

Agenda

- Introduction to Power Bi
- Hands on with power Bi Desktop
- Start connect with Excel,CSV,Web
- Connect with database
- Connect with more than one table(joins and modeling)
- Build Visuals
- Deploy Solutions

System requirement

8 GB RAM

10 windows

Power BI Desktop Client

Office tools

SQL/Oracle

What is Power BI?

Power BI is a cloud-based **Business Analysis and Intelligence service by Microsoft**. It is a collection of business intelligence and data visualization tools such as software services, apps and data connectors

Microsoft offers three types of Power BI platforms:

- Power BI Desktop (A desktop application)
- Power BI Service (SaaS i.e., Software as a Service)
- Power BI Mobile (For iOS and Android devices)

What is Power BI Desktop?

- *Power BI Desktop* is a free application you install on your local computer that lets you connect to, transform, and visualize your data.
- With Power BI Desktop, you can connect to multiple different sources of data, and combine them (often called *modeling*) into a data model.
- This data model lets you build visuals, and collections of visuals you can share as reports, with other people inside your organization.
- Most users who work on business intelligence projects use Power BI Desktop to create reports, and then use the *Power BI service* to share their reports with others.

Power BI Service (SaaS i.e., Software as a Service)



- **Power BI** is a collection of software services, apps, and connectors that work together to help you create, share, and consume business insights in the way that serves you and your business most effectively.
- The Microsoft Power BI service (app.powerbi.com), sometimes referred to as Power BI online, is the SaaS (*Software as a Service*) part of Power BI.
- In the Power BI service, *dashboards* help you keep a finger on the pulse of your business. Dashboards display *tiles*, which you can select to open *reports* for exploring further.
- Dashboards and reports connect to *datasets* that bring all of the relevant data together in one place.

Power BI offers a set of mobile apps for iOS, Android, and Windows mobile devices. In the mobile apps, you connect to and interact with your cloud and on-premises data.

Why Power BI?

Why Power BI?

A quick start. You'll be able to get insights quickly with an uncomplicated setup, no required training, and included dashboards for services such as Salesforce, Google Analytics, and Microsoft Dynamics.

Streamlined publication and distribution. Instead of emailing large files or putting them on a shared drive, analysts upload reports and visualizations to the Power BI service, and their data is refreshed whenever the underlying dataset is updated.

Real-time information. Dashboards update in real time, as data is pushed or streamed in, which gives viewers the ability to solve problems and identify opportunities quickly.

Ability to customize Power BI app navigation. An "app navigation experiences" feature gives report developers the power to customize navigation to help viewers find content quickly and understand the relationships between different reports and dashboards.

- Power BI can help connect multiple data sets like excel, csv, pdf, database

•Data Analysis

Power BI can collect your company data, whether it's located in the cloud or locally, and provides quick and easy access to this data. Your customers get a live 360 ° view of their business, enabling them to search and explore their data quickly and easily.

•Interactive reporting

Customers can see all data on only one screen and the Power BI Mobile apps are automatically updated with changes to your data so you can access updated data and reports no matter where you are or whenever you need it.

•Financial overview

In just a few seconds, Power BI gives you the full picture of your data across different data sources. Therefore, you can see all your financial data in a single view.

•User-friendly mobility

With the intuitive tools you can explore the underlying data, which makes it easy to find exactly the answers you need.

•Data Visualization

With Power BI you can be both creative and productive. Combine data from various databases, files and web services with the visual tools in Power BI and gain unique insight into your data

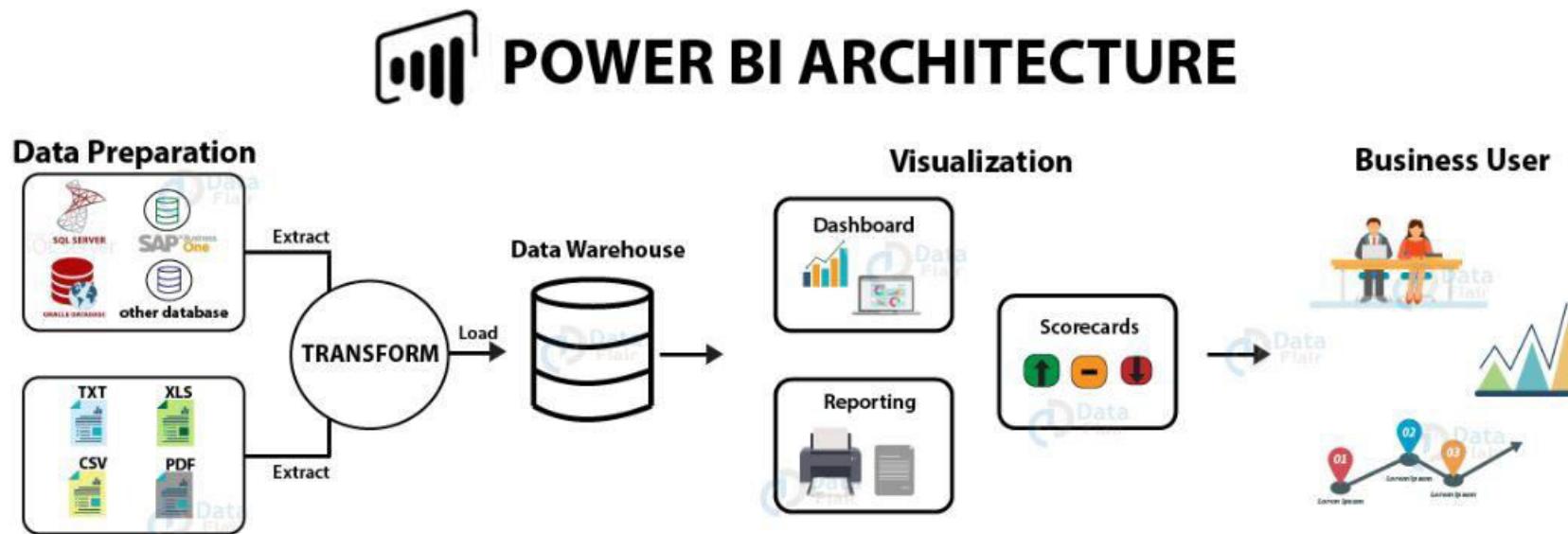
Power BI Features

Power BI Features

There are some of the most important and interesting features of Power BI:

- Attractive Visualizations/ custom visualizations
- `GetData` (Data sources)/data connections
- Datasets
- Dashboards
- Filters
- Reports
- Trend indicators
- Online Analytical Processing (OLAP)
- Navigation pane
- Natural language Q & A box
- DAX functions and formula

Power BI Architecture



1) Data Integration

In Power BI, we can import data from different kinds of data sources in different formats. In the data integration step, Power BI brings data together (extracted) from different data sources and converts it into a standard format. After data is integrated into Power BI, it is stored in a common storage area known as the **staging area**.

2. Data Processing

Once Power BI integrates and stores data at a secure place, the raw data requires some processing. Several processing or cleansing operations transform the raw data such as removing redundant values, etc. Later, we apply relevant business rules on the processed data that transforms it according to our business needs. This transformed data is loaded into the data warehouses. This completes a full process of ETL.

3. Data Presentation

In this final phase, the processed data moves from the warehouse and goes into the Power BI platforms like Power BI Desktop to *create reports, dashboards, and scorecards*. Power BI offers a wide range of visualizations. We can also import custom visualization from the marketplace. From the report development platforms, we can publish the reports on the web or mobile apps to share it with other business users.

Objectives

- i. Hands on a basic navigations in Power BI
- ii. Connecting Power BI to excel
- iii. Connecting to csv file
- iv. Connecting to data base
- v. Managing relationship in powerbi
- iii. Exploring properties of the canvas
- iv. Adding text boxes and images
- v. Stacked Bar and Column Charts with all options covered
- vi. Changing aggregate functions and showing %Age totals

Power BI Desktop Interface:

The Report has five main areas:

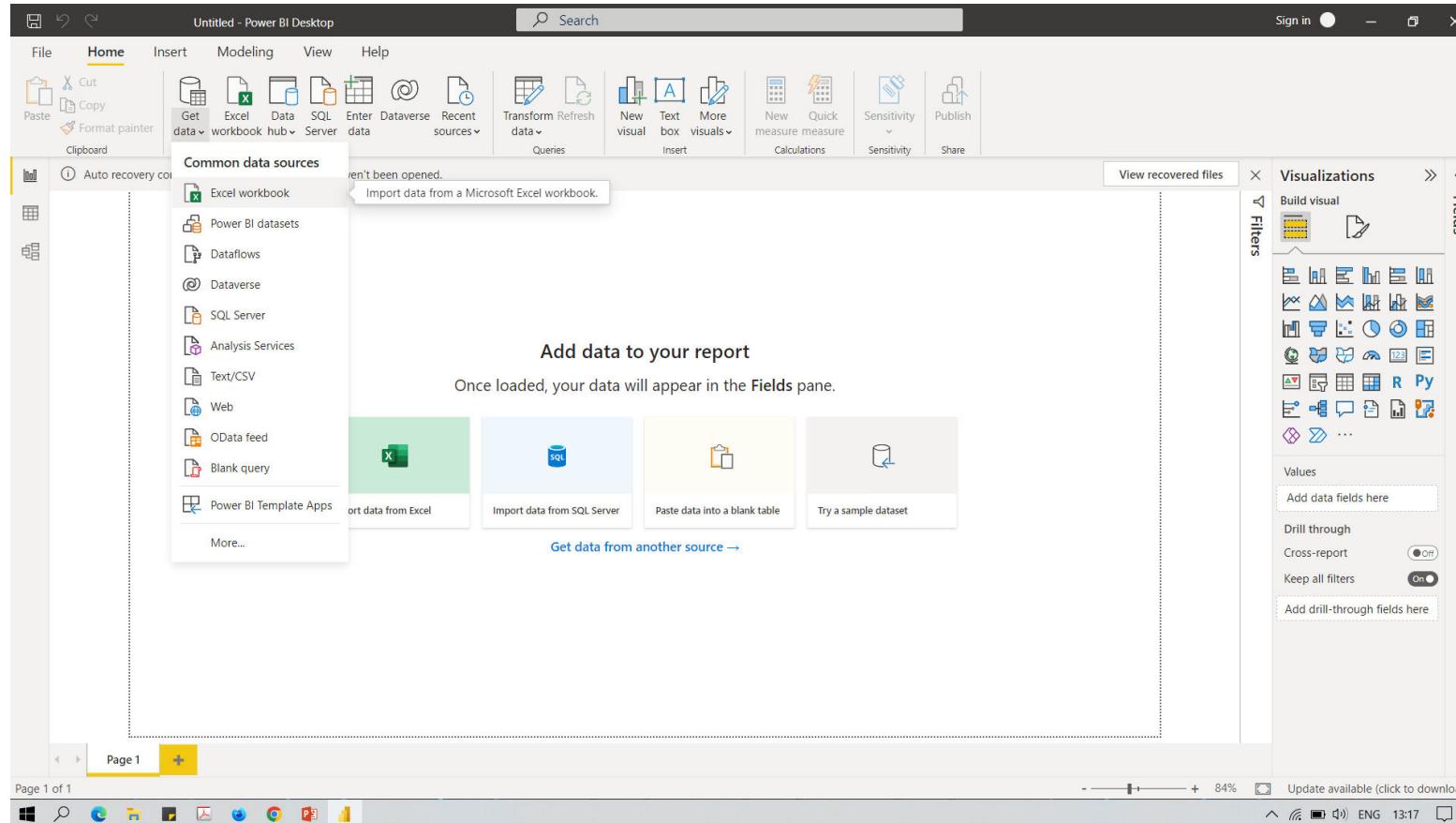
1. **Ribbon:** The **Ribbon** displays common tasks associated with reports and visualizations;
2. **Pages:** The **Pages** tab area along the bottom allows you to select or add a report page;
3. **Visualizations:** The **Visualizations** pane allows you to change visualizations, customize colors or axes, apply filters, drag fields, and more;
4. **Fields:** The **Fields** pane, allows you to drag and drop query elements and filters onto the **Report** view, or drag to the **Filters** area of the **Visualizations** pane;
5. **Views Pane:** There are three types of views in the views pane
 - **Reports View** – allows you to create any number of report pages with visualizations.
 - **Data View** – allows you to inspect, explore, and understand data in your Power BI Desktop model.
 - **Relationship or Model view** – allows you to show all of the tables, columns, and relationships in your model.

