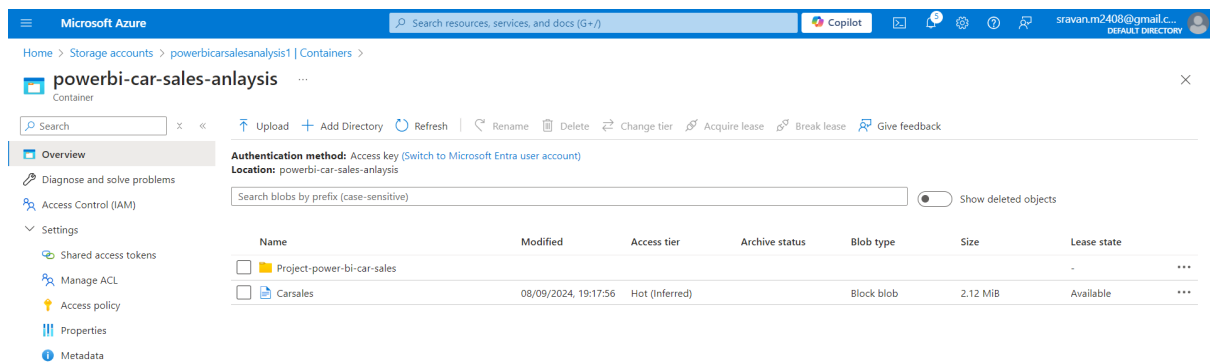
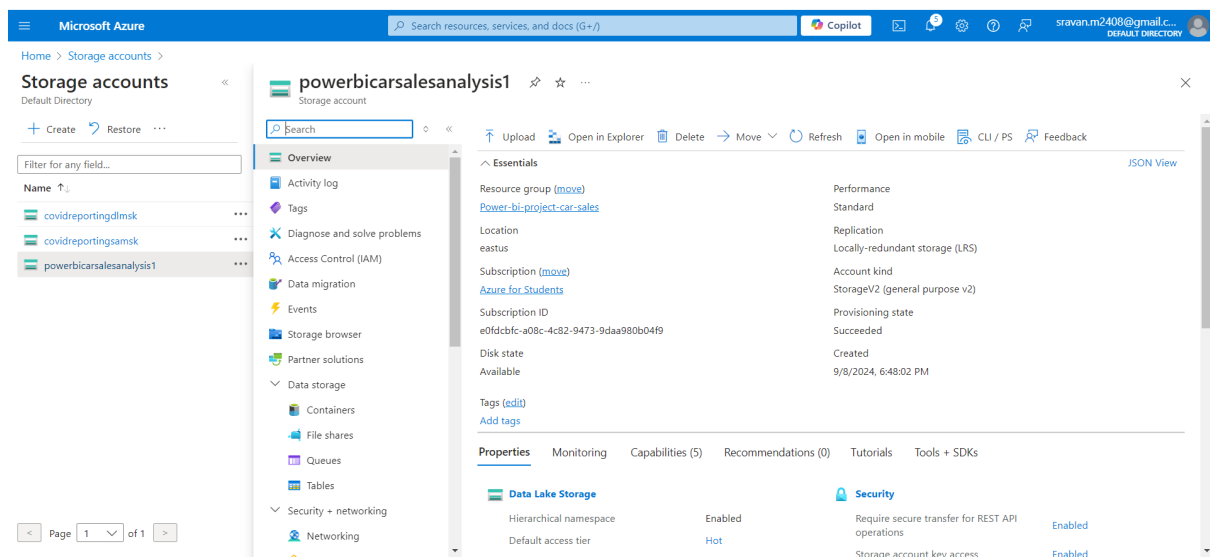


Power BI Car Sales Analysis using Azure

First, we have created a storage container in azure, in azure datalake gen 2 storage from there we have connected it to power BI using account sign key and load the data into power BI.



Data Cleaning:

Now we can see the data, and performing the data cleaning to check we using power query, to check quality of data.

By using transform Data

Power BI Car Sales Analysis using Azure

The screenshot shows the Power BI Desktop interface with the Power Query Editor window open. The editor displays a table with 17 columns and 999+ rows. The columns are: Source.Name, Car_Id, Date, Customer Name, Gender, and Annual Income. The data is transformed from a source named 'Table.TransformColumnTypes(*Expanded Table Column1,{{"Source.Name", type text}, {"Car_Id", type text}, {"Date", type date}, {"Customer Name", type text}, {"Gender", type text}, {"Annual Income", type number}})'. The 'Query1' settings are visible on the right, showing the source and applied steps.

Source.Name	Car_Id	Date	Customer Name	Gender	Annual Income
Carsales	C_CND_000001	02-01-2022	Geraldine	Male	
Carsales	C_CND_000002	02-01-2022	Gia	Male	
Carsales	C_CND_000003	02-01-2022	Gianna	Male	
Carsales	C_CND_000004	02-01-2022	Giselle	Male	
Carsales	C_CND_000005	02-01-2022	Grace	Male	
Carsales	C_CND_000006	02-01-2022	Guadalupe	Male	
Carsales	C_CND_000007	02-01-2022	Hailey	Male	
Carsales	C_CND_000008	02-01-2022	Graham	Male	
Carsales	C_CND_000009	02-01-2022	Naomi	Male	
Carsales	C_CND_000010	02-01-2022	Grayson	Female	
Carsales	C_CND_000011	02-01-2022	Gregory	Male	
Carsales	C_CND_000012	02-01-2022	Amar'E	Male	
Carsales	C_CND_000013	02-01-2022	Griffin	Male	
Carsales	C_CND_000014	02-01-2022	Harrison	Male	
Carsales	C_CND_000015	02-01-2022	Zainab	Male	
Carsales	C_CND_000016	02-01-2022	Zara	Male	
Carsales	C_CND_000017	02-01-2022	Zoe	Female	
Carsales	C_CND_000018	02-01-2022	Zoeey	Female	
Carsales	C_CND_000019	02-01-2022	Aaliyah	Male	
Carsales	C_CND_000020	02-01-2022	Ashley	Male	

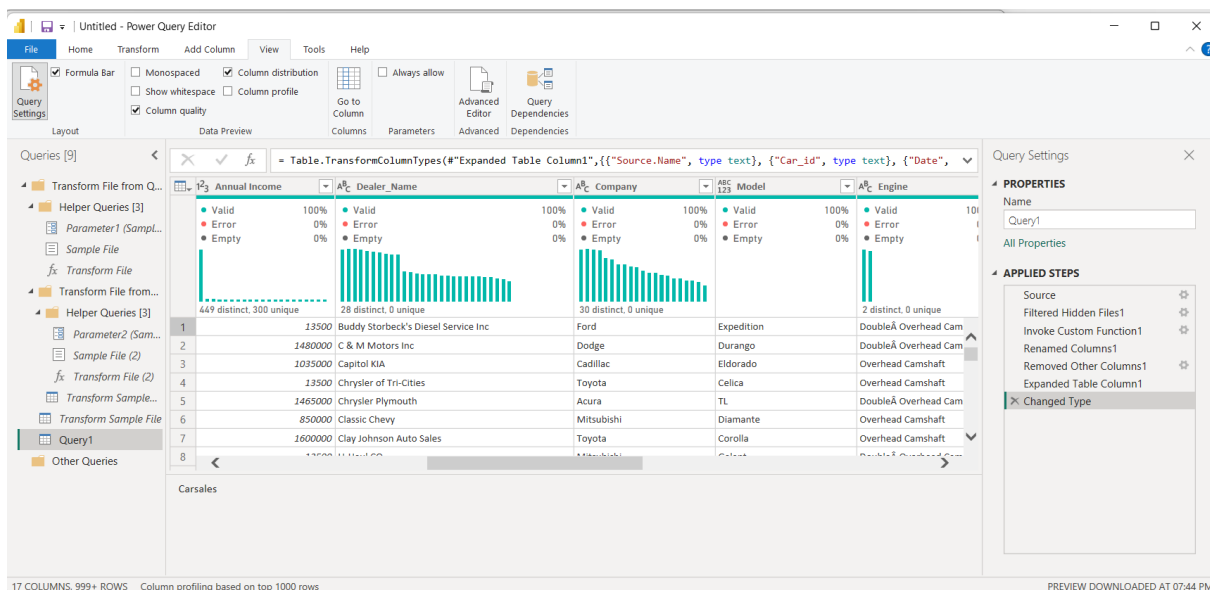
Table: Query1 (23,906 rows)

The screenshot shows the Power BI Desktop interface with the Power Query Editor window open. The editor displays a table with 17 columns and 999+ rows. The columns are: Source.Name, Car_Id, Date, Customer Name, Gender, and Annual Income. The data is transformed from a source named 'Table.TransformColumnTypes(*Expanded Table Column1,{{"Source.Name", type text}, {"Car_Id", type text}, {"Date", type date}, {"Customer Name", type text}, {"Gender", type text}, {"Annual Income", type number}})'. The 'Query1' settings are visible on the right, showing the source and applied steps. The 'Data Preview' tab is selected, showing column distribution charts for each column.

