

Data Visualization Tools and Software

Aim: To understand Data Modeling, create and manage tables and relationships in Power BI.

Tasks:

1. Introduction to Data Modelling
 - a. Understand basics of Entity-Relationship diagram and various relationship measures.
 - b. Know Your PowerBI workspace
 - c. Import Sample Data
2. Learn Data Modeling In Power BI
 - a. Data Models In Power BI
 - b. Create and manage relationships between your data sources
 - c. Configure table and column properties
 - d. Create calculated columns and tables
 - e. Create hierarchies
3. Create quick measures.
 - a. Use DAX(Data Analysis Expression) for creating various expressions and filters
 - b. Optimize data models
4. Create Visualization
 - a. Explore time-based data

Introduction to Data Modelling

Data Modeling is one of the features used to connect multiple data sources in BI tool using a relationship. A relationship defines how data sources are connected with each other and you can create interesting data visualizations on multiple data sources.

Create data

To create a data model in Power BI, you need to add all data sources in Power BI new report option. To add a data source, go to the Get data option. Then, select the data source you want to connect and click the Connect button.

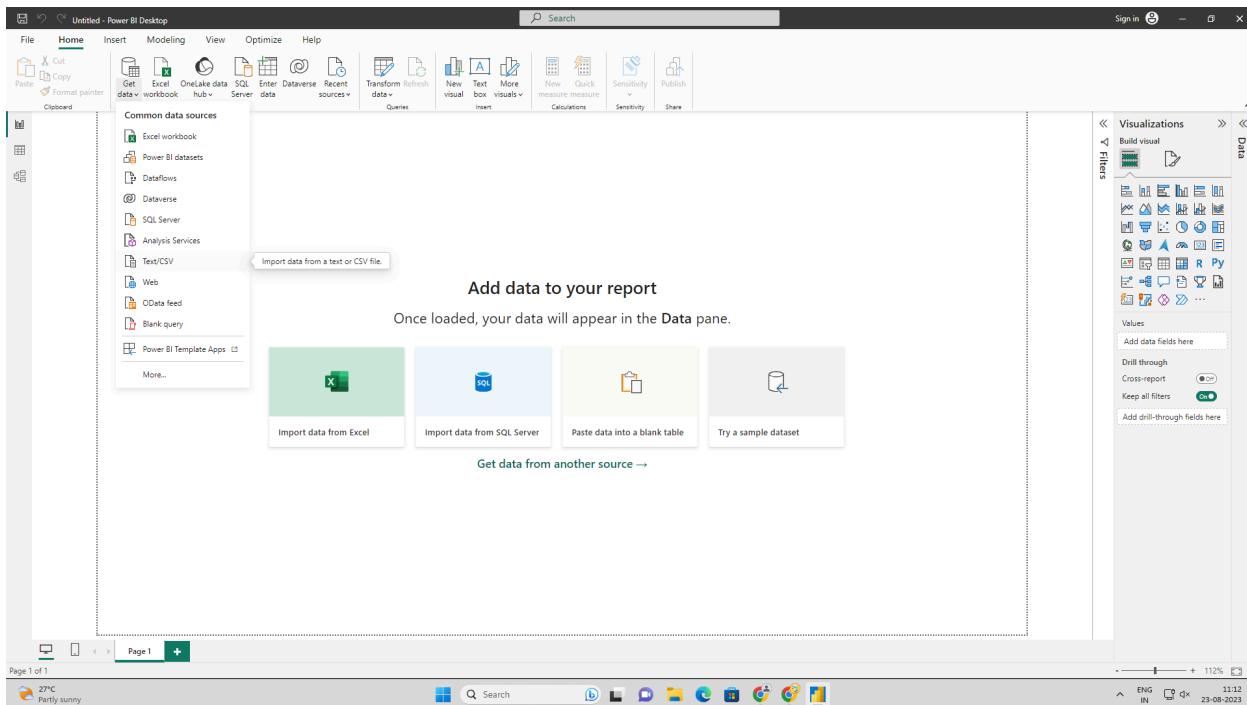


Fig.- Add all data sources in Power BI

A screenshot of the Power BI Navigator. On the left, there's a tree view of data sources under 'Display Options'. Under 'Practice Shop-Records.xlsx (4)', several tables are listed: 'Country', 'Date', 'Products', and 'Sales'. The 'Sales' table is currently selected. On the right, there's a preview of the 'Sales' table with columns: Customer_ID, Customer_Name, Country_Code, Product_ID, Quantity, and Date. The data shows various sales entries across different countries and products. At the bottom, there are 'Load', 'Transform Data', and 'Cancel' buttons.

Fig.- Importing data from a CSV file

Column Quality

Shows the percentage of rows within a column that are valid, empty, or errors.

The screenshot shows the Power Query Editor interface with the 'Column Settings' ribbon tab selected. The 'Data Preview' pane displays a table with columns: Customer_ID, Customer_Name, Country_Code, Product_ID, Quantity, Date_ID. The 'Query Settings' pane on the right shows the query name 'Sales' and the applied step 'Changed Type'. The status bar at the bottom indicates 'PREVIEW DOWNLOADED AT 11:14'.

	Customer_ID	Customer_Name	Country_Code	Product_ID	Quantity	Date_ID
1	101 A	IN		10	800	201901
2	102 B	FR		11	104	201901
3	103 C	US		12	300	201901
4	104 D	IT		13	240	201901
5	105 E	MY		14	321	201901
6	106 F	UK		15	105	201902
7	107 G	AU		16	503	201902
8	108 H	TH		17	438	201902
9	109 I	NZ		18	352	201902
10	110 J	IN		19	678	201902
11	111 K	RU		20	424	201903
12	112 L	IN		10	965	201903
13	113 M	US		11	236	201903
14	114 N	FR		12	463	201903
15	115 O	NZ		13	198	201903
16	116 P	TH		14	673	201904
17	117 Q	AU		15	392	201904
18	118 R	IN		16	851	201904
19	119 S	MY		17	425	201904
20	120 T	JP		18	294	201904
21	121 U	KW		19	383	201905
22	122 V	IT		20	298	201905
23	123 W	TH		10	283	201905
24	124 X	US		11	593	201905
25	125 Y	FR		12	296	201906
26	126 Z	JP		13	519	201906
27	127 A	IN		10	800	201906
28	128 B	MY		11	204	201906
29	129 C	US		12	300	201907
30	130 D	IT		13	240	201907
31	131 E	MY		14	321	201907
32	132 F	UK		15	105	201907
33	133 G	AU		16	503	201907
34	134 H	TH		17	438	201908
35	135 I	NZ		18	352	201908
36	136 J	IN		19	678	201908
37	137 K	RU		20	424	201908
38	138 L	IN		10	965	201909

Fig.-Show column quality details in data preview

The screenshot shows the Power Query Editor interface with the 'Column Settings' ribbon tab selected. The 'Data Preview' pane displays a table with columns: Country_Code, Column1, Column2. The 'Query Settings' pane on the right shows the query name 'Country' and the applied step 'Changed Type'. The status bar at the bottom indicates 'PREVIEW DOWNLOADED AT 11:14'.

	Country_Code	Column1	Column2
1	IN	India	
2	FR	France	
3	US	United States	
4	IT	Italy	
5	MY	Malaysia	
6	UK	United Kingdom	
7	AU	Australia	
8	TH	Thailand	
9	NZ	New Zealand	
10	RU	Russia	
11	JP	Japan	
12	KW	Kuwait	

Fig.-Country column quality details

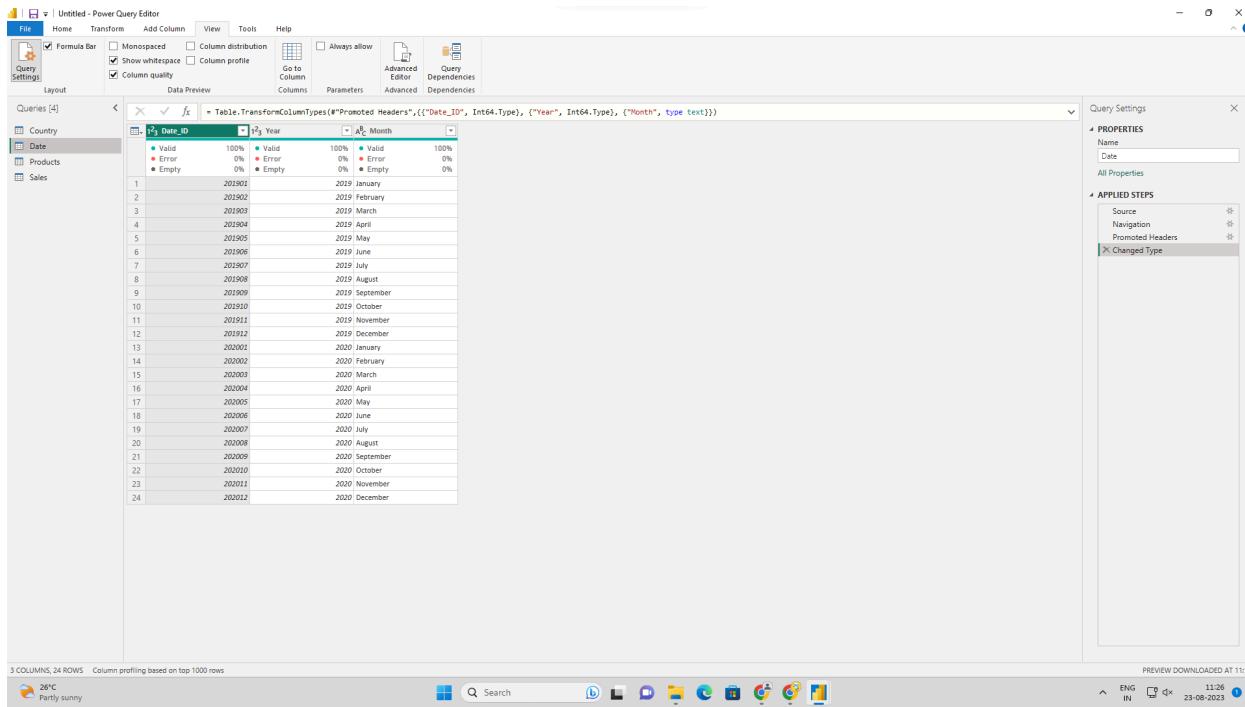


Fig.-Date column quality details

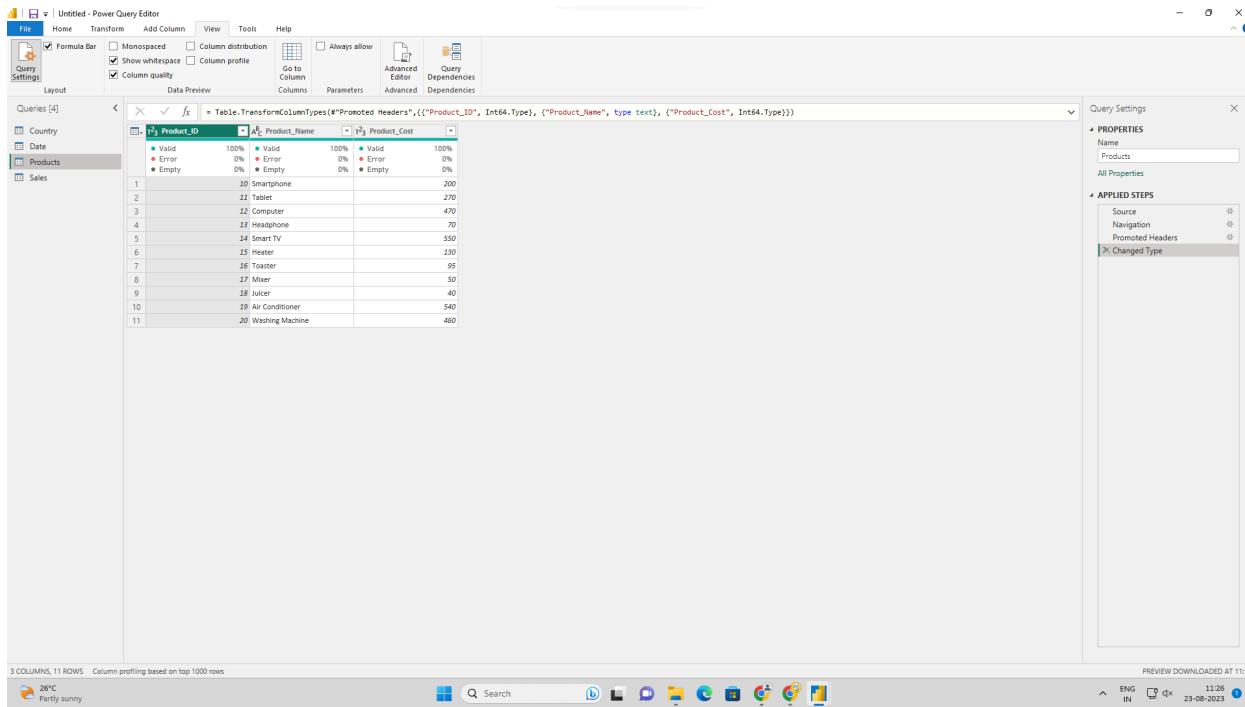


Fig.-Products column quality details

File Home Transform Add Column View Tools Help

Always allow Advanced Editor Query Dependencies

Query Settings

Properties

APPLIED STEPS

Source Navigation Promoted Headers Changed Type

PREVIEW DOWNLOADED AT 11:14

ENG IN 11:23 23-08-2023

Fig.-Sales column quality details

Save your work

When our query is where we want , select Close & Apply from Power Query Editor's File menu. This action applies the changes and closes the editor.