The screenshot shows the Power BI Desktop interface with several key components highlighted:

- Ribbon:** The top navigation bar containing File, Home, View, Modeling, and Help tabs, along with various icons for file operations, data management, and visualization creation.
- Report View:** Indicated by three arrows pointing to the first three icons in the Home tab's ribbon.
- Data View:** Indicated by an arrow pointing to the fourth icon in the Home tab's ribbon.
- Relationship View:** Indicated by an arrow pointing to the fifth icon in the Home tab's ribbon.
- Report Canvas:** The main workspace where visualizations are built, currently labeled "Report Canvas".
- Visualizations Pane:** A pane on the right side of the canvas containing a grid of visualization icons and a "Values" section with a placeholder "Drag data fields here".
- Fields Pane:** A pane on the right side of the canvas containing sections for "Page level filters", "Drillthrough filters", and "Report level filters", each with a placeholder "Drag data fields here".
- Pages Tab:** A tab at the bottom left of the canvas area, currently showing "Page 1".

Connecting Power BI to excel

Connecting to excel



Connecting Power BI to excel

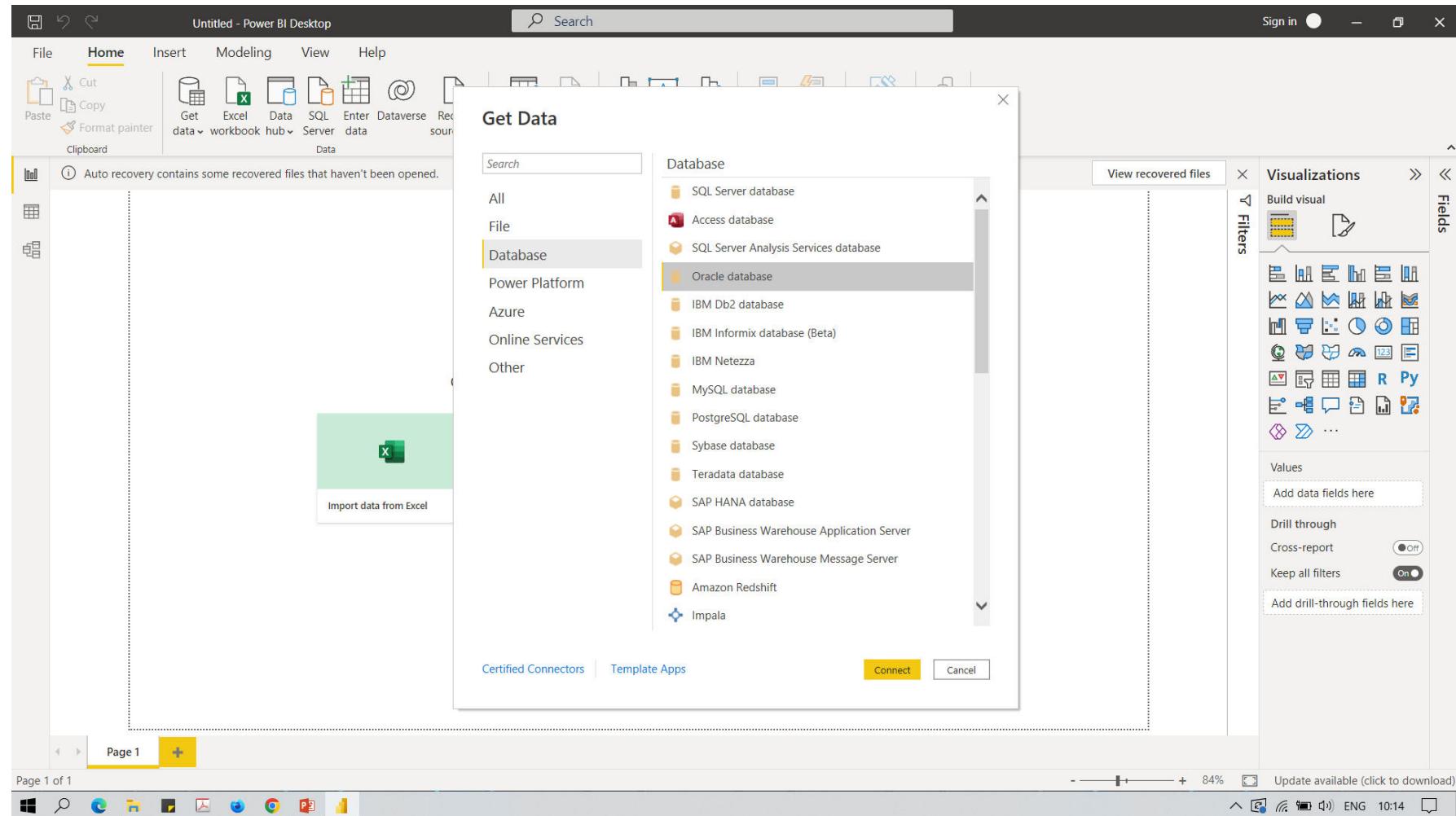
The screenshot shows the Power BI Desktop interface with the following details:

- Home Tab:** Selected tab.
- File Tab:** Contains options like Paste, Cut, Copy, Get data, Insert, Modeling, View, and Help.
- Navigator Pane:** Shows a preview of an Excel file named "city and state.xlsx [3]". It lists three tables: "city", "country", and "state1".
- Preview Area:** Displays a table titled "state1" with the following data:

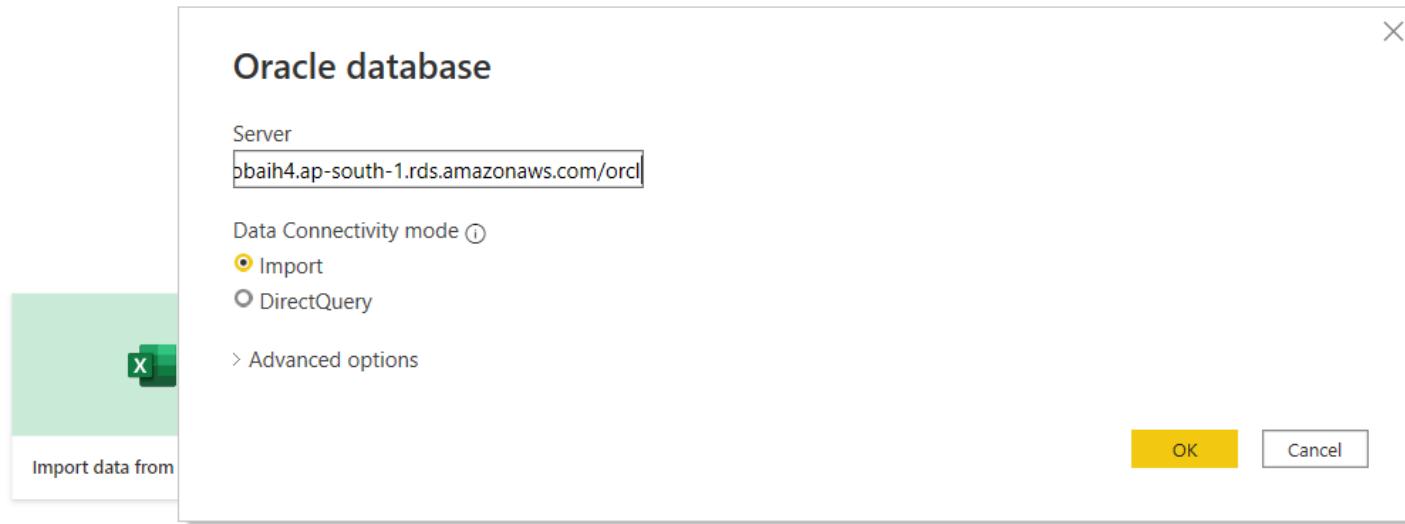
state_id	state_name	country_code
1	Karnataka	201
2	Maharashtra	201
3	Gujarat	201
4	Andhra	201
5	Kerala	201
6	Anuradhapura	202

- Visualizations Panel:** Shows various visualization icons for building reports.
- Filters Panel:** Options for drill-through, cross-report, and keep all filters.
- Buttons at the bottom:** Load, Transform Data, Cancel.
- Page Navigation:** Page 1, +.
- System Status:** Page 1 of 1, 84%, Update available (click to download), ENG, 13:18.

Connect to Oracle Data Base



Connect to Oracle Data Base



The screenshot shows the 'Navigator' pane of a database application. The tree view displays the following structure:

- TEAM8_VIJAY
- TEAM9_ANAND
- TEAM9_ANUsha
- TEAM9_BHARAT
- TEAM9_KAVERI
- TEAM9_KEERTHANA
- TEAM9_NIKHIL
- TEAM9_NIKITHA
- TEAM9_NITIN
- TEAM9_PANTHALARAJAN
- TEAM9_PRIYADHARSHINI
- TEAM9_RAHUL
- TEAM9_SHOBHA [92]
 - DEPT_EMP_VIEW
 - A1
 - A2
 - AC
 - ACC_PAYABLE
 - ACCOUNTSS
 - ACCOUNTS

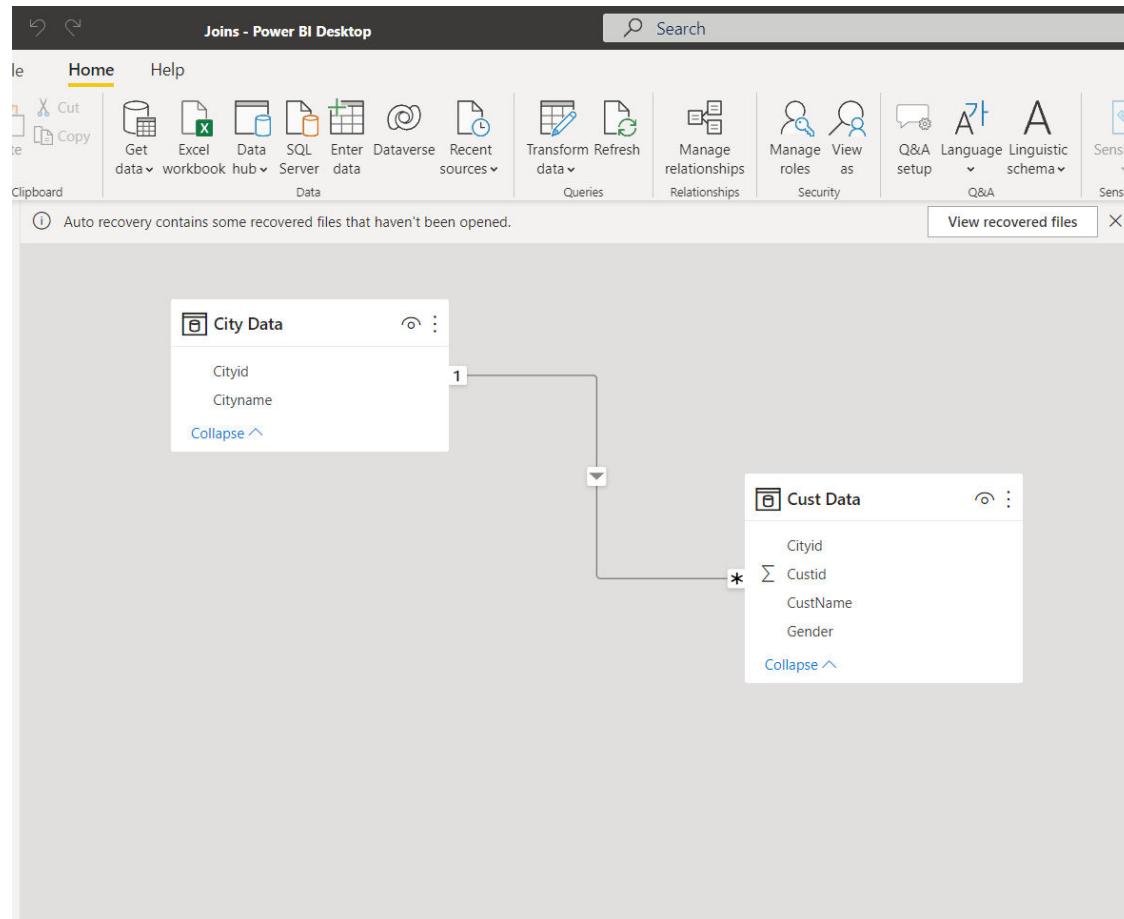
Connect to csv

The screenshot shows the 'Get Data' interface in Power BI. On the left, a search bar and a 'Get Data' button are at the top. Below them is a sidebar with a 'Search' field and categories: All, File, Database, Power Platform, Azure, Online Services, and Other. The 'Text/CSV' option is selected under the 'All' category. On the right, a preview window titled 'city.csv' displays a table with 10 rows of data. The columns are Custid, CustName, Cityid, and Gender. The data is as follows:

Custid	CustName	Cityid	Gender
1	Mike	1	Male
2	John	2	Male
3	Mary	3	Female
4	Peter	4	Male
5	Jacob	1	Male
6	King	2	Male
7	Jenny	2	Female
8	Sara	3	Female
9	Allen	3	Male
10	Tom	4	Male

At the bottom of the preview window, there are buttons for 'Extract Table Using Examples', 'Load', 'Transform Data', and 'Cancel'. At the very bottom of the interface, there are links for 'Certified Connectors' and 'Template Apps'.