Source.Name	Car_Id	Date	Customer Name	Gender	Annual Income
Carsales	C_CND_000001	02-01-2022	Geraldine	Male	
Carsales	C_CND_000002	02-01-2022	Gia	Male	
Carsales	C_CND_000003	02-01-2022	Gianna	Male	
Carsales	C_CND_000004	02-01-2022	Giselle	Male	
Carsales	C_CND_000005	02-01-2022	Grace	Male	
Carsales	C_CND_000006	02-01-2022	Guadalupe	Male	
Carsales	C_CND_000007	02-01-2022	Hailey	Male	
Carsales	C_CND_000008	02-01-2022	Graham	Male	
Carsales	C_CND_000009	02-01-2022	Naomi	Male	
Carsales	C_CND_000010	02-01-2022	Grayson	Female	
Carsales	C_CND_000011	02-01-2022	Gregory	Male	
Carsales	C_CND_000012	02-01-2022	Amar'E	Male	
Carsales	C_CND_000013	02-01-2022	Griffin	Male	
Carsales	C_CND_000014	02-01-2022	Harrison	Male	
Carsales	C_CND_000015	02-01-2022	Zainab	Male	
Carsales	C_CND_000016	02-01-2022	Zara	Male	
Carsales	C_CND_000017	02-01-2022	Zoe	Female	
Carsales	C_CND_000018	02-01-2022	Zoeey	Female	
Carsales	C_CND_000019	02-01-2022	Aaliyah	Male	
Carsales	C_CND_000020	02-01-2022	Ashley	Male	

Table: Query1 (23,906 rows)

Power BI Car Sales Analysis using Azure



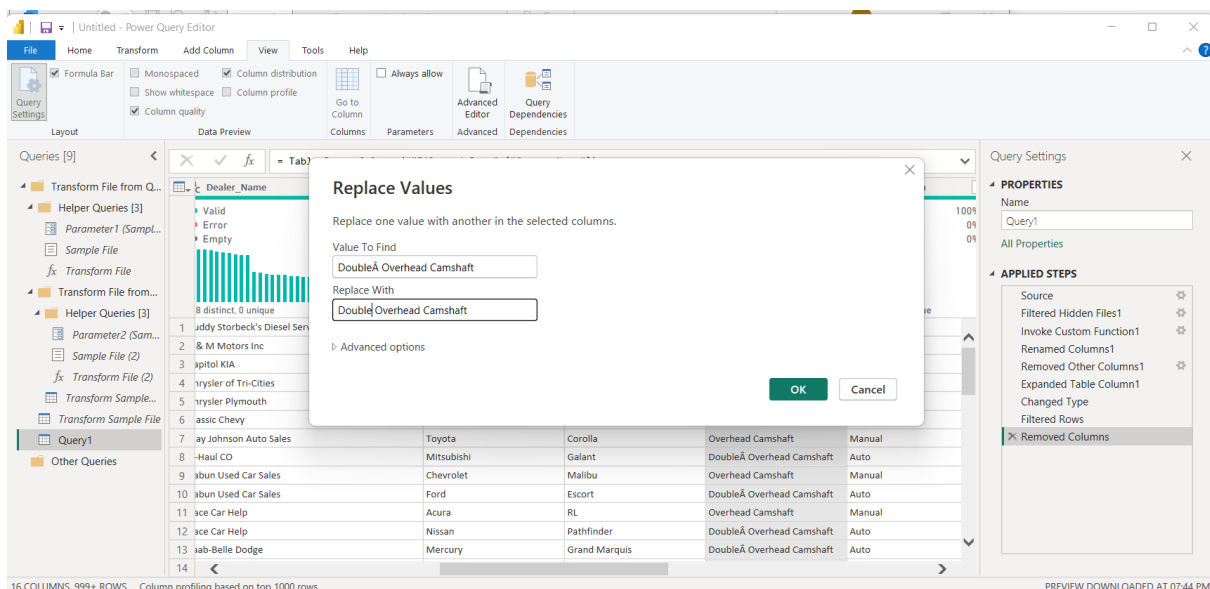
There are no error or empty in the dataset

In any data valid should be always 100%

Empty can be null or blank.

Date should be all the 100%.

We can say the price shouldn't be null and price is like fact here. Customer name is dist. value



Then we close and apply .

Calendar Table :

Power BI Car Sales Analysis using Azure

Now are creating a Calendar table, where in our first KPI requirement we are doing sales overview for year-to-date(YTD), month-to-date(MTD),year-over-year(YOY). These are called by Microsoft as time intelligence function.

q)Why to create a calendar table?

a)A calendar table allows you to run reports with flexibility, efficiency, and most importantly, it is necessary for time intelligence functions. Therefore, every model should include such a table (sometimes more than one).

In the home tab, we have new table

Now are using Dax coding to build, so we name it as date table

Command: Date Table = CALENDAR(min(carsalesdata[Date]),MAX(carsalesdata[Date]))

It automatically pick up

It will have all the dates

Command: Year = YEAR('Date Table'[Date])

To extract year

Command: Month = FORMAT('Date Table'[Date],"MMMM")

For month we use format, because month command gives us the number so we are using format to extract string.

Command : Week = WEEKNUM('Date Table'[Date])