File Home Transform Add Column View Tools Help

Close & Apply New Recent Sources Data Data Sources Manage Parameters Refresh Manage Query Properties Advanced Editor Choose Columns Remove Rows * Rows Manage Columns Manage Rows Sort Transform Data Type: Whole Number Merge Queries Append Queries Text Analytics Vision Azure Machine Learning Combine Combine Files AI Insights

Queries [4]

Customer_ID Customer_Name Country_Code Product_ID Quantity Date_ID

	Value	Valid	Void	Error	Empty	Value	Valid	Void	Error	Empty	Value	Valid	Void	Error	Empty
1	101 A	IN				10	800				203901				
2	102 B	FR				11	104				203901				
3	103 C	US				12	300				203901				
4	104 D	IT				13	240				203901				
5	105 E	MY				14	321				203901				
6	106 F	UK				15	105				203902				
7	107 G	AU				16	503				203902				
8	108 H	TH				17	438				203902				
9	109 I	NZ				18	352				203902				
10	110 J	IN				19	678				203902				
11	111 K	RU				20	424				203903				
12	112 L	IN				21	965				203903				
13	113 M	US				22	236				203903				
14	114 N	FR				23	463				203903				
15	115 O	NZ				24	298				203903				
16	116 P	TH				25	593				203904				
17	117 Q	AU				26	392				203904				
18	118 R	IN				27	811				203904				
19	119 S	MY				28	425				203904				
20	120 T	JP				29	294				203904				
21	121 U	KW				30	383				203905				
22	122 V	IT				31	298				203905				
23	123 W	TH				32	283				203905				
24	124 X	US				33	593				203905				
25	125 Y	FR				34	296				203906				
26	126 Z	JP				35	519				203906				
27	127 A	IN				36	800				203906				
28	128 B	FR				37	104				203907				
29	129 C	US				38	300				203907				
30	130 D	IT				39	240				203907				
31	131 E	MY				40	321				203907				
32	132 F	UK				41	105				203907				
33	133 G	AU				42	503				203907				
34	134 H	TH				43	438				203908				
35	135 I	NZ				44	352				203908				
36	136 J	IN				45	678				203908				

6 COLUMNS, 104 ROWS Column profiling based on top 1000 rows

26°C Partly sunny

PREVIEW DOWNLOADED AT 11:14

ENG IN 11:31 23-08-2023

Fig.-Close the editor

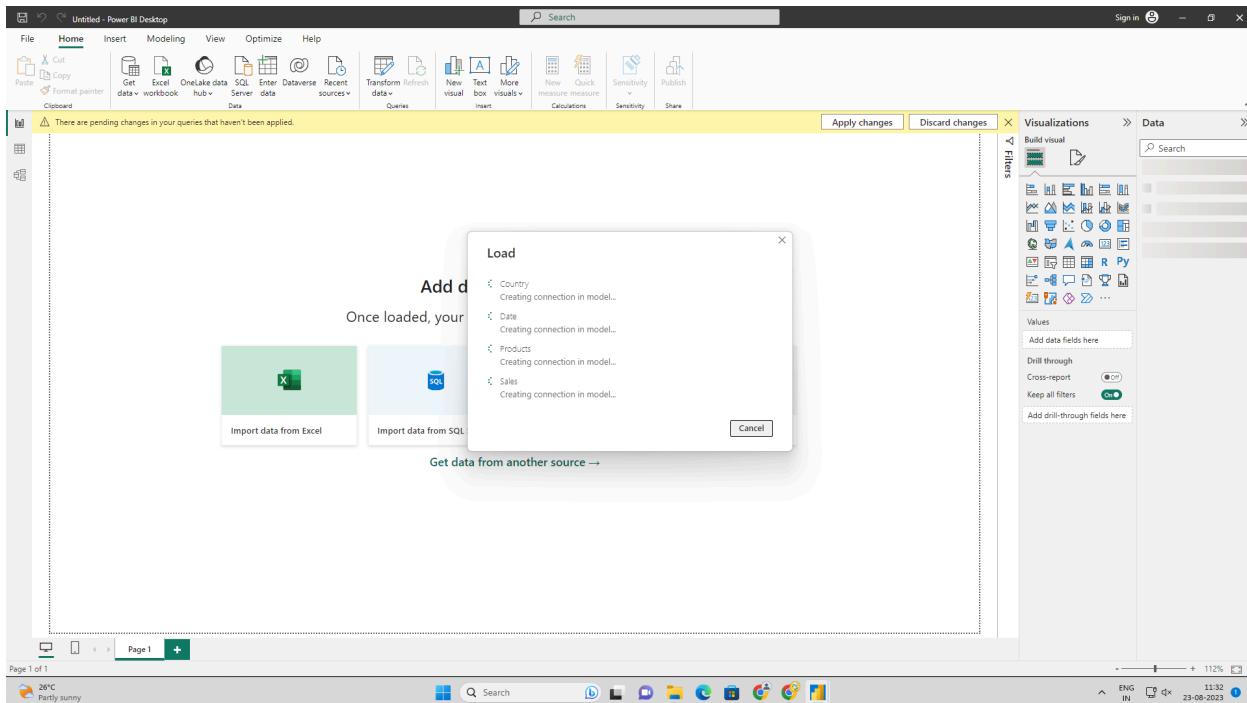


Fig.-Creating model

Report tab

When you navigate to the Report tab, you can see a dashboard and a chart selected for data visualization. You can select different chart types as per your need. In our example, we have selected a Table type from available Visualizations.

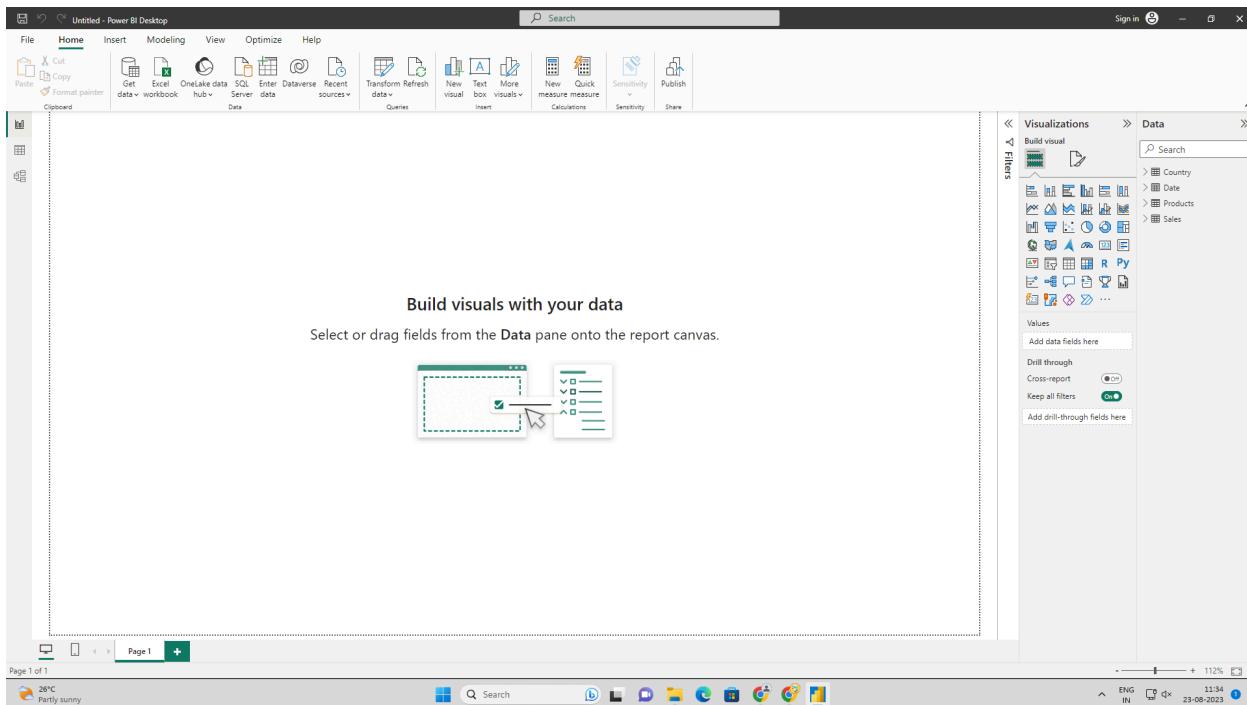


Fig.-Report view of model

Data tab

When you go to the Data tab, you can see all the data as per the defined Relationship from the data sources.

Fig.-Table view of model

In the Model tab, you can see the relationship between data sources.

Fig.- Model view of model

Automatic relationship updates

You can manage how Power BI treats and automatically adjusts relationships in your reports and models.

