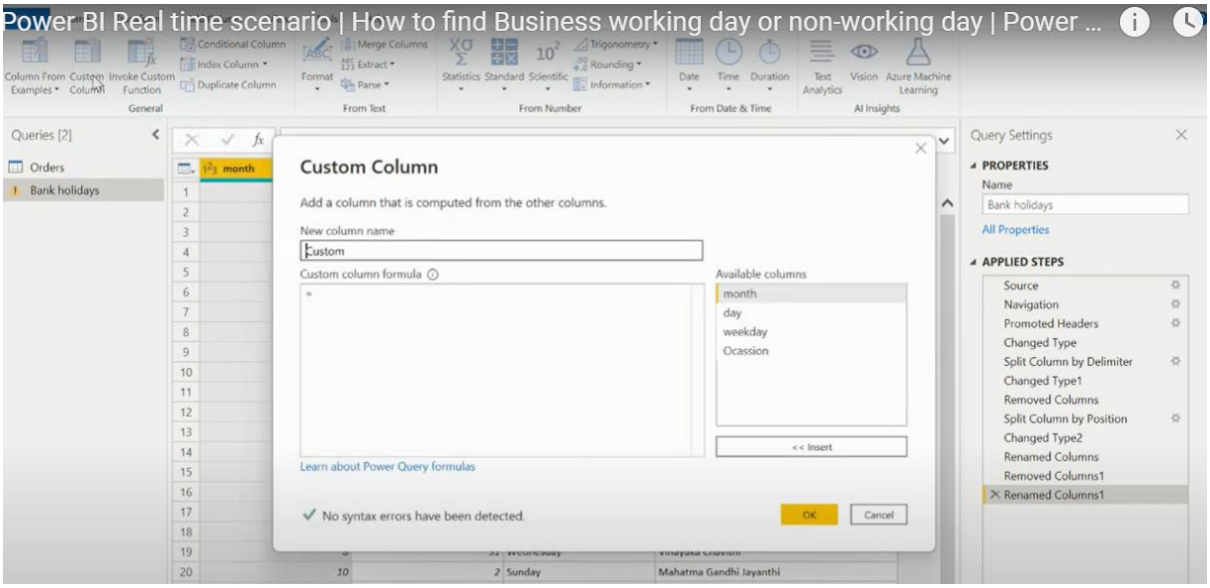


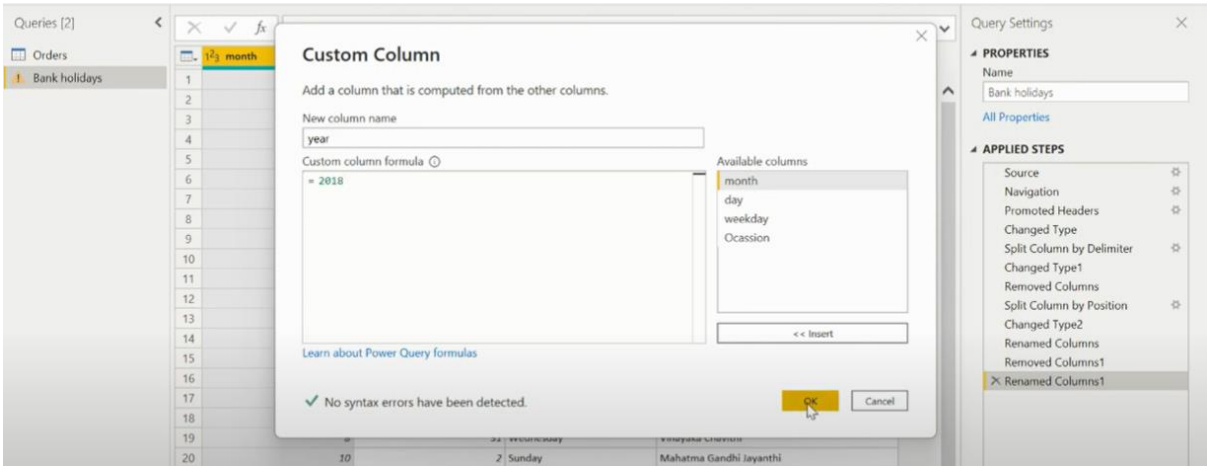


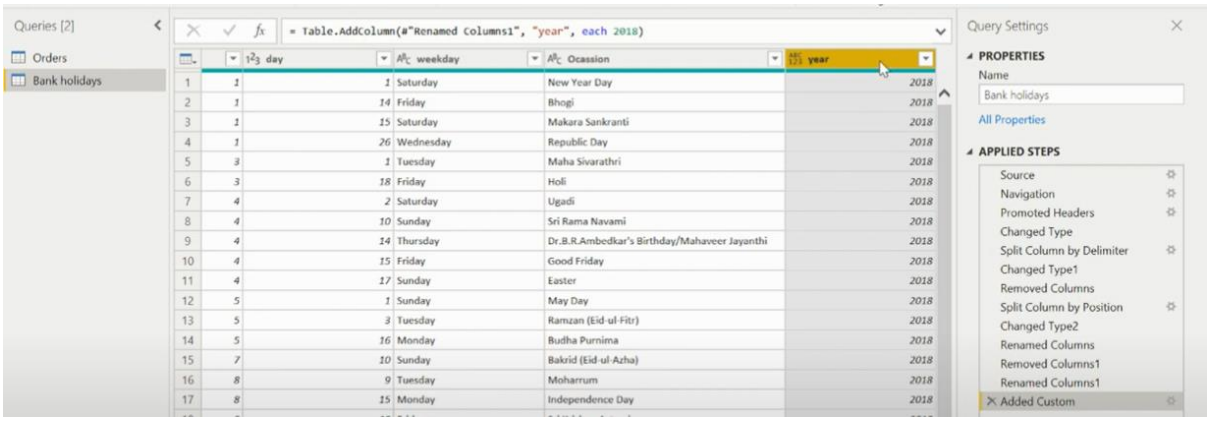
Delete unwanted columns

Adding new column

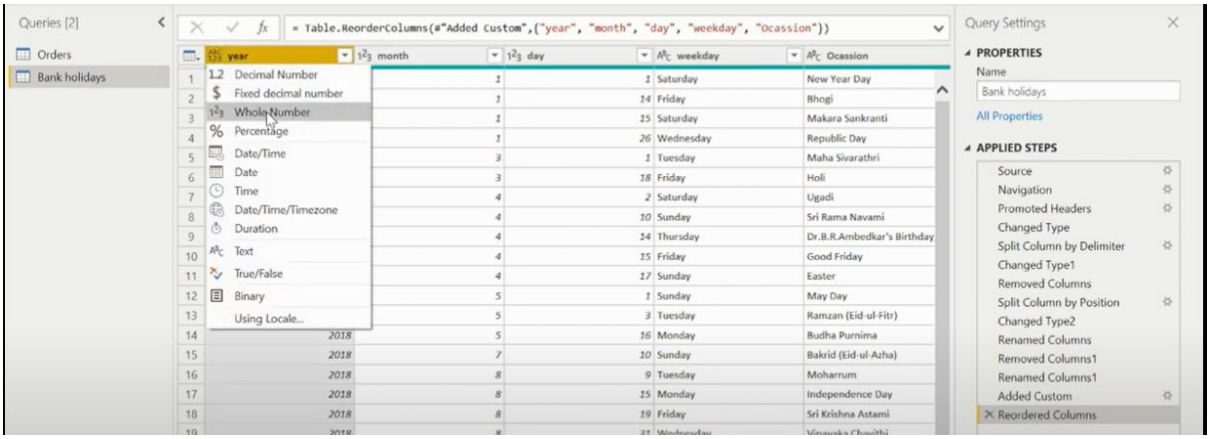
Add new column -> custom column -> give column name -> write custom formula -> click ok -> new column created at end -> rearrange it



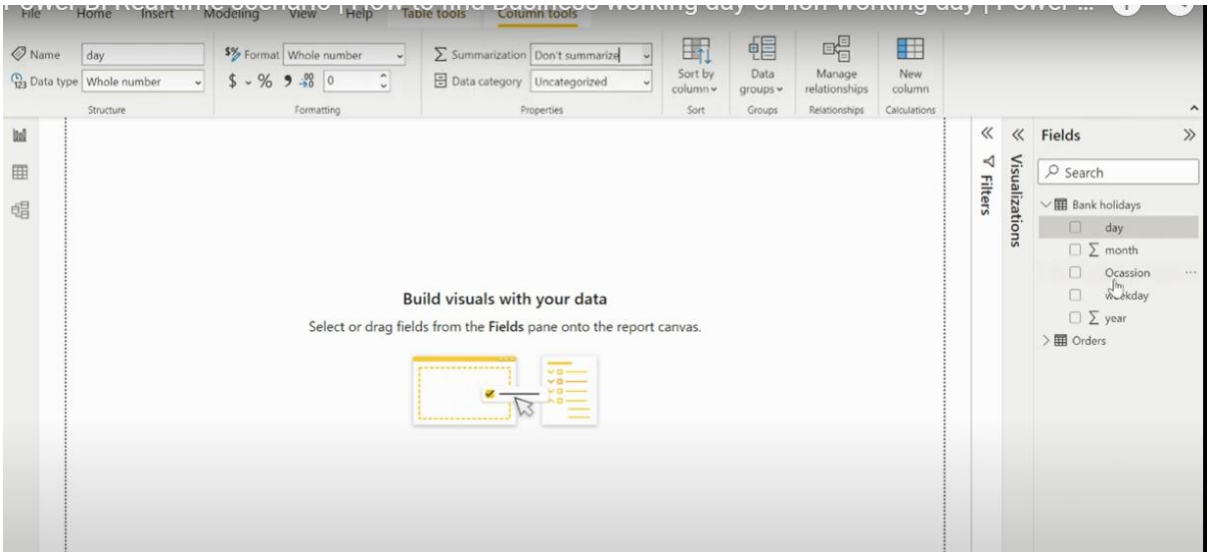




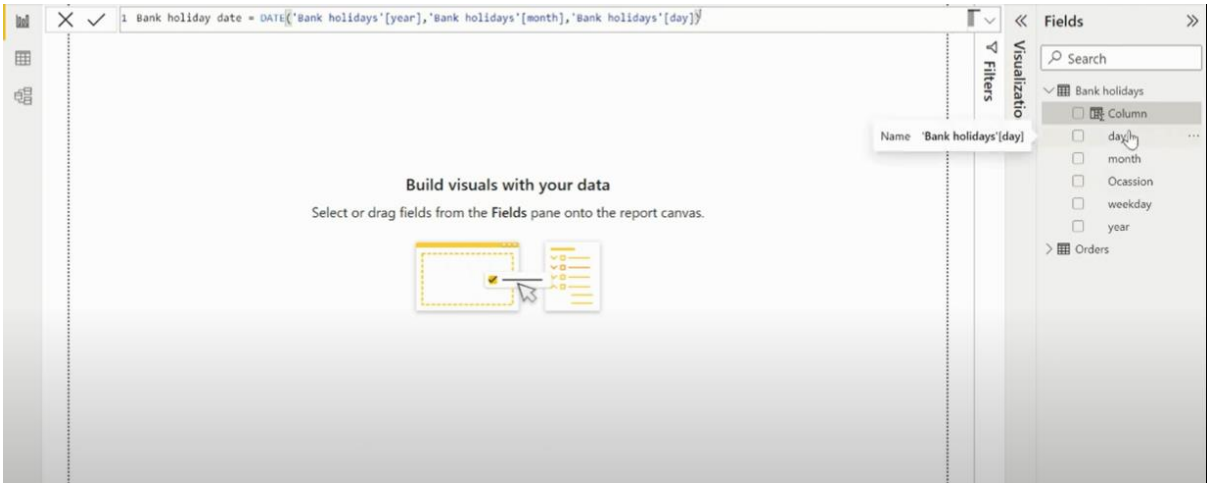
Change data type of year column to whole number



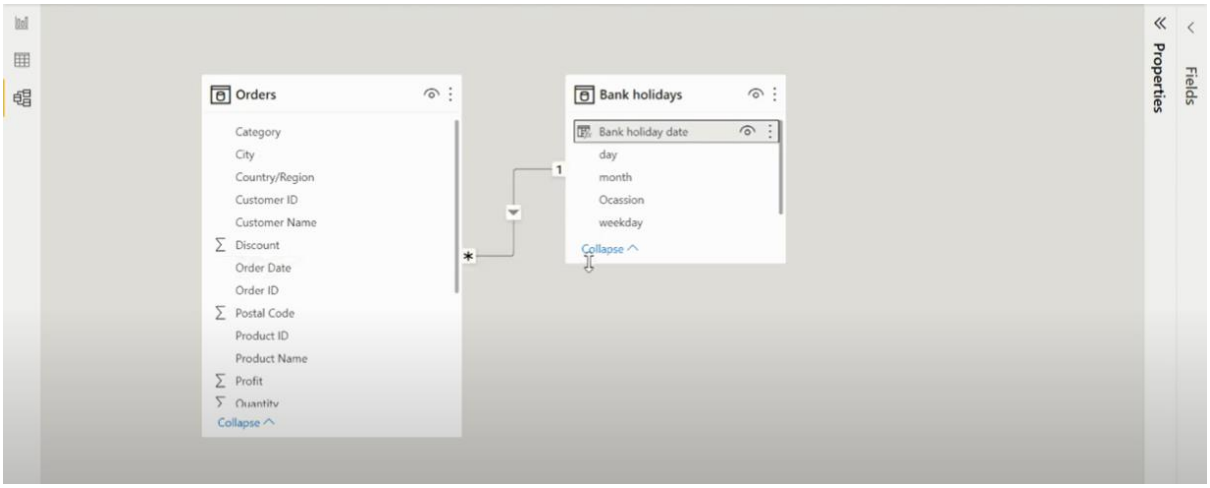
Select day column -> go to column tools -> properties section -> change summarization to don't summarize (same for month and year as well)



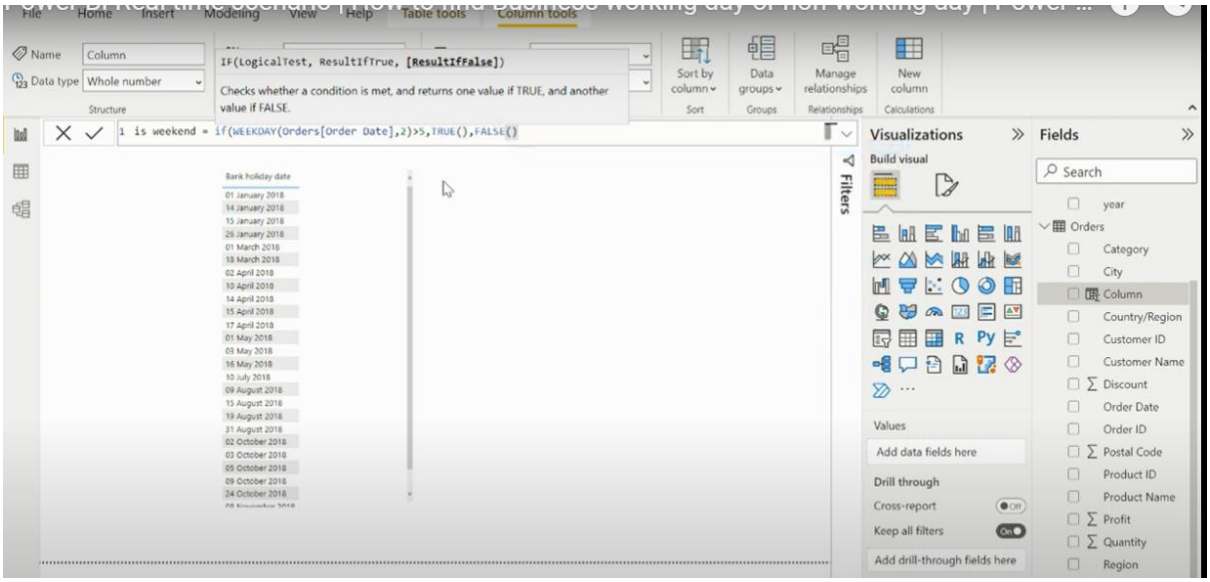
Convert day, month and year to date

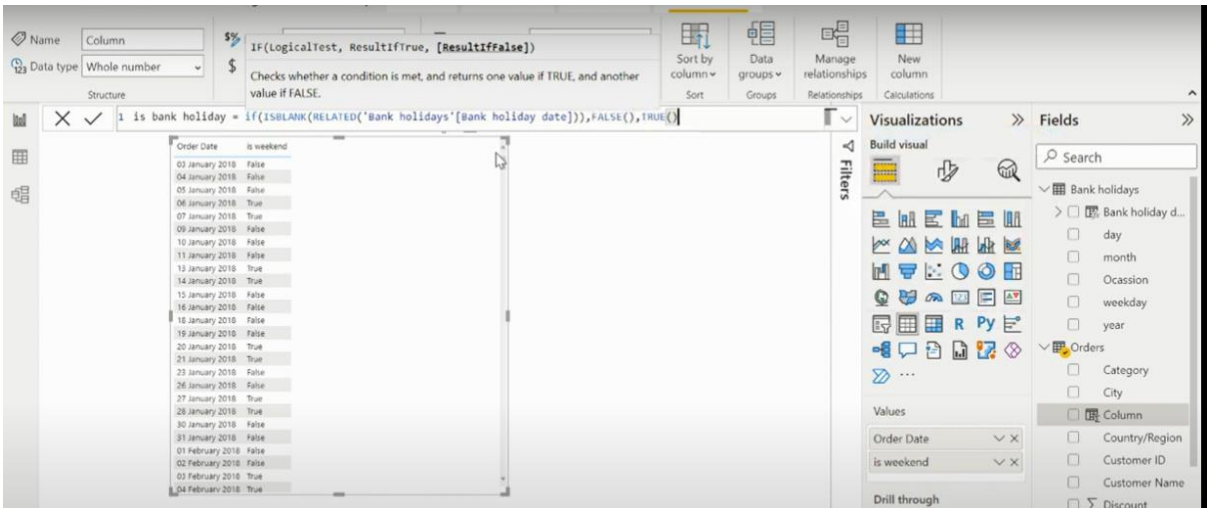


Specify relationship between tables

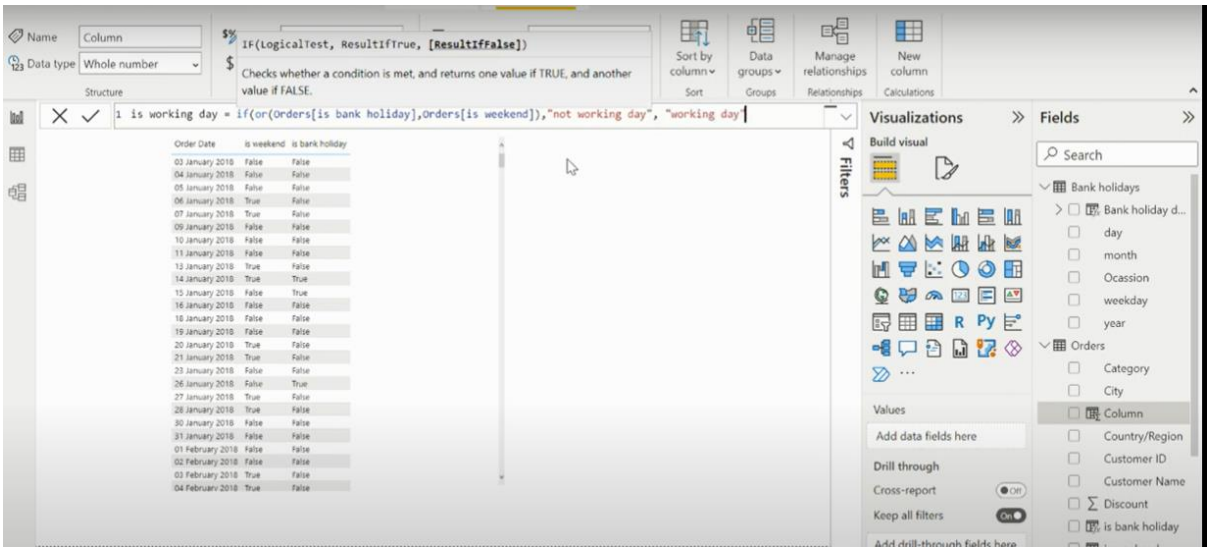


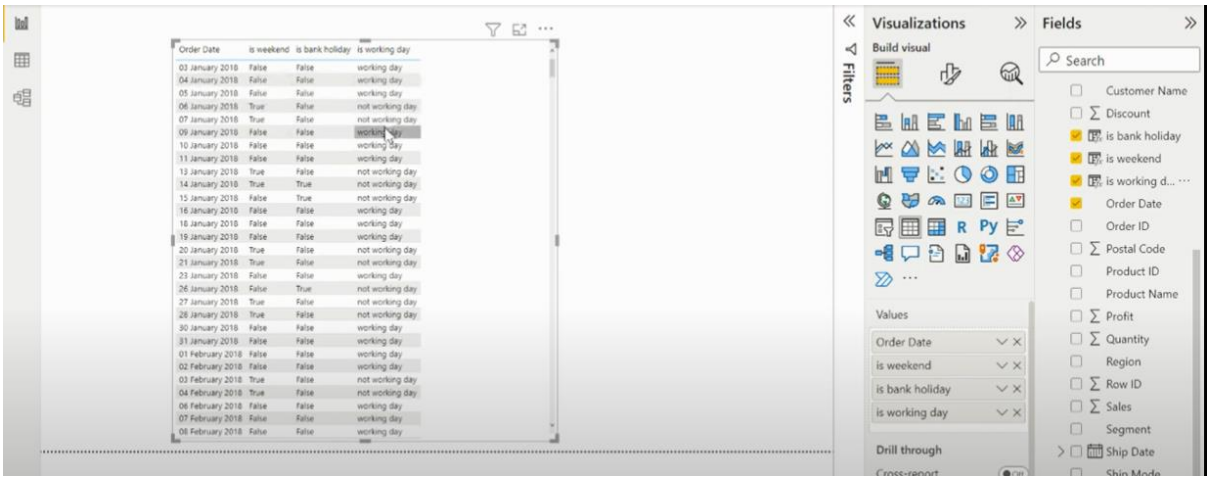
In weekday function, 1st day of the week start from monday





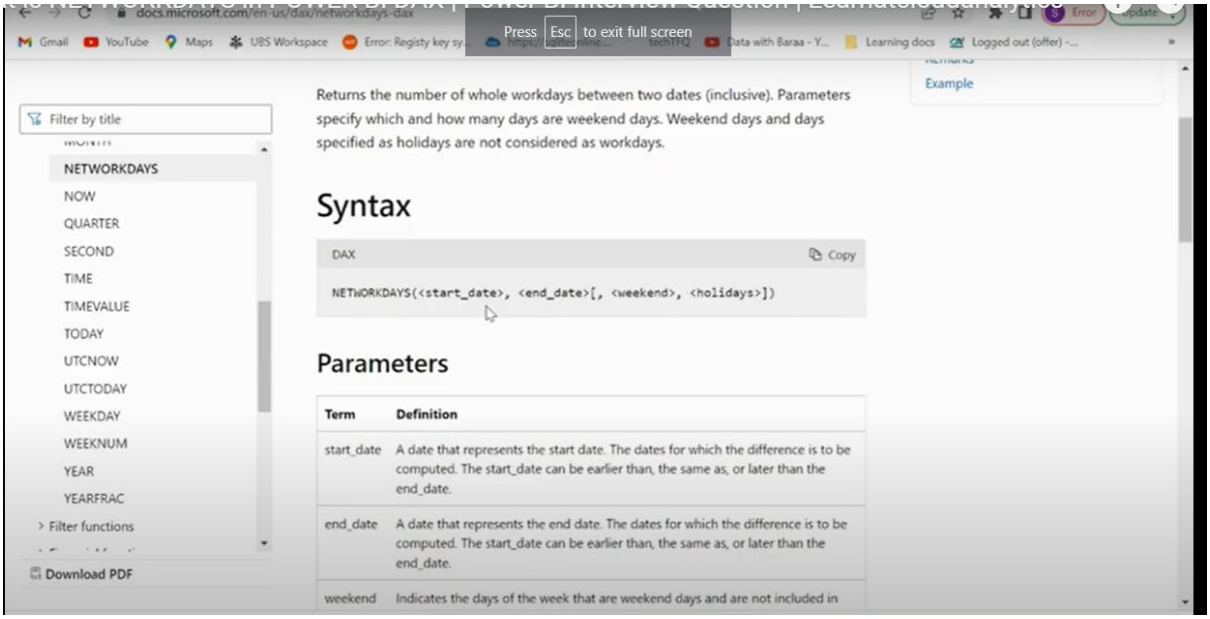

1 is bank holiday = if(ISBLANK(RELATED('Bank holidays'[Bank holiday date])),FALSE(),TRUE())
Visualizations
Build visual
Fields
Search
Values
Order Date
is weekend
is bank holiday
Bank holidays
Bank holiday d...
day
month
Ocassion
weekday
year
Orders
Category
City
Country/Region
Customer ID
Customer Name
Discount
is bank holi...