To extract the week num

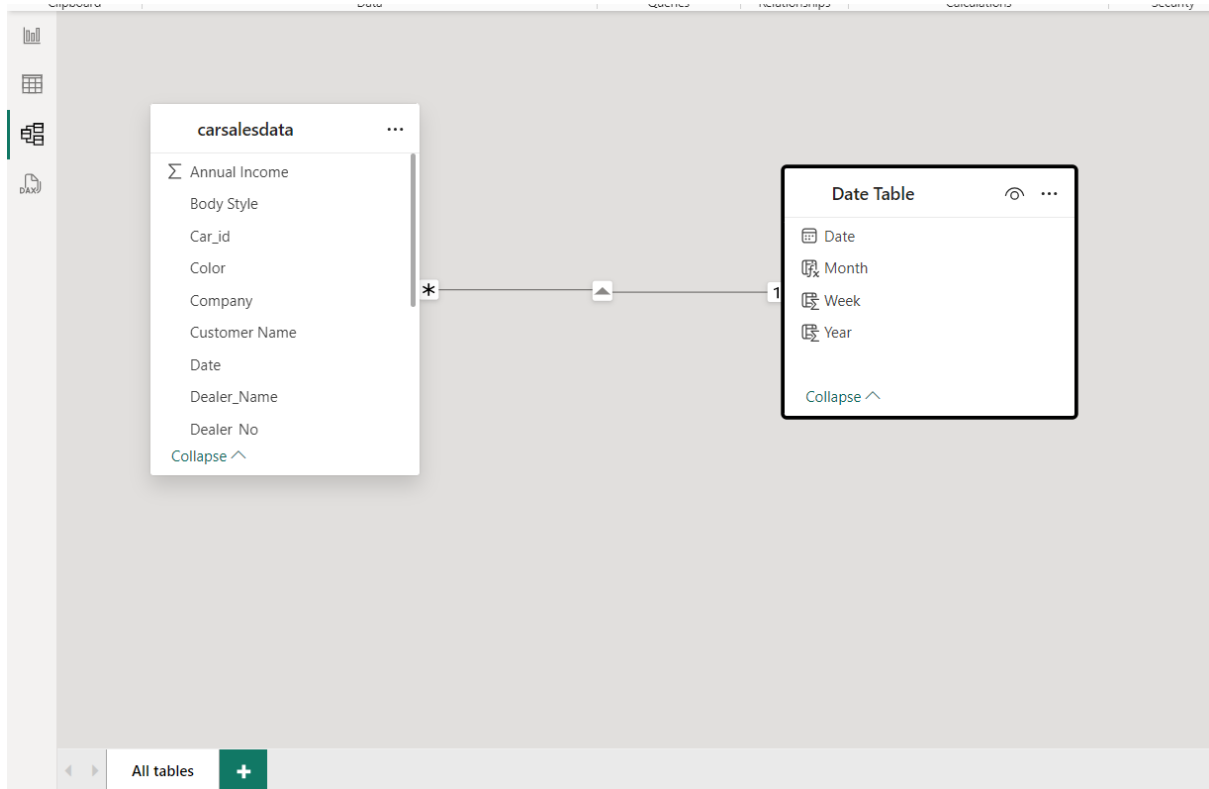
The screenshot displays the Microsoft Power BI Desktop application. The ribbon at the top includes 'File', 'Home', 'Help', 'Table tools', and 'Column tools'. The 'Table tools' tab is active, showing options like 'Get data', 'Excel', 'OneLake', 'SQL Server', 'Enter data', 'Dataverse', 'Recent sources', 'Transform data', 'Refresh', 'Manage relationships', 'New measure', 'Quick measure', 'New column', 'New table', 'Manage roles', 'View as', 'Sensitivity', and 'Publish'. The main workspace shows a table named 'Date Table' with columns: Date, Year, Month, and Week. The data spans from 02-01-2022 to 28-01-2022. The 'Week' column shows values from 2 to 5. The right-hand pane shows the 'Data' view with a search bar and a list of fields, including 'Date Table', 'Date', 'Month', 'Week', 'Year', 'Query1', 'Annual Income', 'Body Style', 'Car_id', 'Color', 'Company', 'Customer Name', 'Dealer_Name', 'Dealer_No', 'Dealer_Region', 'Engine', 'Gender', 'Model', 'Phone', 'Price (\$)', and 'Transmission'. The status bar at the bottom indicates 'Table: Date Table (729 rows) Column: Week (53 distinct values)' and 'Update available (click to download)'.

Date	Year	Month	Week
02-01-2022 00:00:00	2022	January	2
03-01-2022 00:00:00	2022	January	2
04-01-2022 00:00:00	2022	January	2
05-01-2022 00:00:00	2022	January	2
06-01-2022 00:00:00	2022	January	2
07-01-2022 00:00:00	2022	January	2
08-01-2022 00:00:00	2022	January	2
09-01-2022 00:00:00	2022	January	3
10-01-2022 00:00:00	2022	January	3
11-01-2022 00:00:00	2022	January	3
12-01-2022 00:00:00	2022	January	3
13-01-2022 00:00:00	2022	January	3
14-01-2022 00:00:00	2022	January	3
15-01-2022 00:00:00	2022	January	3
16-01-2022 00:00:00	2022	January	4
17-01-2022 00:00:00	2022	January	4
18-01-2022 00:00:00	2022	January	4
19-01-2022 00:00:00	2022	January	4
20-01-2022 00:00:00	2022	January	4
21-01-2022 00:00:00	2022	January	4
22-01-2022 00:00:00	2022	January	4
23-01-2022 00:00:00	2022	January	5
24-01-2022 00:00:00	2022	January	5
25-01-2022 00:00:00	2022	January	5
26-01-2022 00:00:00	2022	January	5
27-01-2022 00:00:00	2022	January	5
28-01-2022 00:00:00	2022	January	5

Power BI Car Sales Analysis using Azure

The tables are independent from each other, so we want to depend on each other now we use data modelling.

Data Modelling:



Connect the date column in carsalesdata with date in datatable, in many to 1.

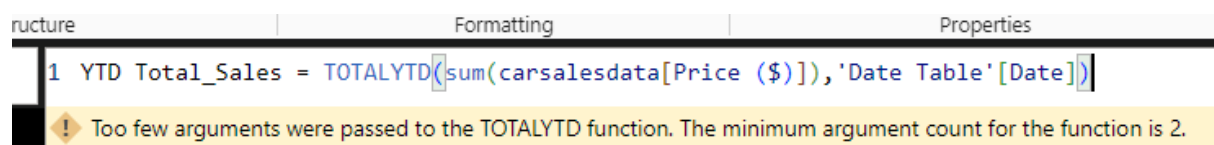
Carsalesdata (fk) , datatable(pk)

- ➔ We have used the canvas background which we have created. In visualizations -> Format-> canvas background upload it and transparency to 0%
- ➔ Canvas settings -> vertical alignment to middle

1st Total Sales KPI :

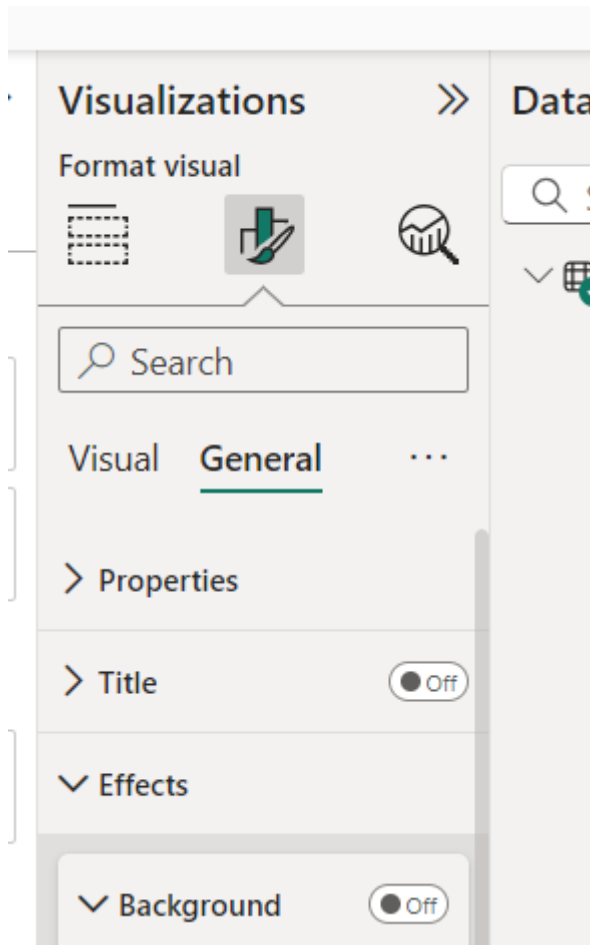
In the data right click -> new measure

Command : YTD Total_Sales = TOTALYTD(sum(carsalesdata[Price (\$)]),'Date Table'[Date])