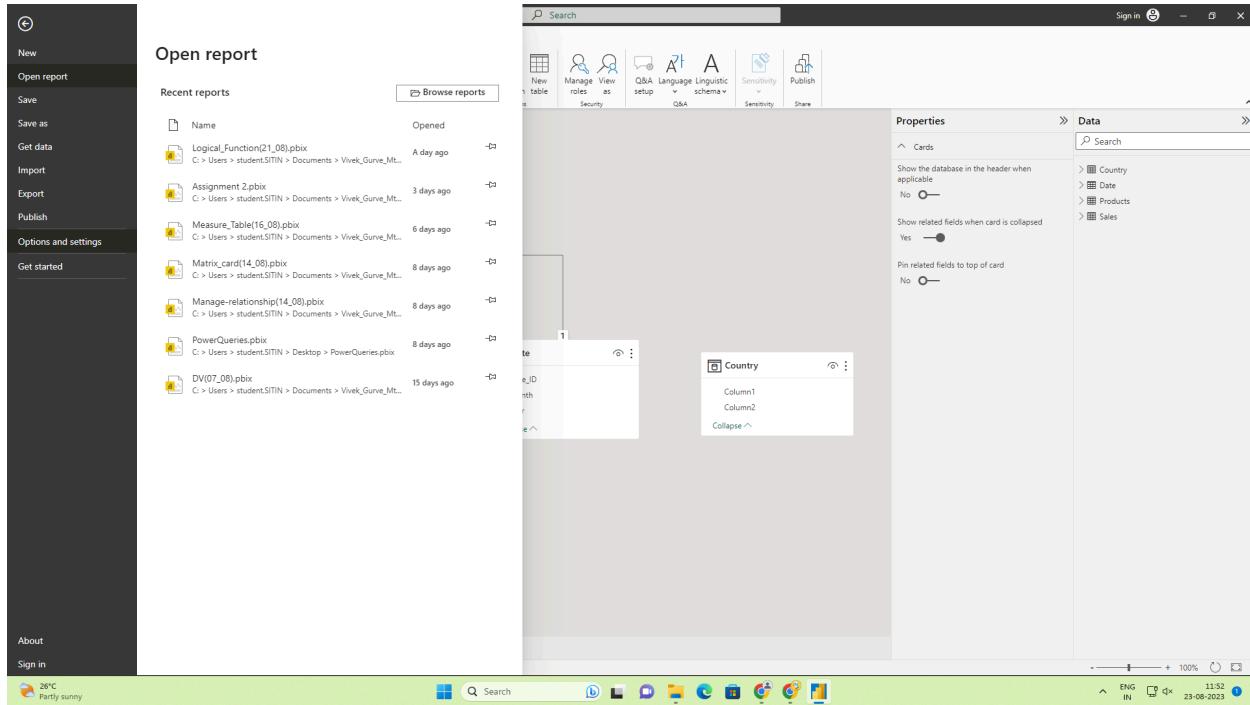


Fig.-Select File and select Options and settings

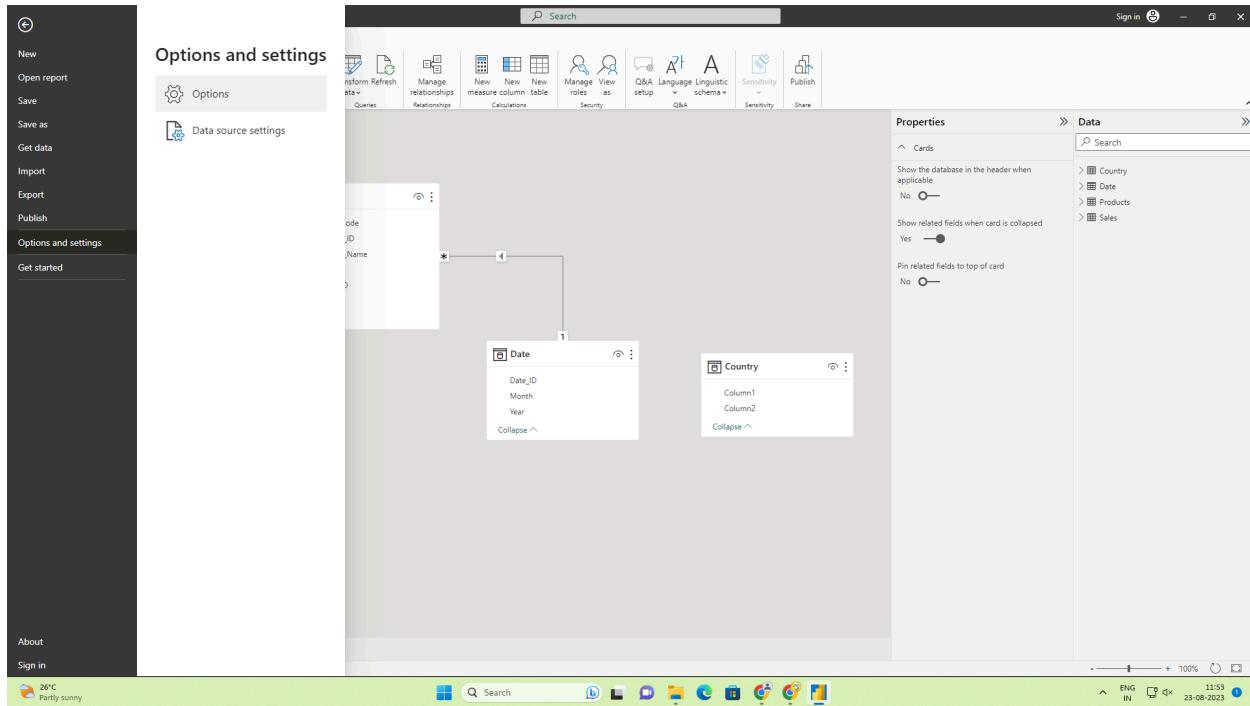


Fig.-Select File and select Options from Power BI Desktop

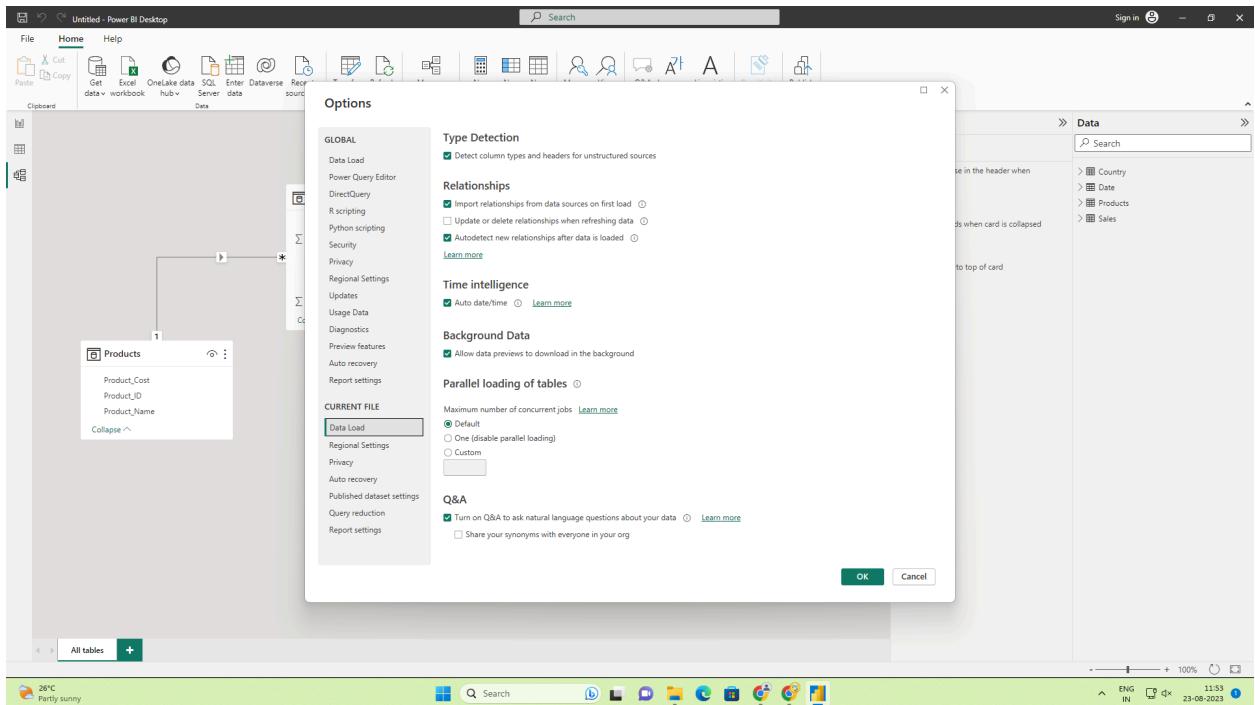


Fig.- Select Data Load in the left pane

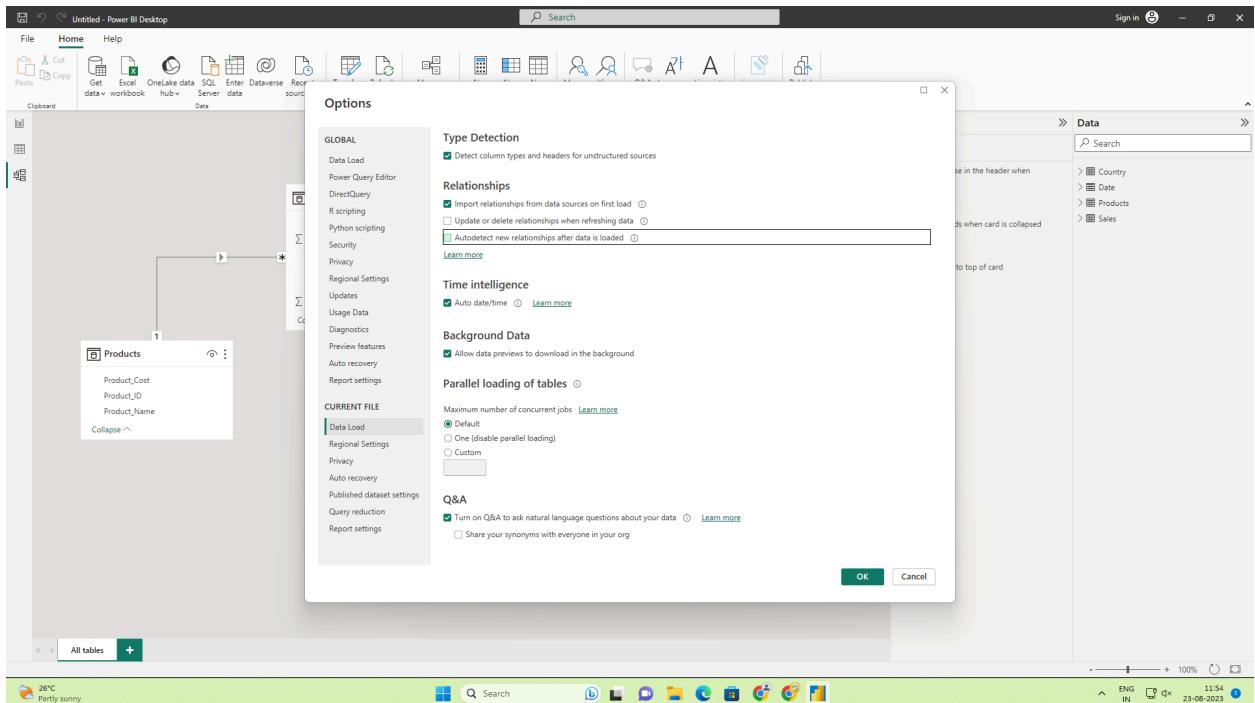


Fig.- uncheck autodetection new relationship after data is loaded

Remove relationships

We can also remove relationships in data visualization. To remove a relationship, you have to right-click and select the “Delete” option.