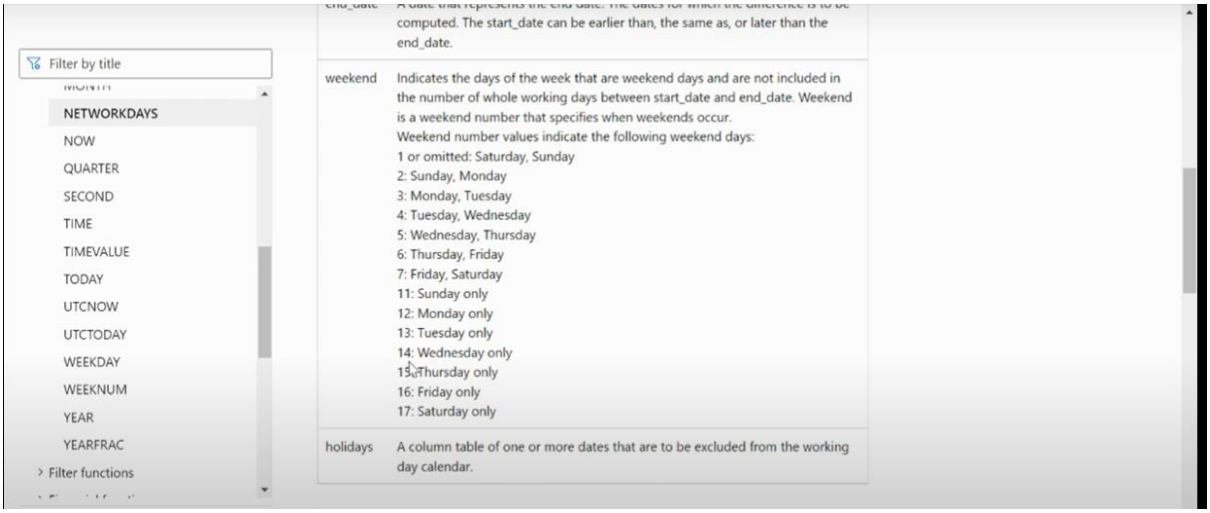

Name
Column
Data type
Whole number
Structure
IF(LogicalTest, ResultIfTrue, [ResultIfFalse])
Checks whether a condition is met, and returns one value if TRUE, and another value if FALSE.
Sort by column
Data groups
Manage relationships
New column
Sort
Groups
Relationships
Calculations
1 is working day = if(or(Orders[is bank holiday],Orders[is weekend]),"not working day", "working day"
Visualizations
Build visual
Fields
Search
Values
Add data fields here
Drill through
Cross-report
Keep all filters
Bank holidays
Orders
Column
is bank holiday

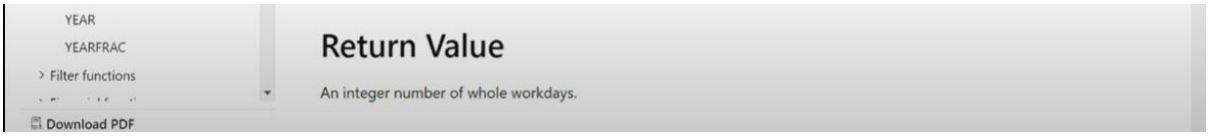

Order Date
is weekend
is bank holiday
is working day
Visualizations
Build visual
Fields
Search
Values
Order Date
is weekend
is bank holiday
is working day
Drill through
Customer Name
Discount
is bank holiday
is weekend
is working d...
Order Date
Order ID
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Row ID
Sales
Segment
Ship Date

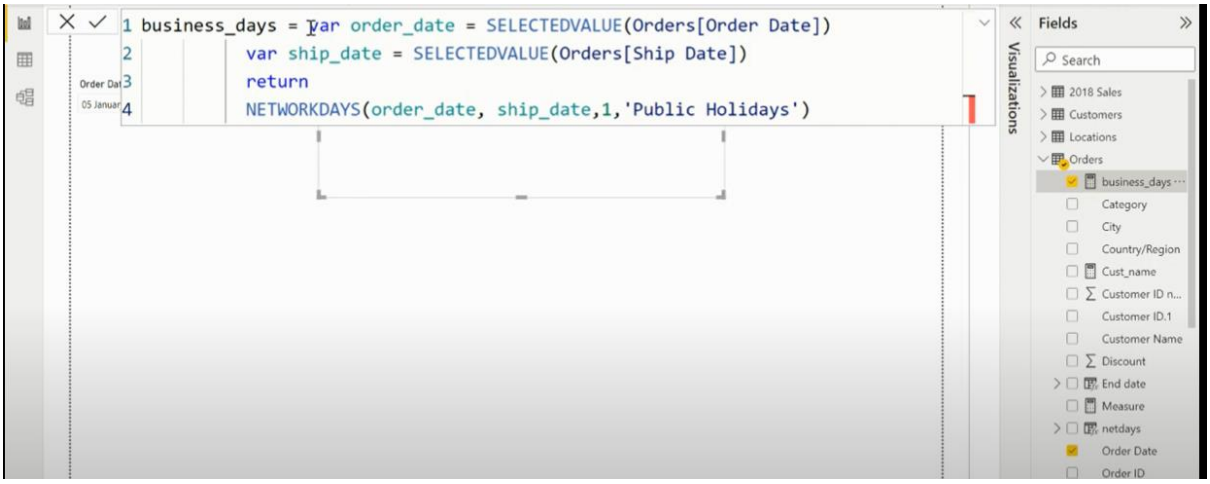
Networkdays in Power BI

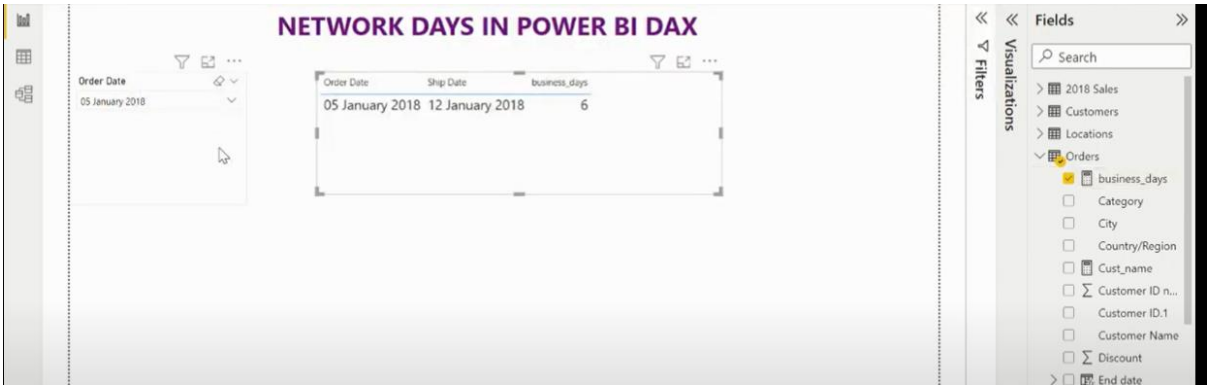
New and easy way to calculate Business working days



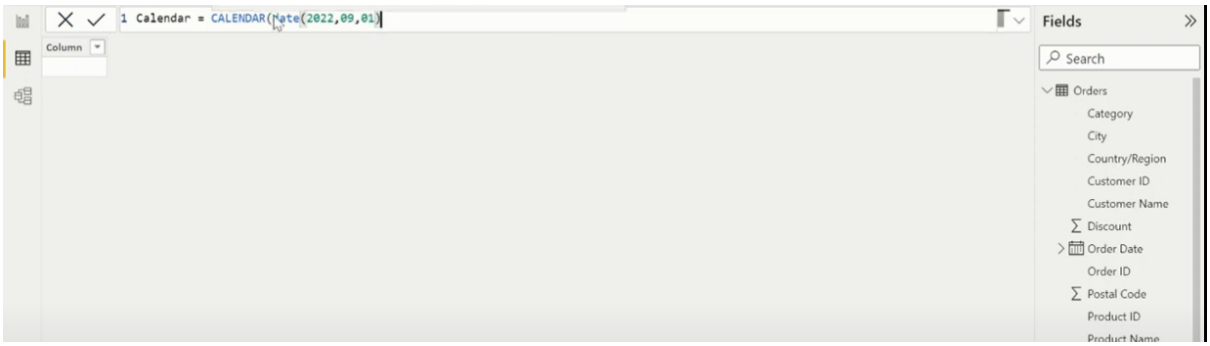




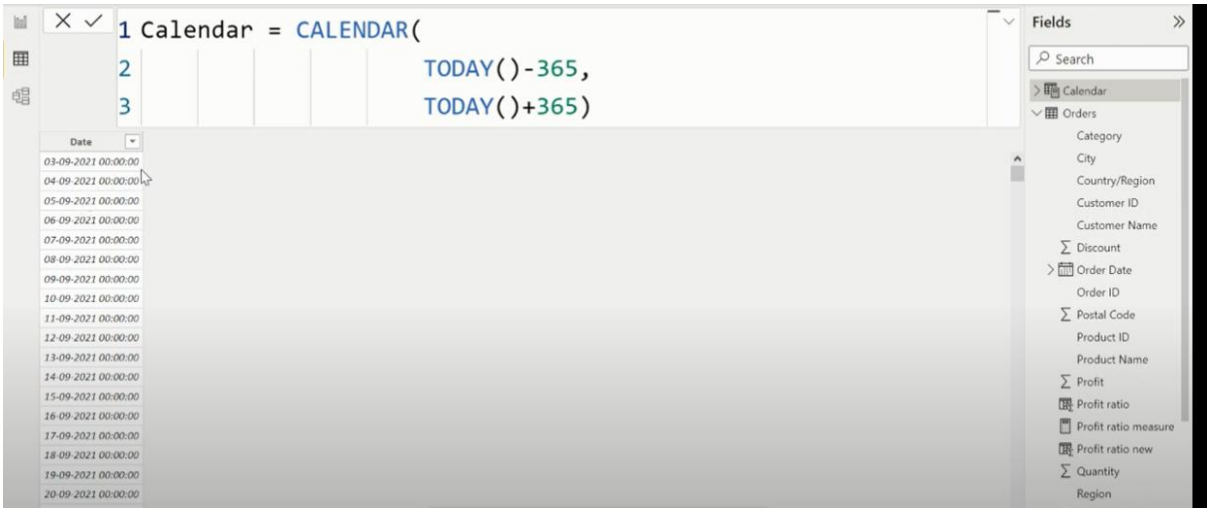




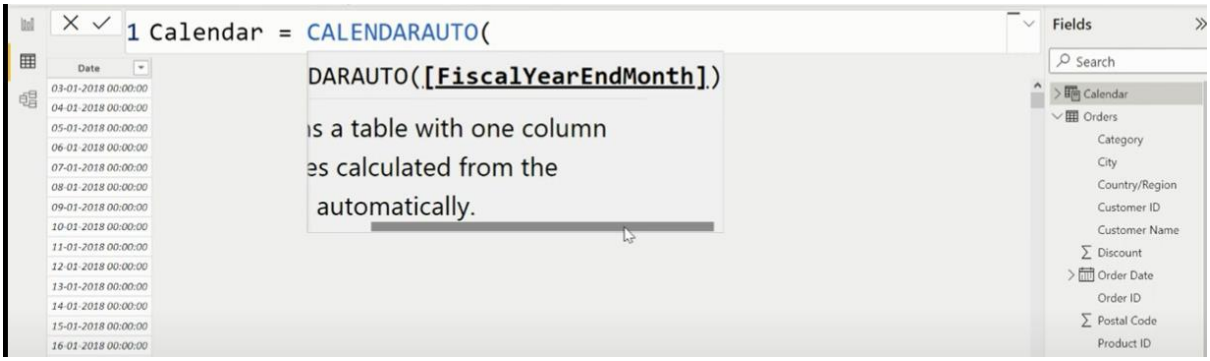
Calendar and CalendarAuto in Power BI



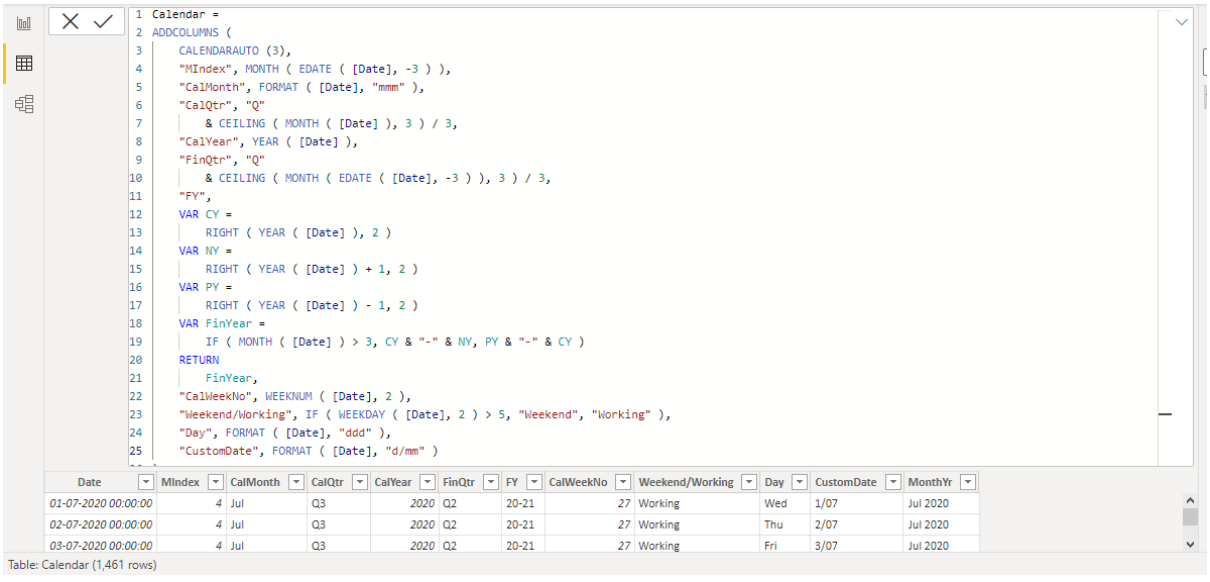

1 Calendar = CALENDAR(date(2022,09,01),date(2022,09,30))
Date
01-09-2022 00:00:00
02-09-2022 00:00:00
03-09-2022 00:00:00
04-09-2022 00:00:00
05-09-2022 00:00:00
06-09-2022 00:00:00
07-09-2022 00:00:00
08-09-2022 00:00:00
09-09-2022 00:00:00
10-09-2022 00:00:00
11-09-2022 00:00:00
12-09-2022 00:00:00
13-09-2022 00:00:00
14-09-2022 00:00:00
15-09-2022 00:00:00
16-09-2022 00:00:00
17-09-2022 00:00:00
18-09-2022 00:00:00
19-09-2022 00:00:00
20-09-2022 00:00:00
21-09-2022 00:00:00
22-09-2022 00:00:00
23-09-2022 00:00:00
Fields
Search
Calendar
Orders
Category
City
Country/Region
Customer ID
Customer Name
Discount
Order Date
Order ID
Postal Code
Product ID
Product Name
Profit
Profit ratio
Profit ratio measure
Profit ratio new
Quantity
Region


1 Calendar = CALENDAR(
2 TODAY()-365,
3 TODAY()+365)
Date
03-09-2021 00:00:00
04-09-2021 00:00:00
05-09-2021 00:00:00
06-09-2021 00:00:00
07-09-2021 00:00:00
08-09-2021 00:00:00
09-09-2021 00:00:00
10-09-2021 00:00:00
11-09-2021 00:00:00
12-09-2021 00:00:00
13-09-2021 00:00:00
14-09-2021 00:00:00
15-09-2021 00:00:00
16-09-2021 00:00:00
17-09-2021 00:00:00
18-09-2021 00:00:00
19-09-2021 00:00:00
20-09-2021 00:00:00
Fields
Search
Calendar
Orders
Category
City
Country/Region
Customer ID
Customer Name
Discount
Order Date
Order ID
Postal Code
Product ID
Product Name
Profit
Profit ratio
Profit ratio measure
Profit ratio new
Quantity
Region


1 Calendar = CALENDAR(
2 MIN(Orders[Order Date]),
3 MAX(Orders[Order Date])
4)
Date
03-01-2018 00:00:00
04-01-2018 00:00:00
05-01-2018 00:00:00
06-01-2018 00:00:00
07-01-2018 00:00:00
08-01-2018 00:00:00
09-01-2018 00:00:00
10-01-2018 00:00:00
11-01-2018 00:00:00
12-01-2018 00:00:00
13-01-2018 00:00:00
14-01-2018 00:00:00
15-01-2018 00:00:00
16-01-2018 00:00:00
17-01-2018 00:00:00
18-01-2018 00:00:00
Name 'Orders'[Order Date]
Fields
Search
Calendar
Orders
Category
City
Country/Region
Customer ID
Customer Name
Discount
Order ID
Postal Code
Product ID
Product Name
Profit
Profit ratio
Profit ratio measure
Profit ratio new
Quantity
Region



Advanced Calender Creation (Including Financial Year)



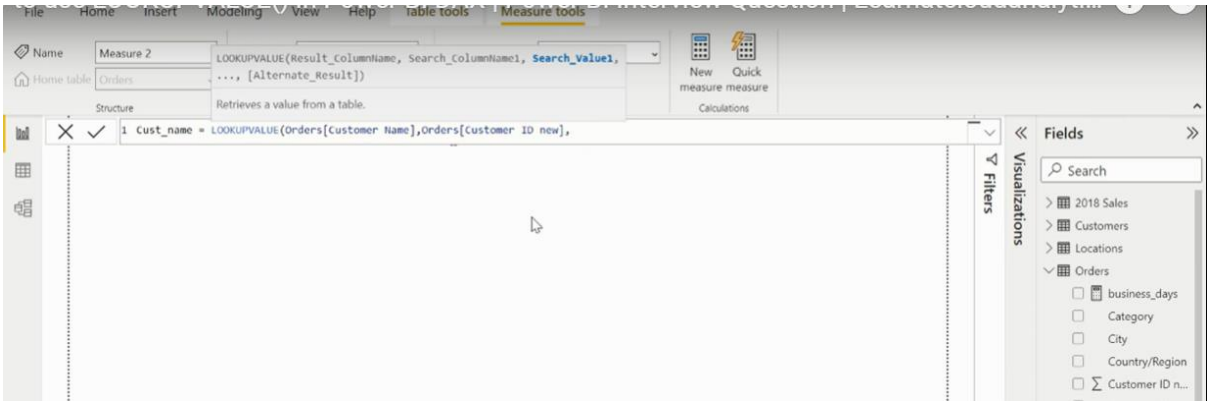
```
Calendar =
ADDCOLUMNS (
    CALENDARAUTO (3),
    "MIndex", MONTH ( EDATE ( [Date], -3 ) ),
    "CalMonth", FORMAT ( [Date], "mmm" ),
    "CalQtr", "Q"
        & CEILING ( MONTH ( [Date] ), 3 ) / 3,
    "CalYear", YEAR ( [Date] ),
    "FinQtr", "Q"
        & CEILING ( MONTH ( EDATE ( [Date], -3 ) ), 3 ) / 3,
    "FY",
    VAR CY =
        RIGHT ( YEAR ( [Date] ), 2 )
    VAR NY =
        RIGHT ( YEAR ( [Date] ) + 1, 2 )
    VAR PY =
        RIGHT ( YEAR ( [Date] ) - 1, 2 )
    VAR FinYear =
        IF ( MONTH ( [Date] ) > 3, CY & "-" & NY, PY & "-" & CY )
    RETURN
        FinYear,
    "CalWeekNo", WEEKNUM ( [Date], 2 ),
    "Weekend/Working", IF ( WEEKDAY ( [Date], 2 ) > 5, "Weekend", "Working" ),
    "Day", FORMAT ( [Date], "ddd" ),
    "CustomDate", FORMAT ( [Date], "d/mm" )
```