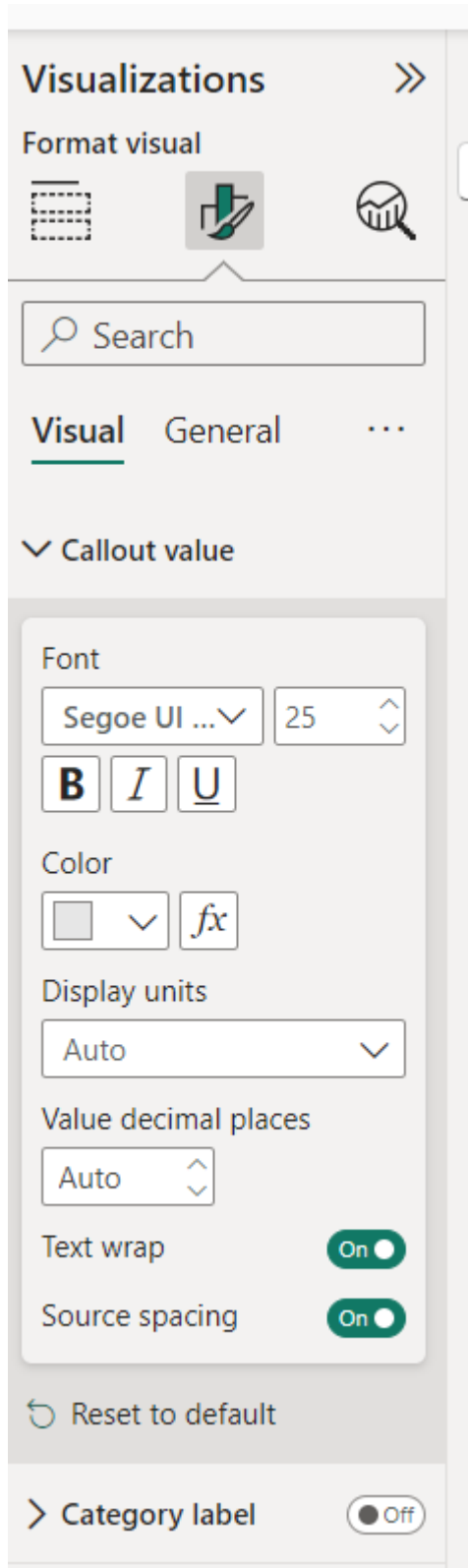
Power BI Car Sales Analysis using Azure

Here the Total YTD data picks the latest year from dataset. Ytd sales we are using card from visualizations to show case the ytd sales.



We have now perform some formatting that, now have to turn off the background

Power BI Car Sales Analysis using Azure



Now create a new measure

Power BI Car Sales Analysis using Azure

Command : $\text{PYTD Total_Sales} = \text{CALCULATE}(\text{SUM}(\text{carsalesdata}[\text{Price}(\$)]), \text{SAMEPERIODLASTYEAR}('Date Table'[\text{Date}]))$

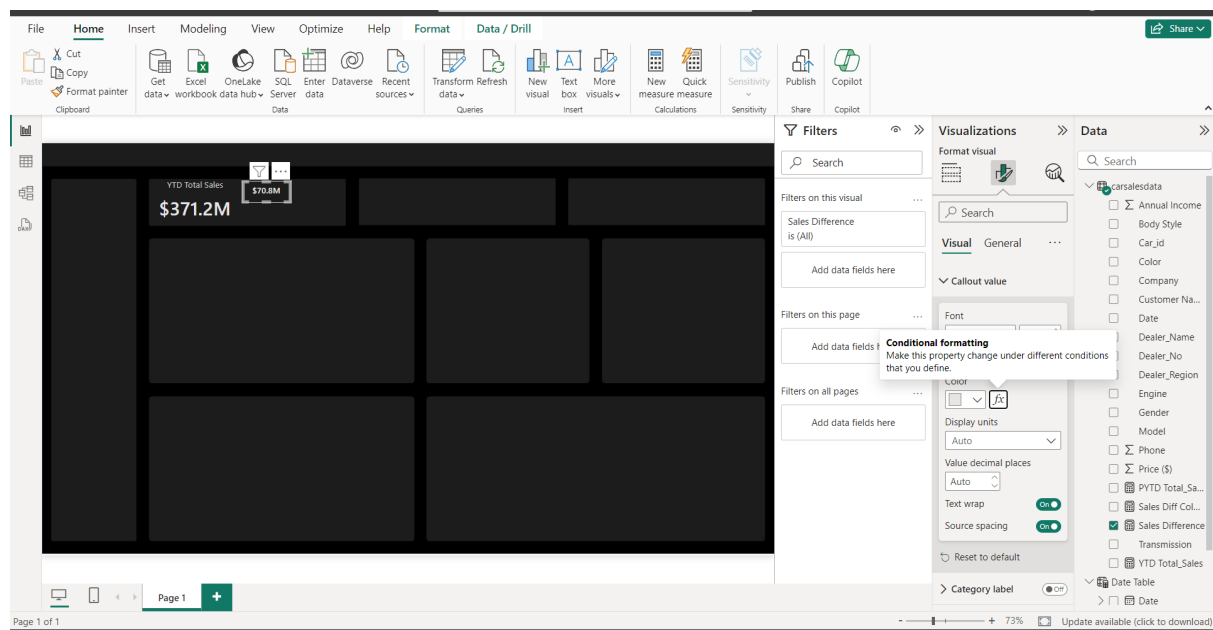
Command : $\text{Sales Difference} = [\text{YTD Total_Sales}] - [\text{PYTD Total_Sales}]$

Q) Now if whenever sales are +ve and if difference is +ve should be in green

And if difference is -ve it should be in red should be dynamic and automatically it should be done.

Command : $\text{Sales Diff Colour} = \text{IF}([\text{Sales Difference}] > 0, "Green", "Red")$

Create a new measure sales diff colour



In format, we could see fx(conditional formatting), select format style as rule :

Power BI Car Sales Analysis using Azure

Color - Callout value



Format style

Rules

What field should we base this on?

Rules

Reverse color order

+ New rule

If value \geq Min Number and $<$ 0 Number then

[Learn more about conditional formatting](#)

OK

Cancel

Color - Callout value



Format style

Rules

What field should we base this on?

Sales Diff Colour

Rules

Reverse color order

+ New rule

If value is Green then

If value is Red then

[Learn more about conditional formatting](#)

OK

Cancel

We will next is year on year sales growth

Power BI Car Sales Analysis using Azure

Command : $\text{YOY Sales Growth} = [\text{Sales Difference}] / [\text{PYTD Total_Sales}]$



Change this

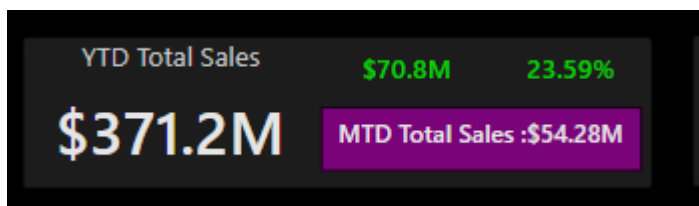
Next, mtd sales :

Command : $\text{MTD Total_Sales} = \text{TOTALMTD}(\text{sum}(\text{carsalesdata}[\text{Price}(\$)]), \text{'Date Table'}[\text{Date}])$

Next for the MTDKPI:

Command : $\text{MTD KPI} = \text{CONCATENATE}(\text{"MTD Total Sales :"}, \text{FORMAT}([\text{MTD Total_Sales}]/1000000, "\$0.00\text{M}"))$

The Final 1st KPI Output



KPI 2 :

We need to find the price of car :

Command : $\text{Avg Price} = \text{SUM}(\text{carsalesdata}[\text{Price}(\$)]) / \text{COUNT}(\text{carsalesdata}[\text{Car_id}])$

Year to date price :

Command : $\text{YTD AVG Price} = \text{TOTALYTD}([\text{Avg Price}], \text{'Date Table'}[\text{Date}])$

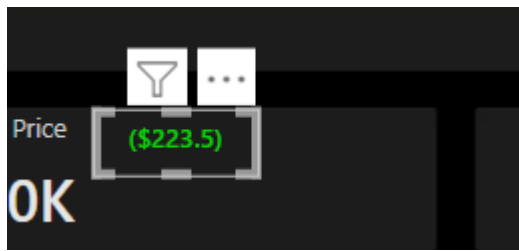
Previous Year date Price :

Command: $\text{PYTD AVG Price} = \text{CALCULATE}([\text{Avg Price}], \text{SAMEPERIODLASTYEAR}(\text{'Date Table'}[\text{Date}]))$