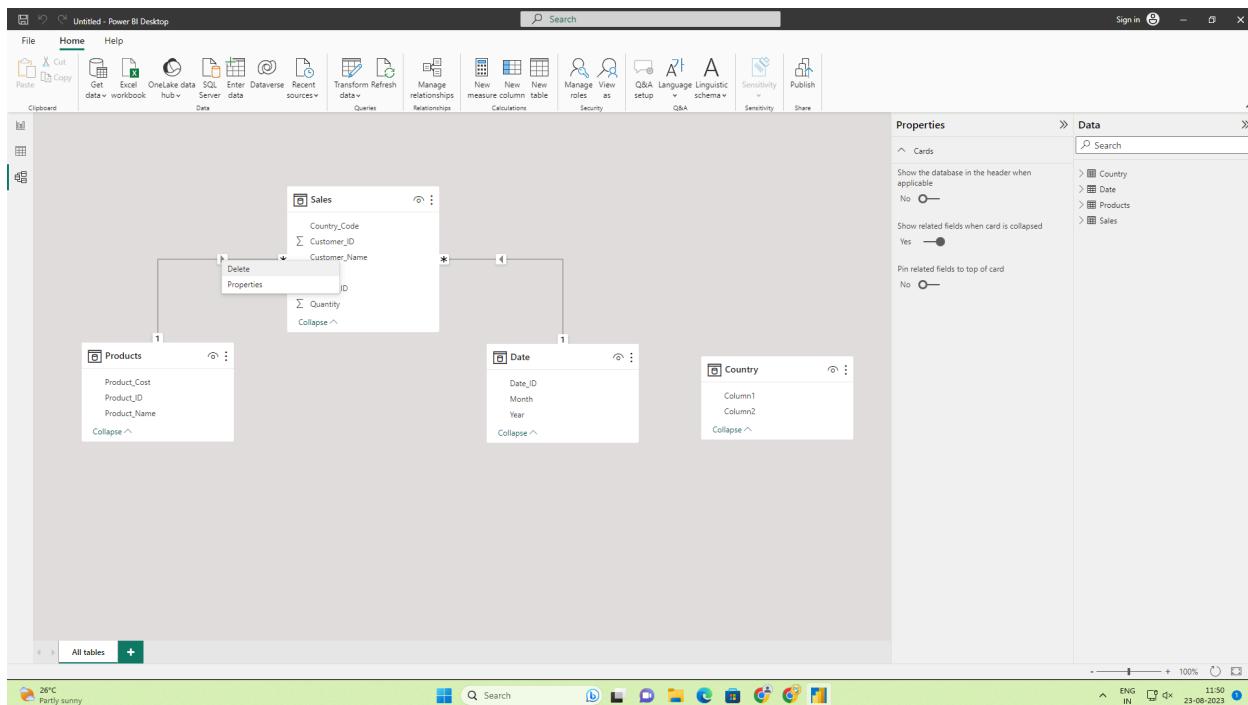


Fig.-Remove relationships

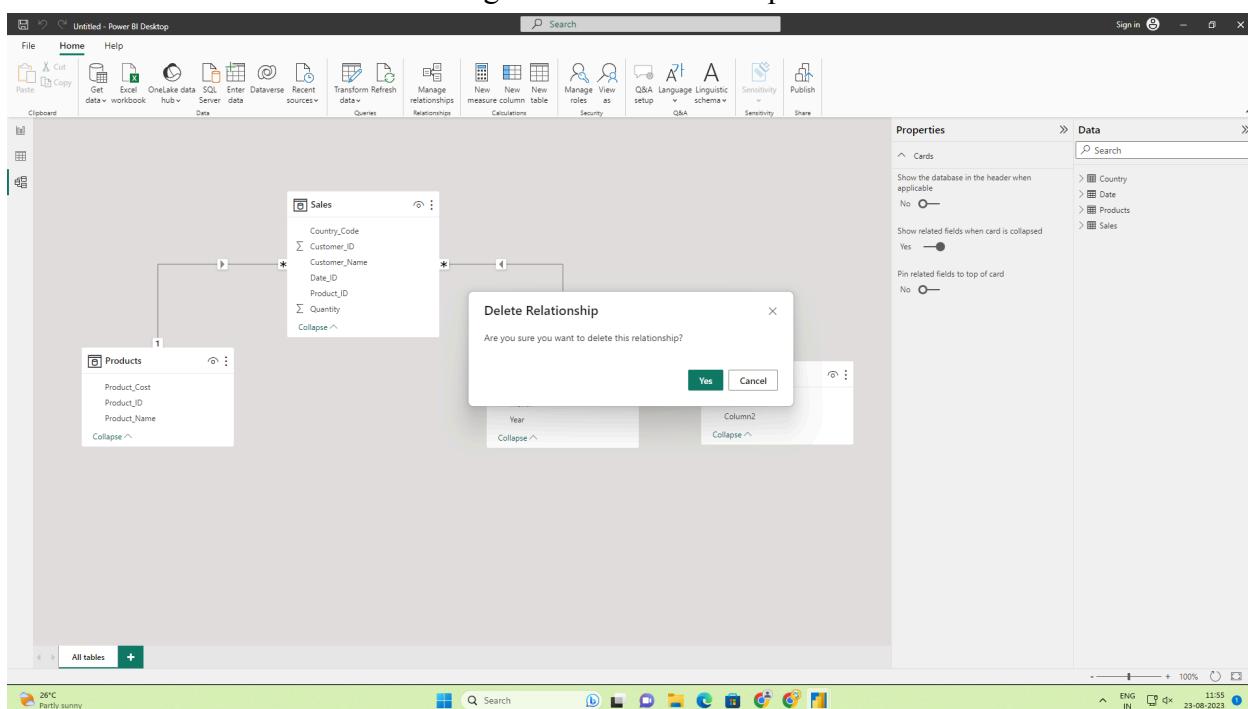


Fig.-Delete relationships between Sales and Products

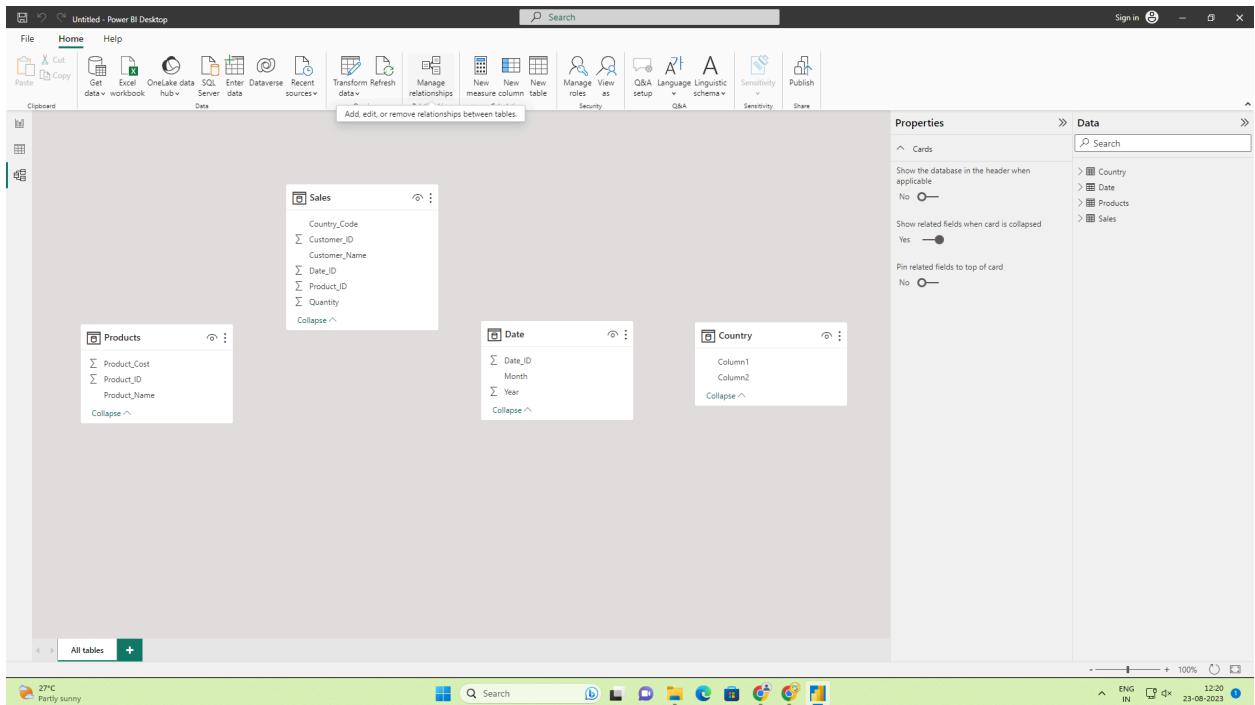


Fig.- Model view of model after deleting relationships

Add relationships

A relationship can be created in one of two ways firstly, by selecting 'Manage Relationships' from the 'Home'

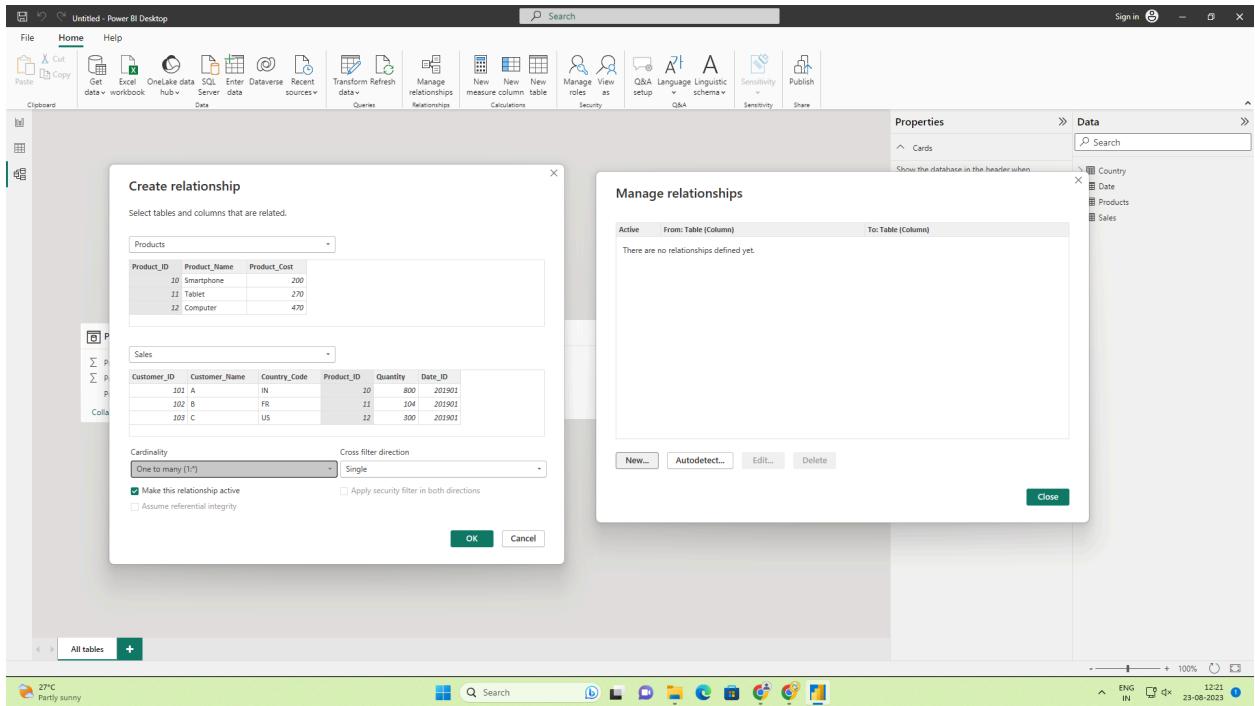


Fig.-Add relationships between Sales and Products

Secondly, by clicking and dragging the column that you want the relationship to be formed from one table onto the column of another table.