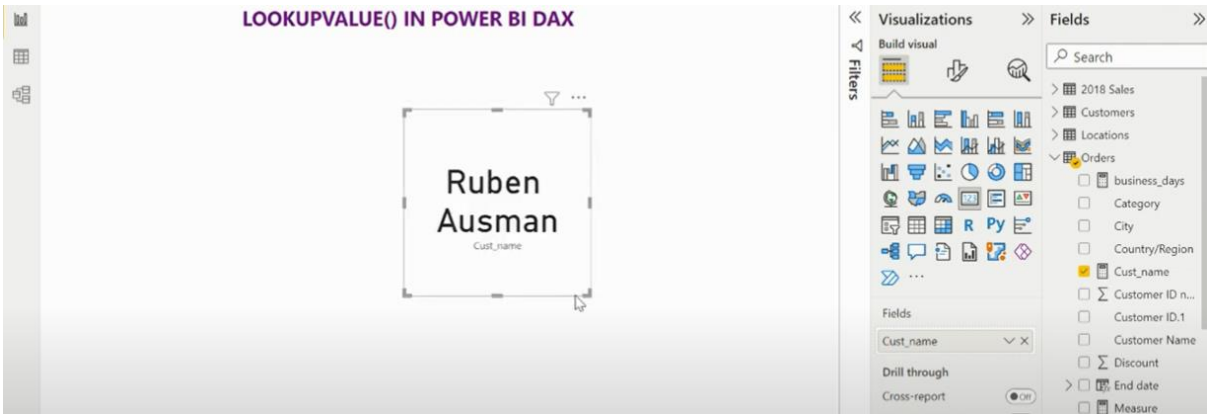
Date	MIndex	CalMonth	CalQtr	CalYear	FinQtr	FY	CalWeekNo	Weekend/Working	Day	CustomDate	MonthYr
01-07-2020 00:00:00	4	Jul	Q3	2020	Q2	20-21	27	Working	Wed	1/07	Jul 2020
02-07-2020 00:00:00	4	Jul	Q3	2020	Q2	20-21	27	Working	Thu	2/07	Jul 2020
03-07-2020 00:00:00	4	Jul	Q3	2020	Q2	20-21	27	Working	Fri	3/07	Jul 2020

Table: Calendar (1,461 rows)

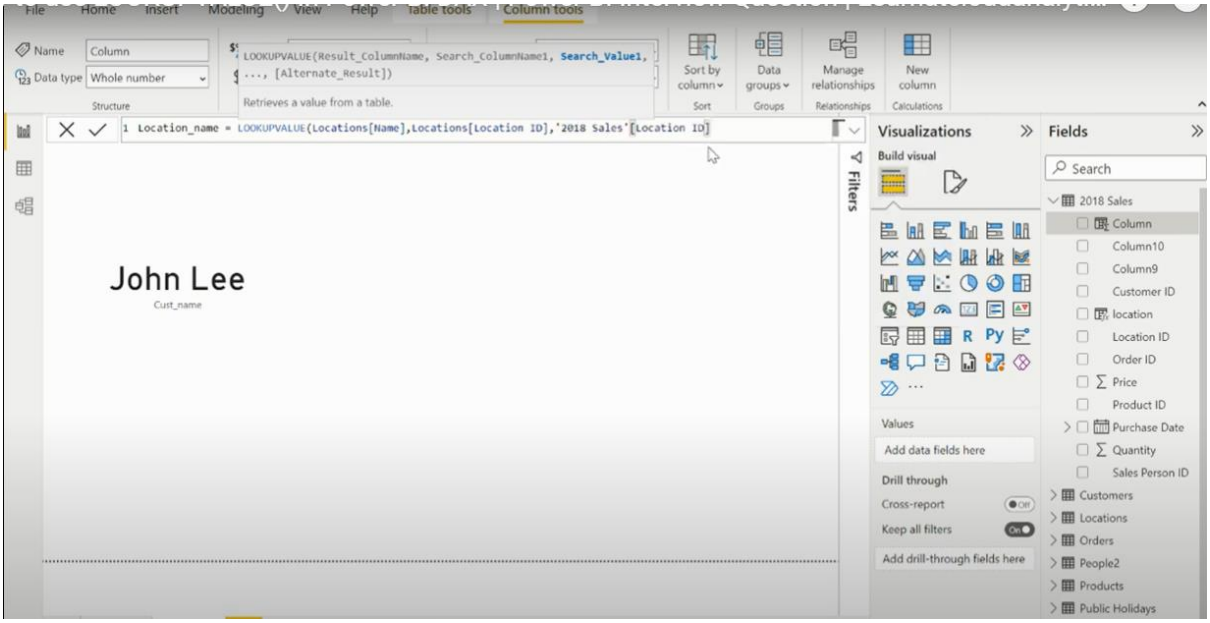
Lookupvalue in Power BI

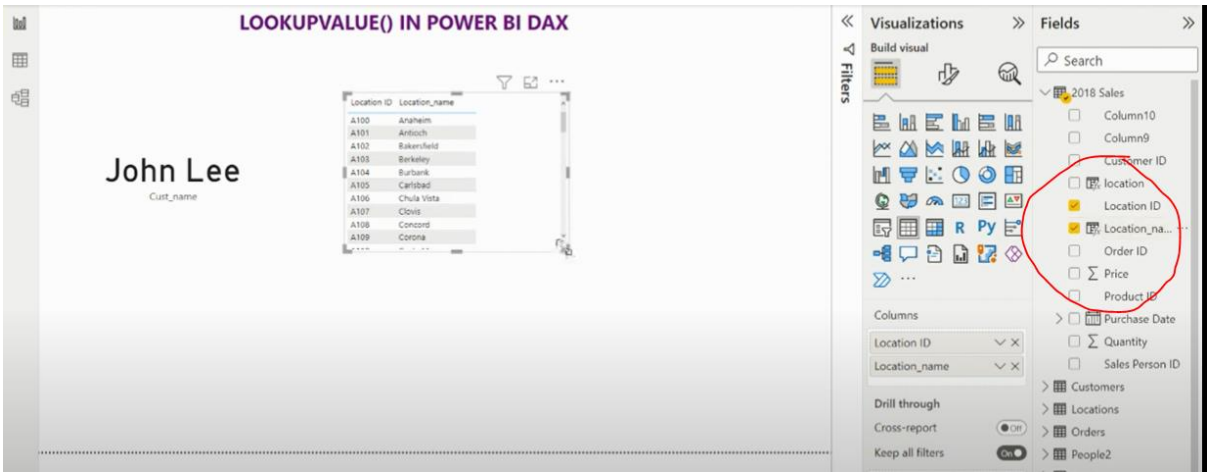
If created using a measure, it gives 1 result at a time corresponding to given search value and can be visualized using a card





If created using a column works same as vlookup in excel



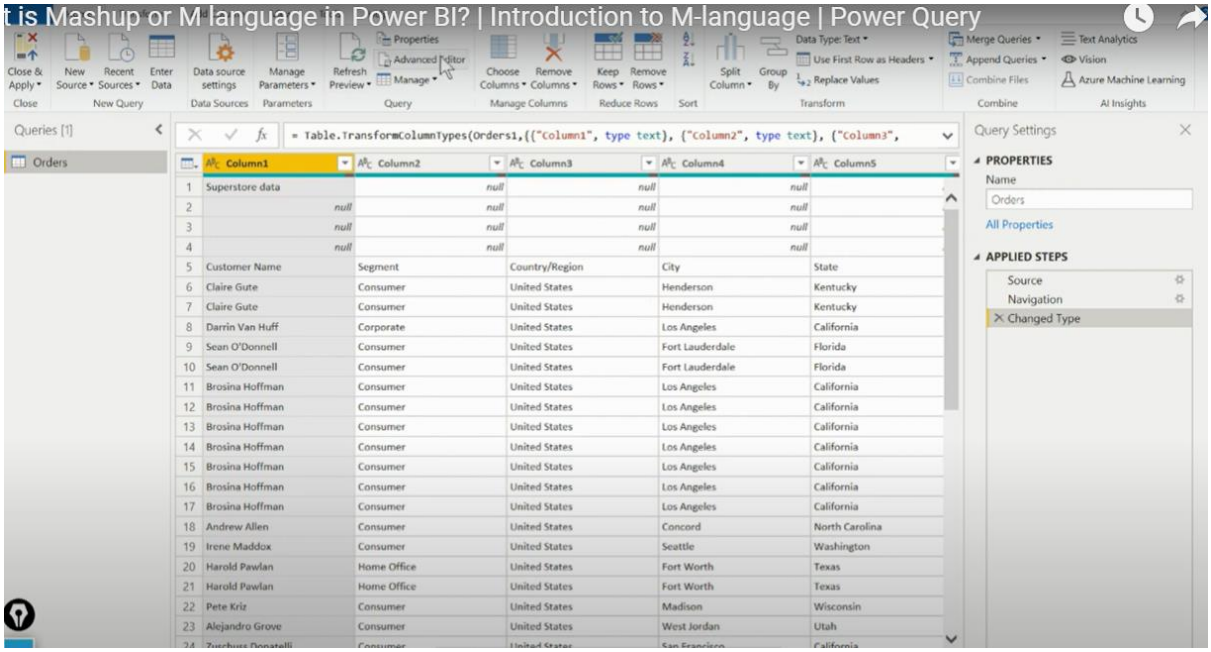


What is M (Mashup) Language in Power BI?

The steps taken during the data transformation stage are written in M language, the code is generated automatically.

M language is used to the transformation which are not possible with the default options given (for e.g. deleting custom rows)

Home -> Query Group -> Advanced Editor

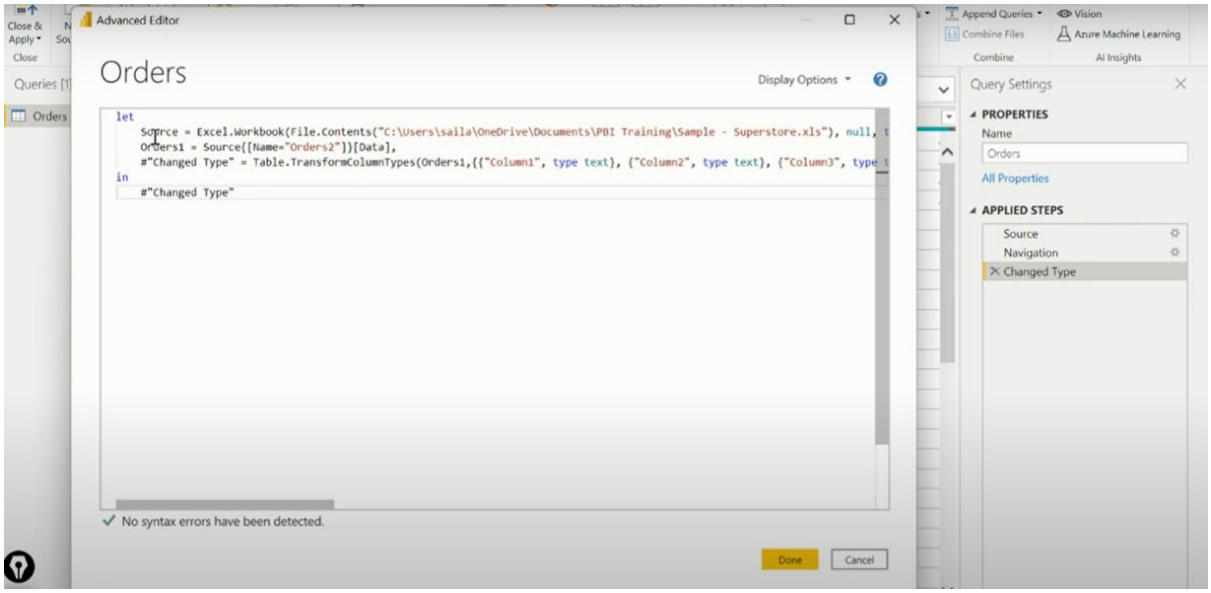


Code is generated for all applied steps on right hand side

There are two main keywords **let** and **in**

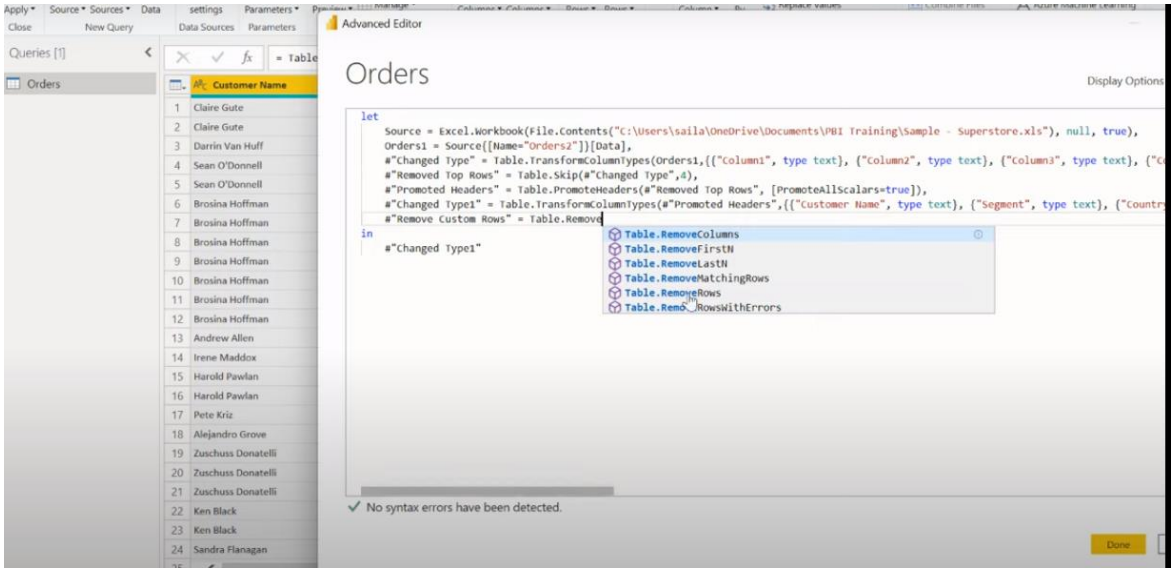
Code is written inside **let** and ends with last step inside **in**

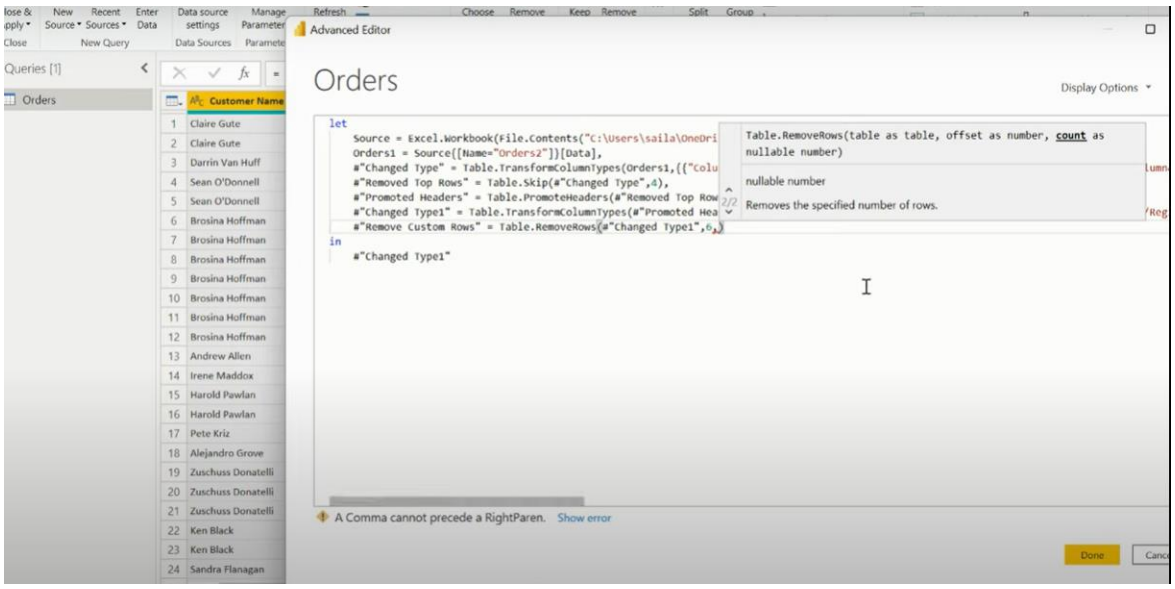
Each step from 2nd step onwards contains reference of previous step

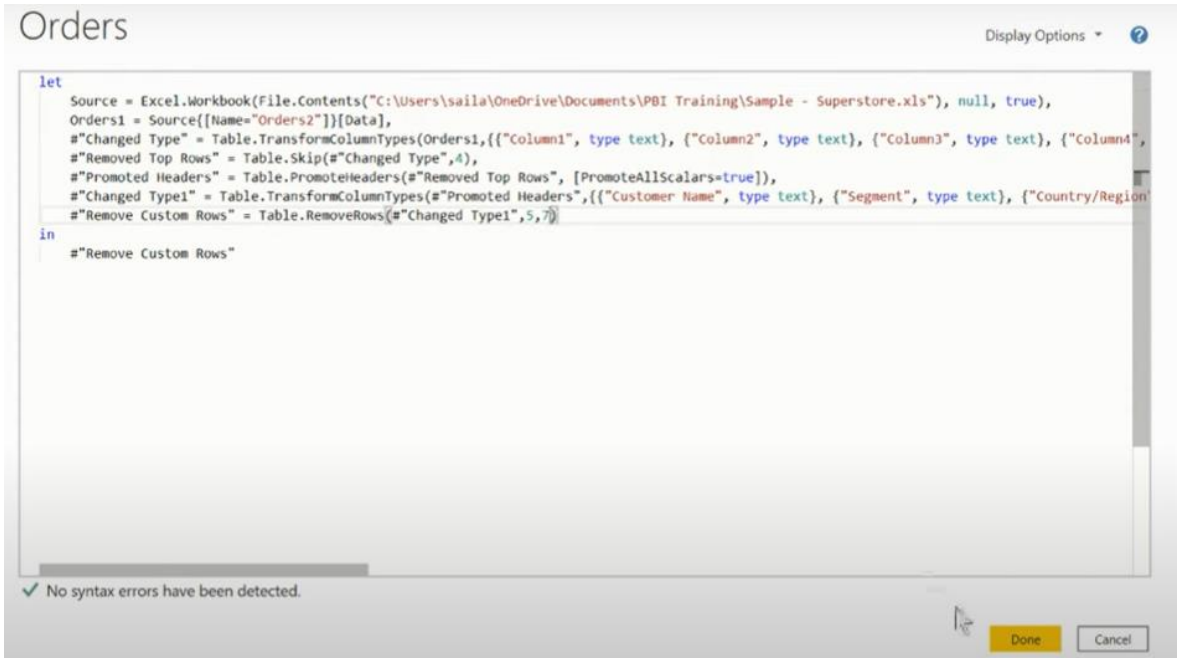


How to delete custom rows in Power BI?