Now, to Find the Avg Price Difference:

Power BI Car Sales Analysis using Azure

Command : AVG Price Difference = [YTD AVG Price]-[PYTD AVG Price]



We are getting like this means the value is -ve

For changing colour we create another measure

Command: AVG Price colour = IF([AVG Price Difference]>0,"Green","Red")

YOY avg price growth:

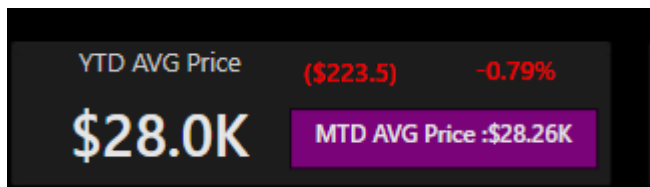
Command: YOY AVG Price Growth = [AVG Price Difference]/[PYTD AVG Price]

MTD AVG Price: -

Command: MTD AVG Price = TOTALMTD([Avg Price],'Date Table'[Date])

MTD AVG KPI: -

Command: MTD AVG Price KPI = CONCATENATE("MTD AVG Price : ",FORMAT([MTD AVG Price]/1000,"\$0.00K"))



3 KPI :

YTD cars Sold :

Command : YTD Cars Sold = TOTALYTD(count(carsalesdata[Car_id]),'Date Table'[Date])

count(carsalesdata[Car_id]) -> count of field of need to be unique to find to count of the cars year cars sold.

Previous year cars sold :

Command : PYTD Cars Sold =

CALCULATE(COUNT(carsalesdata[Car_id]),SAMEPERIODLASTYEAR('Date Table'[Date]))

Power BI Car Sales Analysis using Azure

Cars sold difference :

Command : Cars Sold Difference = [YTD Cars Sold]-[PYTD Cars Sold]

Cars sold colour:

Command : Cars Sold Colour = IF(carsalesdata[Cars Sold Difference]>0,"Green","Red")

YOY Cars Sold :

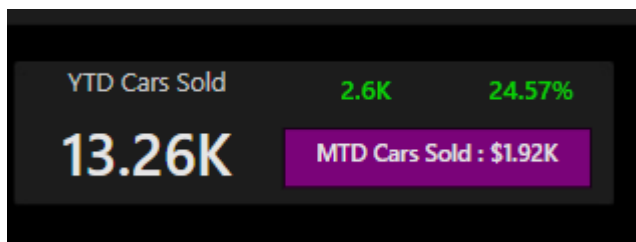
Command : YOY Cars Sold Growth = [Cars Sold Difference]/[PYTD Cars Sold]

MTD Cars Sold

Command : MTD Cars Sold = TOTALMTD(COUNT(carsalesdata[Car_id]),'Date Table'[Date])

MTD Cars Sold KPI :

Command : MTD Cars Sold KPI = CONCATENATE("MTD Cars Sold : ",FORMAT([MTD Cars Sold]/1000,"0.00"))



KPI Chat Requirements :

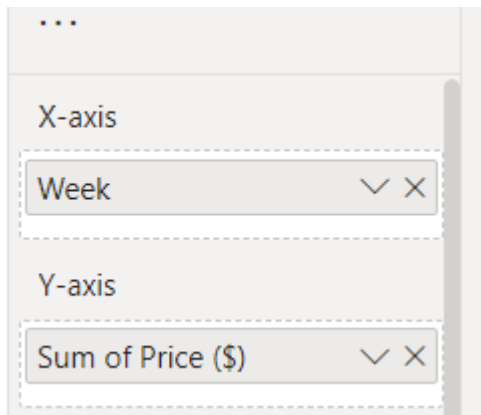
Problem Statement:-

YTD Sales Weekly Trend: Display a line chart illustrating the weekly trend of YTD sales. The X-axis should represent weeks, and the Y-axis should show the total sales amount.

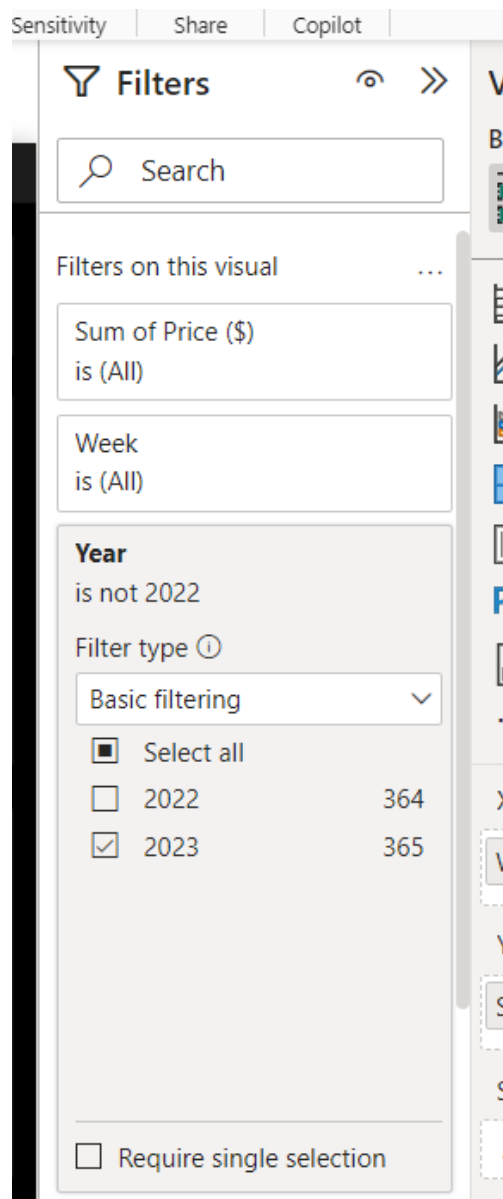
First, we take area chart and in the x-axis as we have already calculated the week.

In y axis we take directly the price.

Power BI Car Sales Analysis using Azure



Then add filter.



We are only taking 2023. In the filter.

Power BI Car Sales Analysis using Azure

In the format -> general -> grid lines turn off both horizontal and vertical. And on markers and next we need to find the max week sales with yellow point showing that is the max sales.

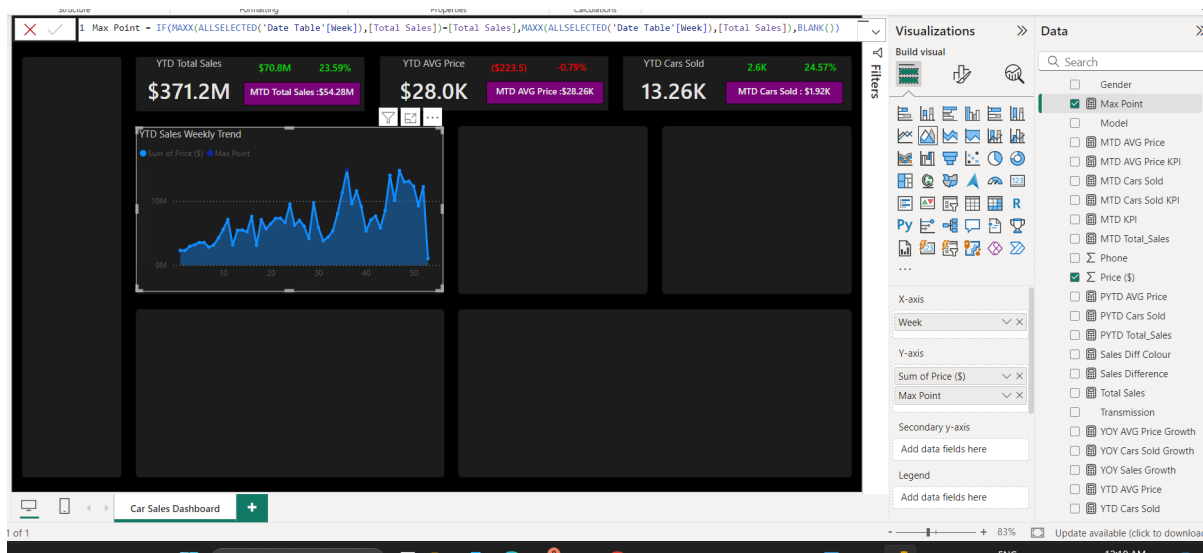
Create max point :