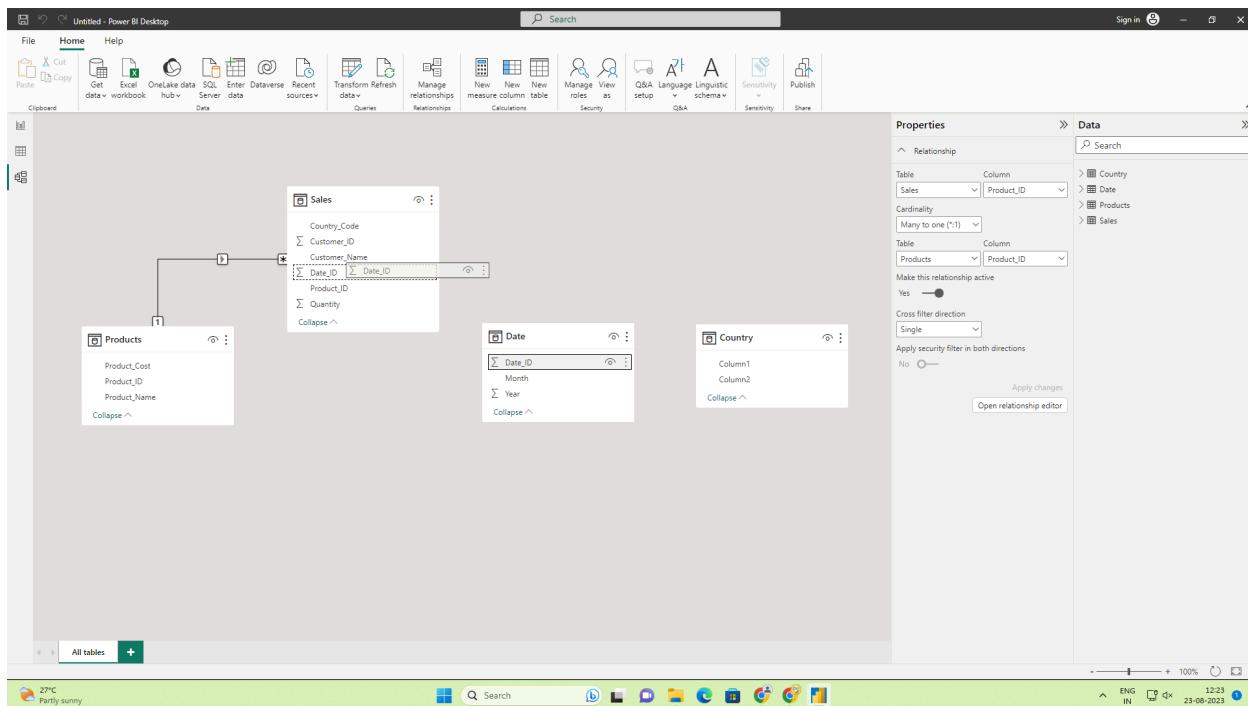


Fig.-Add relationships between Sales and Date

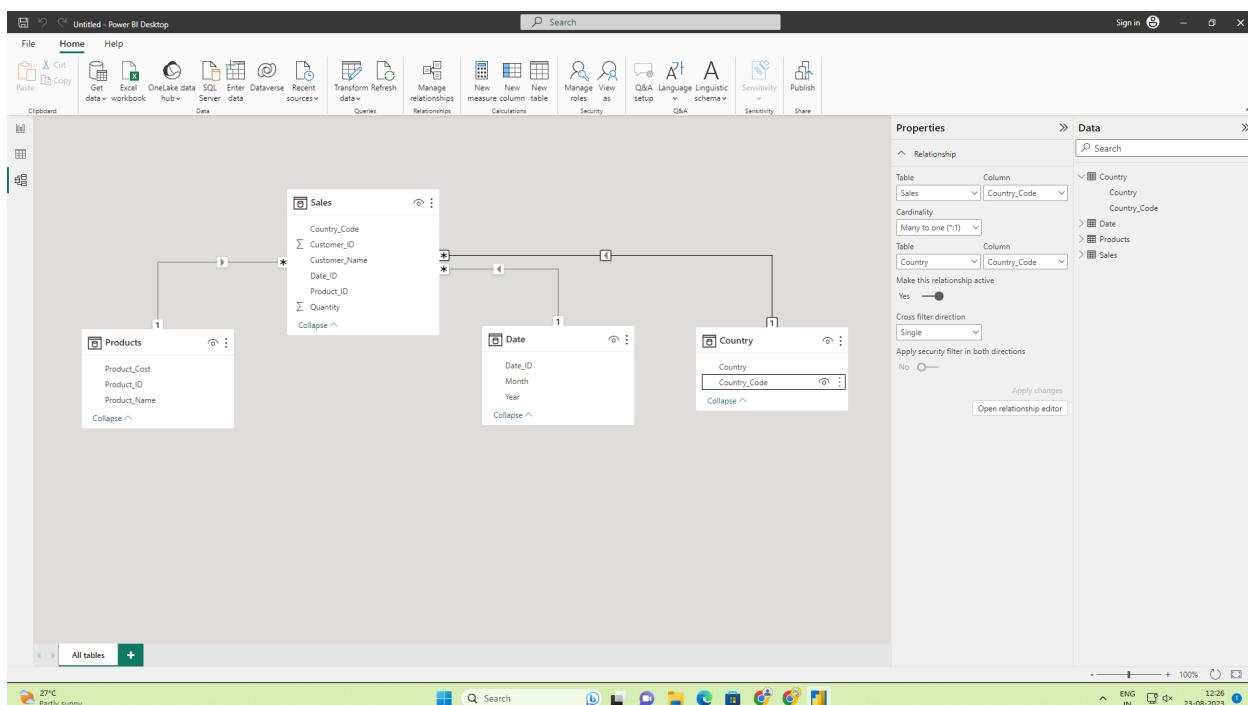


Fig.- Model view of model after Adding relationships

Relate function

Code- Country = RELATED(Country[Country])

The screenshot shows the Power BI Desktop interface with a table named "Sales". A new column, "Country", has been added using the formula `= RELATED(Country[Country])`. The "Data" pane on the right shows the relationship between the "Country" column and the "Country" table, which contains columns like Customer_ID, Customer_Name, and Country_Code.

Customer_ID	Customer_Name	Country_Code	Product_ID	Quantity	Date_ID	Country
101	A	IN	10	800	201901	India
102	B	FR	11	104	201901	France
103	C	US	12	300	201901	United States
104	D	IT	13	240	201901	Italy
105	E	MY	14	321	201901	Malaysia
106	F	UK	15	105	201902	United Kingdom
107	G	AU	16	503	201902	Australia
108	H	TH	17	438	201902	Thailand
109	I	NZ	18	352	201902	New Zealand
110	J	IN	19	678	201902	India
111	K	RU	20	424	201903	Russia
112	L	IN	21	965	201903	India
113	M	US	22	236	201903	United States
114	N	FR	23	463	201903	France
115	O	NZ	24	198	201903	New Zealand
116	P	TH	25	673	201904	Thailand
117	Q	AU	26	392	201904	Australia
118	R	IN	27	851	201904	India
119	S	MY	28	425	201904	Malaysia
120	T	JP	29	294	201904	Japan
121	U	KW	30	383	201905	Kuwait
122	V	IT	31	298	201905	Italy
123	W	TH	32	283	201905	Thailand
124	X	US	33	593	201905	United States
125	Y	FR	34	296	201906	France
126	Z	JP	35	519	201906	Japan
127	A	IN	36	800	201906	India
128	B	FR	37	104	201906	France
129	C	US	38	300	201907	United States
130	D	IT	39	240	201907	Italy
131	E	MY	40	321	201907	Malaysia
132	F	UK	41	105	201907	United Kingdom
133	G	AU	42	503	201907	Australia
134	H	TH	43	438	201908	Thailand
135	I	NZ	44	352	201908	New Zealand
136	J	IN	45	678	201908	India
137	K	RU	46	424	201908	Russia
138	L	IN	47	965	201908	India

Fig.-Related column from sales country to country

Code- Product_Cost = RELATED(Products[Product_Cost])

The screenshot shows the Power BI Desktop interface with a table named "Sales". A new column, "Product_Cost", has been added using the formula `= RELATED(Products[Product_Cost])`. The "Data" pane on the right shows the relationship between the "Product_Cost" column and the "Products" table, which contains columns like Customer_ID, Customer_Name, and Product_ID.

Customer_ID	Customer_Name	Country_Code	Product_ID	Quantity	Date_ID	Country	Product_Cost
101	A	IN	10	800	201901	India	200
102	B	FR	11	104	201901	France	270
103	C	US	12	300	201901	United States	470
104	D	IT	13	240	201901	Italy	70
105	E	MY	14	321	201901	Malaysia	550
106	F	UK	15	105	201902	United Kingdom	130
107	G	AU	16	503	201902	Australia	95
108	H	TH	17	438	201902	Thailand	50
109	I	NZ	18	352	201902	New Zealand	40
110	J	IN	19	678	201902	India	540
111	K	RU	20	424	201903	Russia	460
112	L	IN	21	965	201903	India	200
113	M	US	22	463	201903	United States	270
114	N	FR	23	198	201903	France	470
115	O	NZ	24	798	201903	New Zealand	70
116	P	TH	25	672	201904	Thailand	550
117	Q	AU	26	392	201904	Australia	130
118	R	IN	27	851	201904	India	95
119	S	MY	28	425	201904	Malaysia	50
120	T	JP	29	294	201904	Japan	40
121	U	KW	30	383	201905	Kuwait	540
122	V	IT	31	298	201905	Italy	460
123	W	TH	32	283	201905	Thailand	200
124	X	US	33	593	201905	United States	270
125	Y	FR	34	296	201906	France	470
126	Z	JP	35	519	201906	Japan	70
127	A	IN	36	800	201906	India	200
128	B	FR	37	104	201906	France	270
129	C	US	38	300	201907	United States	470
130	D	IT	39	240	201907	Italy	70
131	E	MY	40	321	201907	Malaysia	550
132	F	UK	41	105	201907	United Kingdom	130
133	G	AU	42	503	201907	Australia	95
134	H	TH	43	438	201908	Thailand	50
135	I	NZ	44	352	201908	New Zealand	40
136	J	IN	45	678	201908	India	540
137	K	RU	46	424	201908	Russia	460
138	L	IN	47	965	201908	India	200

Fig.-Related column from sales Product_Cost to Products Product_Cost

Add New Columns

let us create a new column Total_Cost

Code- Total_Cost = Sales[Quantity]*Sales[Product_Cost]

The screenshot shows the Power BI Desktop interface with a table named 'Sales'. A new column 'Total_Cost' is being created, defined by the formula `= Sales[Quantity]*Sales[Product_Cost]`. The column properties show it is of type 'Whole number'. The Data pane on the right lists the columns: Country, Customer_ID, Date, Product_Cost, Quantity, Sales, and Total_Cost.

Fig.-Create new column Total_Cost (Quantity*Product_Cost)

The screenshot shows the same Power BI Desktop interface after changing the currency of the 'Total_Cost' column. The formula remains the same: `= Sales[Quantity]*Sales[Product_Cost]`, but the column properties now show it is of type 'Whole number'. The Data pane on the right lists the columns: Country, Customer_ID, Date, Product_Cost, Quantity, Sales, and Total_Cost. The 'Total_Cost' column is highlighted in blue.

Fig.- Change Total_Cost currency

Assignment3 - Power BI Desktop

File Home Help Table tools Column tools

Name: Total_Cost Format: Currency

Data type: Whole number \$ % Auto

Summarization: Sum Data category: Uncategorized Sort by column: Sort Data groups: Groups Manage relationships: Relationships New column: New column

Total_Cost = Sales[Quantity]*Sales[Product_Cost]

Customer_ID	Customer_Name	Country_Code	Product_ID	Quantity	Date_ID	Country	Product_Cost	Total_Cost
101	A	IN	10	800	201901	India	200	₹ 160,000
102	B	FR	11	104	201901	France	270	₹ 28,080
103	C	US	12	300	201901	United States	470	₹ 141,000
104	D	IT	13	240	201901	Italy	70	₹ 16,800
105	E	MY	14	321	201901	Malaysia	550	₹ 176,550
106	F	UK	15	105	201902	United Kingdom	130	₹ 13,650
107	G	AU	16	503	201902	Australia	95	₹ 47,785
108	H	TH	17	438	201902	Thailand	50	₹ 21,900
109	I	NZ	18	352	201902	New Zealand	40	₹ 14,080
110	J	IN	19	678	201902	India	540	₹ 36,320
111	K	RU	20	424	201903	Russia	460	₹ 193,040
112	L	IN	10	965	201903	India	200	₹ 193,000
113	M	US	11	236	201903	United States	270	₹ 63,720
114	N	FR	12	463	201903	France	470	₹ 21,7610
115	O	NZ	13	198	201903	New Zealand	70	₹ 13,860
116	P	TH	14	673	201904	Thailand	550	₹ 37,0150
117	Q	AU	15	392	201904	Australia	130	₹ 50,960
118	R	IN	16	851	201904	India	95	₹ 80,845
119	S	MY	17	425	201904	Malaysia	50	₹ 21,250
120	T	JP	18	294	201904	Japan	40	₹ 11,760
121	U	KW	19	383	201905	Kuwait	540	₹ 205,620
122	V	IT	20	298	201905	Italy	460	₹ 13,7080
123	W	TH	21	283	201905	Thailand	200	₹ 56,600
124	X	US	22	593	201905	United States	270	₹ 160,110
125	Y	FR	23	296	201906	France	470	₹ 130,120
126	Z	JP	24	519	201906	Japan	70	₹ 36,330
127	A	IN	25	800	201906	India	200	₹ 160,000
128	B	FR	26	104	201906	France	270	₹ 28,080
129	C	US	27	300	201907	United States	470	₹ 141,000
130	D	IT	28	240	201907	Italy	70	₹ 16,800
131	E	MY	29	321	201907	Malaysia	550	₹ 176,550
132	F	UK	30	105	201907	United Kingdom	130	₹ 13,650
133	G	AU	31	503	201907	Australia	95	₹ 47,785
134	H	TH	32	438	201908	Thailand	50	₹ 21,900
135	I	NZ	33	352	201908	New Zealand	40	₹ 14,080
136	J	IN	34	678	201908	India	540	₹ 36,320
137	K	RU	35	424	201908	Russia	460	₹ 193,040
138	L	IN	36	665	201909	India	200	₹ 193,000

Table Sales (104 rows) Column: Total_Cost (26 distinct values)

Update available (click to download)