Manage Relationship



Manage Relationship

Edit relationship

Select tables and columns that are related.

City Data

Cityid	Cityname
1	Bangalore
2	Chennai
3	Hyderabad

Cust Data

Custid	CustName	Cityid	Gender
1	Mike	1	Male
2	John	2	Male
3	Mary	3	Female

Cardinality

One to many (1:*)

Cross filter direction

Both

Make this relationship active

Apply security filter in both directions

Assume referential integrity

OK

Cancel

X Q&A Sensitivity Share

View recovered

Manage relationships

Active	From: Table (Column)	To: Table (Column)
<input checked="" type="checkbox"/>	Cust Data (Cityid)	City Data (Cityid)

New... Autodetect... Edit... Delete

Manage relationship-Single Flow

The diagram illustrates a data flow between three tables:

- CompanyEmployee** (Left): Employee, Tenure, City
- ProjectHours** (Center): Ticket, SubmittedBy, Hours, Project, DateSubmitted
- CompanyProject** (Right): Project, Priority

Relationships are indicated by orange arrows:

- An arrow points from the **Employee** column in **CompanyEmployee** to the **SubmittedBy** column in **ProjectHours**.
- An arrow points from the **Project** column in **ProjectHours** to the **Project** column in **CompanyProject**.

The screenshot shows a data visualization interface with the following components:

- Table View:** Displays "Employee" and "Count of Project" for each employee. The data includes:

Employee	Count of Project
Bento, Nuno	6
Bowen, Eli	6
Brewer, Alan	6
Hamilton, David	6
Han, Mu	6
Ito, Shu	6
Total	6
- Filters:** A sidebar with a magnifying glass icon.
- Visualizations:** A grid of icons representing different chart types.
- Fields:** A sidebar with a search bar and sections for:
 - CompanyEmployee:** Employee (checked), City, Tenure
 - CompanyProject:** Priority, Project (checked)
 - ProjectHours:** (checked)

Manage relationship-both side Flow

CompanyEmployee

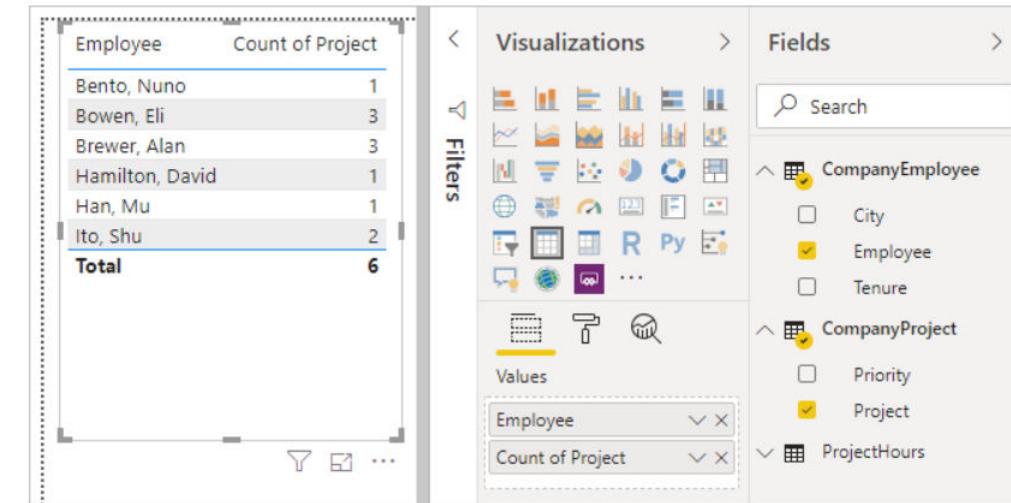
Employee	Tenure	City
Brewer, A	15	Redmond
Bowen, Eli	10	San Jose
Bento, Nuno	15	Redmond
Hamilton, David	3	San Jose
Han, Mu	1	San Jose
Ito, Shu	1	Redmond

ProjectHours

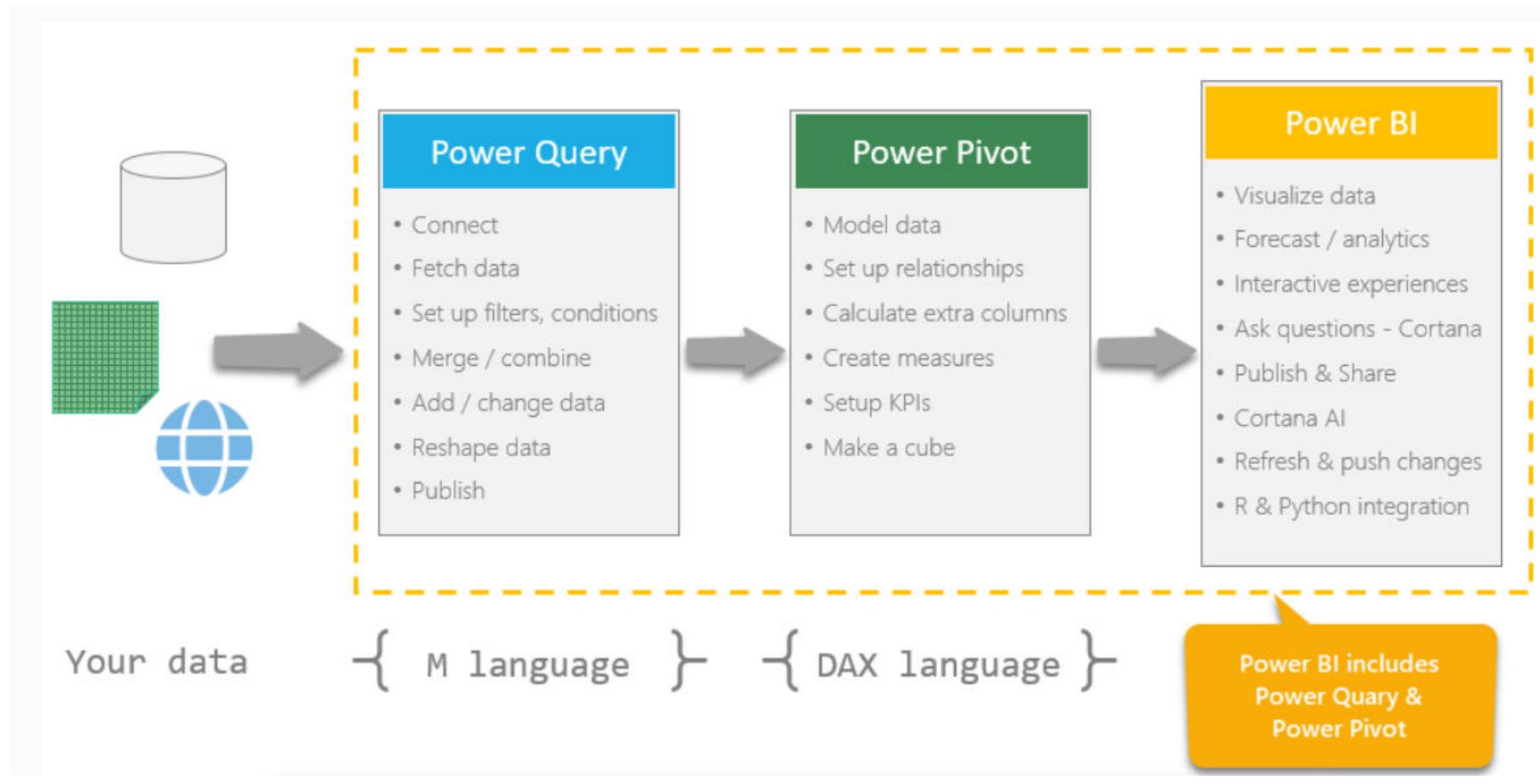
Ticket	SubmittedBy	Hours	Project	DateSubmit
1001	Brewer, Alan	22	Blue	1/1/2013
1002	Brewer, Alan	26	Red	2/1/2013
1003	Ito, Shu	34	Yellow	12/4/2012
1004	Brewer, Alan	13	Orange	1/2/2012
1005	Bowen, Eli	29	Purple	10/1/2013
1006	Bento, Nuno	35	Green	2/1/2013
1007	Hamilton, David	10	Yellow	10/1/2013
1008	Han, Mu	28	Orange	1/2/2012
1009	Ito, Shu	22	Purple	2/1/2013
1010	Bowen, Eli	28	Green	10/1/2013
1011	Bowen, Eli	9	Blue	10/15/2013

CompanyProject

Project	Priority
Blue	A
Red	B
Green	C
Yellow	C
Purple	B
Orange	C



Power Query and Power Pivot



Power Query is an ETL (Extract, Transform, Load) self-service tool that works like an Excel add-in. It allows users to extract data from different sources, manipulate the specified data into a form that matches their needs, and load it into Excel. Back in 2013, a specially created group of developers inside Microsoft released for Excel a free Power Query add-on (other names are Data Explorer, Get and Transform), which can do a lot of useful things for everyday work:

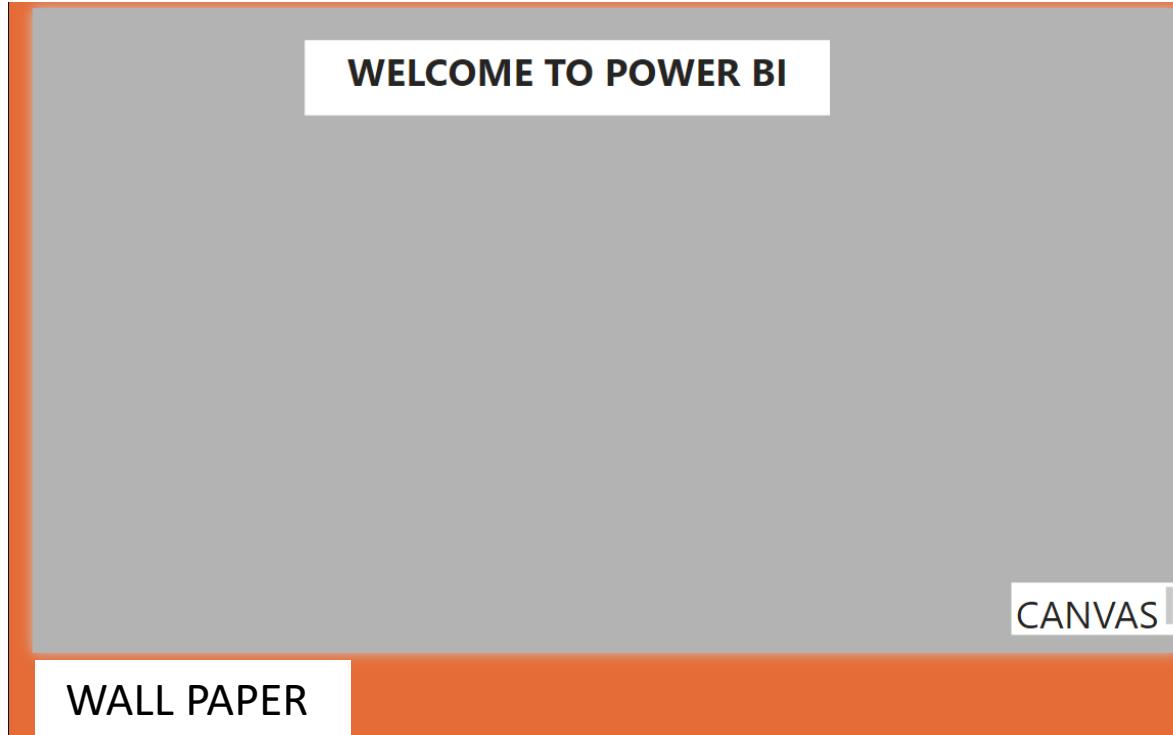
Transform tables in every way by bringing them into the desired view (filter, sort, change the order of columns, transpose, add totals, expand cross-tables into flat ones, and rollback)

Power Pivot

Power Pivot is an in-memory data modeling component that provides highly compressed data storage and extremely fast aggregation and calculation. It is also available as part of Excel and can be used to create a data model in an Excel workbook. Power Pivot can load data by itself or can load data into Power Query. It is very similar to the SSAS (SQL Server Analysis Services) tabular model, which is similar to the server version of Power Pivot.