Home -> Query Group -> Advanced Editor

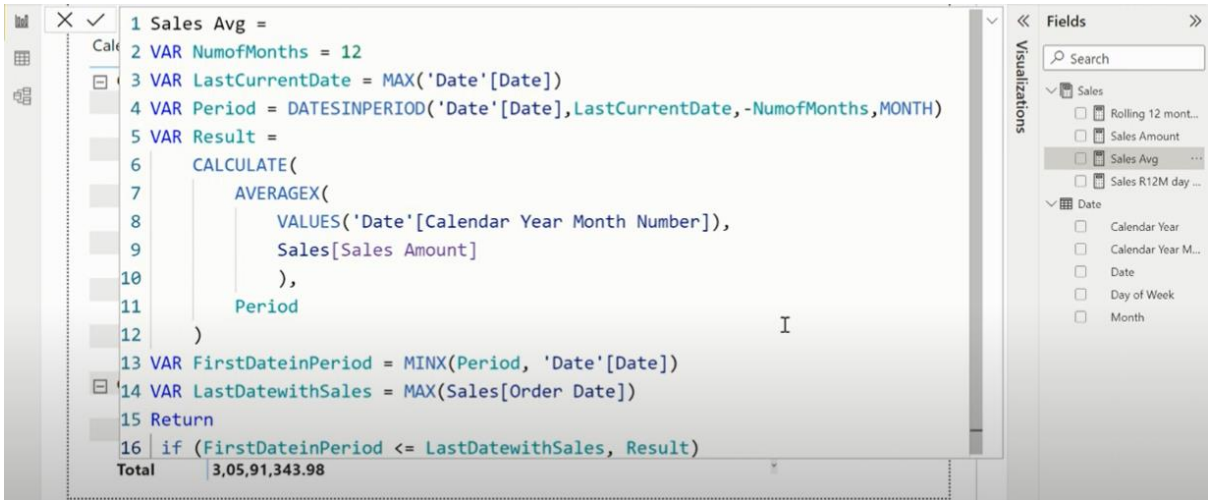

Advanced Editor
Orders
Display Options
Queries [1]
Orders
Customer Name
Claire Gute
Claire Gute
Darrin Van Huff
Sean O'Donnell
Sean O'Donnell
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Andrew Allen
Irene Maddox
Harold Pawlan
Harold Pawlan
Pete Kriz
Alejandro Grove
Zuschuss Donatelli
Zuschuss Donatelli
Zuschuss Donatelli
Ken Black
Ken Black
Sandra Flanagan
let
Source = Excel.Workbook(File.Contents("C:\Users\saila\OneDrive\Documents\PBI Training\Sample - Superstore.xls"), null, true),
Orders1 = Source{[Name="Orders2"]}[Data],
#"Changed Type" = Table.TransformColumnTypes(Orders1,{{"Column1", type text}, {"Column2", type text}, {"Column3", type text}, {"
#"Removed Top Rows" = Table.Skip(#"Changed Type",4),
#"Promoted Headers" = Table.PromoteHeaders(#"Removed Top Rows", [PromoteAllScalars=true]),
#"Changed Type1" = Table.TransformColumnTypes(#"Promoted Headers",{{"Customer Name", type text}, {"Segment", type text}, {"Country
#"Remove Custom Rows" = Table.Remove
in
#"Changed Type1"
Table.RemoveColumns
Table.RemoveFirstN
Table.RemoveLastN
Table.RemoveMatchingRows
Table.RemoveRows
Table.RemoveRowsWithErrors
No syntax errors have been detected.
Done

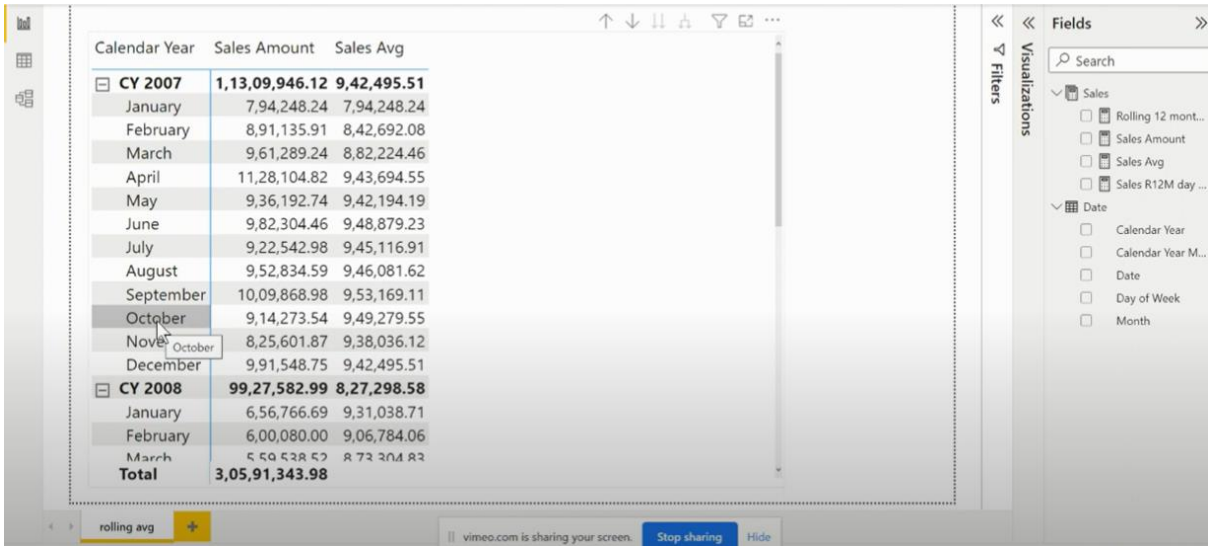

Advanced Editor
Orders
Display Options
Queries [1]
Orders
Customer Name
Claire Gute
Claire Gute
Darrin Van Huff
Sean O'Donnell
Sean O'Donnell
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Brosina Hoffman
Andrew Allen
Irene Maddox
Harold Pawlan
Harold Pawlan
Pete Kriz
Alejandro Grove
Zuschuss Donatelli
Zuschuss Donatelli
Zuschuss Donatelli
Ken Black
Ken Black
Sandra Flanagan
let
Source = Excel.Workbook(File.Contents("C:\Users\saila\OneDri
Orders1 = Source{[Name="Orders2"]}[Data],
#"Changed Type" = Table.TransformColumnTypes(Orders1,{{"Colu
#"Removed Top Rows" = Table.Skip(#"Changed Type",4),
#"Promoted Headers" = Table.PromoteHeaders(#"Removed Top Row
#"Changed Type1" = Table.TransformColumnTypes(#"Promoted Hea
#"Remove Custom Rows" = Table.RemoveRows(#"Changed Type1",6,)
in
#"Changed Type1"
Table.RemoveRows(table as table, offset as number, count as nullable number)
nullable number
Removes the specified number of rows.
A Comma cannot precede a RightParen. Show error
Done


Orders
Display Options
let
Source = Excel.Workbook(File.Contents("C:\Users\saila\OneDrive\Documents\PBI Training\Sample - Superstore.xls"), null, true),
Orders1 = Source{[Name="Orders2"]}[Data],
#"Changed Type" = Table.TransformColumnTypes(Orders1,{{"Column1", type text}, {"Column2", type text}, {"Column3", type text}, {"Column4",
#"Removed Top Rows" = Table.Skip(#"Changed Type",4),
#"Promoted Headers" = Table.PromoteHeaders(#"Removed Top Rows", [PromoteAllScalars=true]),
#"Changed Type1" = Table.TransformColumnTypes(#"Promoted Headers",{{"Customer Name", type text}, {"Segment", type text}, {"Country/Region"
#"Remove Custom Rows" = Table.RemoveRows(#"Changed Type1",5,7)
in
#"Remove Custom Rows"
No syntax errors have been detected.
Done
Cancel

Rolling Average

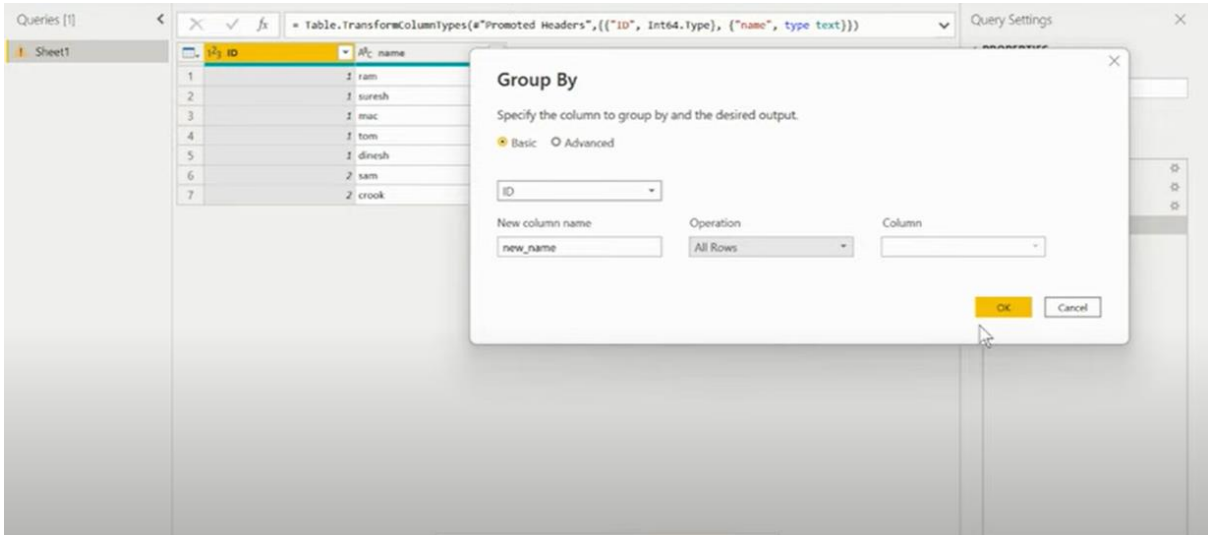
DatesinPeriod: Returns the dates between the specified start dates, no of intervals & type of interval
Minx: Returns the smallest value by evaluating expression on each row of table

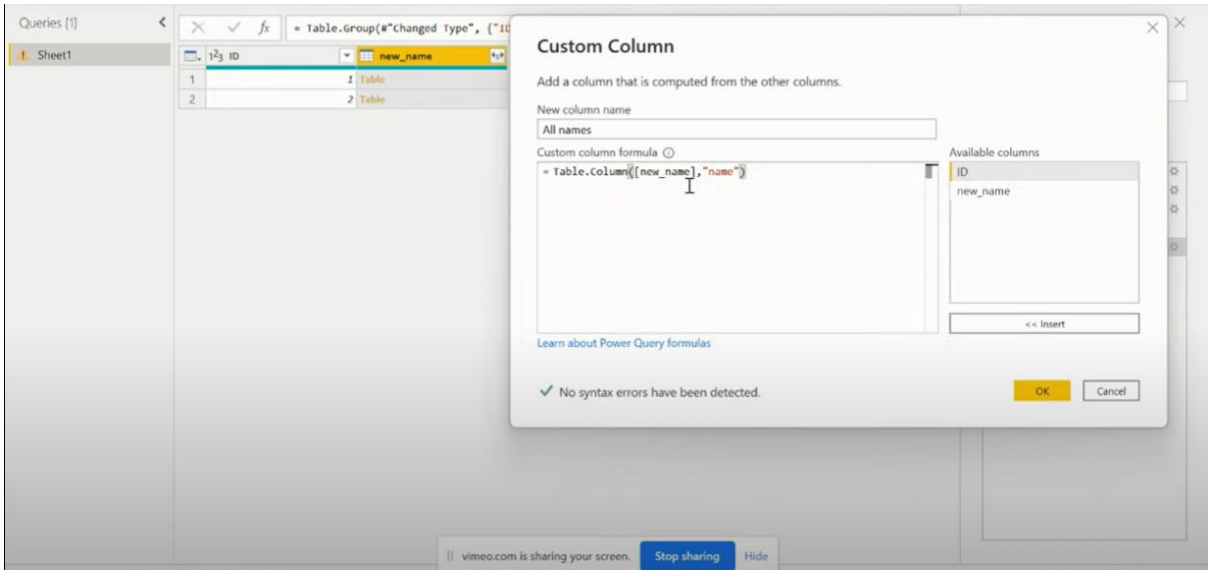


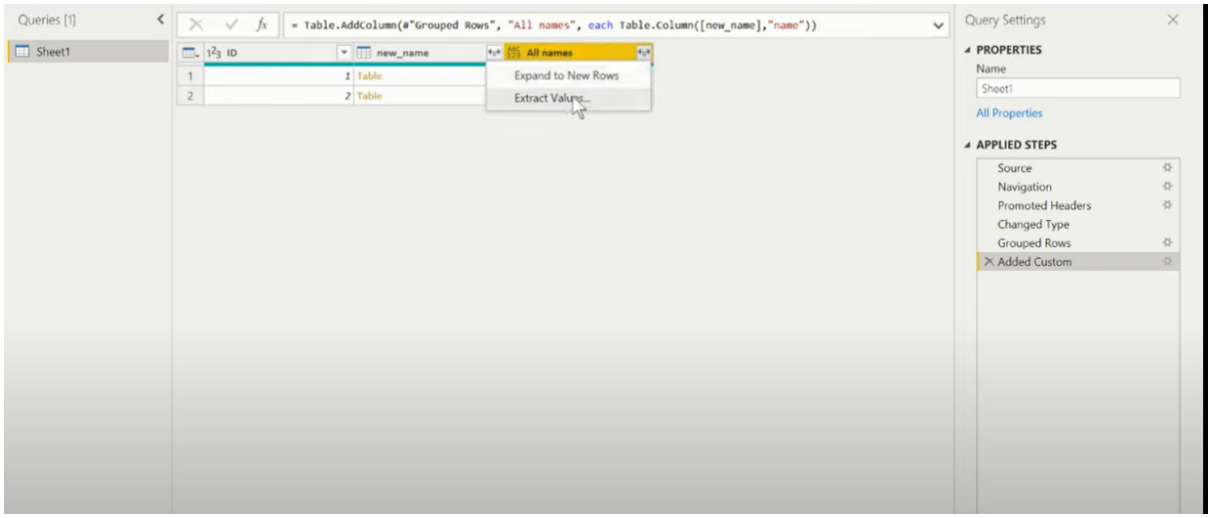


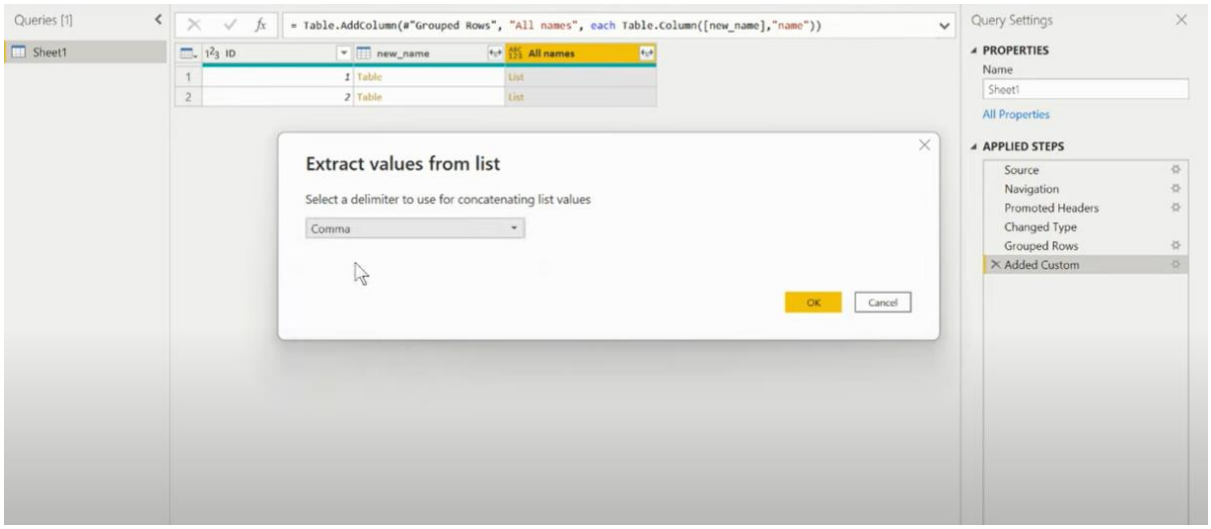
How to convert rows to comma separated values in Power BI

Go to Home -> Transform Data -> Select Table -> Home -> Groupby -> Specify New Column Name -> Operation -> All rows -> Add Column -> Custom Column -> Specify New Column Name -> Use Table.Column -> New Column name as Table (Newly created column during groupby) -> original column name as column -> Expand values -> Extract Values -> Use comma as delimiter -> Click Ok









Show/Hide Visual based on Slicer Selection in Power BI

Create a measure -> select visual -> add measure to the filter on this visual -> value is 1 -> apply filter

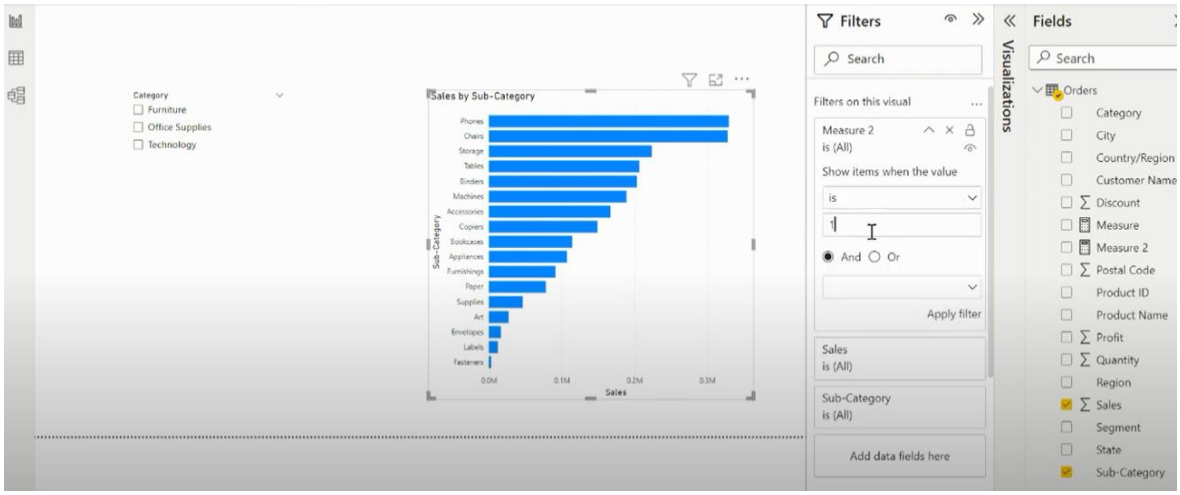
Isfilter: Checks if any filter is applied on selected column (output is Boolean T/F)

Int: converts Boolean output into 1/0

Note: If no category is selected in slicer, then visual will be blank


Show/Hide Visual based on slicer selection
Category
Furniture
Office Supplies
Technology
Sales by Sub-Category
Sub-Category
Filters
Visualizations
Fields
Search
Orders
Category
City
Country/Region
Customer Name
Discount
Measure
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Sales
Segment
State
Sub-Category

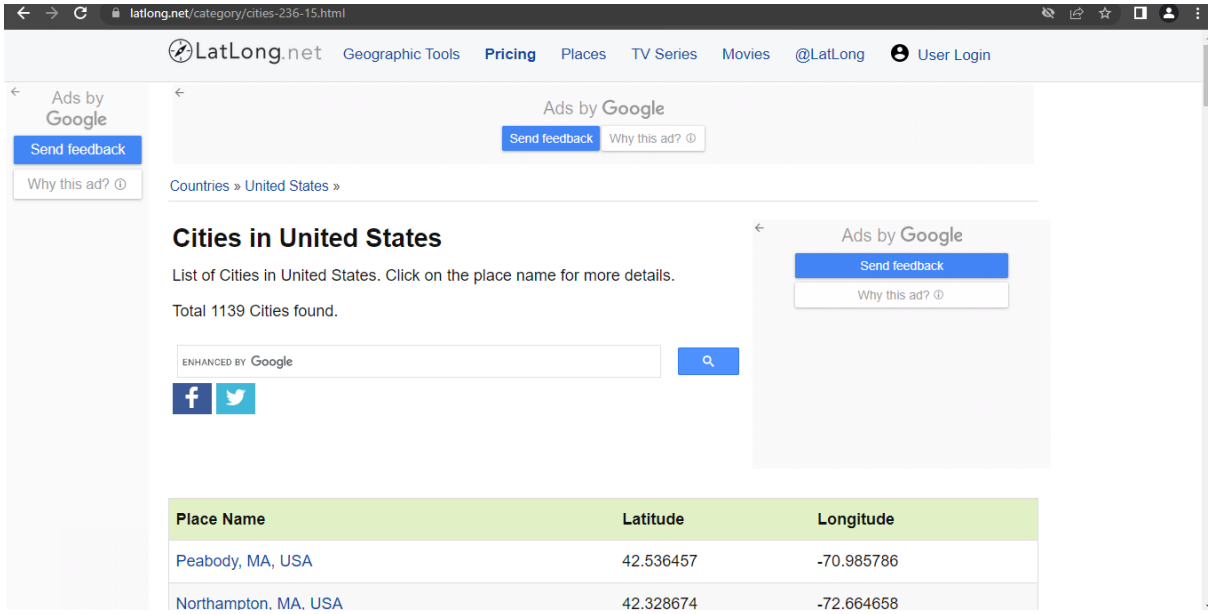

1 Measure 2 = int(ISFILTERED(Orders[Category]))
Category
Furniture
Office Supplies
Technology
Sales by Sub-Category
Phones
Chairs
Storage
Tables
Binders
Machines
Accessories
Copiers
Bookcases
Appliances
Furnishings
Paper
Supplies
Art
Envelopes
Labels
Fasteners
Sub-Category
0.0M
0.1M
0.2M
0.3M
Sales
Filters
Visualizations
Build visual
Field
Category
Drill through
Cross-report
Off
Keep all filters
On
Add drill-through fields here
Fields
Search
Orders
Category
City
Country/Region
Customer Name
Discount
Measure
Measure 2
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Sales
Segment
State
Sub-Category


Category
Furniture
Office Supplies
Technology
Sales by Sub-Category
Phones
Chairs
Storage
Tables
Binders
Machines
Accessories
Copiers
Bookcases
Appliances
Furnishings
Paper
Supplies
Art
Envelopes
Labels
Fasteners
Sub-Category
0.0M
0.1M
0.2M
0.3M
Sales
Filters
Search
Filters on this visual
Measure 2
is (All)
Show items when the value
is
1
And
Or
Apply filter
Sales
is (All)
Sub-Category
is (All)
Add data fields here
Visualizations
Fields
Search
Orders
Category
City
Country/Region
Customer Name
Discount
Measure
Measure 2
Postal Code
Product ID
Product Name
Profit
Quantity
Region
Sales
Segment
State
Sub-Category

Web Scrapping Example 1 (Extracting tables from multiple pages of html link)

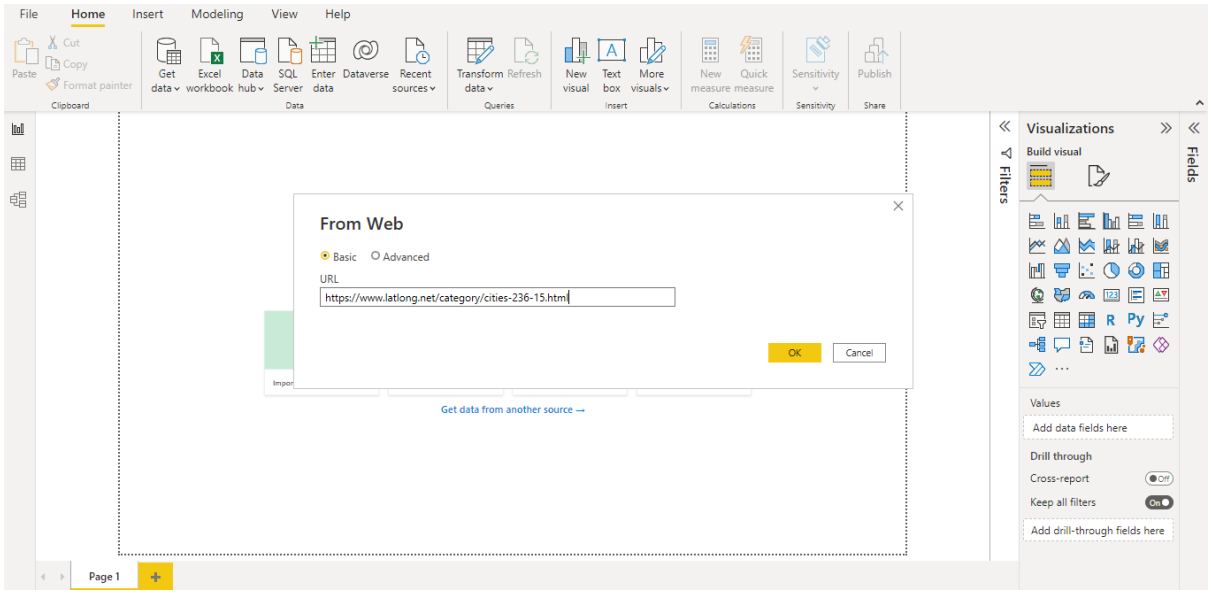
Want to extract Lat long data for us cities from below web link. This link has total of 1139 records. The records are spanned over 12 pages with each page containing 100 records (except last).