27°C Party sunny

ENG IN 12:28 26-08-2023

Fig.- Change Total_Cost currency in Indian Rupee

let us create a new column Cost level

Code- Cost level = If('Sales'[Total_Cost]>=200000,"Very High",

If('Sales'[Total_Cost]>=100000,"High", If('Sales'[Total_Cost]>=50000,"Average","Low"))

Assignment3 - Power BI Desktop

File Home Help Table tools Column tools

Name: Cost level Format: Text

Data type: Whole number \$ % Auto

Summarization: Don't summarize Data category: Uncategorized Sort by column: Sort Data groups: Groups Manage relationships: Relationships New column: New column

Cost level =

```

1 if('Sales'[Total_Cost]>=200000,"Very High",
2 ("Sales'[Total_Cost]>=100000,"High",
3 ("Sales'[Total_Cost]>=50000,"Average",
4 "Low"))
5

```

Customer_ID	Customer_Name	Country_Code	Product_ID	Quantity	Date_ID	Country	Product_Cost	Total_Cost	Cost level
101	A	IN	10	800	201901	India	200	₹ 160,000	High
102	B	FR	11	104	201901	France	270	₹ 28,080	Low
103	C	US	12	300	201901	United States	470	₹ 141,000	High
104	D	IT	13	240	201901	Italy	70	₹ 16,800	Low
105	E	MY	14	321	201901	Malaysia	550	₹ 176,550	High
106	F	UK	15	105	201902	United Kingdom	130	₹ 13,650	Low
107	G	AU	16	503	201902	Australia	95	₹ 47,785	Low
108	H	TH	17	438	201902	Thailand	50	₹ 21,900	Low
109	I	NZ	18	352	201902	New Zealand	40	₹ 14,080	Low
110	J	IN	19	678	201902	India	540	₹ 36,320	Very High
111	K	RU	20	424	201903	Russia	460	₹ 193,040	High
112	L	IN	21	965	201903	India	200	₹ 193,000	High
113	M	US	22	236	201903	United States	270	₹ 63,720	Average
114	N	FR	23	463	201903	France	470	₹ 21,7610	Very High
115	O	NZ	24	198	201903	New Zealand	70	₹ 13,860	Low
116	P	TH	25	673	201904	Thailand	550	₹ 37,0150	Very High
117	Q	AU	26	392	201904	Australia	130	₹ 50,960	Average
118	R	IN	27	851	201904	India	95	₹ 80,845	Average
119	S	MY	28	425	201904	Malaysia	50	₹ 21,250	Low
120	T	JP	29	294	201904	Japan	40	₹ 11,760	Low
121	U	KW	30	383	201905	Kuwait	540	₹ 205,620	Very High
122	V	IT	31	298	201905	Italy	460	₹ 13,7080	High
123	W	TH	32	283	201905	Thailand	200	₹ 56,600	Average
124	X	US	33	593	201905	United States	270	₹ 160,110	High
125	Y	FR	34	296	201906	France	470	₹ 130,120	High
126	Z	JP	35	519	201906	Japan	70	₹ 36,330	Low
127	A	IN	36	800	201906	India	240	₹ 200,000	High
128	B	FR	37	104	201906	France	270	₹ 28,080	Low
129	C	US	38	300	201907	United States	470	₹ 141,000	High
130	D	IT	39	240	201907	Italy	70	₹ 16,800	Low
131	E	MY	40	321	201907	Malaysia	550	₹ 176,550	High
132	F	UK	41	105	201907	United Kingdom	130	₹ 13,650	High
133	G	AU	42	503	201907	Australia	95	₹ 47,785	Low
134	H	TH	43	438	201908	Thailand	50	₹ 21,900	Low

Table Sales (104 rows) Column: Cost level (4 distinct values)

Update available (click to download)

27°C Party sunny

ENG IN 12:36 26-08-2023

Fig.-Create new column Cost level

let us create a new column Month ID

Code- Month ID = **UPPER(LEFT('Date'[Month],3))**

The screenshot shows the Power BI Desktop interface with the following details:

- Title Bar:** Assignment3 - Power BI Desktop
- Column Tools ribbon:** Name: Month ID, Data type: Text, Format: Text, Summarization: Don't summarize, Data category: Uncategorized.
- Table View:** Shows a table with columns Date_ID, Year, Month, and Month ID. The Month ID column contains values like JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.
- Data View:** Shows the data source structure. The Date table is expanded, showing fields Date_ID, Month, and Month ID. The Month field is further expanded to show JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.
- Bottom Taskbar:** Shows system icons for weather (27°C, Partly sunny), search, taskbar, and system status (ENGLISH, 12:39, 26-08-2023).

Fig.-Create new column Month ID

Card

A card is a type of visual element in Power BI that displays a single value or metric