Exploring properties of the canvas

- Go to Format your report Page select canvas Setting Explore Size of the canvas and alignment
- Go to Format your report Page select canvas background Explore color and transparency
- Go to Format your report Page select wallpaper Explore color and transparency



Adding text boxes and images

Text – Explore Font, size, alignment, Background

Image – Explore style

Format Visuals – General

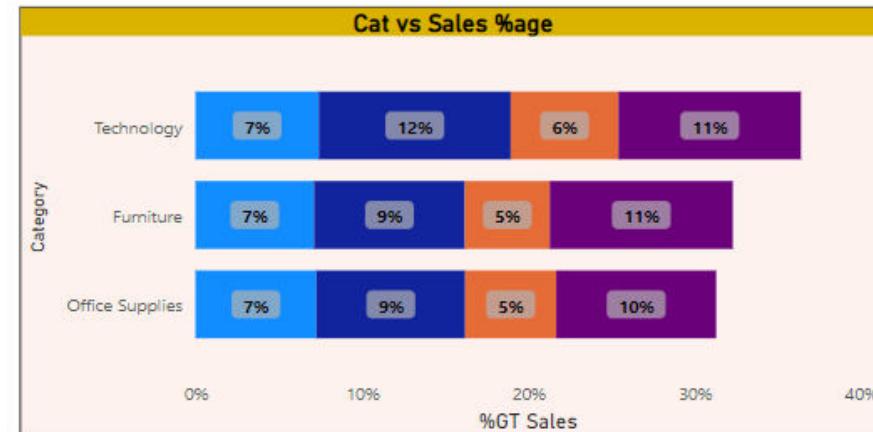
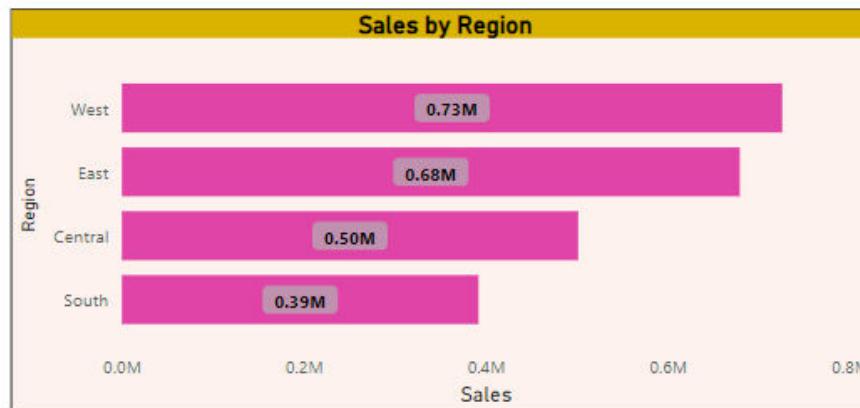
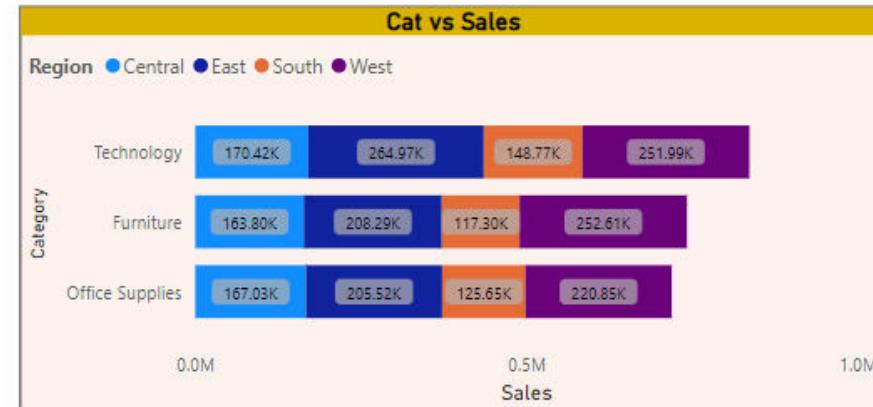
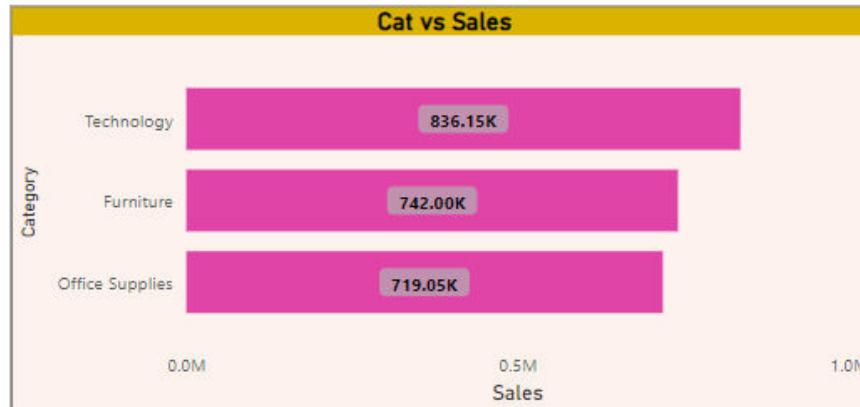
Explore Background color, Visual Border, Shadow

The screenshot shows the Power BI Desktop interface. The ribbon is visible at the top with the 'Insert' tab selected. In the 'Elements' section of the ribbon, two icons are highlighted with yellow circles: 'Text box' and 'Image'. On the canvas, there is a visual card with a yellow header containing the text 'WELCOME TO POWER BI DESKTOP' and a yellow body with the 'Power BI' logo. To the right of the canvas, the 'Format' pane is open, showing settings for the selected visual. The 'General' tab is selected under 'Image'. Under 'Effects', the 'Background' section is expanded, showing options for color (set to dark purple) and transparency (set to 72%). The 'Visual border' and 'Shadow' sections are also expanded, with their respective toggles turned on.

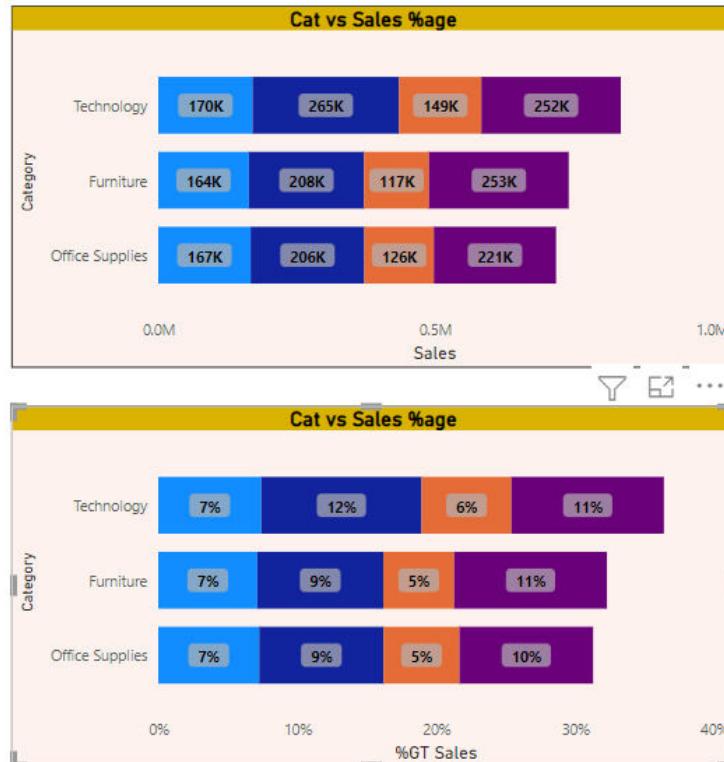
Stacked Bar with all options



Sales Analysis



Changing aggregate functions and showing %Age totals



Filters

Search

Filters on this visual

%GT Sales
is (All)

Category
is (All)

Region
is (All)

Sales
is (All)

Add data fields here

Filters on this page

f grand total for Sum of 'Orders'[Sales]

Add data fields here

Filters on all pages

Add data fields here

Visualizations

Build visual

Icon icons

Bar chart

Line chart

Stacked bar chart

Area chart

Scatter plot

Map

Donut chart

Timeline

Gauge

Table

Card

Text

Image

R Py

Link

Y-axis

Category

X-axis

%GT Sales

Legend

Region

Small multiples

Add data fields here

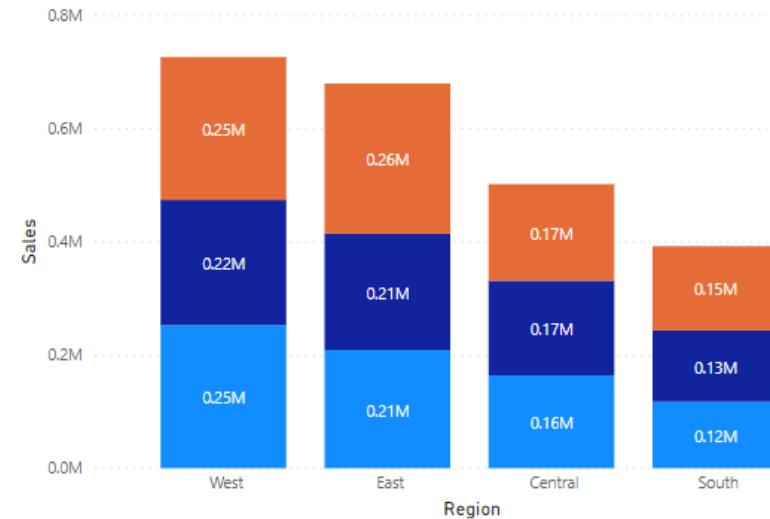
Tooltips

- i. Stacked and Cluster column chart properties
- ii. 100% Stacked Bars
- iii. Line chart and its properties
- iv. Area chart and stacked area charts
- v. Pie and Donut charts
- vi. Tables and Matrix/Crosstab reports
- vi. Tables properties

Stacked and cluster column chart properties

Sales by Region and Category

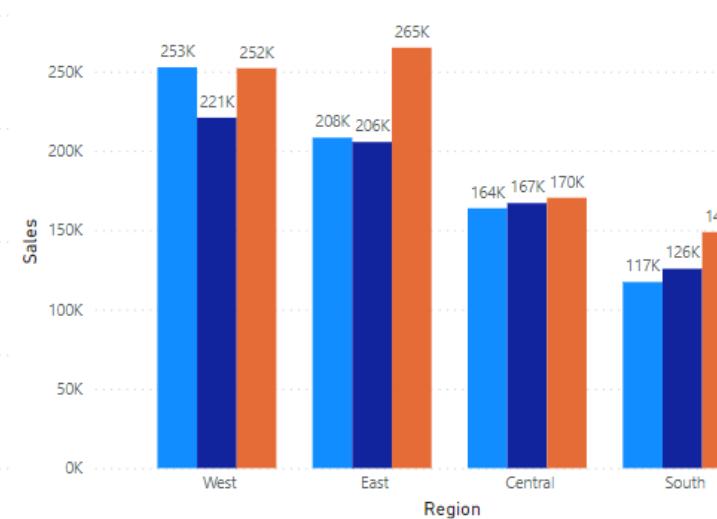
Category ● Furniture ● Office Supplies ● Technology