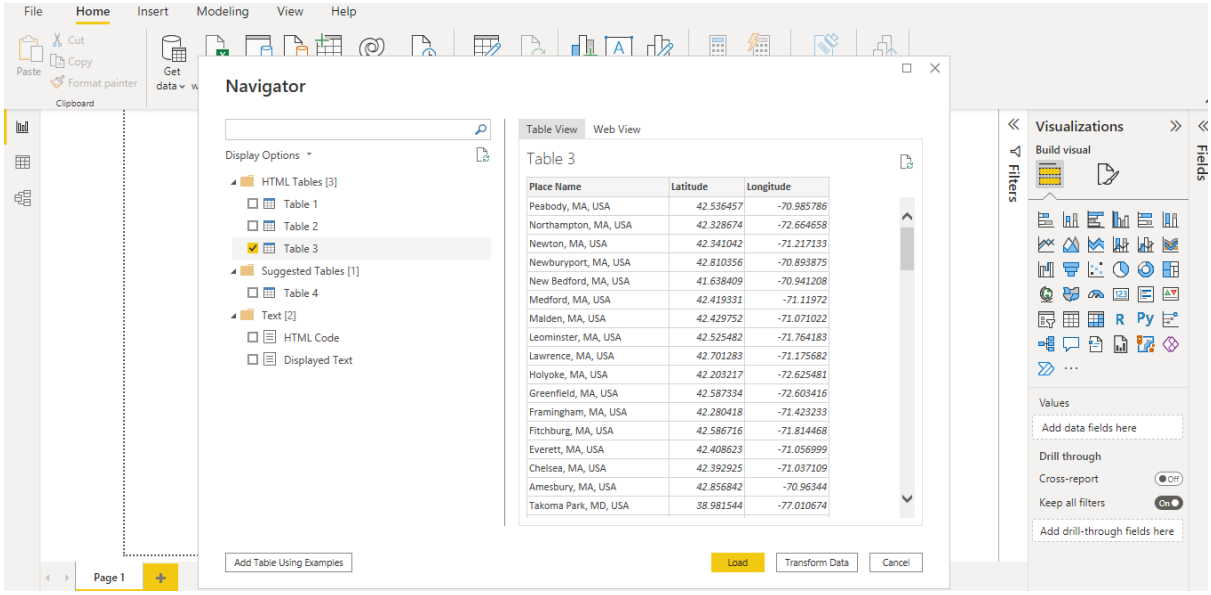
https://www.latlong.net/category/cities-236-15.html

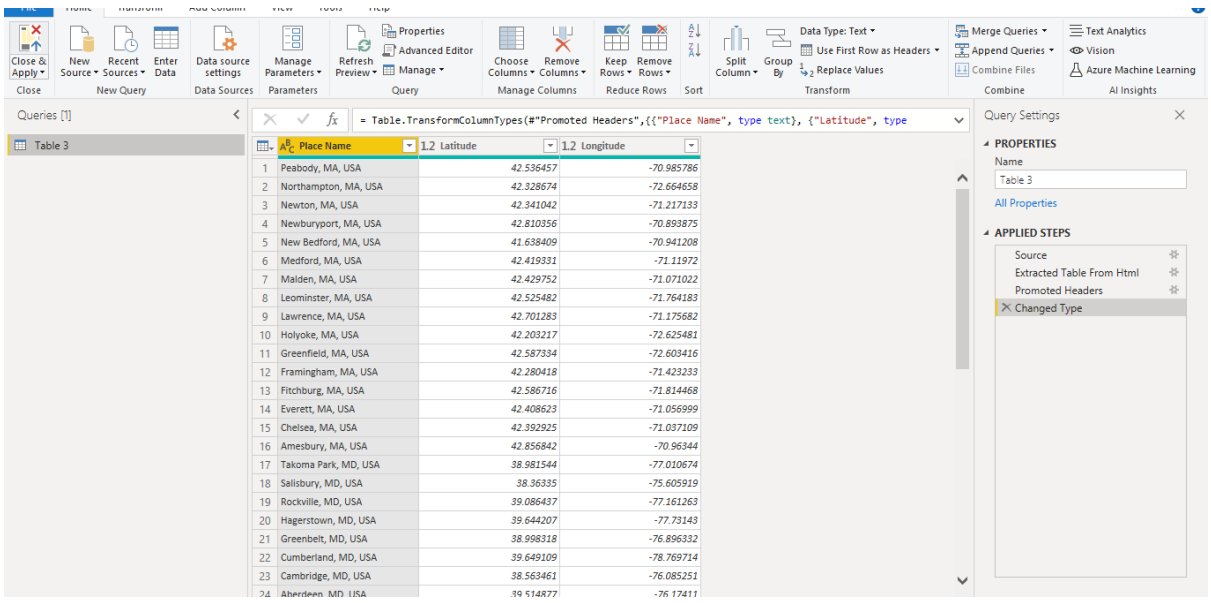


Step 1:

Go To Home -> Get Data -> Web -> Paste the URL -> Click OK -> Select Table -> click Transform data


File
Home
Insert
Modeling
View
Help
From Web
Basic
Advanced
URL
https://www.latlong.net/category/cities-236-15.html
OK
Cancel
Get data from another source →
Visualizations
Build visual
Values
Add data fields here
Drill through
Cross-report
Keep all filters
Add drill-through fields here
Filters
Fields
Page 1

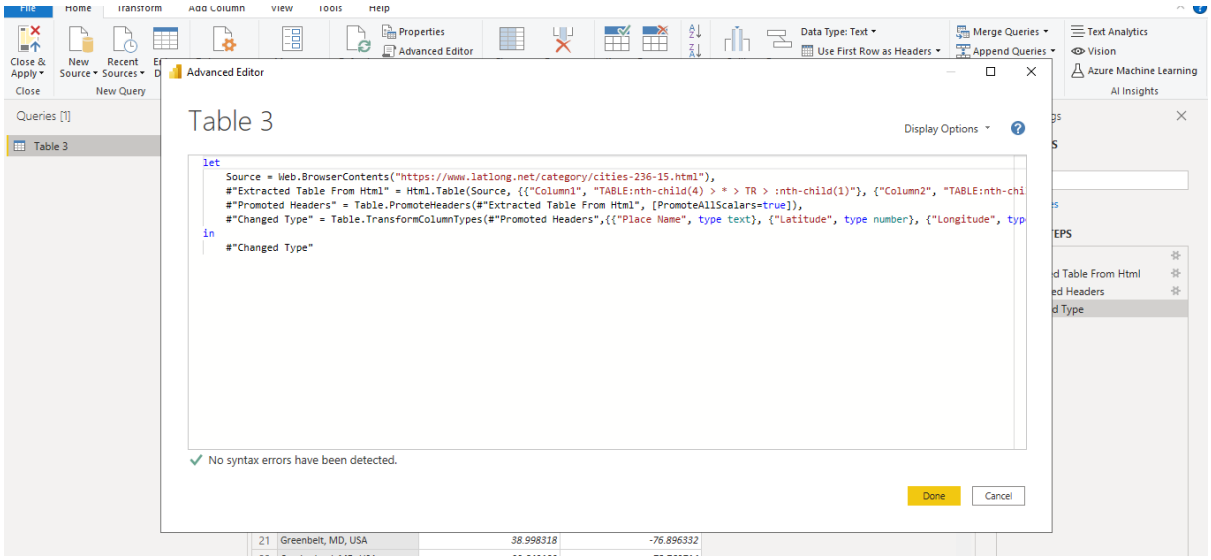

Navigator
Display Options
HTML Tables [3]
Table 1
Table 2
Table 3
Suggested Tables [1]
Table 4
Text [2]
HTML Code
Displayed Text
Table View
Web View
Table 3
Place Name | Latitude | Longitude
Peabody, MA, USA | 42.536457 | -70.985786
Northampton, MA, USA | 42.328674 | -72.664658
Newton, MA, USA | 42.341042 | -71.217133
Newburyport, MA, USA | 42.810356 | -70.893875
New Bedford, MA, USA | 41.638409 | -70.941208
Medford, MA, USA | 42.419331 | -71.11972
Malden, MA, USA | 42.429752 | -71.071022
Leominster, MA, USA | 42.525482 | -71.764183
Lawrence, MA, USA | 42.701283 | -71.175682
Holyoke, MA, USA | 42.203217 | -72.625481
Greenfield, MA, USA | 42.587334 | -72.603416
Framingham, MA, USA | 42.280418 | -71.423233
Fitchburg, MA, USA | 42.586716 | -71.814468
Everett, MA, USA | 42.408623 | -71.056999
Chelsea, MA, USA | 42.392925 | -71.037109
Amesbury, MA, USA | 42.856842 | -70.96344
Takoma Park, MD, USA | 38.981544 | -77.010674
Add Table Using Examples
Load
Transform Data
Cancel
Visualizations
Build visual
Values
Add data fields here
Drill through
Cross-report
Keep all filters
Add drill-through fields here
Filters
Fields
Page 1

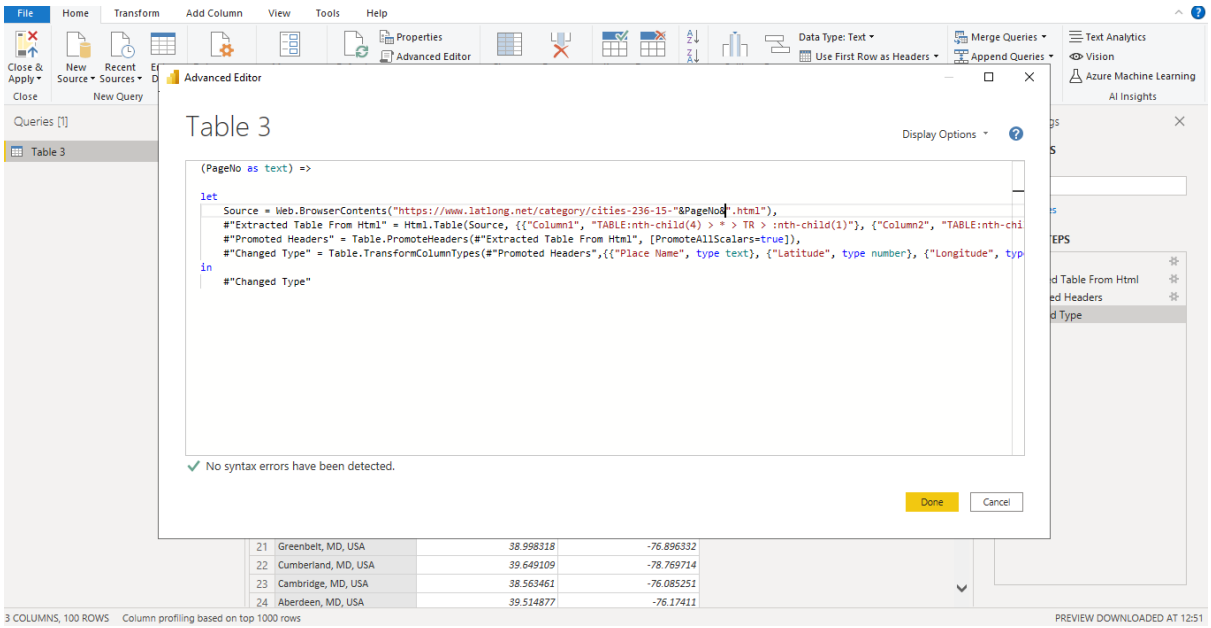

Close & Apply
New Source
Recent Sources
Enter Data
Data source settings
Manage Parameters
Refresh Preview
Properties
Advanced Editor
Manage
Choose Columns
Remove Columns
Keep Rows
Remove Rows
Split Column
Group By
Data Type: Text
Use First Row as Headers
Replace Values
Merge Queries
Append Queries
Combine Files
Text Analytics
Vision
Azure Machine Learning
Queries [1]
Table 3
= Table.TransformColumnTypes(#"Promoted Headers",{{"Place Name", type text}, {"Latitude", type
Place Name | Latitude | Longitude
1 Peabody, MA, USA | 42.536457 | -70.985786
2 Northampton, MA, USA | 42.328674 | -72.664658
3 Newton, MA, USA | 42.341042 | -71.217133
4 Newburyport, MA, USA | 42.810356 | -70.893875
5 New Bedford, MA, USA | 41.638409 | -70.941208
6 Medford, MA, USA | 42.419331 | -71.11972
7 Malden, MA, USA | 42.429752 | -71.071022
8 Leominster, MA, USA | 42.525482 | -71.764183
9 Lawrence, MA, USA | 42.701283 | -71.175682
10 Holyoke, MA, USA | 42.203217 | -72.625481
11 Greenfield, MA, USA | 42.587334 | -72.603416
12 Framingham, MA, USA | 42.280418 | -71.423233
13 Fitchburg, MA, USA | 42.586716 | -71.814468
14 Everett, MA, USA | 42.408623 | -71.056999
15 Chelsea, MA, USA | 42.392925 | -71.037109
16 Amesbury, MA, USA | 42.856842 | -70.96344
17 Takoma Park, MD, USA | 38.981544 | -77.010674
18 Salisbury, MD, USA | 38.36335 | -75.605919
19 Rockville, MD, USA | 39.086437 | -77.161263
20 Hagerstown, MD, USA | 39.644207 | -77.73143
21 Greenbelt, MD, USA | 38.998318 | -76.896332
22 Cumberland, MD, USA | 39.649109 | -78.769714
23 Cambridge, MD, USA | 38.563461 | -76.085251
Query Settings
PROPERTIES
Name
Table 3
All Properties
APPLIED STEPS
Source
Extracted Table From Html
Promoted Headers
Changed Type

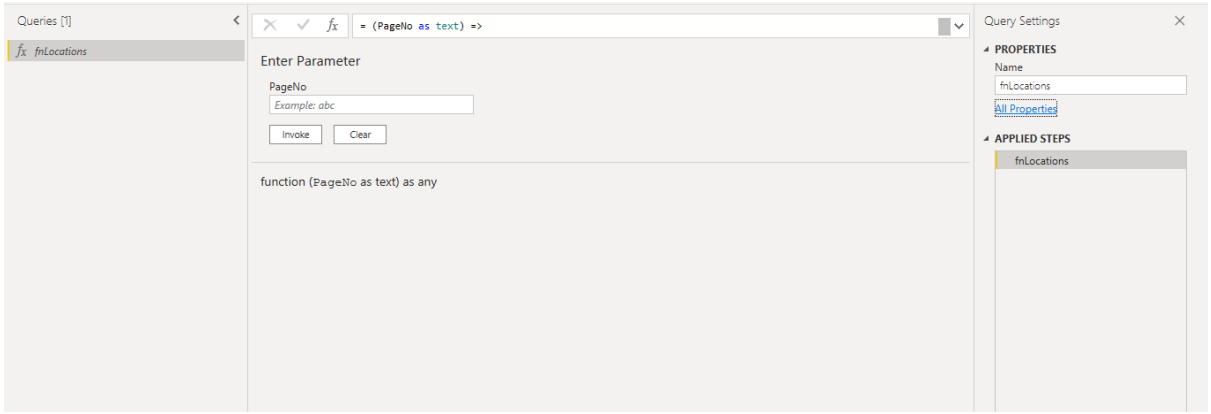
Step 2:

Go To Home -> Query Group -> Advanced Editor -> Define variable **PageNo as text** before let command (text because web link is text string) -> replace Page number in the link with **"&PageNo&"** (this will ensure only variable will change, rest of the link will be same) -> click Done -> it will be saved as fn -> rename the fn (fnLocations)

(In the link **/cities-236-15.html** is similar to **/cities-236-15-1.html ----** for 1st page, similarly for 2nd page ---- **/cities-236-15-1.html**, we will change this no to extract data from all pages)

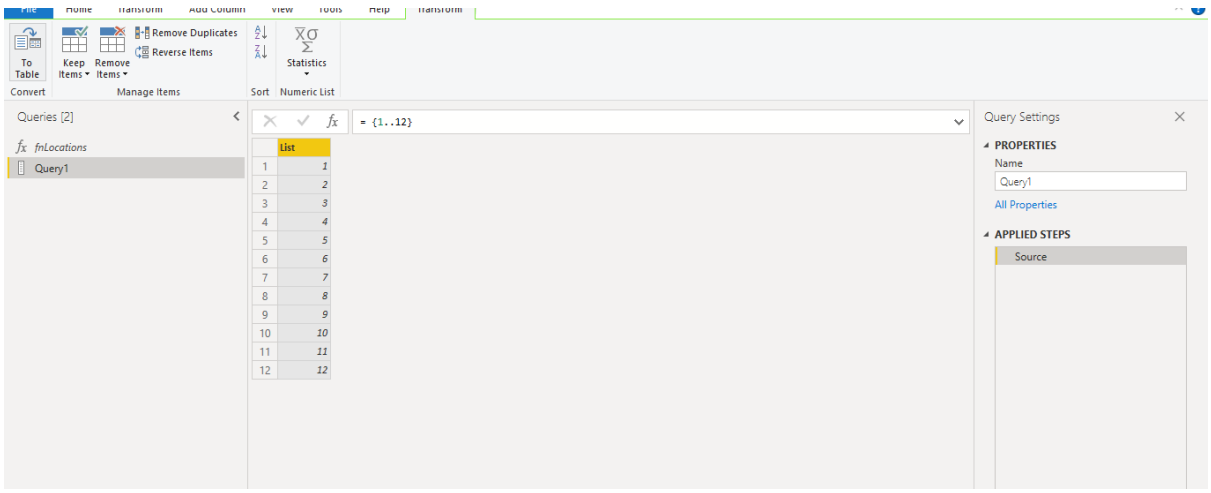


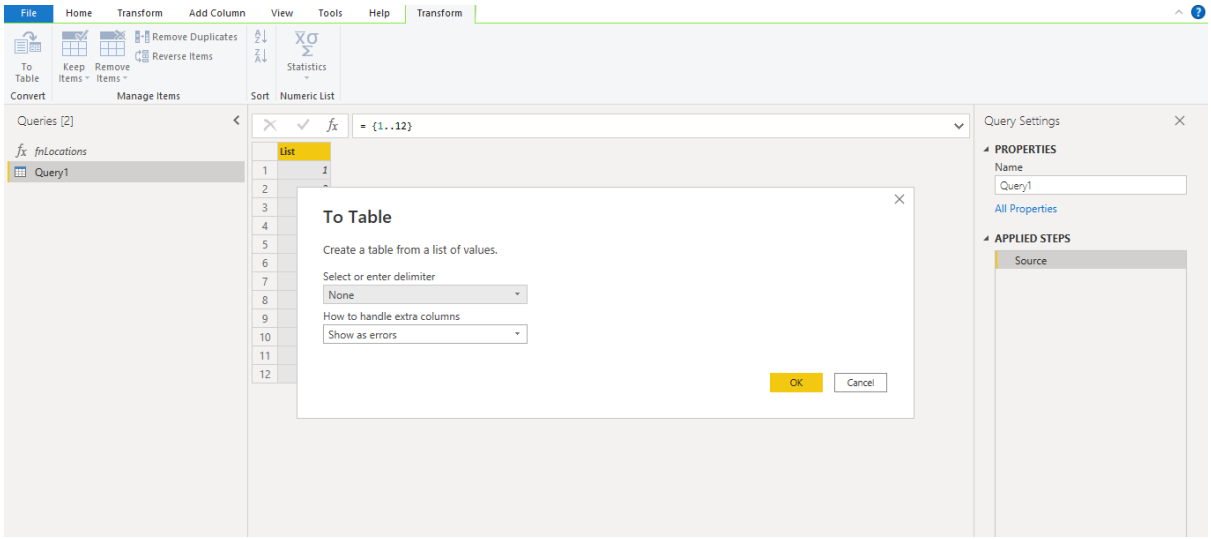


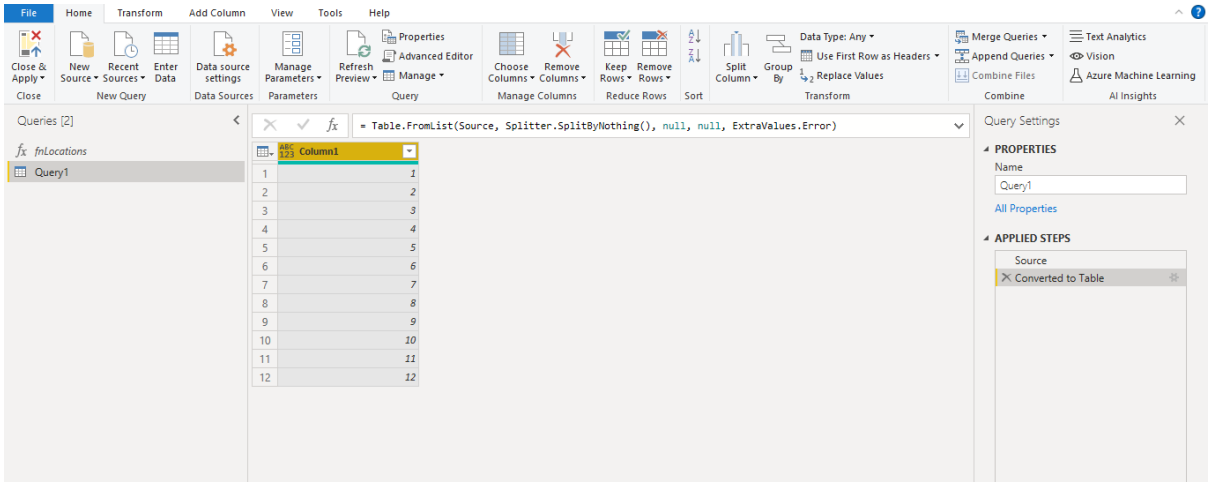


Step 3:

Go To Home -> New Source -> Blank Query -> Type **= {1..12}** -> It will create a list of 12 numbers -> File -> Convert Group -> To Table -> Click Ok -> Table with single column will be created -> change data type of this column to **text**