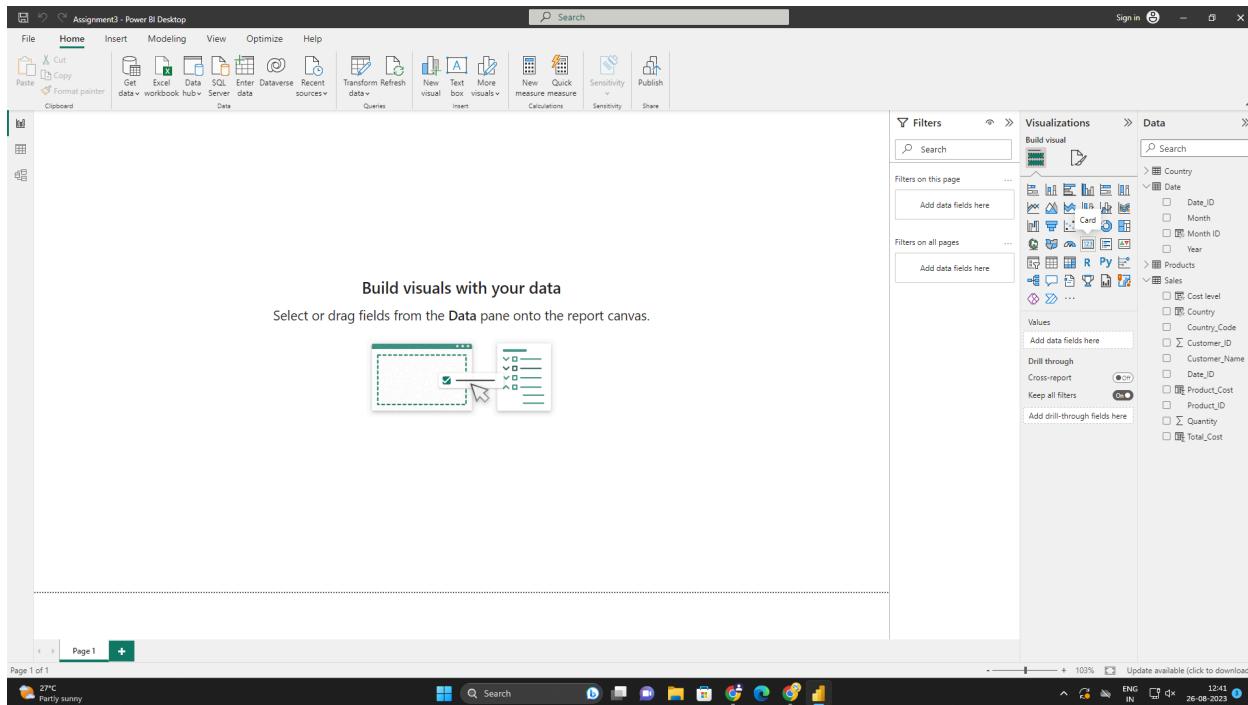


Fig.- Card Location in visual element

let us create a new card Sum of Quantity

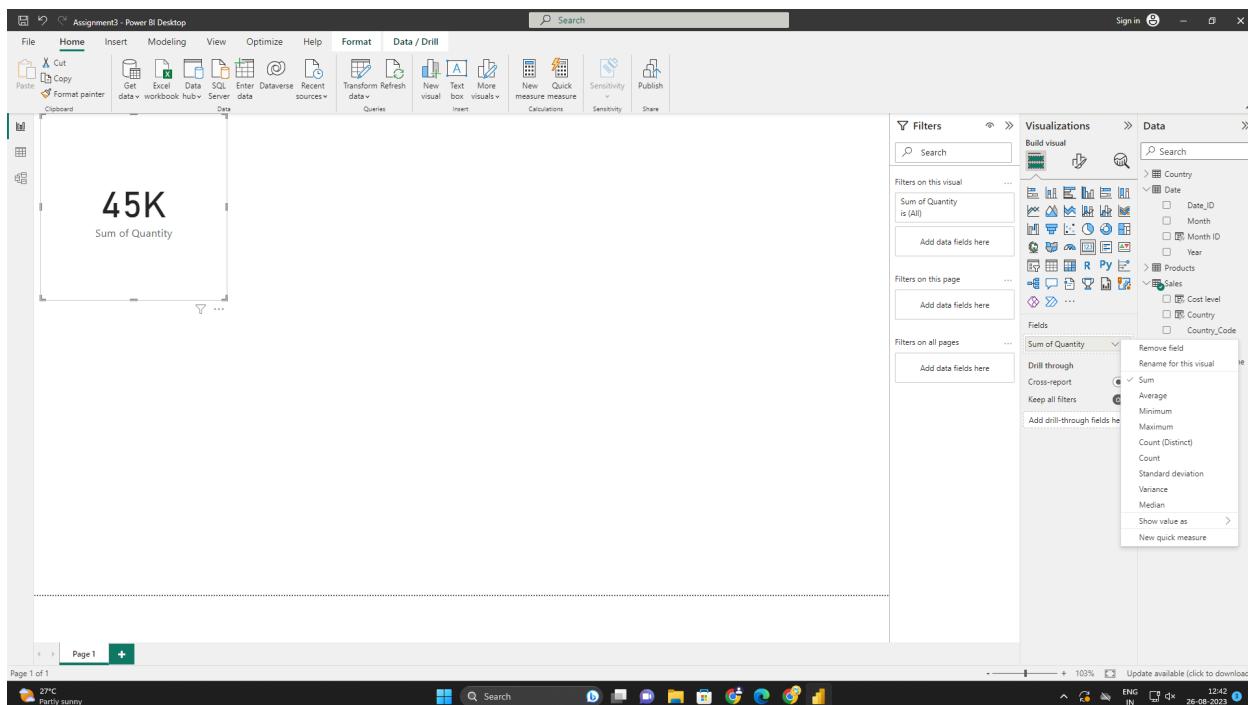


Fig.- Card Sum of Quantity in Report tab

let us create a new card Max of Product_Cost

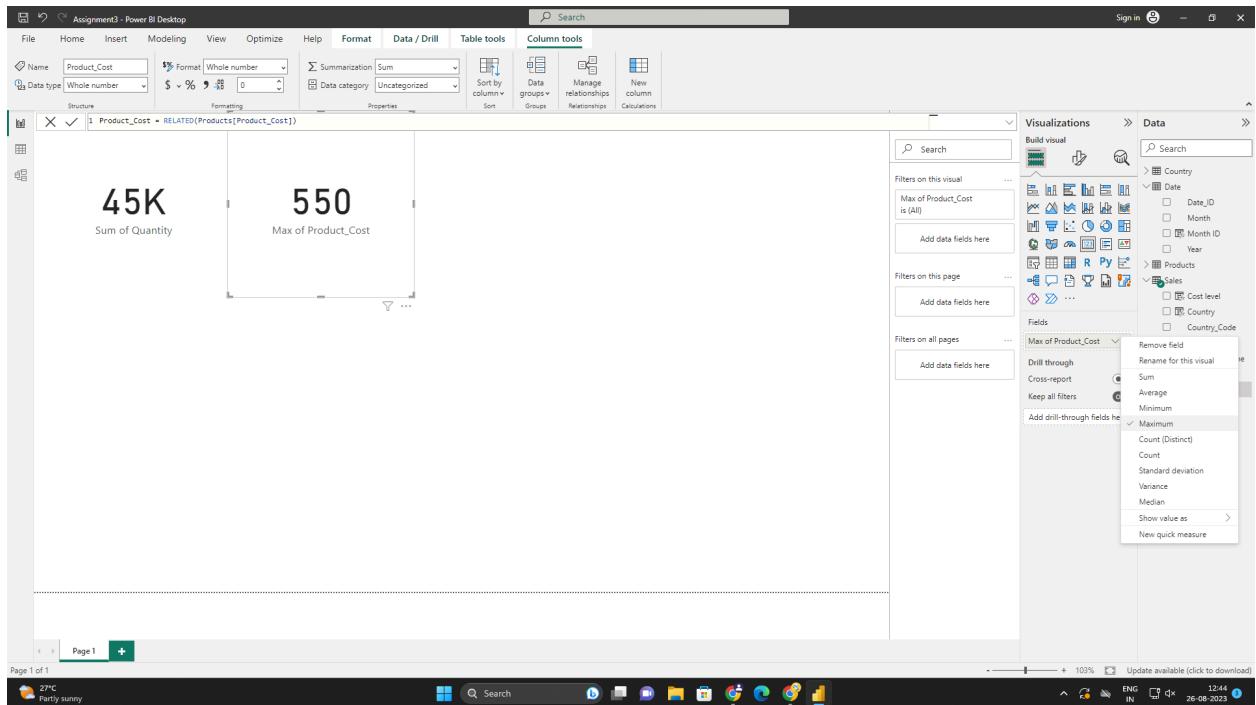


Fig.- Card Max of Product_Cost in Report tab

let us create a new card Count of Product_Cost

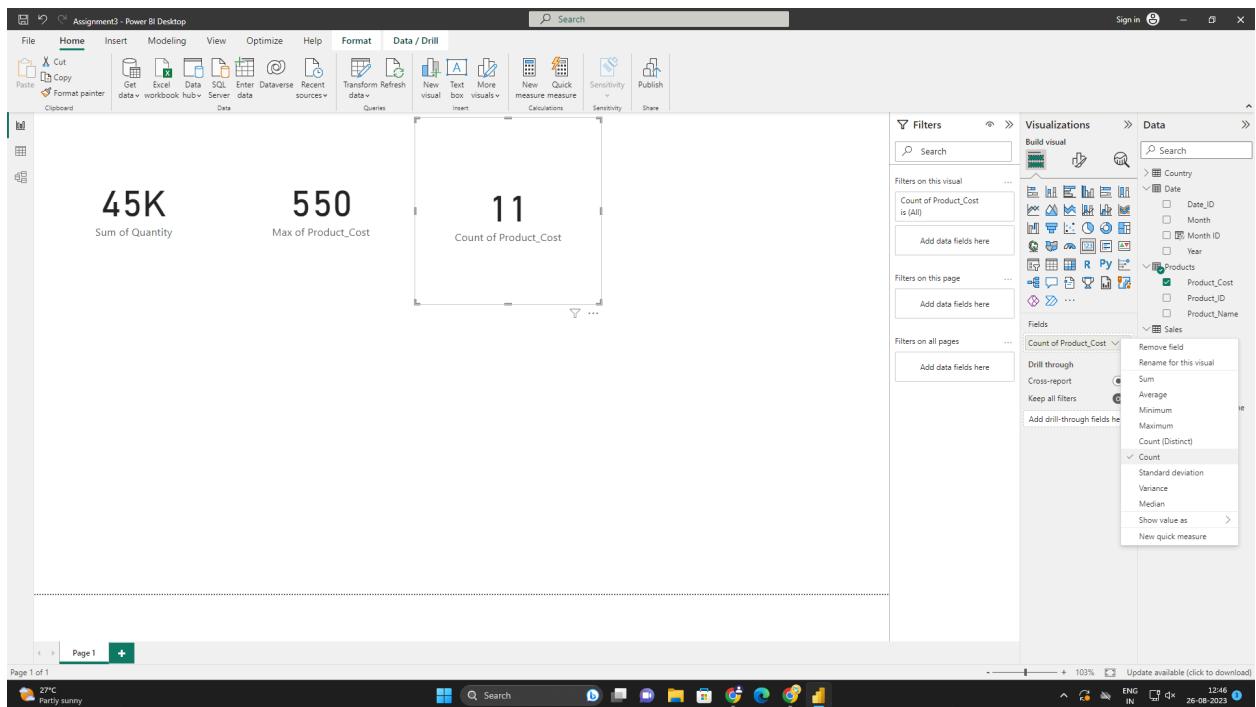


Fig.- Card Count of Product_Cost in Report tab

let us create a new card Sum of Total_Cost

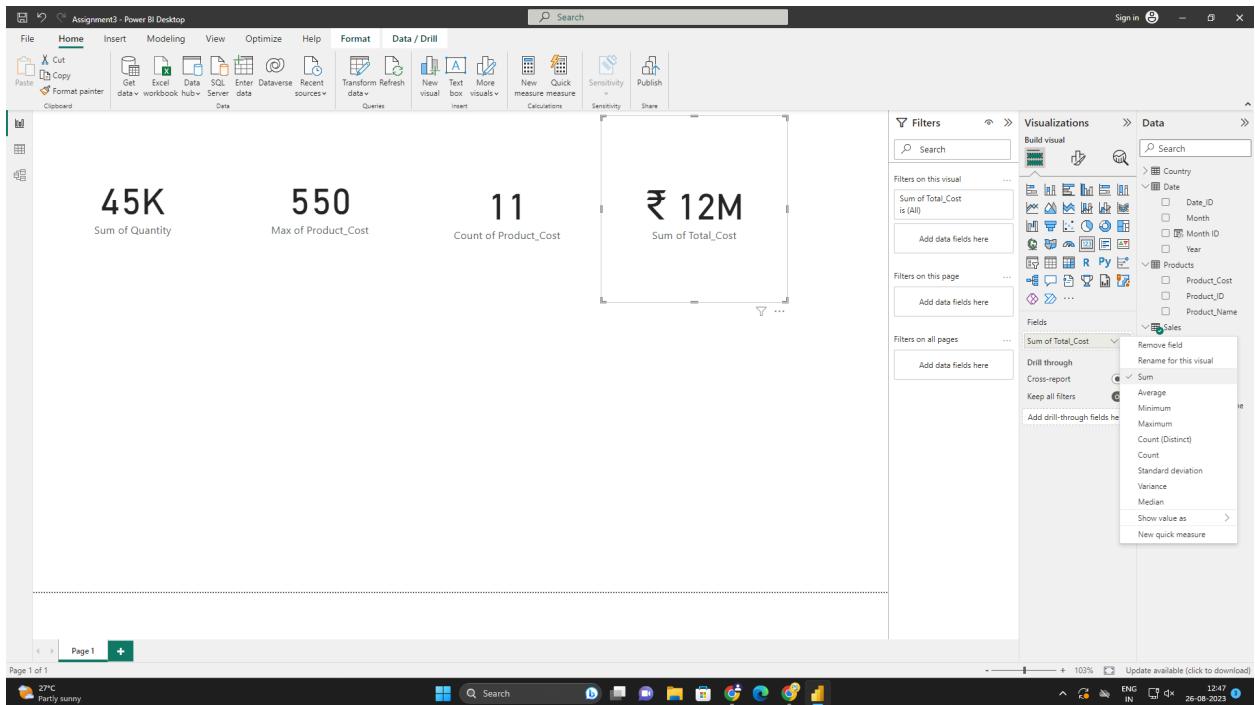


Fig.- Card Sum of Total_Cost in Report tab

let us create a new card Average of Total_Cost

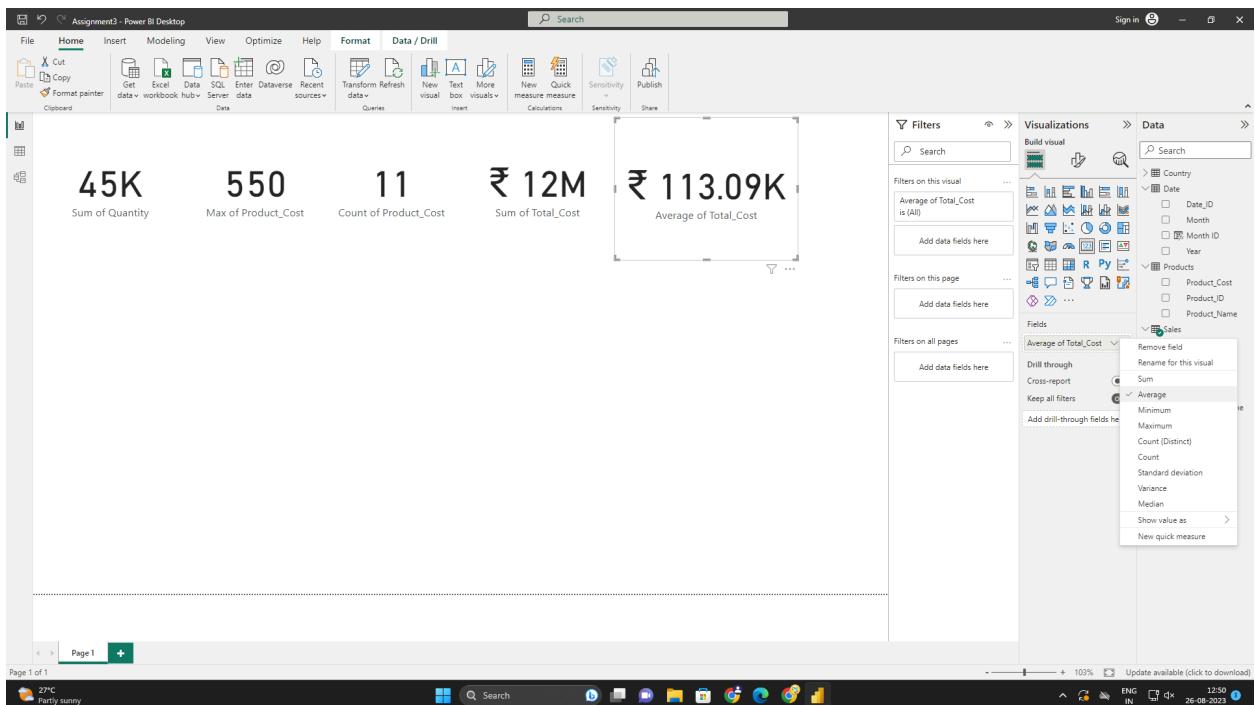


Fig.- Card Average of Total_Cost in Report tab

Card view in report tab after changing property, color, font, size and shape of cards

Fig.- All Card View in Report tab

Matrix

The matrix visual is similar to a table. A table supports two dimensions and the data is flat, meaning duplicate values are displayed and not aggregated.

Product_Name	Sum of Product_Cost
Air Conditioner	540
Computer	470
Headphone	70
Heater	180
Laptop	40
Mixer	50
Smart TV	550
Smartphone	200
Tablet	270
Toaster	95
Washing Machine	460
Total!	2875

Fig.-Matrix of Product_Name and sum of Product_Cost in Report tab

Slicer

Slicers are another way of filtering. They're displayed on the report page, and narrow the portion of the dataset that's shown in the other report visualizations.

The screenshot shows a Power BI Desktop interface with a report tab. On the left, there is a table visualization showing the sum of product cost for various items. A slicer is applied to the 'Product_Name' column, with 'Computer' selected. The report area displays five summary measures: Sum of Quantity (45K), Max of Product_Cost (550), Count of Product_Cost (11), Sum of Total_Cost (₹ 12M), and Average of Total_Cost (₹ 113.09K). The Data pane on the right shows filters for 'Product_Name' set to '(All)'.

Fig.-Slicer of Product_Name in Report tab

The screenshot shows a Power BI Desktop interface with a report tab. A slicer is applied to the 'Product_Name' column, with 'Computer' selected. The report area displays five summary measures: Sum of Quantity (4236), Max of Product_Cost (470), Count of Product_Cost (1), Sum of Total_Cost (₹ 2M), and Average of Total_Cost (₹ 165.91K). Below the slicer, two donut charts are shown: 'Sum of Product_Cost by Country_Code' (FR: 2K (33.33%), US: 4K (66.67%)) and 'Sum of Product_Cost by Cost level' (High: 2K (33.33%), Very High: 4K (66.67%)). The Data pane on the right shows filters for 'Product_Name' set to 'Computer'.