Stacked Column Chart

Sales by Region and Category

Category ● Furniture ● Office Supplies ● Technology

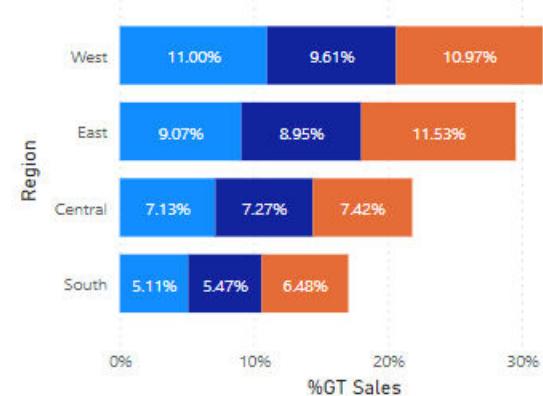


Clustered Column Chart

100% Stacked Bars

%GT Sales by Region and Category

Category ● Furniture ● Office Supplies ● Technology



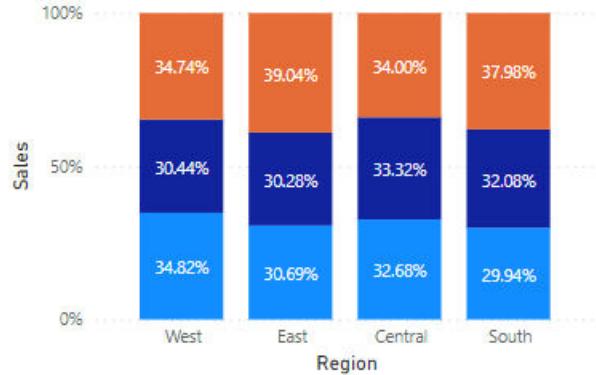
Sales by Region and Category

Category ● Furniture ● Office Supplies ● Technology

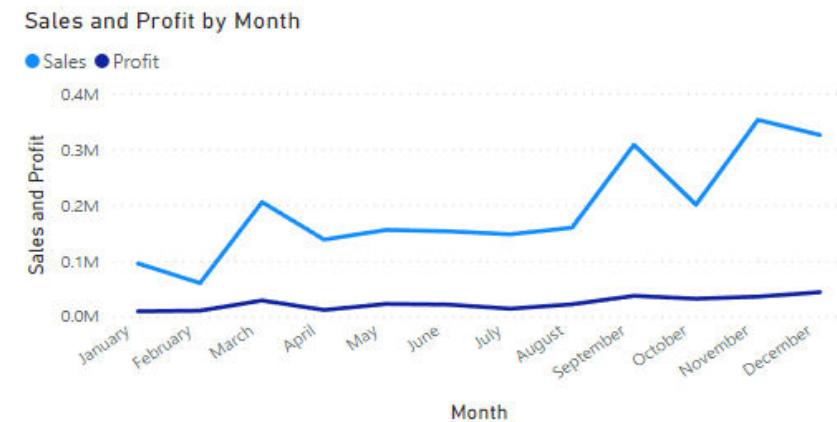
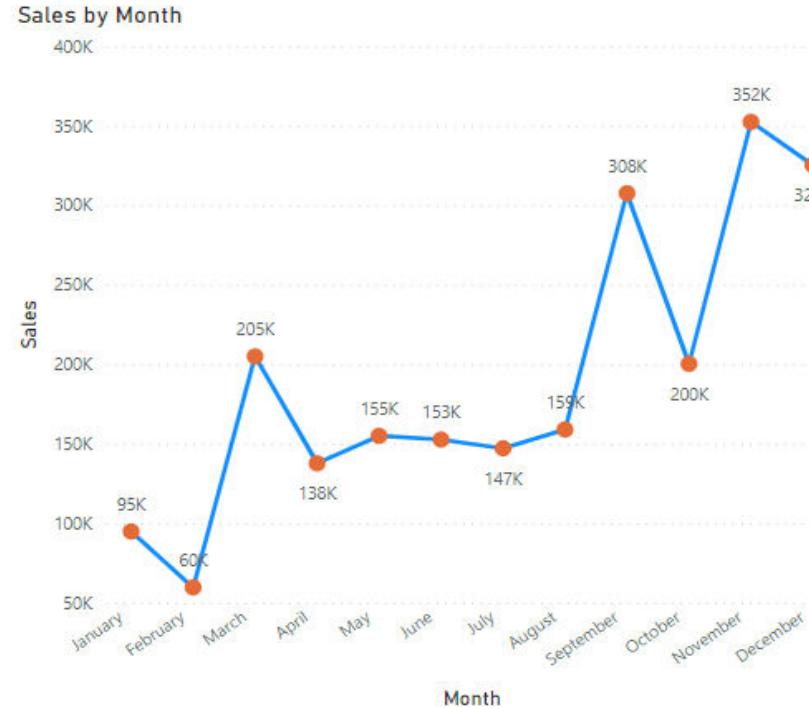


Sales by Region and Category

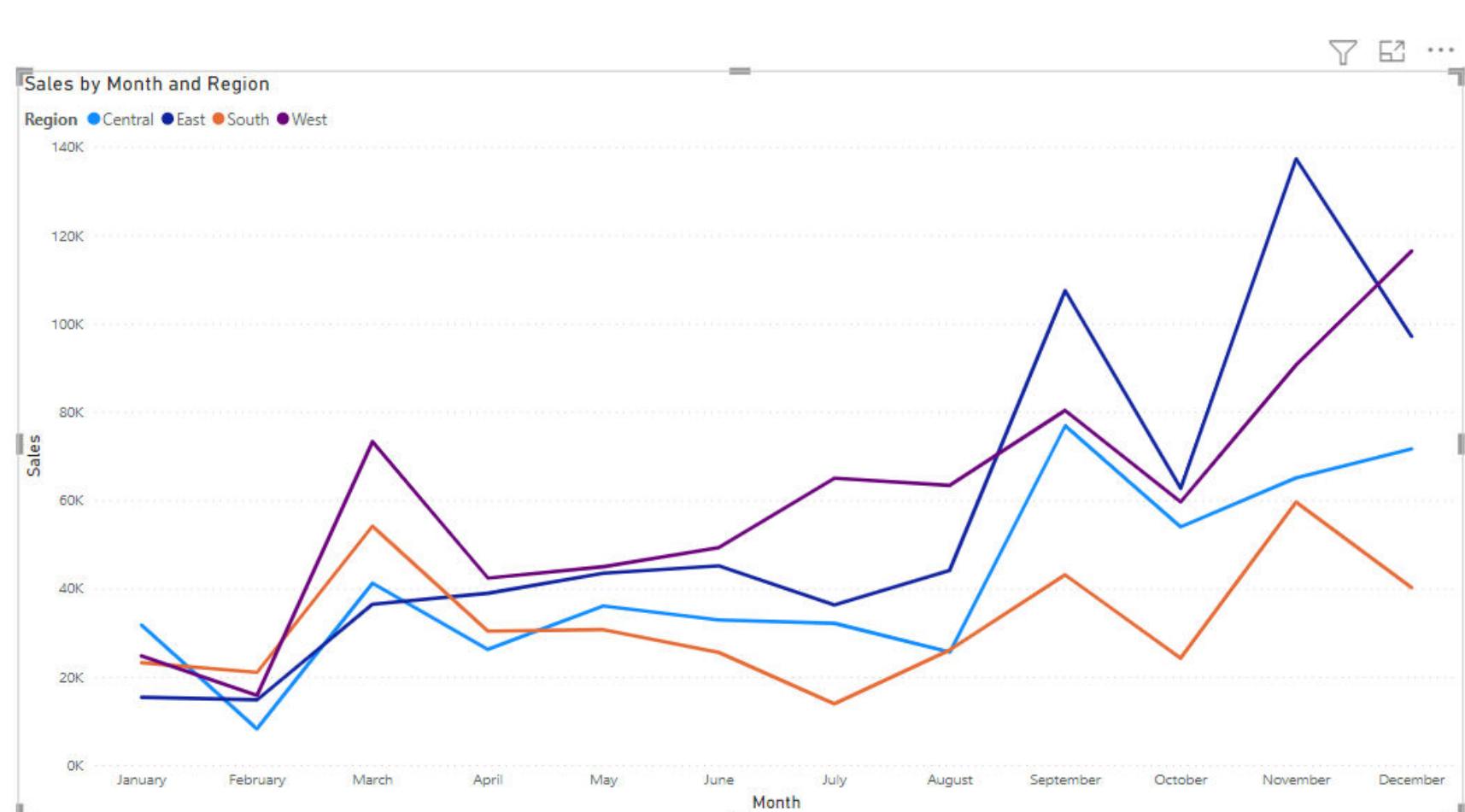
Category ● Furniture ● Office Supplies ● Technology



Line chart and its properties

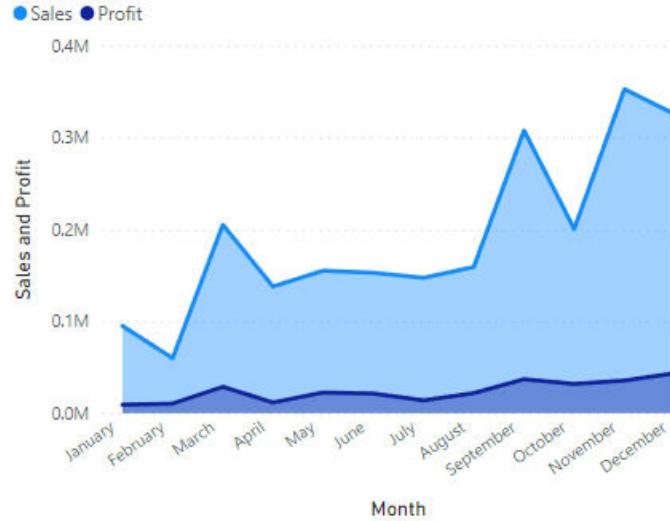


Line chart and its properties



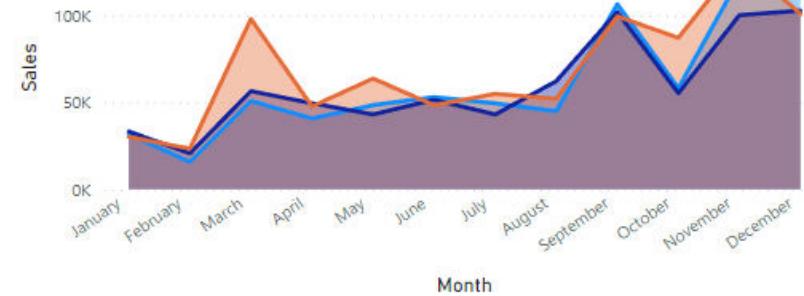
Area chart and stacked area charts

Sales and Profit by Month



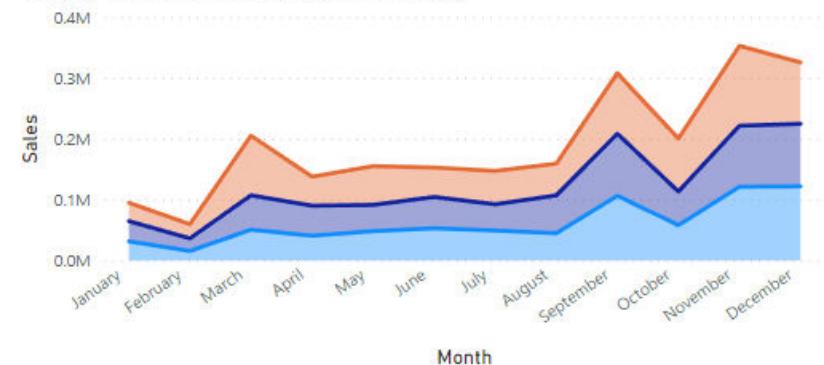
Sales by Month and Category -- area chart

Category ● Furniture ● Office Supplies ● Technology



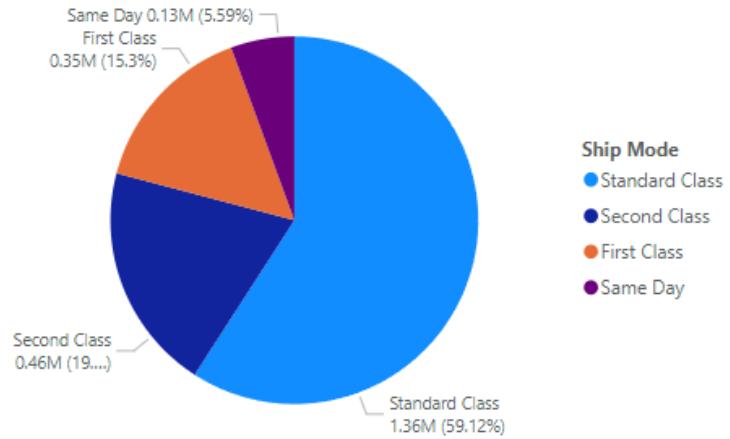
Sales by Month and Category --- stacked area chart

Category ● Furniture ● Office Supplies ● Technology

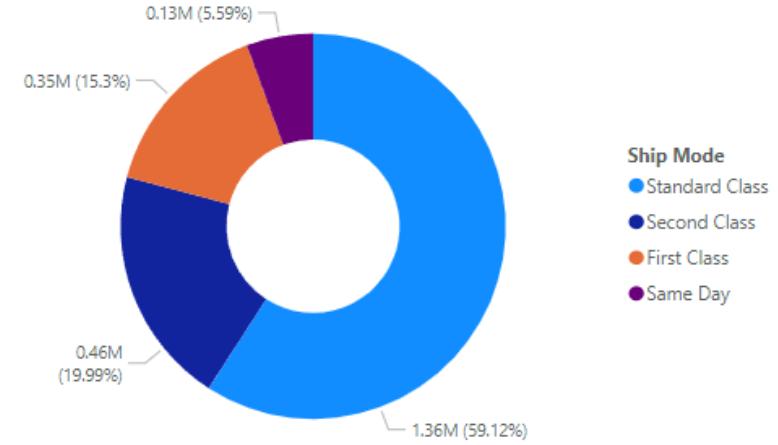


Pie and Donut charts

Sales by Ship Mode



Sales by Ship Mode



Tables and Matrix/Crosstab reports

Category	Sub-Category	Sales	Profit
Furniture	Bookcases	1,14,880.00	-3,472.56
Furniture	Chairs	3,28,449.10	26,590.17
Furniture	Furnishings	91,705.16	13,059.14
Furniture	Tables	2,06,965.53	-17,725.48
Office Supplies	Appliances	1,07,532.16	18,138.01
Office Supplies	Art	27,118.79	6,527.79
Office Supplies	Binders	2,03,412.73	30,221.76
Office Supplies	Envelopes	16,476.40	6,964.18
Office Supplies	Fasteners	3,024.28	949.52
Office Supplies	Labels	12,486.31	5,546.25
Office Supplies	Paper	78,479.21	34,053.57
Office Supplies	Storage	2,23,843.61	21,278.83
Office Supplies	Supplies	46,673.54	-1,189.10
Technology	Accessories	1,67,380.32	41,936.64
Technology	Copiers	1,49,528.03	55,617.82
Technology	Machines	1,89,238.63	3,384.76
Technology	Phones	3,30,007.05	44,515.73
Total Values		22,97,200.86	2,86,397.02