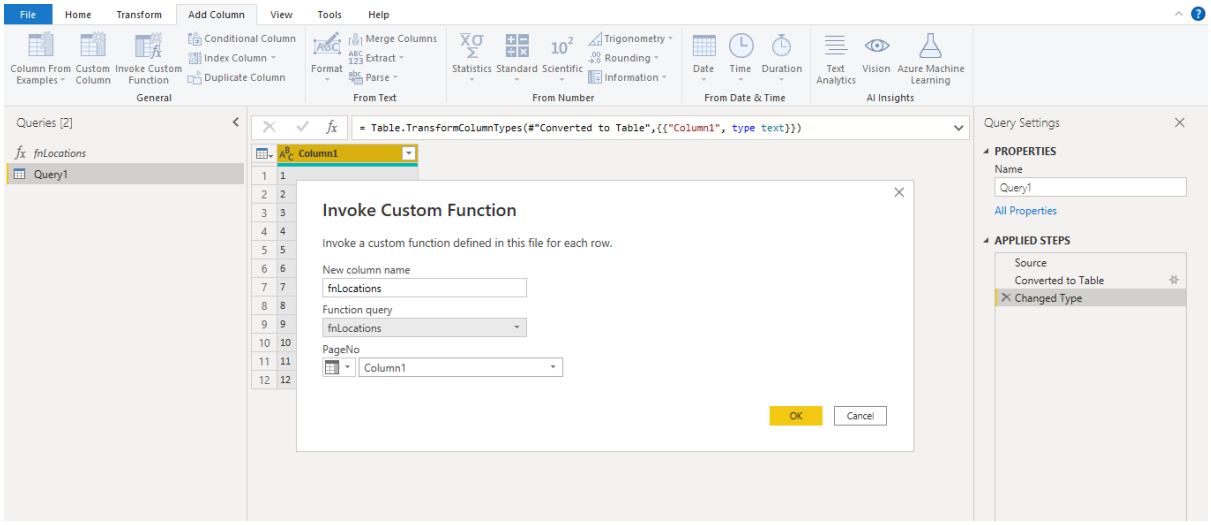


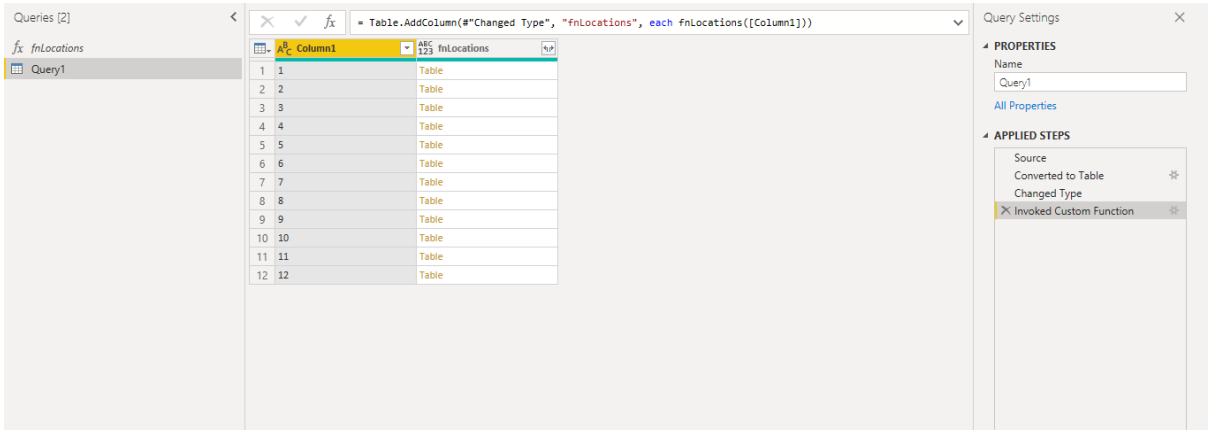


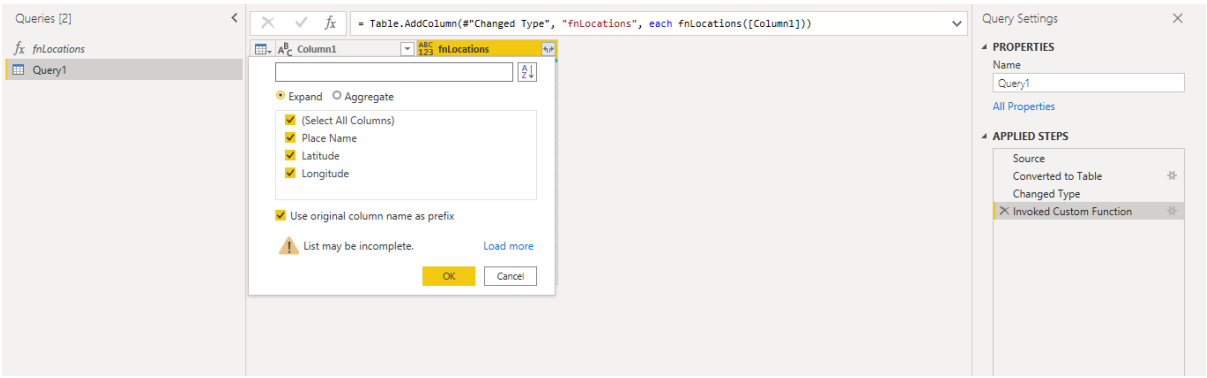


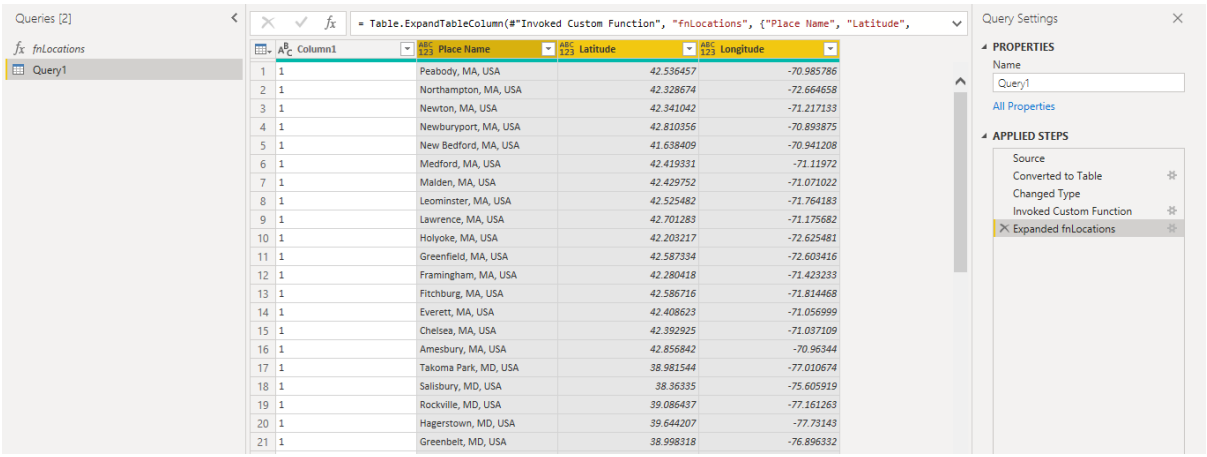
Step 4:

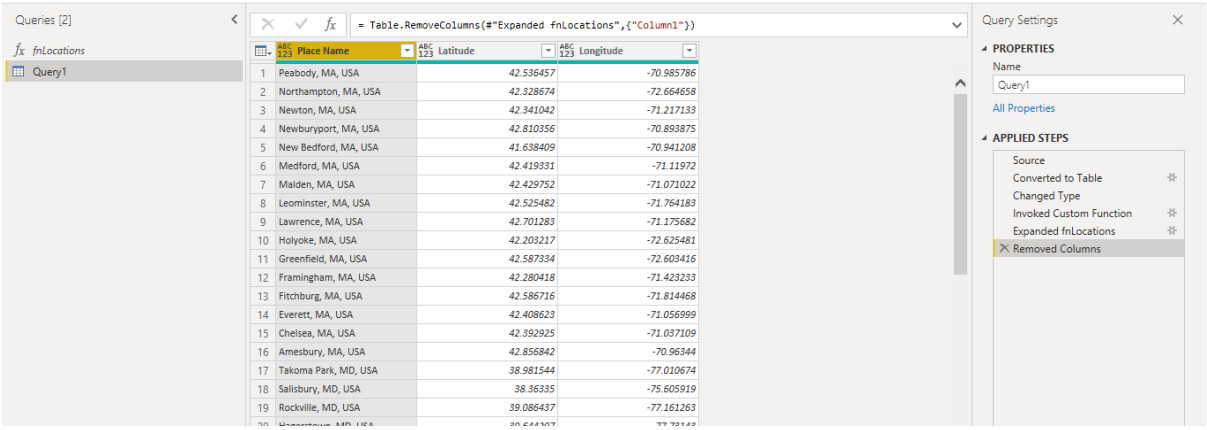
Go To Add Column -> Invoke Custom Function -> select function quey name (fnLocation) -> Click Ok -> Expand -> Select Required Columns -> Click OK -> Delete Column 1



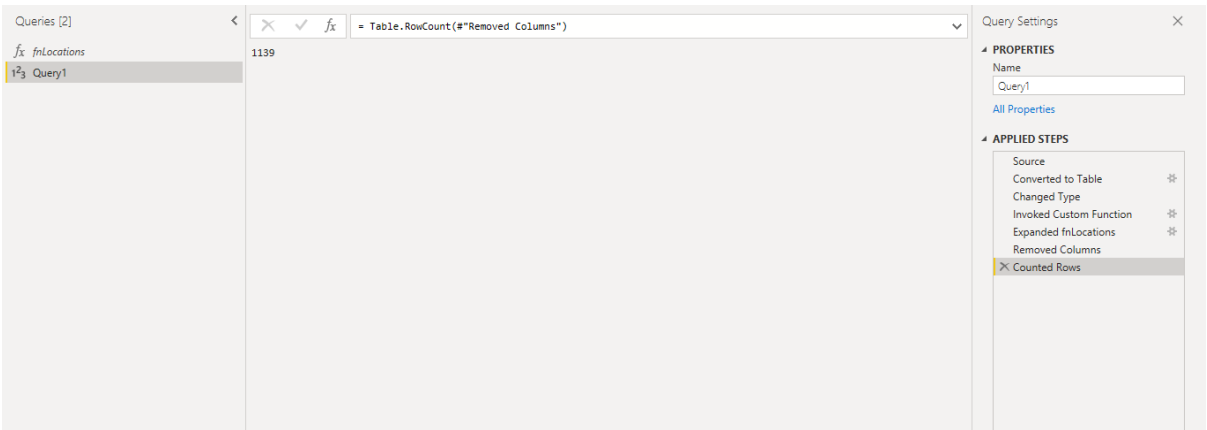








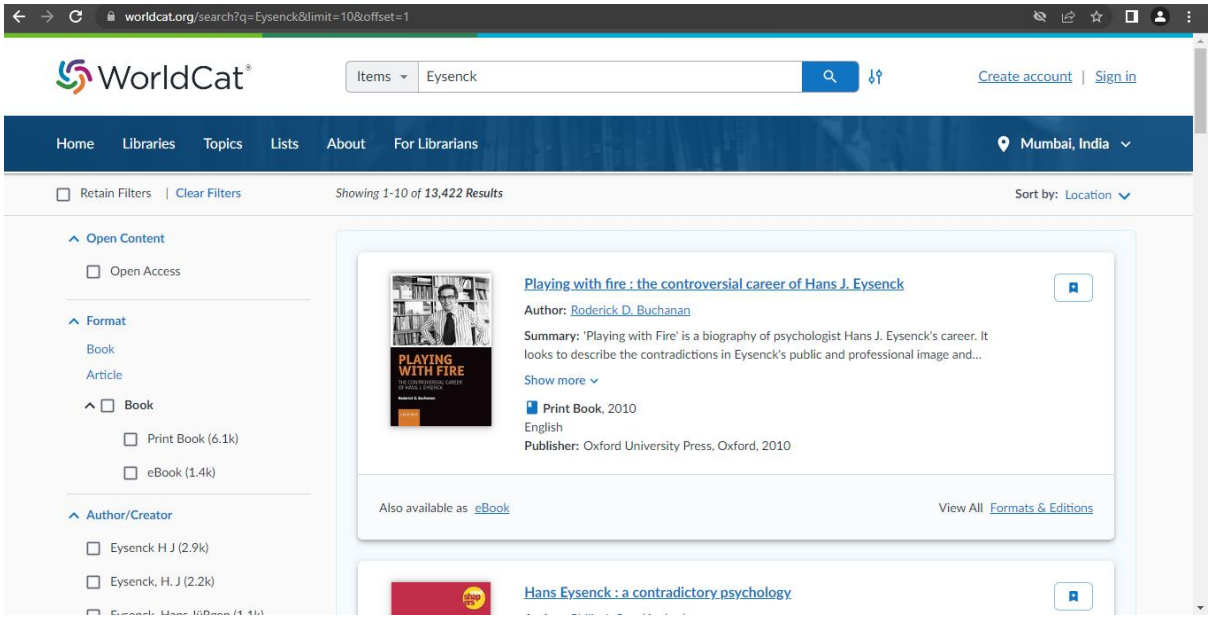
Go To Transform -> Table Group -> Count Rows (To match the records from web link)

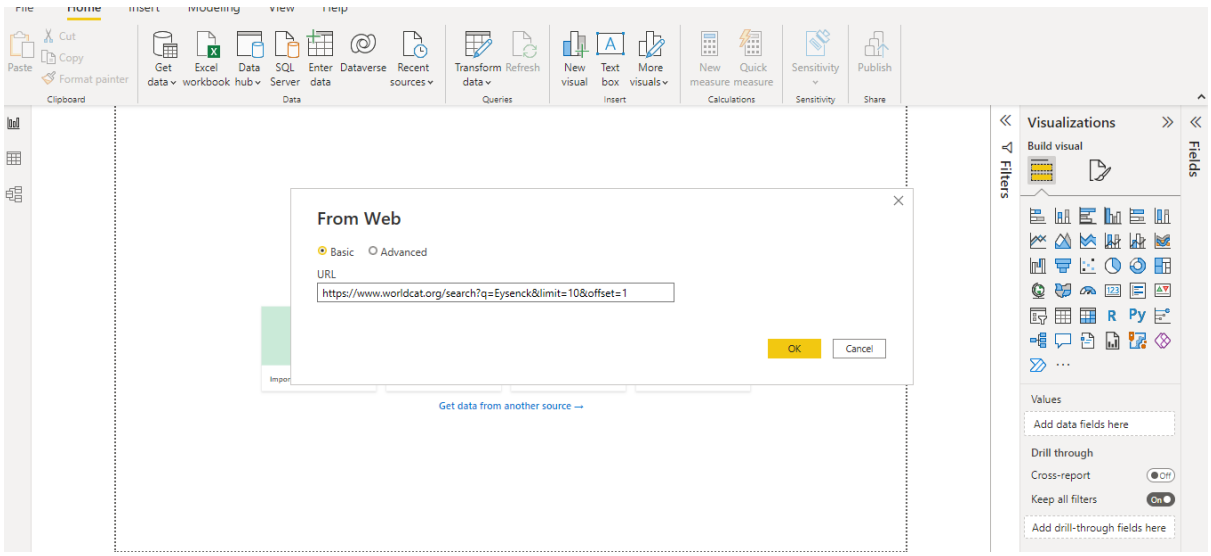


Web Scrapping Example 2 (Extracting Custom data from multiple pages of web link)

Want to extract book name, author, book type etc. from below web link.

https://www.worldcat.org/search?q=Eysenck&limit=10&offset=1

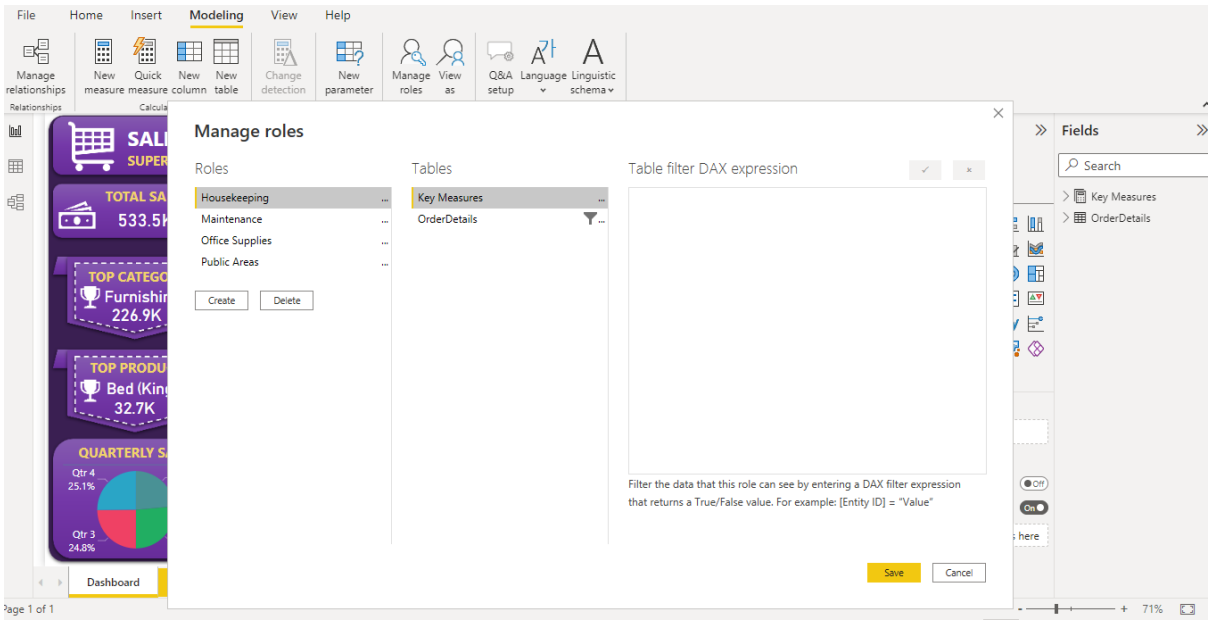


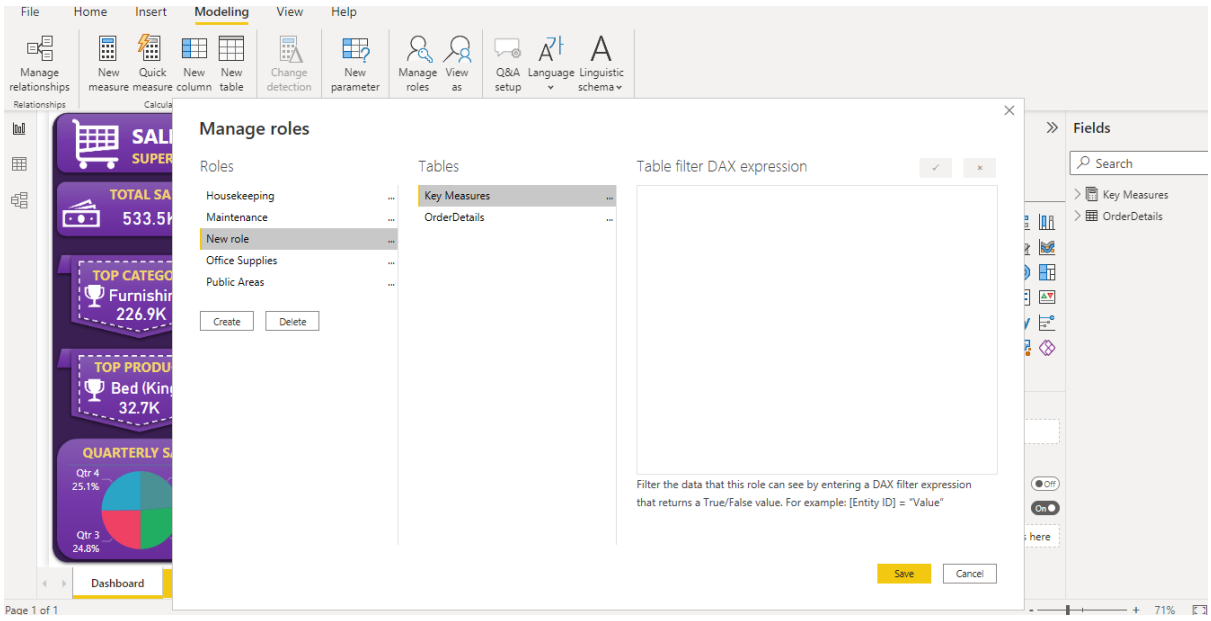


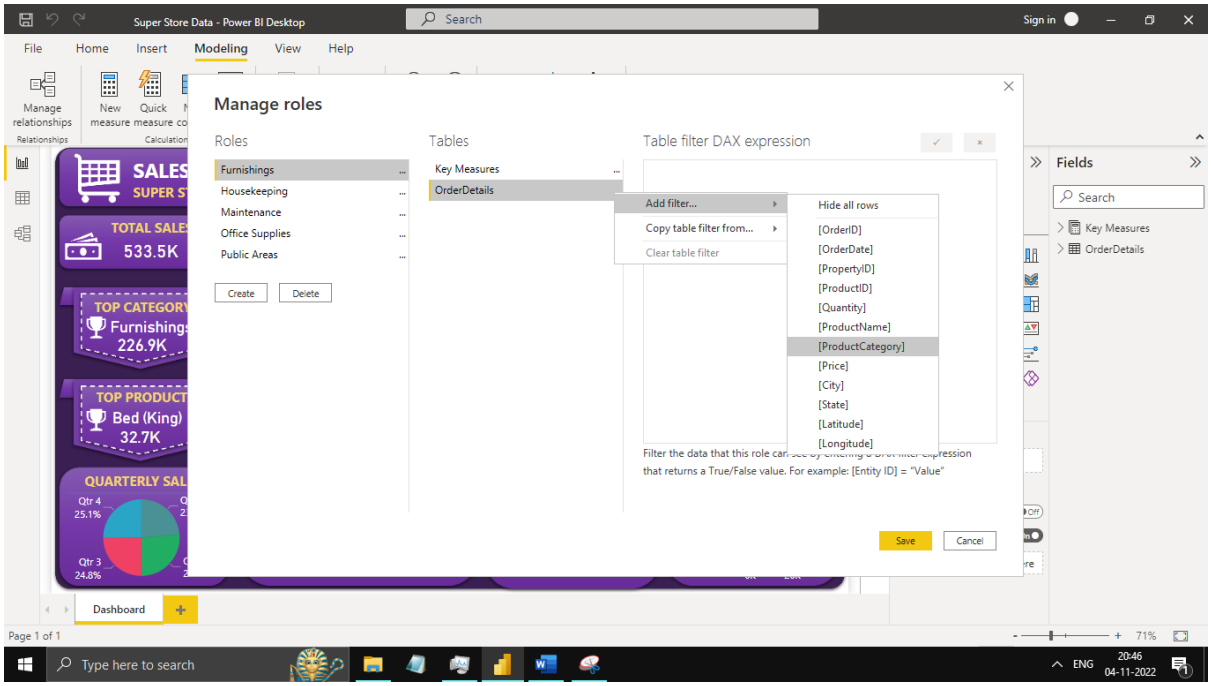
Row Level Security

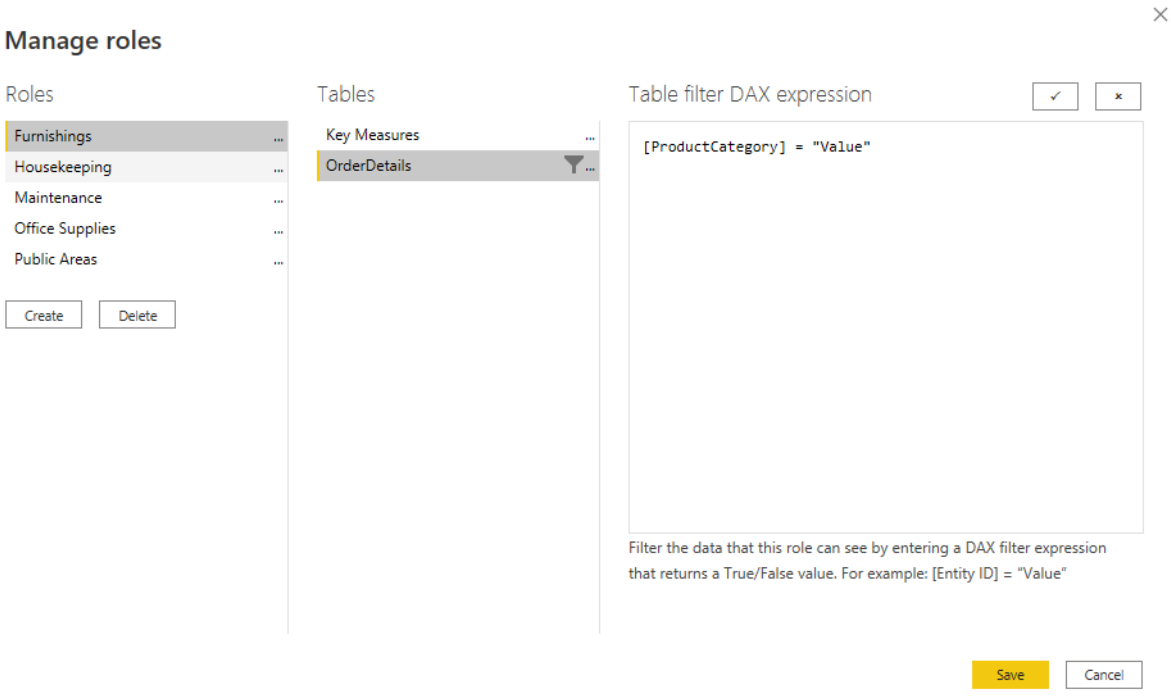
It is done to show only relevant data to the end user (for e.g. giving access of category wise data to the person to lead that category)