Fig.-Slicer of Computer Product in Report tab

Pie Chart

The pie chart is a round-shaped circle chart where each category data set is shown in a pie shape.

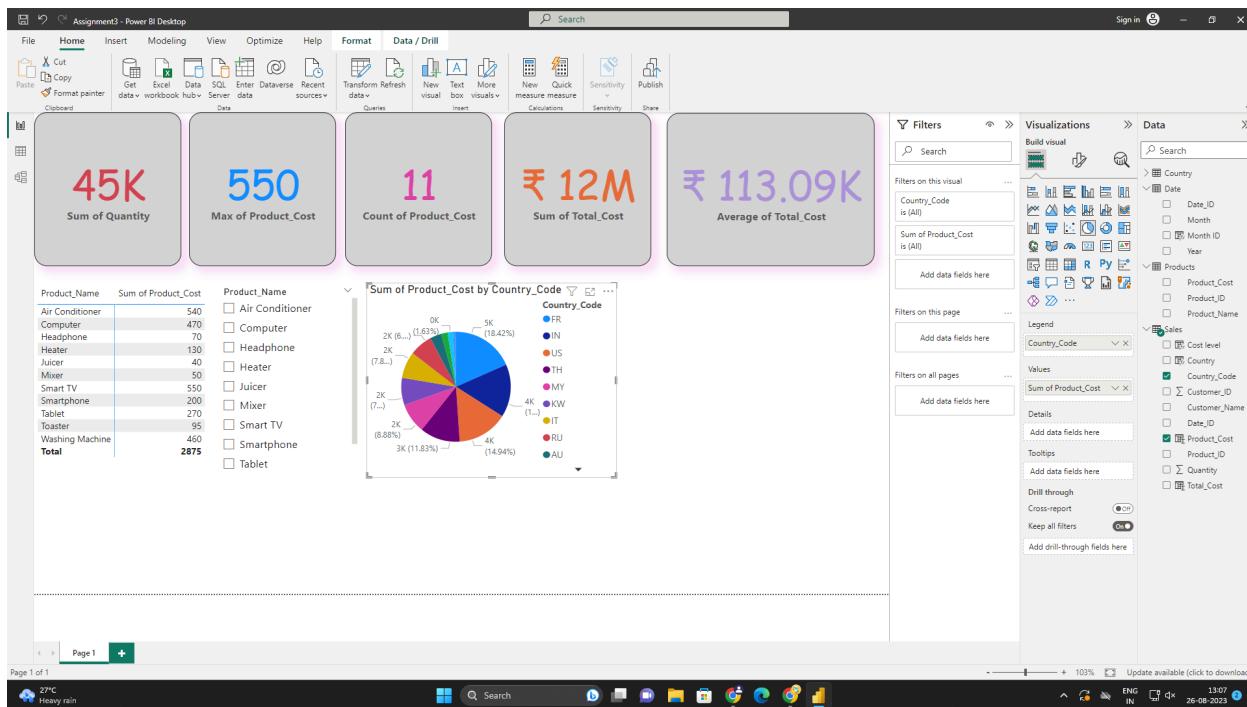


Fig.-Pi Chart of Product_Cost by Country_code in Report tab

Doughnut Chart

A doughnut chart is similar to a pie chart in that it shows the relationship of parts to a whole.

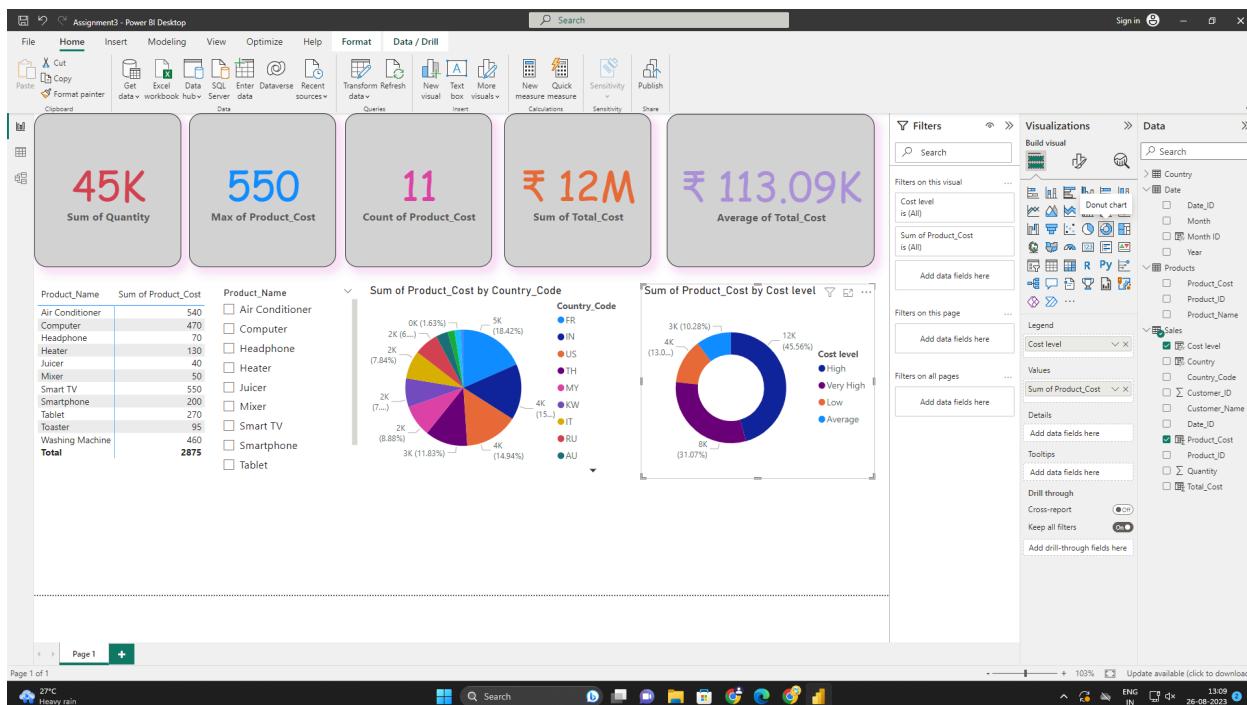


Fig.- Doughnut Chart of Product_Cost by Cost_level in Report tab

Hierarchy

Hierarchy is a collection of related fields within a dataset, arranged in a way that displays one element ranked over the other fields.

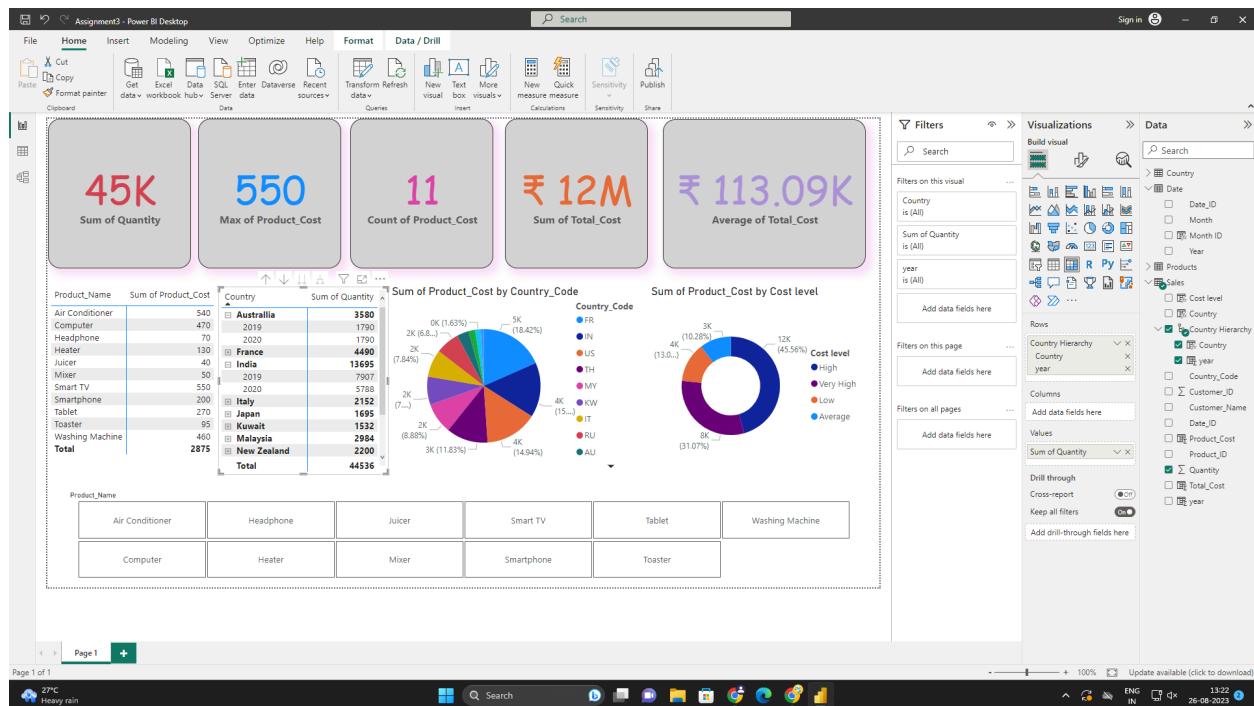


Fig.-Hierarchy with Country, Year and Sum of Quantity in Report tab

End Result

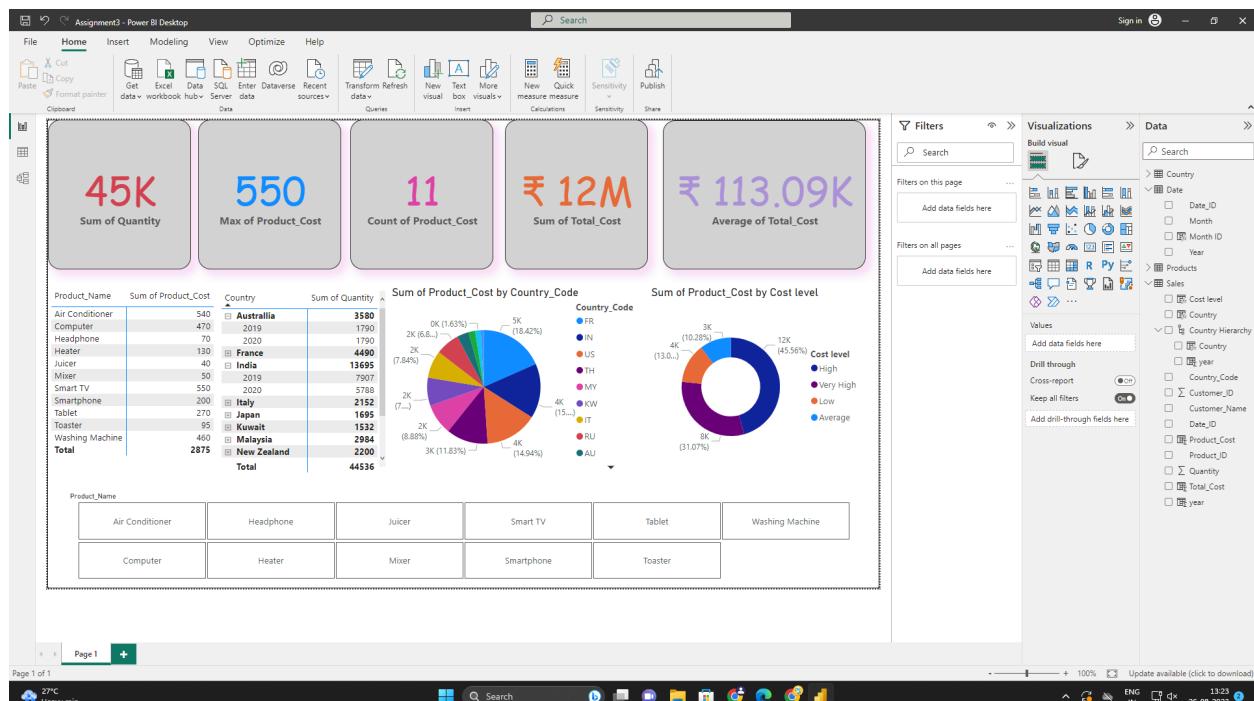


Fig.- Report tab View