Matrix					
Category	Central	East	South	West	Total
Furniture	1,63,797.16	2,08,291.20	1,17,298.68	2,52,612.74	7,41,999.80
Office Supplies	1,67,026.42	2,05,516.06	1,25,651.31	2,20,853.25	7,19,047.03
Technology	1,70,416.31	2,64,973.98	1,48,771.91	2,51,991.83	8,36,154.03
Total	5,01,239.89	6,78,781.24	3,91,721.91	7,25,457.82	22,97,200.86

Table		
Category	Region	Sales
Furniture	Central	1,63,797.16
Furniture	East	2,08,291.20
Furniture	South	1,17,298.68
Furniture	West	2,52,612.74
Office Supplies	Central	1,67,026.42
Office Supplies	East	2,05,516.06
Office Supplies	South	1,25,651.31
Office Supplies	West	2,20,853.25
Technology	Central	1,70,416.31
Technology	East	2,64,973.98
Technology	South	1,48,771.91
Technology	West	2,51,991.83
Total		22,97,200.86

Tables properties

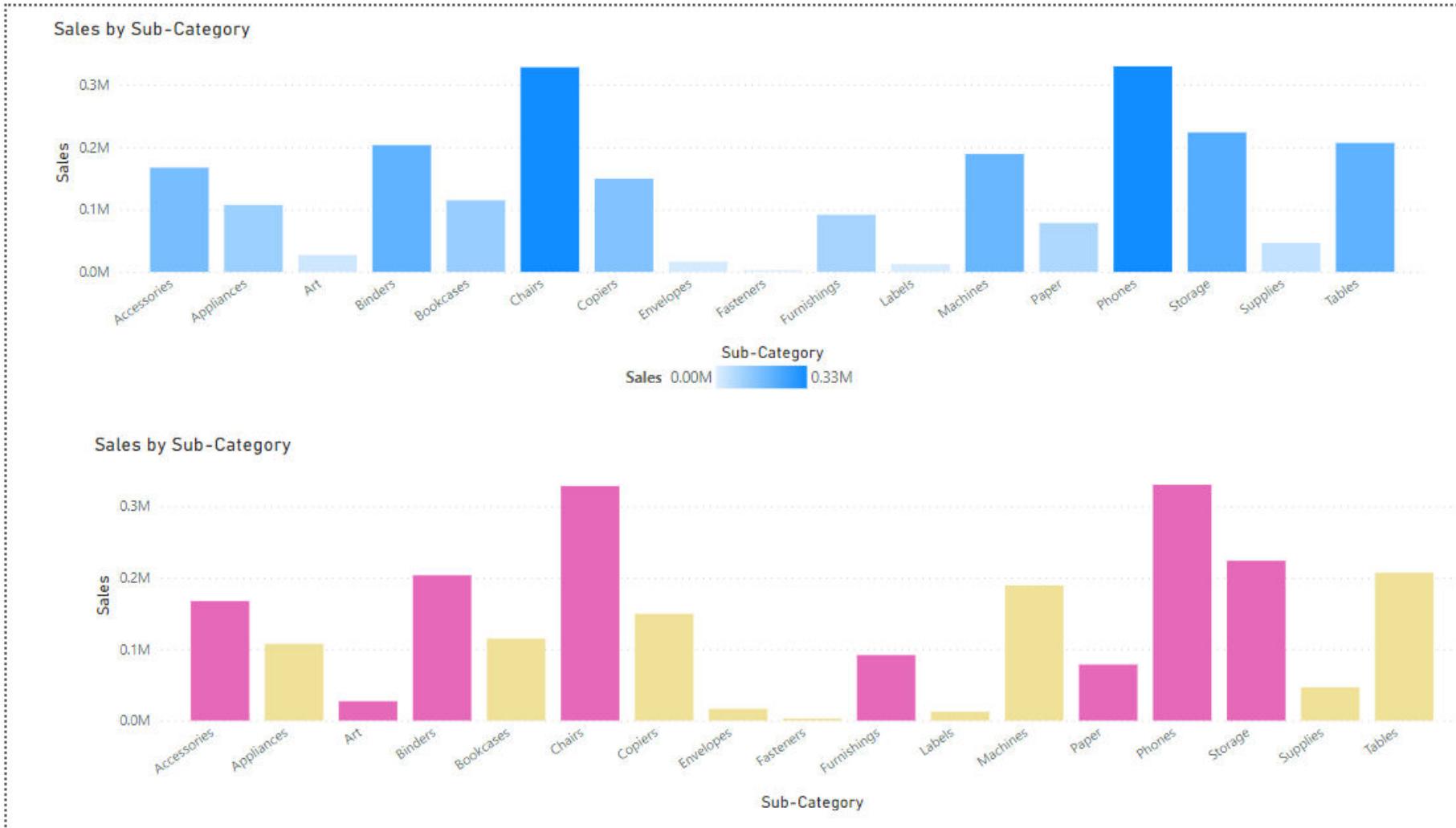
Sub-Category	Sales	Profit
Accessories	167.38K	41,936.64
Appliances	107.53K	18,138.01
Art	27.12K	6,527.79
Binders	203.41K	30,221.76
Bookcases	114.88K	-3,472.56
Chairs	328.45K	26,590.17
Copiers	149.53K	55,617.82
Envelopes	16.48K	6,964.18
Fasteners	3.02K	949.52
Furnishings	91.71K	13,059.14
Labels	12.49K	5,546.25
Machines	189.24K	3,384.76
Paper	78.48K	34,053.57
Phones	330.01K	44,515.73
Total	2,297.20K	2,86,397.02

Sub-Category	Sales	Profit
Accessories	167.38K	41,936.64
Appliances	107.53K	18,138.01
Art	27.12K	6,527.79
Binders	203.41K	30,221.76
Bookcases	114.88K	-3,472.56
Chairs	328.45K	26,590.17
Copiers	149.53K	55,617.82
Envelopes	16.48K	6,964.18
Fasteners	3.02K	949.52
Furnishings	91.71K	13,059.14
Labels	12.49K	5,546.25
Machines	189.24K	3,384.76
Paper	78.48K	34,053.57
Phones	330.01K	44,515.73
Total	2,297.20K	2,86,397.02

Sub-Category	Sales	Profit
Accessories	1,67,380.32	41,936.64
Appliances	1,07,532.16	18,138.01
Art	27,118.79	6,527.79
Binders	2,03,412.73	30,221.76
Bookcases	1,14,880.00	-3,472.56
Chairs	3,28,449.10	26,590.17
Copiers	1,49,528.03	55,617.82
Envelopes	16,476.40	6,964.18
Fasteners	3,024.28	949.52
Furnishings	91,705.16	13,059.14
Labels	12,486.31	5,546.25
Machines	1,89,238.63	3,384.76
Paper	78,479.21	34,053.57
Phones	3,30,007.05	44,515.73
Storage	2,23,843.61	21,278.83
Supplies	46,673.54	-1,189.10
Tables	2,06,965.53	-17,725.48
Total	22,97,200.86	2,86,397.02

- i. Column level formatting and coloring background color based on conditions and gradients
- ii. Font color formatting
- iii. Data bars
- iv. Icons
- v. Conditional formatting on other chart types and controlling the same
- vi. Tree maps

Column level formatting and colouring background colour based on conditions and gradients



Font colour formatting

Sub-Category	Sales	Profit
Accessories	1,67,380.32	41,936.64
Appliances	1,07,532.16	18,138.01
Art	27,118.79	6,527.79
Binders	2,03,412.73	30,221.76
Bookcases	1,14,880.00	-3,472.56
Chairs	3,28,449.10	26,590.17
Copiers	1,49,528.03	55,617.82
Envelopes	16,476.40	6,964.18
Fasteners	3,024.28	949.52
Furnishings	91,705.16	13,059.14
Labels	12,486.31	5,546.25
Machines	1,89,238.63	3,384.76
Paper	78,479.21	34,053.57
Phones	3,30,007.05	44,515.73
Storage	2,23,843.61	21,278.83
Supplies	46,673.54	-1,189.10
Tables	2,06,965.53	-17,725.48
Total	22,97,200.86	2,86,397.02

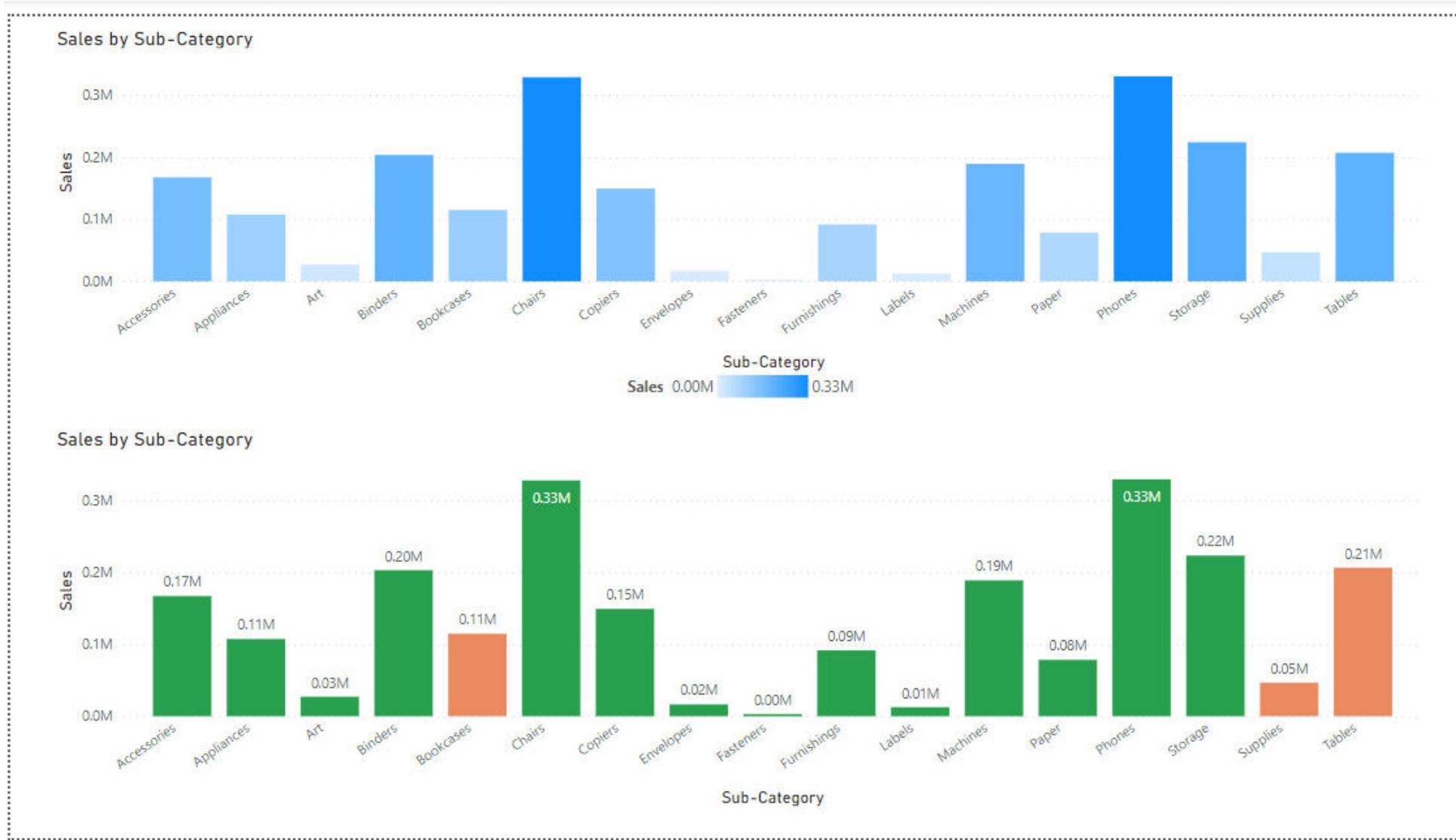
Data bars

Sub-Category	Sales	Profit
Accessories	1,673,380.32	41,936.64
Appliances	1,07,532.16	18,138.01
Art	27,118.79	6,527.79
Binders	2,03,412.73	30,221.76
Bookcases	1,14,880.00	-3,472.56
Chairs	3,28,449.10	26,590.17
Copiers	1,49,528.03	55,617.82
Envelopes	16,476.40	6,964.18
Fasteners	3,024.28	949.52
Furnishings	91,705.16	13,059.14
Labels	12,486.31	5,546.25
Machines	1,89,238.63	3,384.76
Paper	78,479.21	34,053.57
Phones	3,30,007.05	44,515.73
Storage	2,23,843.61	21,278.83
Supplies	46,673.54	-1,189.10
Tables	2,06,965.53	-17,725.48
Total	22,97,200.86	2,86,397.02