Command : Total Sales = SUM(carsalesdata[Price (\$)])

Then create that point we are using MAXX

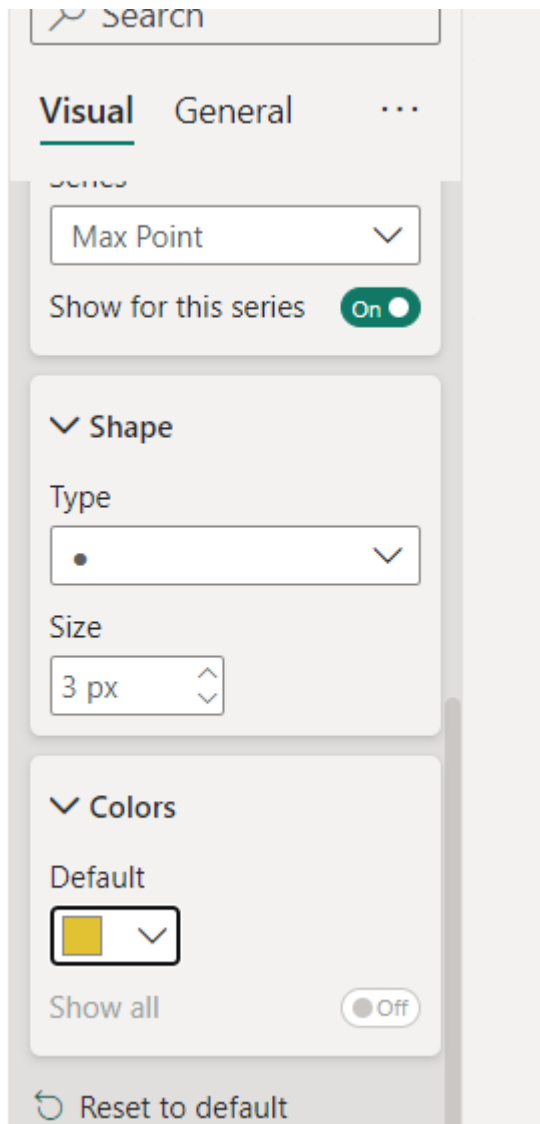
Command :

Max Point = IF(MAXX(ALLSELECTED('Date Table'[Week]),[Total Sales])=[Total Sales],MAXX(ALLSELECTED('Date Table'[Week]),[Total Sales]),BLANK())



Now turn off the legends , and in markers :

Power BI Car Sales Analysis using Azure



Now turn on the data labels and turn off the data labels for series, only on for max point

Power BI Car Sales Analysis using Azure

▼ Data labels On

Apply settings to

Series

Max Point ▼

Show for this series On

▼ Options

Position

Auto ▼

Label density

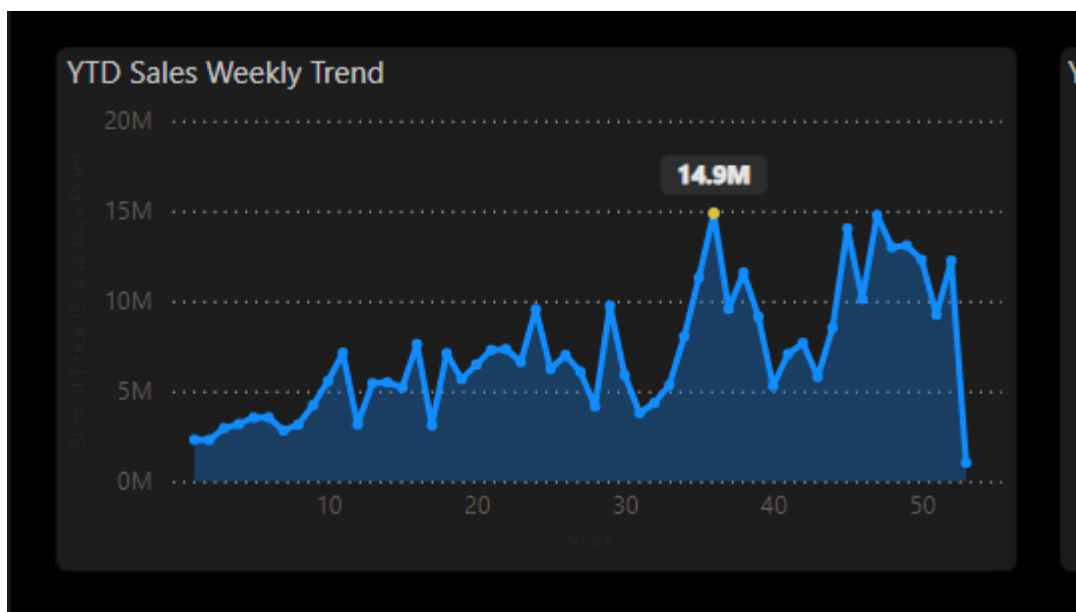
50 %

Minimum offset

Auto

Maximum offset

Auto

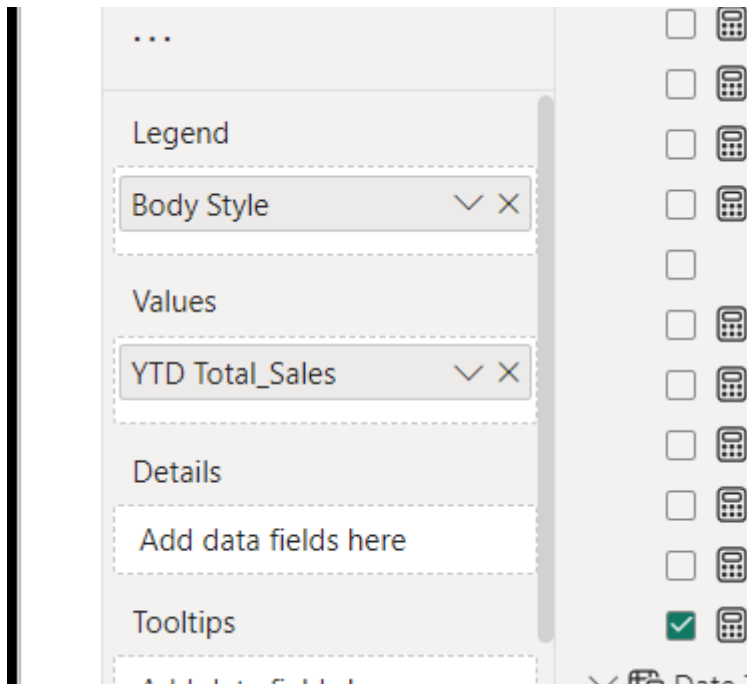


The border for horizontal are off but it is still showing

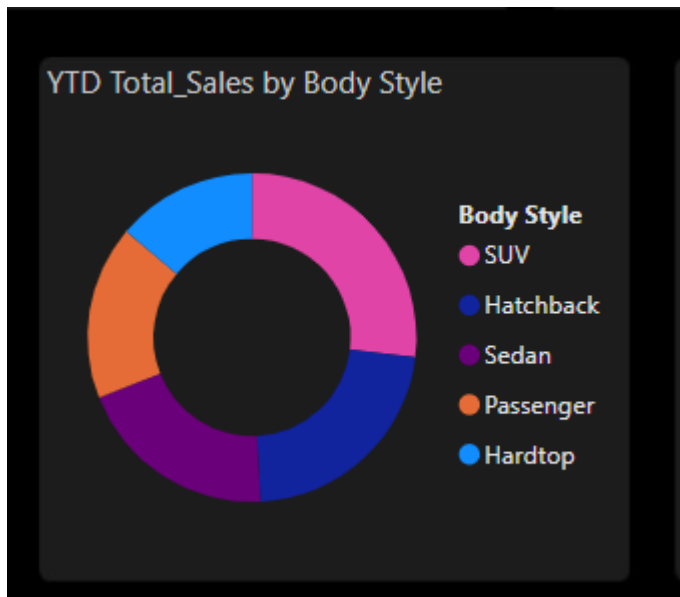
Power BI Car Sales Analysis using Azure

Problem Statement 2 :

YTD Total Sales by Body Style: Visualize the distribution of YTD total sales across different car body styles using a Pie chart.