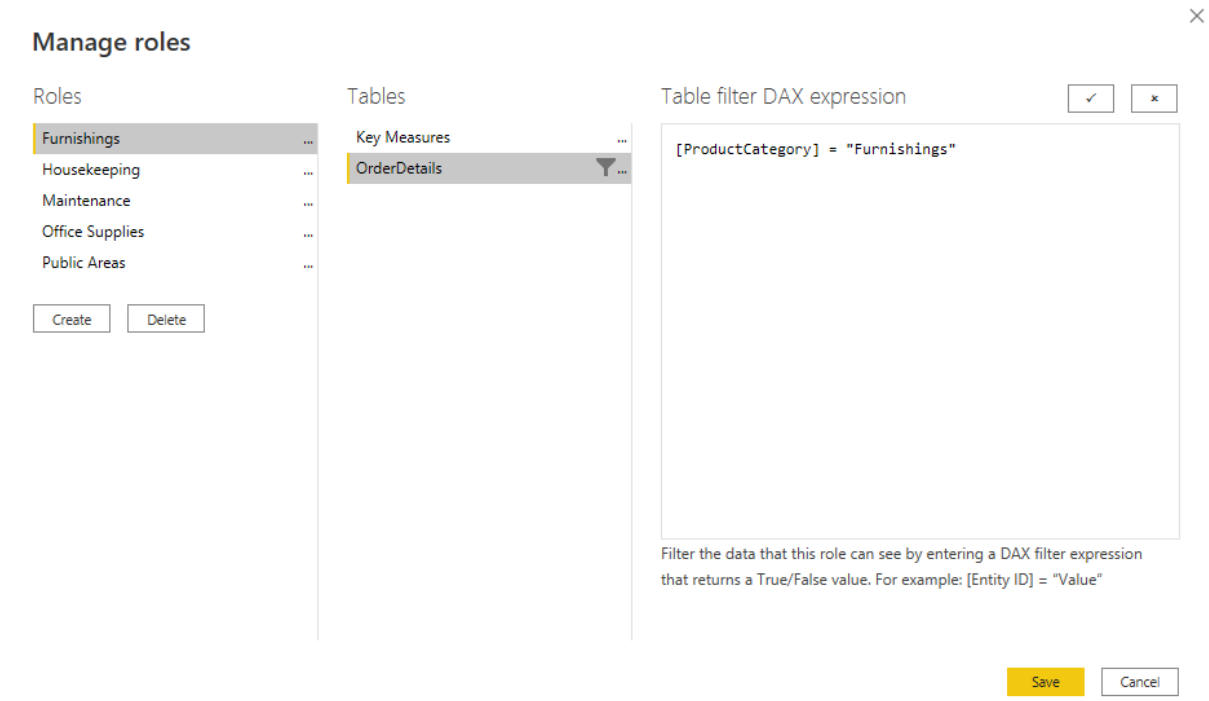
Go To Modelling -> Manage Roles -> Create -> Rename Role **(Category)** -> Select Table -> Add Filter -> Select Field -> Change value as **Category Name** -> Save





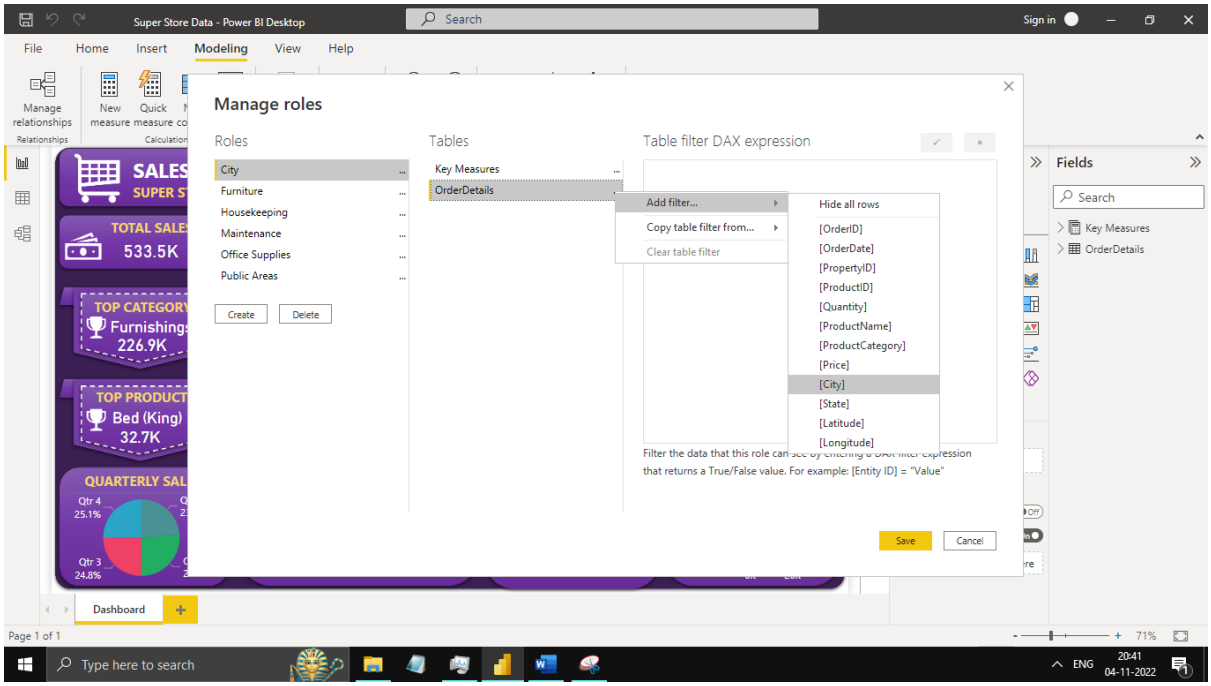

Super Store Data - Power BI Desktop
Search
Sign in
File
Home
Insert
Modeling
View
Help
Manage relationships
New measure
Quick measure
Manage roles
Roles
Furnishings
Housekeeping
Maintenance
Office Supplies
Public Areas
Create
Delete
Tables
Key Measures
OrderDetails
Table filter DAX expression
Add filter...
Copy table filter from...
Clear table filter
Hide all rows
[OrderID]
[OrderDate]
[PropertyID]
[ProductID]
[Quantity]
[ProductName]
[ProductCategory]
[Price]
[City]
[State]
[Latitude]
[Longitude]
Filter the data that this role can see by entering a DAX filter expression that returns a True/False value. For example: [Entity ID] = "Value"
Save
Cancel
Fields
Search
Key Measures
OrderDetails
SALES
TOTAL SALES
533.5K
TOP CATEGORY
Furnishings
226.9K
TOP PRODUCT
Bed (King)
32.7K
QUARTERLY SAL
Qtr 4
25.1%
Qtr 3
24.8%
Dashboard
Page 1 of 1
71%
Type here to search
ENG
20:46
04-11-2022

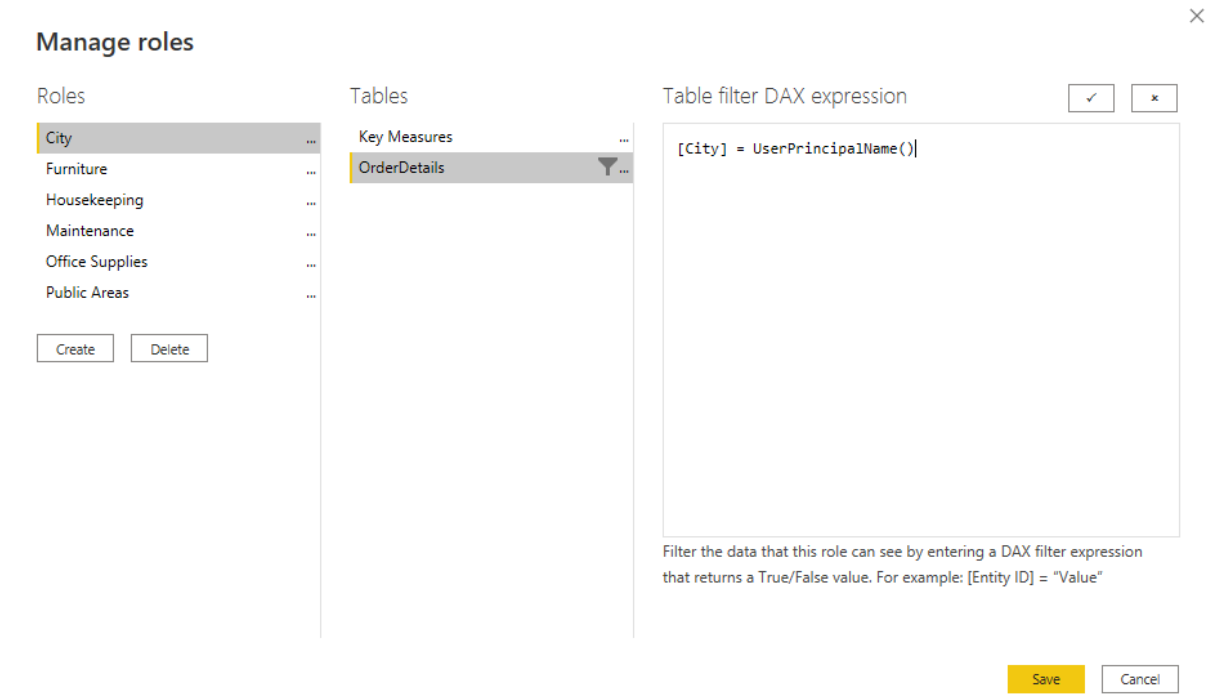

Manage roles
Roles
Furnishings
Housekeeping
Maintenance
Office Supplies
Public Areas
Create
Delete
Tables
Key Measures
OrderDetails
Table filter DAX expression
[ProductCategory] = "Value"
Filter the data that this role can see by entering a DAX filter expression that returns a True/False value. For example: [Entity ID] = "Value"
Save
Cancel



Creating multiple roles with single piece of code (for city)

Go To Modelling -> Manage Roles -> Create -> Rename Role **(City)** -> Select Table -> Add Filter -> Select Field -> Change value as **UserPrincipalName()** -> Save

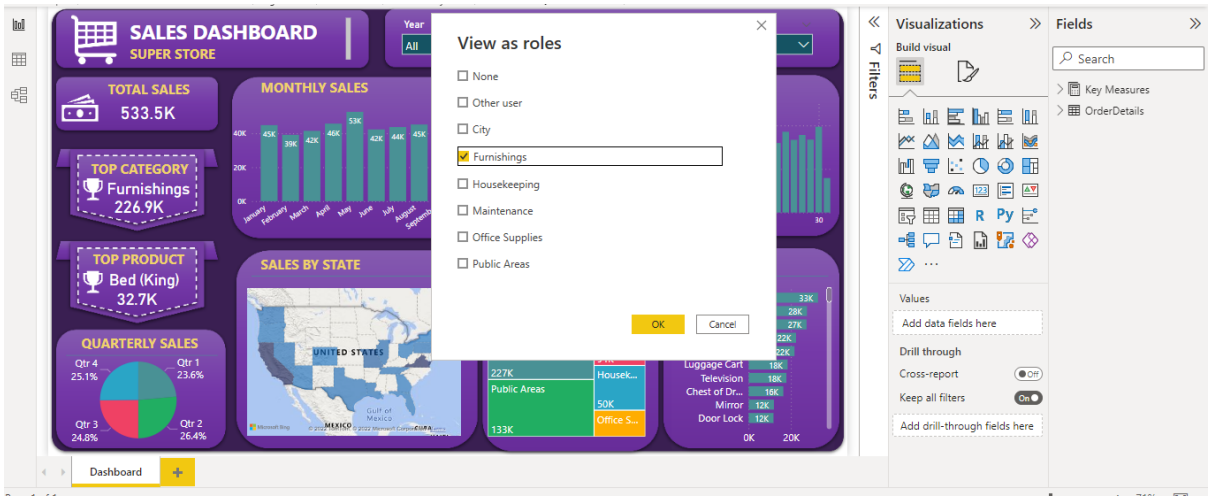




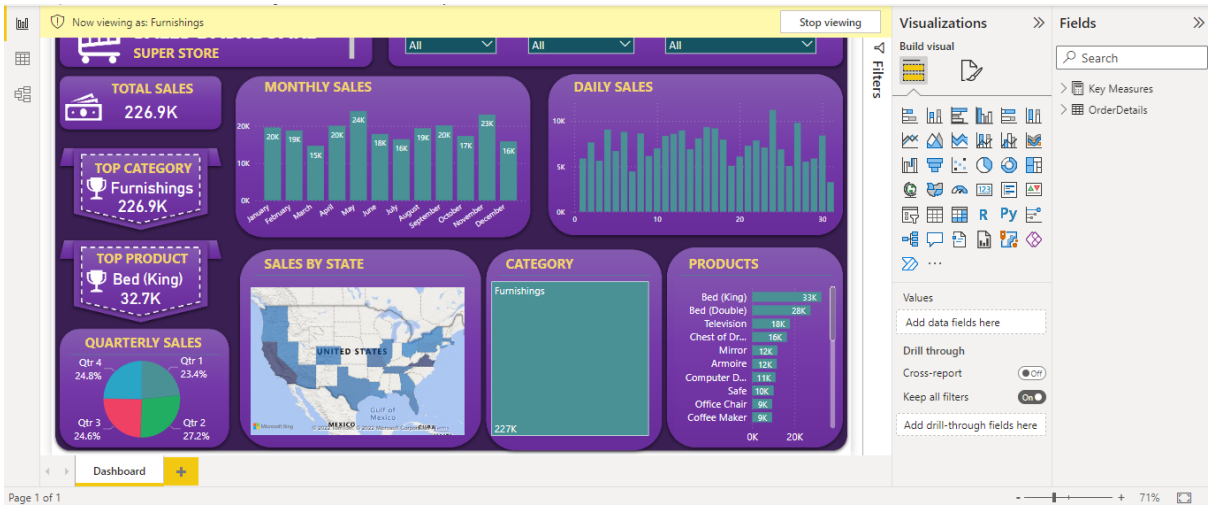
Dashboard – Sales for all categories

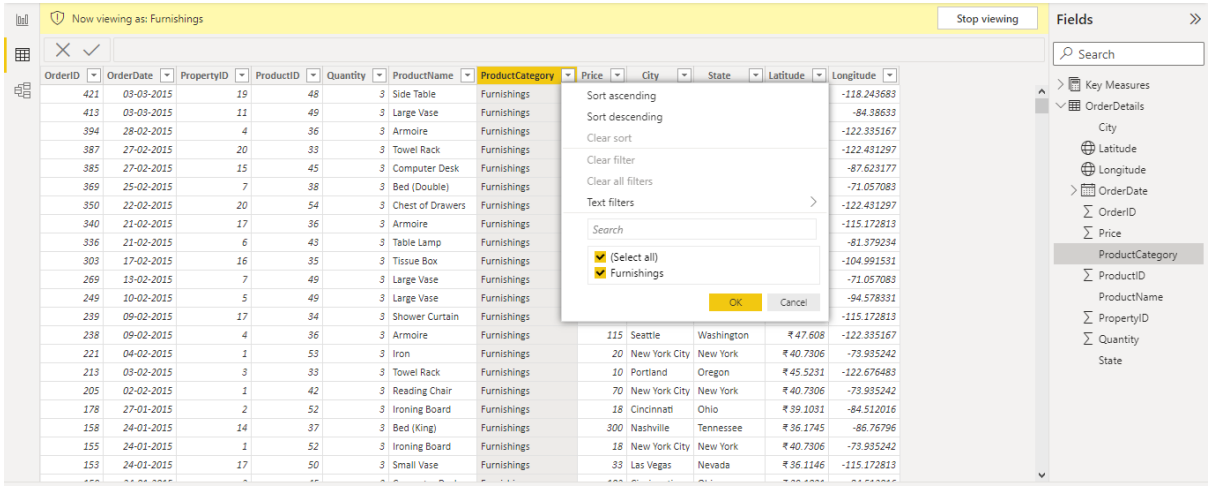
To View from the point of end user

Go To Modelling -> View as -> Select Role **(Furnishings)** -> Click Ok

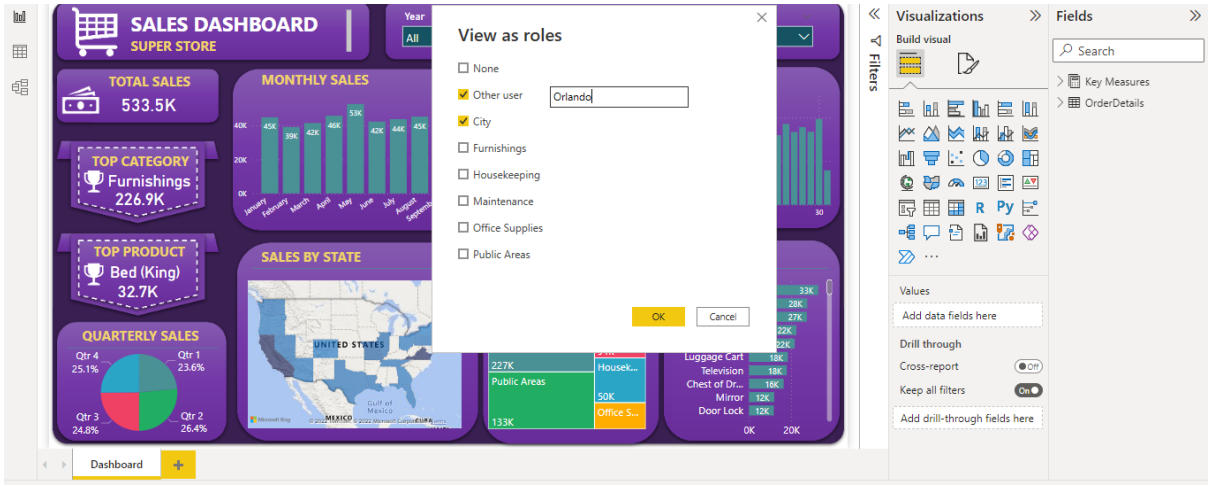


Data is filtered as per Furnishing Category and values are updated accordingly in Power View as well as data view.