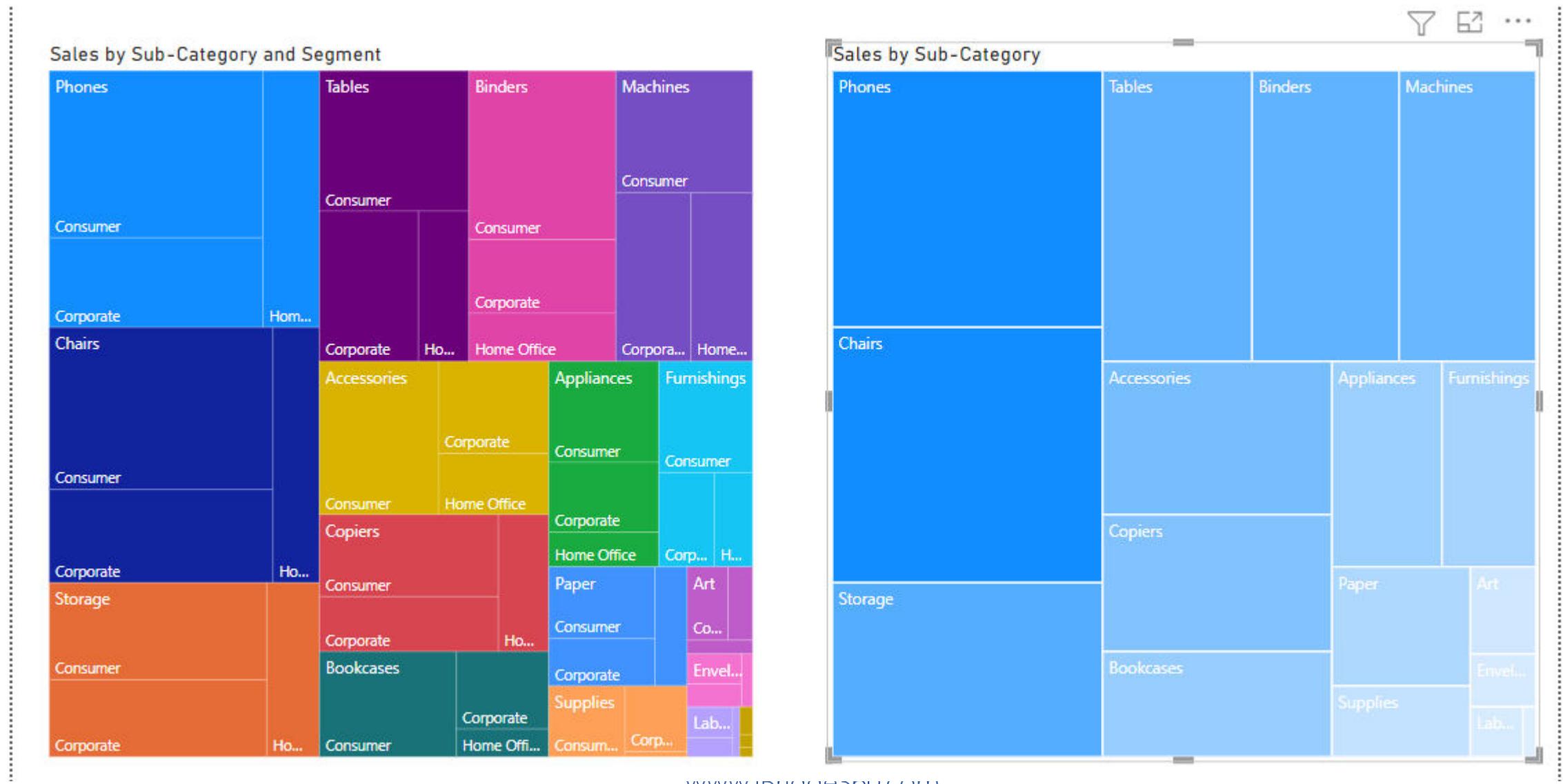
Icons

Sub-Category	Sales	Profit	
Accessories	1,67,380.32	41,936.64	↑
Appliances	1,07,532.16	18,138.01	↑
Art	27,118.79	6,527.79	↑
Binders	2,03,412.73	30,221.76	↑
Bookcases	1,14,880.00	-3,472.56	↓
Chairs	3,28,449.10	26,590.17	↑
Copiers	1,49,528.03	55,617.82	↑
Envelopes	16,476.40	6,964.18	↑
Fasteners	3,024.28	949.52	↑
Furnishings	91,705.16	13,059.14	↑
Labels	12,486.31	5,546.25	↑
Machines	1,89,238.63	3,384.76	↑
Paper	78,479.21	34,053.57	↑
Phones	3,30,007.05	44,515.73	↑
Storage	2,23,843.61	21,278.83	↑
Supplies	46,673.54	-1,189.10	↓
Tables	2,06,965.53	-17,725.48	↓
Total	22,97,200.86	2,86,397.02	

Conditional formatting on other chart types and controlling the same



Tree Map



- i. Introduction to DAX
- ii. Difference between columns and measures and implementations of the same
- iii. Calculated Column –Extracting the characters
- iv. Sales 10% up up and down analysis (Static what if analysis)
- v. Card visual and its properties
- vi. Profit %Age calculation and showing data in a percentage form
- vii. Gauge chart and its properties
- viii. Year, quarter, month and day extract functions from dates

Data Analysis Expressions (DAX) is a syntax language that comprises formulae and expressions that are used in data manipulation

Derived fields/calculated fields

- Tables
- Columns
- Measures

Tables

Sample Table = {1} -Row

Sample Table = {(1)} -Column

Sample Table = {(1,2,3,4)} 1 row 4 columns

Sample Table = {(1,2),(3,4)} 2 row 2 columns

Multi clm table =

```
SUMMARIZE(Orders,Orders[City],Orders[Category],Orders[Sales])
```

Difference between columns and measures and implementations of the same



Non Agg:

Cust Name: custfname concat with custlname

Year of Birth: extract year from dob

Agg:

No of Customers: count of custid

Columns:

Non Aggregated calculations

Is calculated at the data level of power bi

Measures:

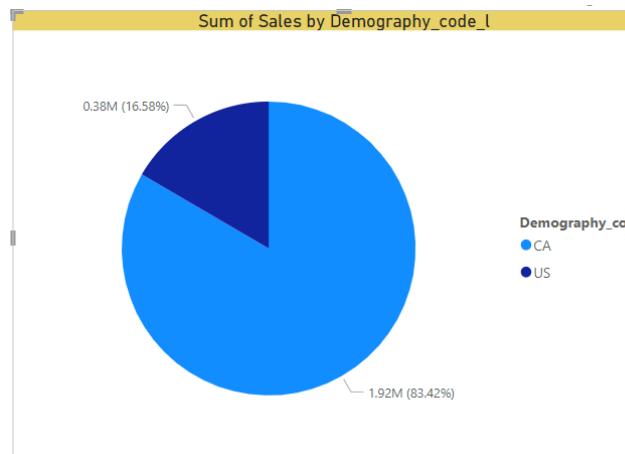
Aggregated calculations

Is calculated at the visual level of power bi

Calculated Column

```
Demograpy Code_L = LEFT(Orders[Order ID],2)  
Demograpy Code_R = RIGHT(Orders[Order ID],2)  
Demograpy Code_M = MID(Orders[Order ID],4,4)
```

joining two columns =
`CONCATENATE(Orders[Demography_code_1],CO
NCATENATE(" - ",Orders[City]))`



Order ID	dem_code_L	dem_code_R	dem_code_M
CA-2018-103100	CA	00	2018
CA-2018-103800	CA	00	2018
CA-2018-110100	CA	00	2018
CA-2018-111500	CA	00	2018
CA-2018-123400	CA	00	2018
CA-2018-126200	CA	00	2018
CA-2018-131800	CA	00	2018
CA-2018-132500	CA	00	2018
CA-2018-138100	CA	00	2018
CA-2018-145800	CA	00	2018
CA-2018-146500	CA	00	2018
CA-2018-147900	CA	00	2018
CA-2018-152100	CA	00	2018
CA-2018-159800	CA	00	2018
CA-2019-101000	CA	00	2019
CA-2019-114300	CA	00	2019
CA-2019-117800	CA	00	2019
CA-2019-124800	CA	00	2019
CA-2019-129700	CA	00	2019
CA-2019-136700	CA	00	2019
CA-2019-143700	CA	00	2019
CA-2019-149300	CA	00	2019

Calculated Measure

SUM	SUMX
Returns a scalar value	Returns a scalar value
Works on column level	Works on row level
Expression not allowed	Expression are allowed

Sum of Sales(SUM) = sum(Orders[Sales])

Total amount = sumx(orders, orders[quantity]*Orders[Sales])

Category	Sum of Sales	Sum of Sales(SUM)
Furniture	7,41,999.80	7,41,999.80
Office Supplies	7,19,047.03	7,19,047.03
Technology	8,36,154.03	8,36,154.03
Total	22,97,200.86	22,97,200.86

Category	Sum of Sales	Sum of Quantity	Total amount
Furniture	7,41,999.80	8028	38,59,215.23
Office Supplies	7,19,047.03	22906	35,48,585.32
Technology	8,36,154.03	6939	40,80,261.52
Total	22,97,200.86	37873	1,14,88,062.07

Calculated Measure

What if analysis:

what if sales is 10% more

$$\text{Proj Up Sales} = \text{SUM}(\text{Orders}[Sales]) * 1.1$$

$$\text{sum}(\text{orders}[sales]) + (\text{sum}(\text{orders}[sales]) * 10) / 100$$

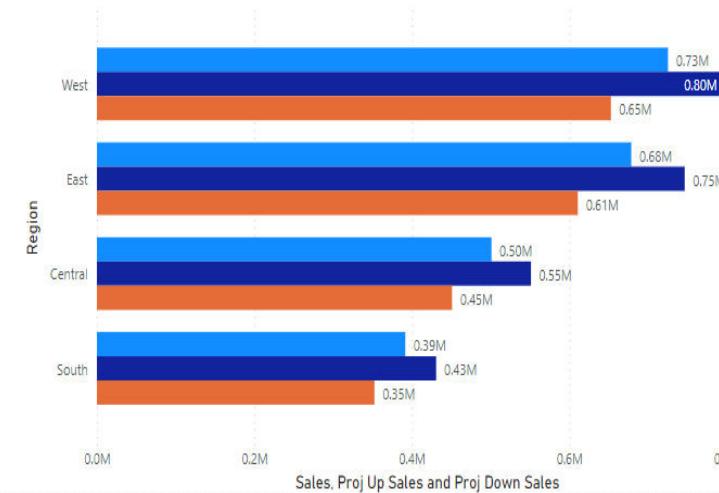
what if sales is 10% less

$$\text{Proj Down Sales} = \text{SUM}(\text{Orders}[Sales]) * 0.9$$

$$\text{sum}(\text{orders}[sales]) - (\text{sum}(\text{orders}[sales]) * 10) / 100$$

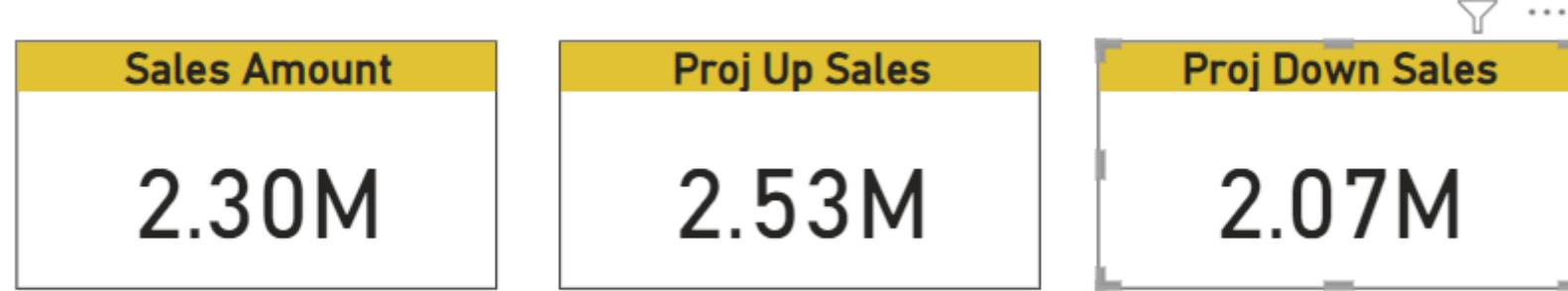
Sales, Proj Up Sales and Proj Down Sales by Region