Copy area chart from format painter and copy on it

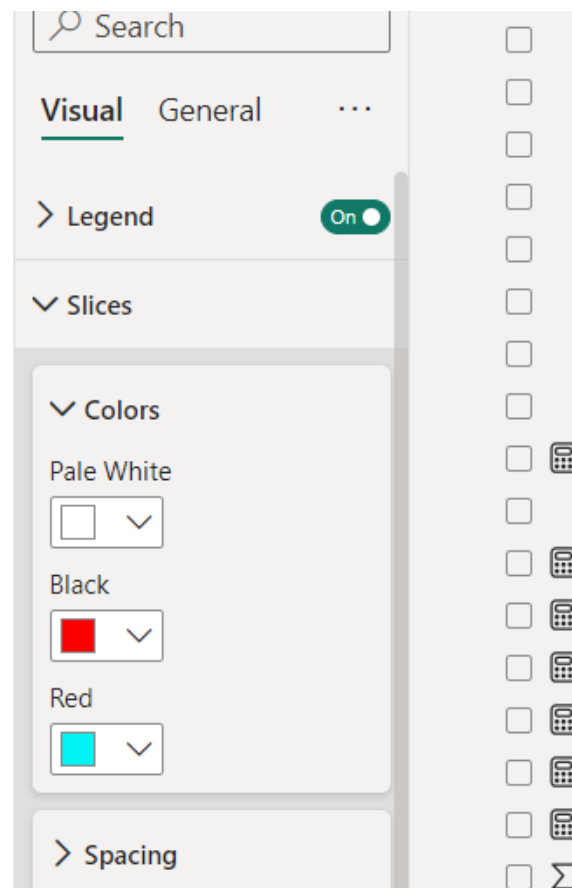
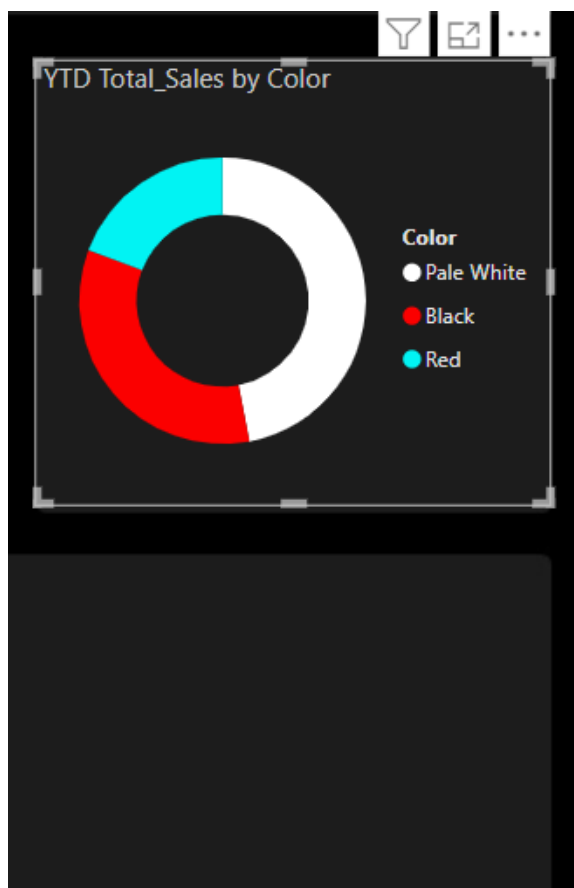
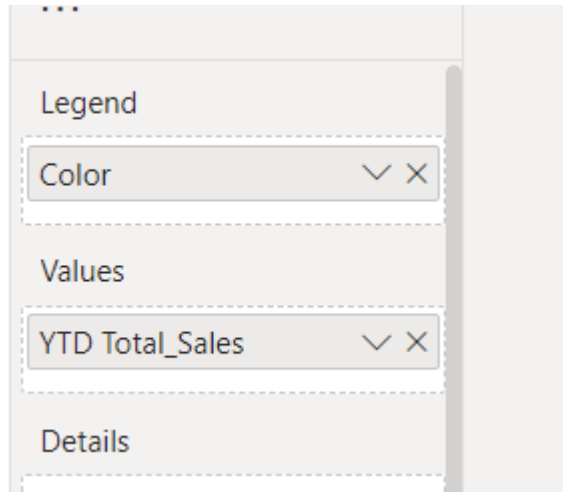


Problem statement3 :

Power BI Car Sales Analysis using Azure

YTD Total Sales by Color: Present the contribution of various car colors to the YTD total sales through a pie chart.

Copy paste the previous donut chart and change legend from body style to colour



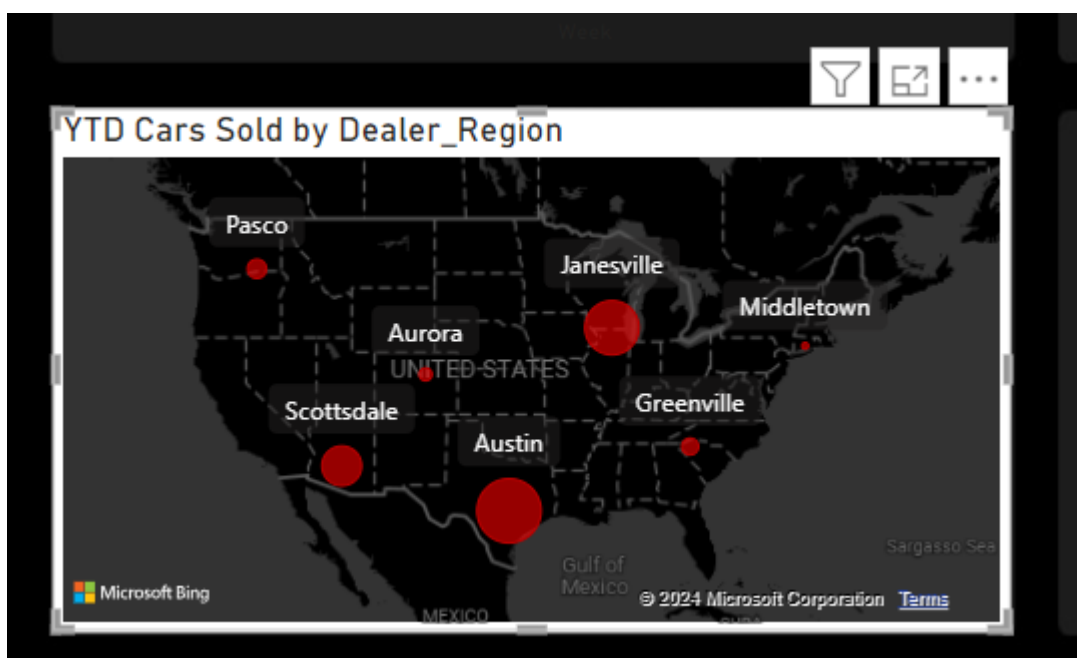
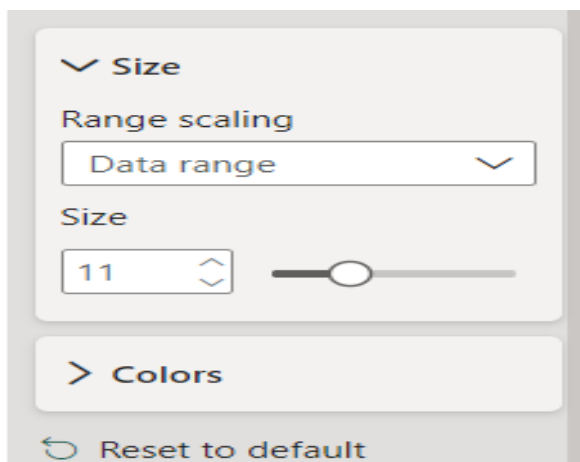
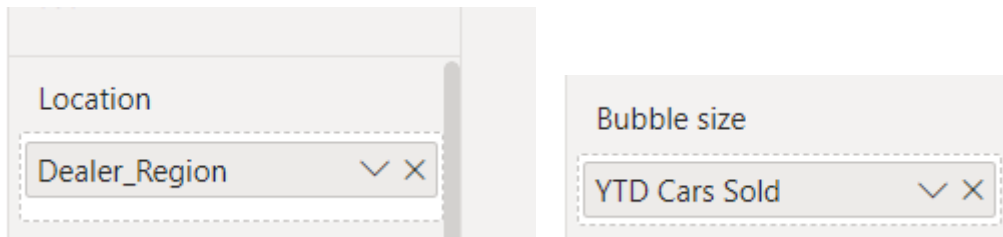
Using sicles changed the colour