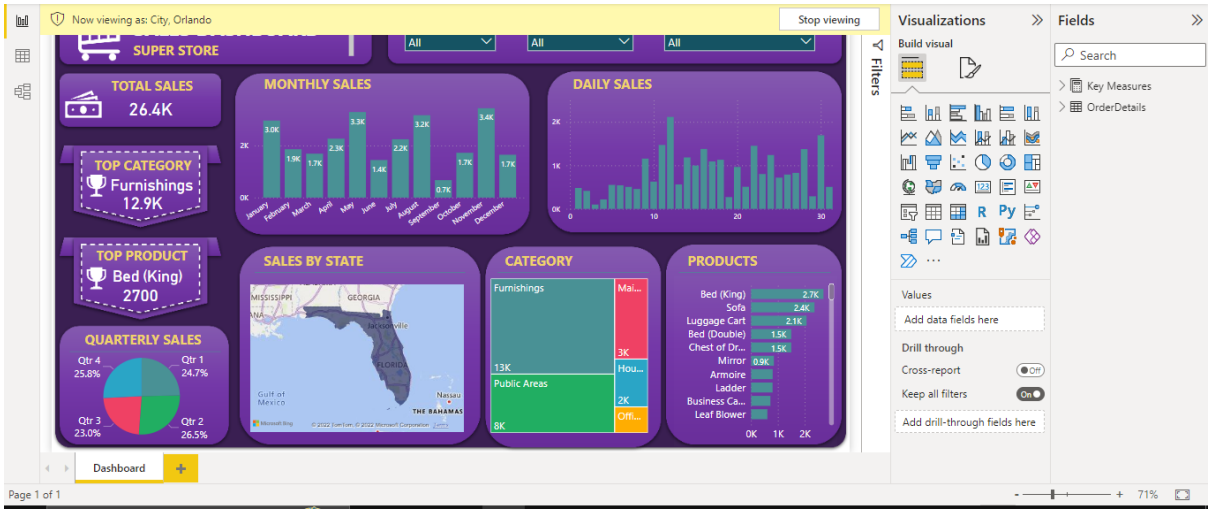


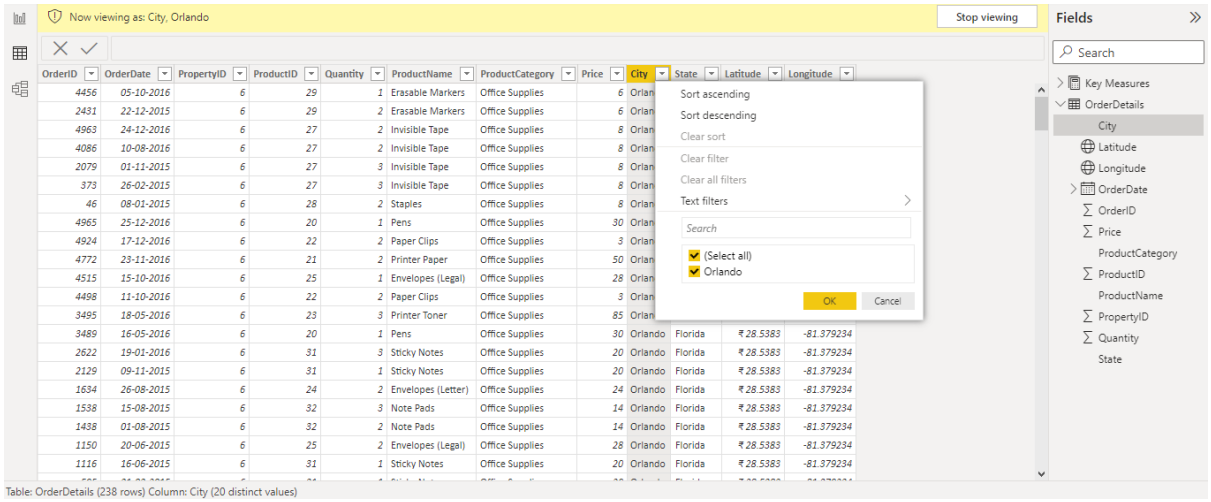


Go To Modelling -> View as -> Select Role **(City)** -> Select Role **(City Name: Orlando) ->** Click Ok



Data is filtered as per Orlando City and values are updated accordingly in Power View as well as data view





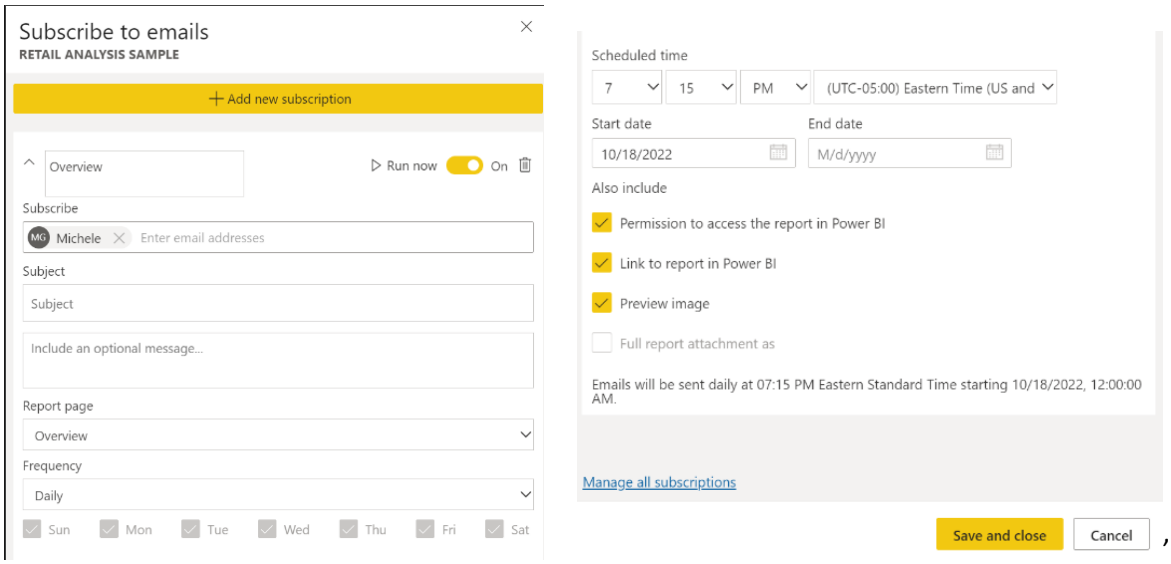
Workspace

Published reports can be saved in the required workspace.

Subscription

To share the report in image format on mail (in case of single page)

And in PDF/PPT format (in case of multiple page), same option should be ticked



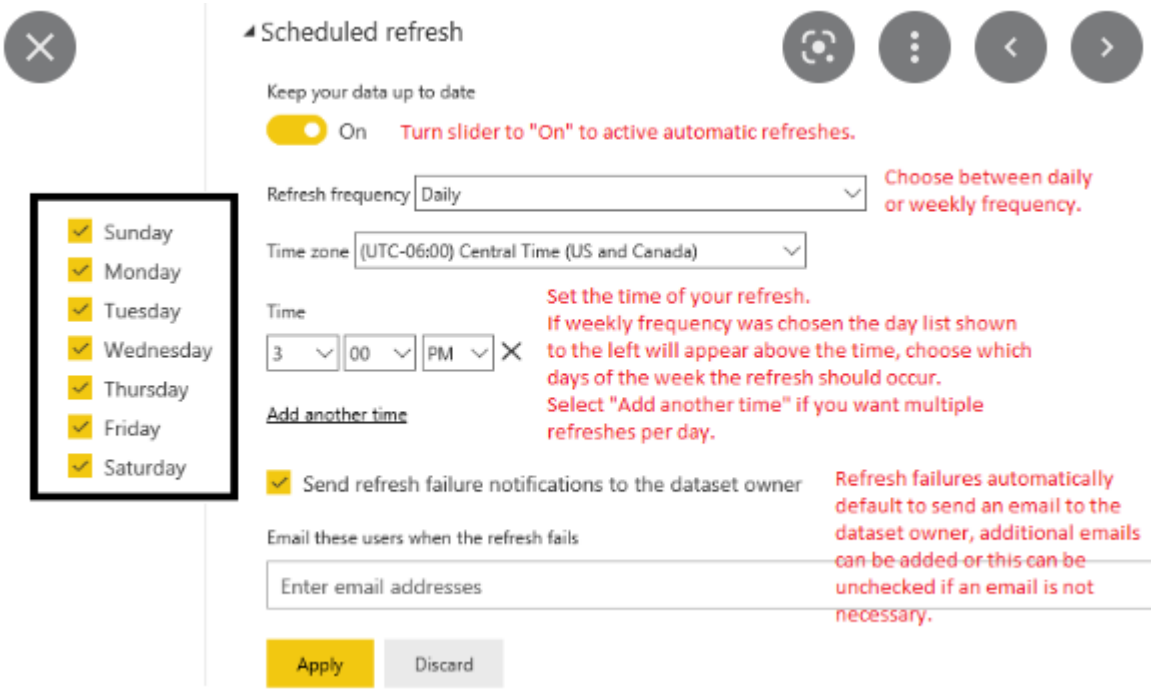
,

Scheduled Refresh

To refresh the report automatically

8 Scheduled Refresh can be set with pro licence

48 Scheduled Refresh can be set with premium licence



What is Query Folding in Power BI?

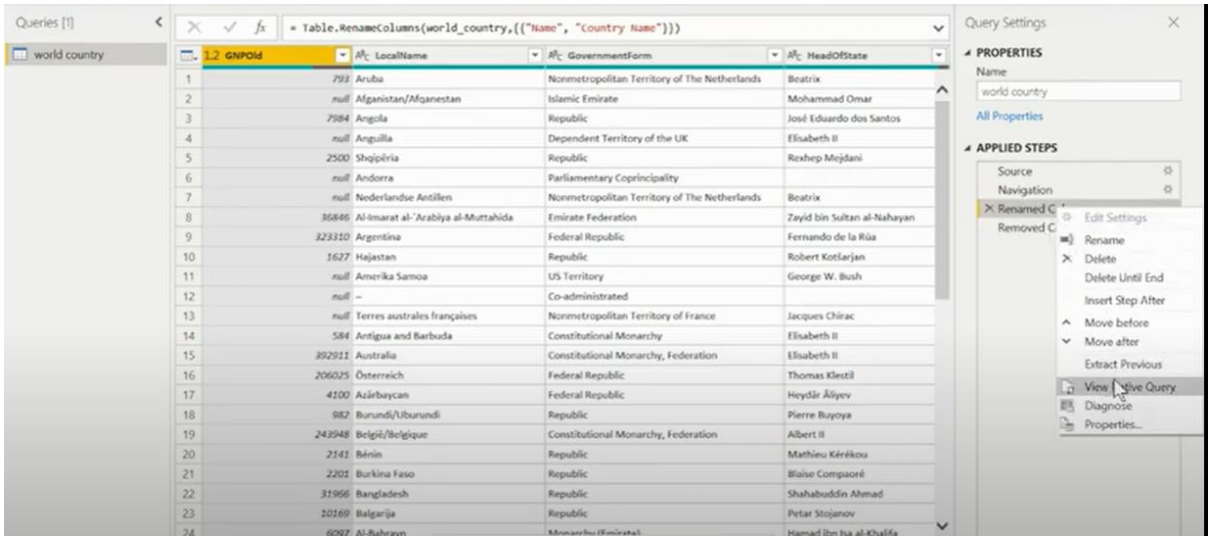
Query folding is the ability for a Power Query to generate a single query statement that retrieves and transforms source data.

Mashup engine is able to “translate” M language to a language that the underlying data source will “understand” — in most cases it’s SQL.

By pushing complex calculations and transformations directly to a source, Power Query leverages the capabilities of the robust relational database engines, that are built to cope with large volumes of data in the most efficient way.

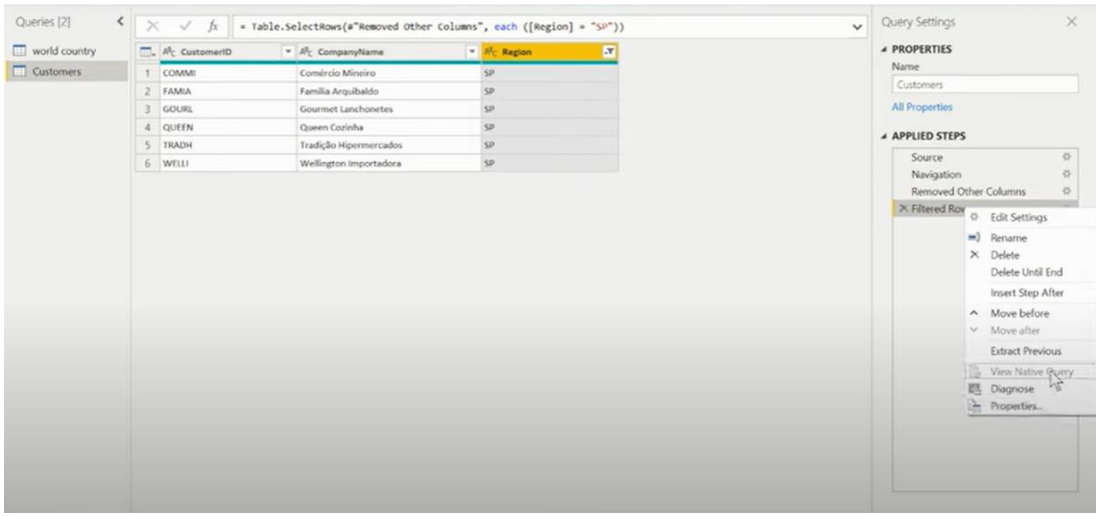
How to check if Query folding has been achieved or not?

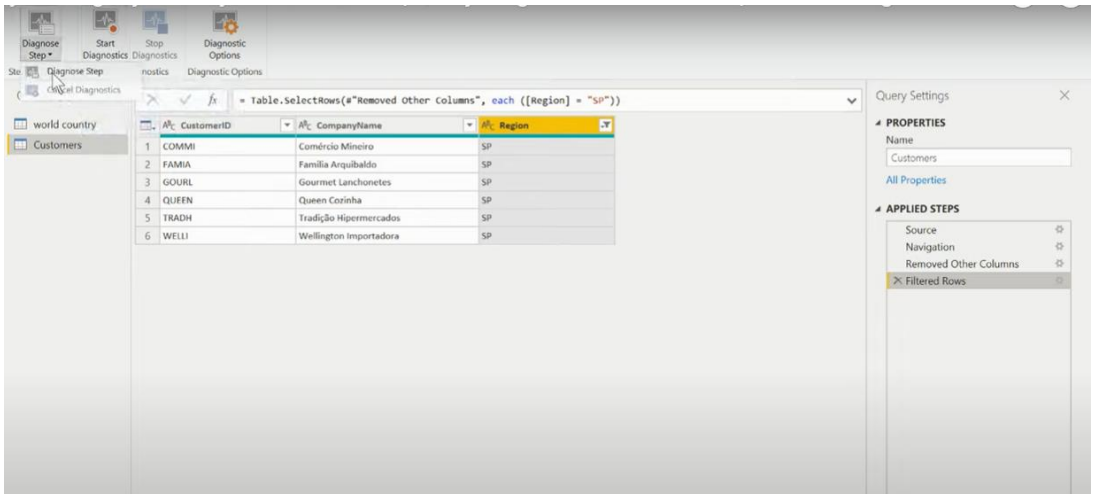
Right click on Applied Steps -> View Native Query -> Click Ok (You can see the folded query)

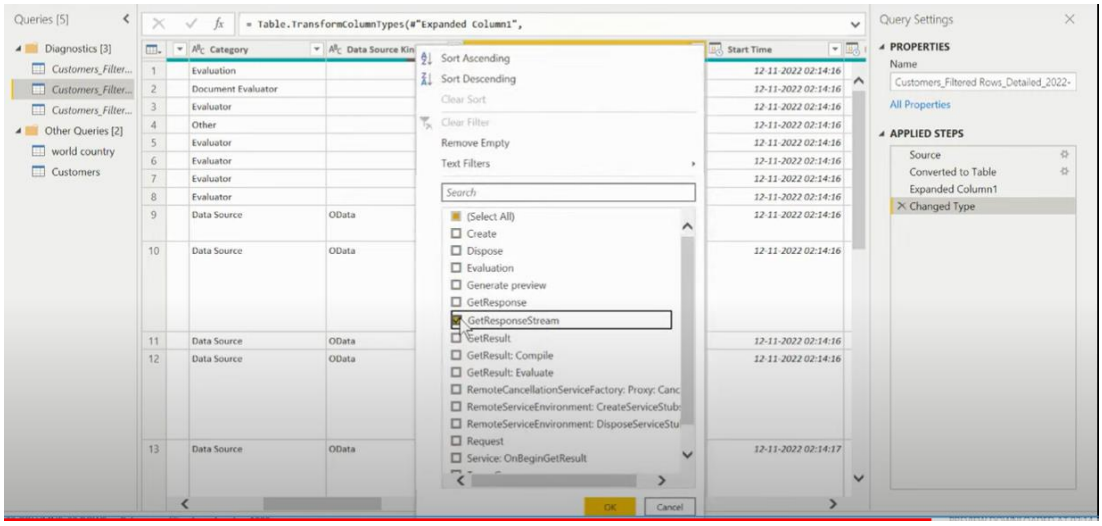


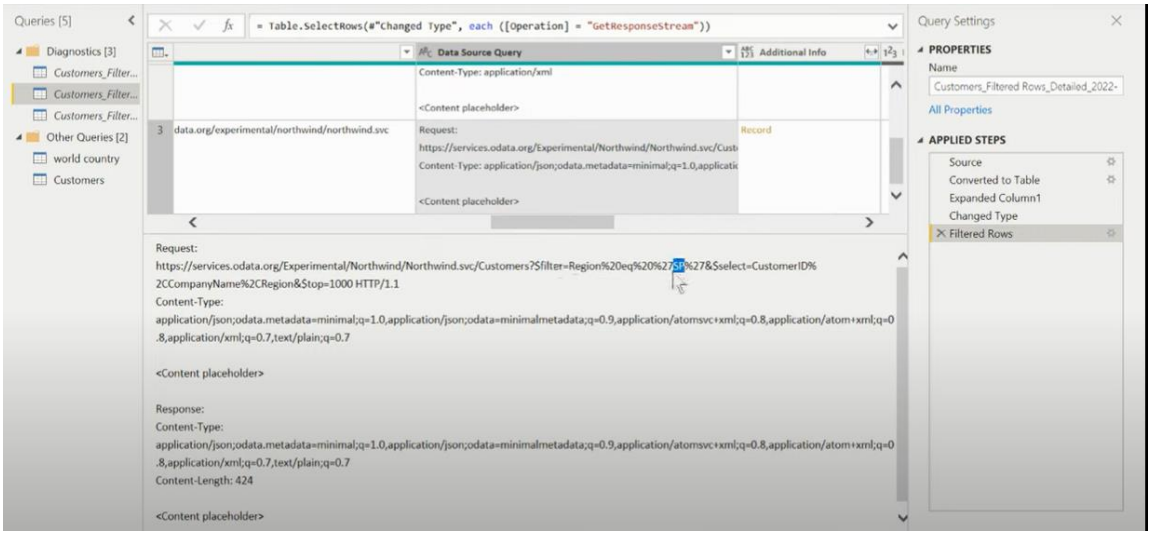
What if the View Native Query option is not available?

GoTo Tools -> Diagnose Step -> Diagnose -> Click -> It will generate queries (For Counters, Detailed and Aggregation) -> Detailed Query Option -> GoTo Operation Column -> Filter by GetResponseStream -> Click Ok -> GoTo DataSourceQuery Column -> Click on the Request -> Check if the applied steps are reflecting or not


Queries [2]
world country
Customers
= Table.SelectRows(#"Removed Other Columns", each ([Region] = "SP"))
CustomerID
CompanyName
Region
1 COMMI Comércio Mineiro SP
2 FAMIA Família Arquibaldo SP
3 GOURL Gourmet Lanchonetes SP
4 QUEEN Queen Cozinha SP
5 TRADH Tradição Hipermercados SP
6 WELLI Wellington Importadora SP
Query Settings
PROPERTIES
Name
Customers
All Properties
APPLIED STEPS
Source
Navigation
Removed Other Columns
Filtered Rows
Edit Settings
Rename
Delete
Delete Until End
Insert Step After
Move before
Move after
Extract Previous
View Native Query
Diagnose
Properties...


Diagnose Step
Start Diagnostics
Stop Diagnostics
Diagnostic Options
Diagnose Step
Diagnostic Options
= Table.SelectRows(#"Removed Other Columns", each ([Region] = "SP"))
world country
Customers
CustomerID
CompanyName
Region
1 COMMI Comércio Mineiro SP
2 FAMIA Família Arquibaldo SP
3 GOURL Gourmet Lanchonetes SP
4 QUEEN Queen Cozinha SP
5 TRADH Tradição Hipermercados SP
6 WELLI Wellington Importadora SP
Query Settings
PROPERTIES
Name
Customers
All Properties
APPLIED STEPS
Source
Navigation
Removed Other Columns
Filtered Rows


Queries [5]
Diagnostics [3]
Customers_Filter...
Customers_Filter...
Customers_Filter...
Other Queries [2]
world country
Customers
= Table.TransformColumnTypes(#"Expanded Column1",
Category
Data Source Kin
Start Time
1 Evaluation 12-11-2022 02:14:16
2 Document Evaluator 12-11-2022 02:14:16
3 Evaluator 12-11-2022 02:14:16
4 Other 12-11-2022 02:14:16
5 Evaluator 12-11-2022 02:14:16
6 Evaluator 12-11-2022 02:14:16
7 Evaluator 12-11-2022 02:14:16
8 Evaluator 12-11-2022 02:14:16
9 Data Source OData 12-11-2022 02:14:16
10 Data Source OData 12-11-2022 02:14:16
11 Data Source OData 12-11-2022 02:14:16
12 Data Source OData 12-11-2022 02:14:16
13 Data Source OData 12-11-2022 02:14:17
Sort Ascending
Sort Descending
Clear Sort
Clear Filter
Remove Empty
Text Filters
Search
(Select All)
Create
Dispose
Evaluation
Generate preview
GetResponse
GetResponseStream
GetResult
GetResult: Compile
GetResult: Evaluate
RemoteCancellationServiceFactory: Proxy: Canc
RemoteServiceEnvironment: CreateServiceStub:
RemoteServiceEnvironment: DisposeServiceStu
Request
Service: OnBeginGetResult
OK
Cancel
Query Settings
PROPERTIES
Name
Customers_Filtered Rows_Detailed_2022-
All Properties
APPLIED STEPS
Source
Converted to Table
Expanded Column1
Changed Type



Where Data is Stored in Power BI?

Data Source	Metadata	Data
Live Connection (Analysis Services)	Nothing stored except database name encrypted in Azure SQL DB	Nothing Stored
Direct Query (SQL Server, Oracle, etc.)	Encrypted in Azure Blob Storage	Nothing Stored
Pushed or streamed data	Encrypted in Azure Blob Storage	V1 – stored encrypted in Azure Blob storage V2 – stored encrypted in Azure SQL Database
Data loaded into model (data may be refreshable or non refreshable)	Encrypted in Azure Blob Storage	Encrypted in Azure Blob Storage

Power BI Refresh Types?

https://learn.microsoft.com/en-us/power-bi/connect-data/refresh-data