Power BI Car Sales Analysis using Azure

Problem Statement 4 :

YTD Cars Sold by Dealer Region: Showcase the YTD sales data based on different dealer regions using a map chart to visualize the sales distribution geographically.

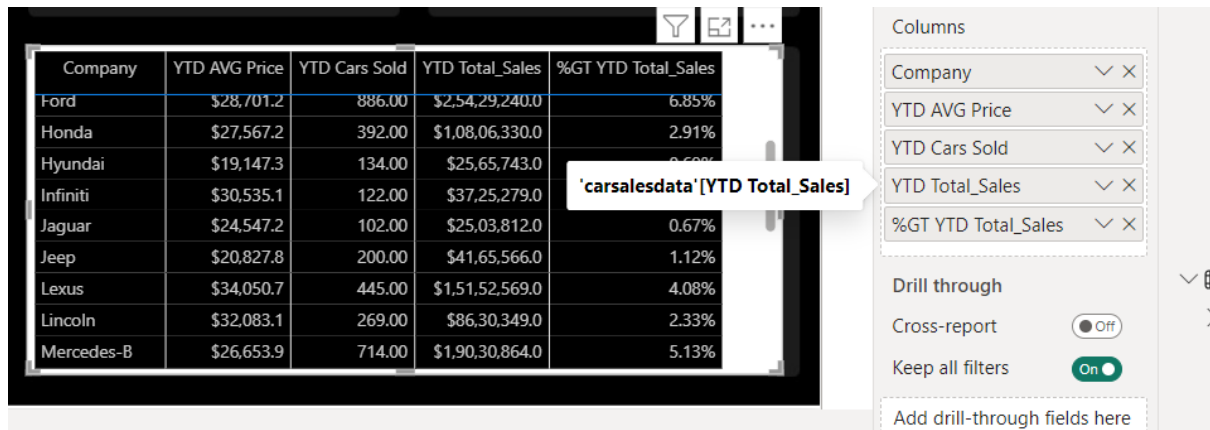
Now click on map from visualization :



Power BI Car Sales Analysis using Azure

Problem Statement 5 :

Company-Wise Sales Trend in Grid Form: Provide a tabular grid that displays the sales trend for each company. The grid should showcase the company name along with their YTD sales figures.



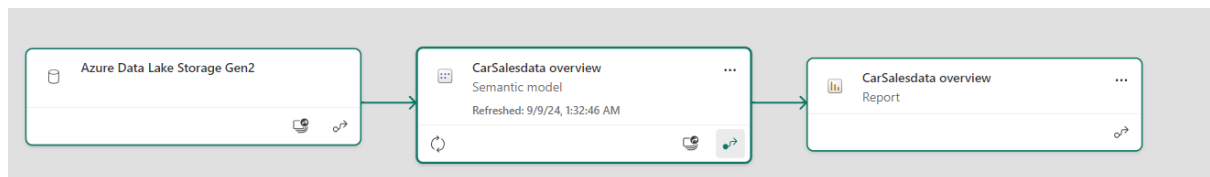
The screenshot displays a Power BI report with a table visualization and the Columns pane. The table shows car sales data for various companies, including Ford, Honda, Hyundai, Infiniti, Jaguar, Jeep, Lexus, Lincoln, and Mercedes-B. The columns are Company, YTD AVG Price, YTD Cars Sold, YTD Total_Sales, and %GT YTD Total_Sales. A tooltip is visible over the 'carsalesdata[YTD Total_Sales]' column. The Columns pane on the right shows the selected fields and options for Drill through, Cross-report, and Keep all filters.

Company	YTD AVG Price	YTD Cars Sold	YTD Total_Sales	%GT YTD Total_Sales
Ford	\$28,701.2	886.00	\$2,54,29,240.0	6.85%
Honda	\$27,567.2	392.00	\$1,08,06,330.0	2.91%
Hyundai	\$19,147.3	134.00	\$25,65,743.0	0.60%
Infiniti	\$30,535.1	122.00	\$37,25,279.0	0.67%
Jaguar	\$24,547.2	102.00	\$25,03,812.0	0.67%
Jeep	\$20,827.8	200.00	\$41,65,566.0	1.12%
Lexus	\$34,050.7	445.00	\$1,51,52,569.0	4.08%
Lincoln	\$32,083.1	269.00	\$86,30,349.0	2.33%
Mercedes-B	\$26,653.9	714.00	\$1,90,30,864.0	5.13%

Visualization - > table

Add the columns.

Data Flow



Data Modelling:

Link : <https://app.powerbi.com/reportEmbed?reportId=e5e61871-92c0-43bd-9aa7-7095d11b2a89>

Background: Our company is a car dealership that sells various car models. To effectively track and analyse our sales performance, we need a comprehensive Car Sales Dashboard in Power BI.

Objective: The objective of this project is to design and develop a dynamic and interactive Car Sales Dashboard using Power BI. The dashboard will visualize critical KPIs related to our car sales, helping us understand our sales performance over time and make data-driven decisions.

Problem Statement 1: KPI's Requirement

Power BI Car Sales Analysis using Azure

The dashboard should provide real-time insights into key performance indicators (KPIs) related to our sales data. This will enable us to make informed decisions, monitor our progress, and identify trends and opportunities for growth.

1. Sales Overview:

- Year-to-Date (YTD) Total Sales
- Month-to-Date (MTD) Total Sales
- Year-over-Year (YOY) Growth in Total Sales
- Difference between YTD Sales and Previous Year-to-Date (PTYD) Sales

2. Average Price Analysis:

- YTD Average Price
- MTD Average Price
- YOY Growth in Average Price
- Difference between YTD Average Price and PTYD Average Price

3. Cars Sold Metrics:

- YTD Cars Sold
- MTD Cars Sold
- YOY Growth in Cars Sold
- Difference between YTD Cars Sold and PTYD Cars Sold

Problem Statement 2: Charts Requirement

1. **YTD Sales Weekly Trend:** Display a line chart illustrating the weekly trend of YTD sales. The X-axis should represent weeks, and the Y-axis should show the total sales amount.
2. **YTD Total Sales by Body Style:** Visualize the distribution of YTD total sales across different car body styles using a Pie chart.
3. **YTD Total Sales by Color:** Present the contribution of various car colors to the YTD total sales through a pie chart.
4. **YTD Cars Sold by Dealer Region:** Showcase the YTD sales data based on different dealer regions using a map chart to visualize the sales distribution geographically.
5. **Company-Wise Sales Trend in Grid Form:** Provide a tabular grid that displays the sales trend for each company. The grid should showcase the company name along with their YTD sales figures.

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6. **Details Grid Showing All Car Sales Information:** Create a detailed grid that presents all relevant information for each car sale, including car model, body style, colour, sales amount, dealer region, date, etc