Sales ● Proj Up Sales ● Proj Down Sales



Region	Sales	Proj Up Sales	Proj Down Sales
West	7,25,457.82	7,98,003.61	6,52,912.04
East	6,78,781.24	7,46,659.36	6,10,903.12
Central	5,01,239.89	5,51,363.88	4,51,115.90
South	3,91,721.91	4,30,894.10	3,52,549.71
Total	22,97,200.86	25,26,920.95	20,67,480.77

Card visual and its properties

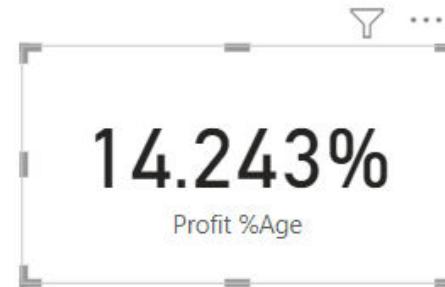


Profit %Age calculation and showing data in a percentage form

Profit %Age:

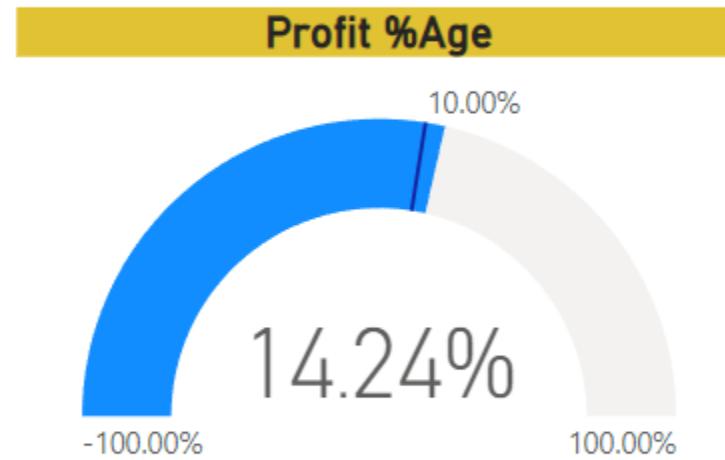
$$(\text{profit}/\text{cp}) * 100$$

Profit %Age = $\text{SUM}(\text{Orders}[\text{Profit}]) / (\text{SUM}(\text{Orders}[\text{Sales}]) - \text{SUM}(\text{Orders}[\text{Profit}]))$



Sub-Category	Sales	Profit	Profit %Age
Accessories	1,67,380.32	41,936.64	33.43%
Appliances	1,07,532.16	18,138.01	20.29%
Art	27,118.79	6,527.79	31.70%
Binders	2,03,412.73	30,221.76	17.45%
Bookcases	1,14,880.00	-3,472.56	-2.93%
Chairs	3,28,449.10	26,590.17	8.81%
Copiers	1,49,528.03	55,617.82	59.22%
Envelopes	16,476.40	6,964.18	73.21%
Fasteners	3,024.28	949.52	45.77%
Furnishings	91,705.16	13,059.14	16.60%
Labels	12,486.31	5,546.25	79.92%
Machines	1,89,238.63	3,384.76	1.82%
Paper	78,479.21	34,053.57	76.65%
Phones	3,30,007.05	44,515.73	15.59%
Storage	2,23,843.61	21,278.83	10.50%
Supplies	46,673.54	-1,189.10	-2.48%
Tables	2,06,965.53	-17,725.48	-7.89%
Total	22,97,200.86	2,86,397.02	14.24%

Gauge chart and its properties



Year, quarter, month and day extract functions from dates

Order Year = YEAR(Orders[Order Date])

Order Qtr = QUARTER(Orders[Order Date])

Order Month = MONTH(Orders[Order Date])

Order Day = DAY(Orders[Order Date])

Order Year	Order Qtr	Order Month	Order Day	Sales	Profit	Profit %Age
2018	4	11	25	4,415.70	148.03	3.48%
2018	4	11	26	1,705.99	-62.16	-3.52%
2018	4	11	27	203.66	41.30	25.43%
2018	4	11	28	2,280.83	12.47	0.55%
2018	4	11	29	649.04	104.68	19.23%
2018	4	11	30	219.15	11.83	5.71%
2018	4	12	1	5,624.39	875.14	18.43%
2018	4	12	2	1,771.81	111.37	6.71%
2018	4	12	3	505.88	146.83	40.89%
2018	4	12	4	129.98	62.39	92.31%
2018	4	12	5	2,963.64	425.04	16.74%
2018	4	12	6	1,970.98	-19.02	-0.96%
2018	4	12	7	548.40	201.78	58.22%
2018	4	12	8	1,095.12	125.93	12.99%
2018	4	12	9	1,522.65	125.75	9.00%
2018	4	12	10	573.34	101.14	21.42%
2018	4	12	12	4,938.40	-72.10	-1.44%
2018	4	12	13	293.15	8.73	3.07%
2018	4	12	14	7,641.66	2,220.52	40.96%
2018	4	12	15	1,264.47	-144.73	-10.27%
2018	4	12	16	4,394.19	415.64	10.45%
2018	4	12	17	45.53	7.19	18.76%
2018	4	12	19	3,436.76	356.96	11.59%
2018	4	12	20	6,962.44	1,557.01	28.80%
2019	1	1	1	1,022.44	179.26	10.16%
Total				22,972,008.86	2,863,970.02	14.24%

- i. Format functions on date extractions
- ii. Handling sorting with dates on calendar month and day names
- iii. Introduction to conditional statements and syntax of the IF statement
- iv. If statement for deriving metro flag
- v. If statement to derive weekend and weekday flags
- vi. If statement to derive the profit tag

Format functions on date extractions

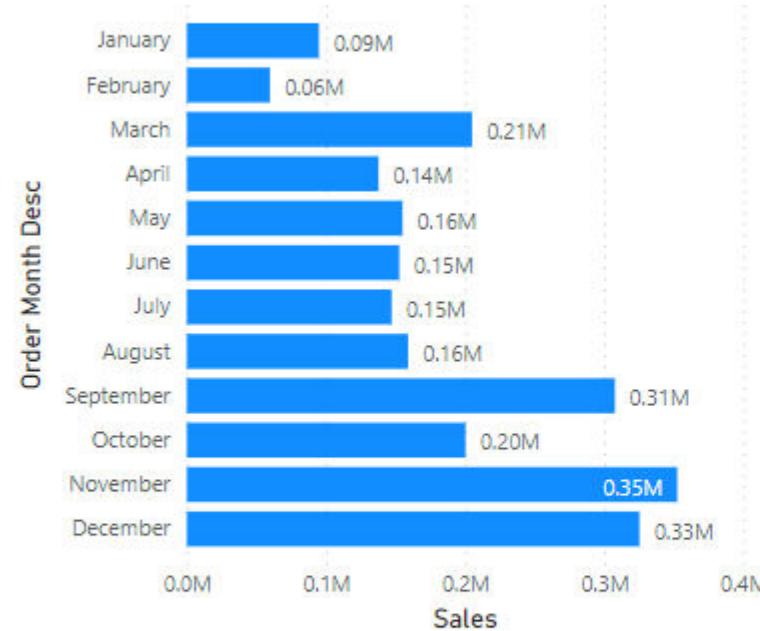
```
Order year= FORMAT(Orders[Order Date],"yyyy")
Order qtr= = FORMAT(Orders[Order Date],"q")
Order month desc= FORMAT(Orders[Order Date],"m")
Order month desc = FORMAT(Orders[Order Date],"mm")
Order month desc = FORMAT(Orders[Order Date],"mmm")
Order month desc = FORMAT(Orders[Order Date],"mmmm")
Order day desc = FORMAT(Orders[Order Date],"d")
Order day desc = FORMAT(Orders[Order Date],"dd")
Order day desc = FORMAT(Orders[Order Date],"ddd")
Order day desc = FORMAT(Orders[Order Date],"dddd")
Order qtr desc = "Q-" & FORMAT(Orders[Order Date],"q")
```

Format functions on date extractions

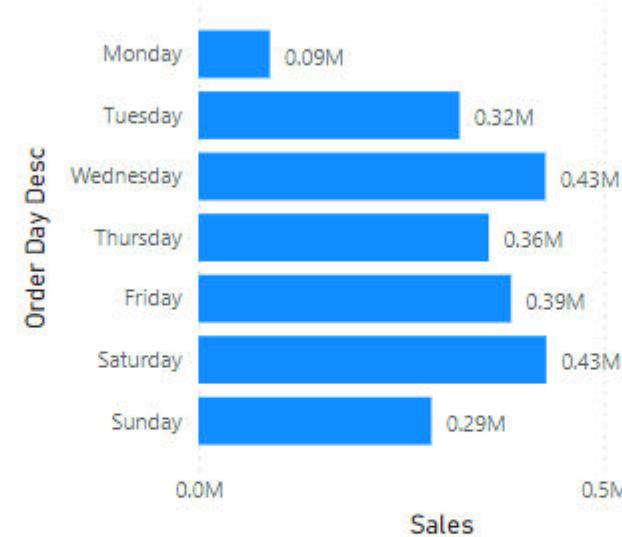
Demography Code	Order Year	Order Qtr	Order Month	Order Day	Date Extract	Order Month Desc	Order Day Desc	Order Month No	Order Day No
CA	2020	3	7	17	Q-3	July	Friday	7	5
CA	2021	4	12	21	Q-4	December	Tuesday	12	2
CA	2021	4	12	21	Q-4	December	Tuesday	12	2
US	2020	2	4	19	Q-2	April	Sunday	4	7
US	2020	2	4	19	Q-2	April	Sunday	4	7
US	2020	2	4	19	Q-2	April	Sunday	4	7
US	2020	4	12	25	Q-4	December	Friday	12	5
CA	2018	4	10	31	Q-4	October	Wednesday	10	3
CA	2018	4	10	31	Q-4	October	Wednesday	10	3
CA	2018	4	10	31	Q-4	October	Wednesday	10	3
CA	2018	4	10	31	Q-4	October	Wednesday	10	3
CA	2018	4	10	31	Q-4	October	Wednesday	10	3
CA	2020	2	6	25	Q-2	June	Thursday	6	4
CA	2018	4	12	13	Q-4	December	Thursday	12	4
CA	2021	4	11	19	Q-4	November	Friday	11	5
CA	2018	2	4	18	Q-2	April	Wednesday	4	3
CA	2018	2	4	18	Q-2	April	Wednesday	4	3
CA	2018	2	4	18	Q-2	April	Wednesday	4	3
CA	2020	3	7	3	Q-3	July	Friday	7	5
CA	2020	3	7	3	Q-3	July	Friday	7	5
CA	2019	3	9	18	Q-3	September	Wednesday	9	3
CA	2019	3	9	18	Q-3	September	Wednesday	9	3
CA	2018	4	10	28	Q-4	October	Sunday	10	7
CA	2018	4	10	28	Q-4	October	Sunday	10	7
CA	2018	4	10	28	Q-4	October	Sunday	10	7
CA	2019	4	11	27	Q-4	November	Wednesday	11	3
CA	2020	4	11	3	Q-4	November	Tuesday	11	2
--	----	-	--	-	--	--	--	--	-

Format functions on date extractions

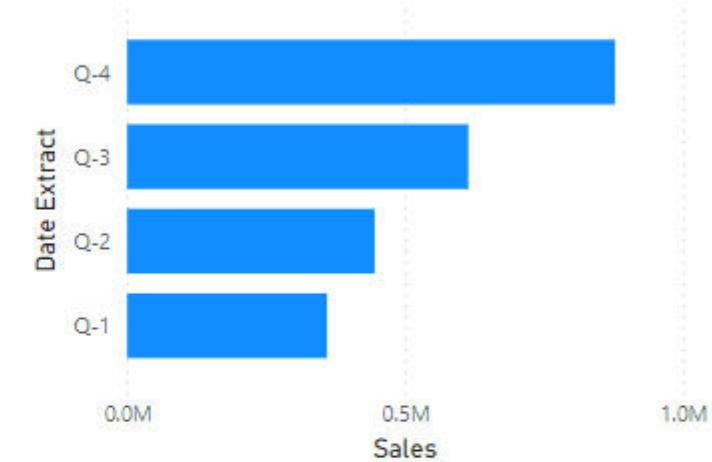
Sales by Order Month Desc



Sales by Order Day Desc



Sales by Date Extract



. Handling sorting with dates on calendar month and day names

Order Day No = WEEKDAY(Orders[Order Date],2)

Introduction to conditional statements and syntax of the IF statement



Conditional Statements:

IF

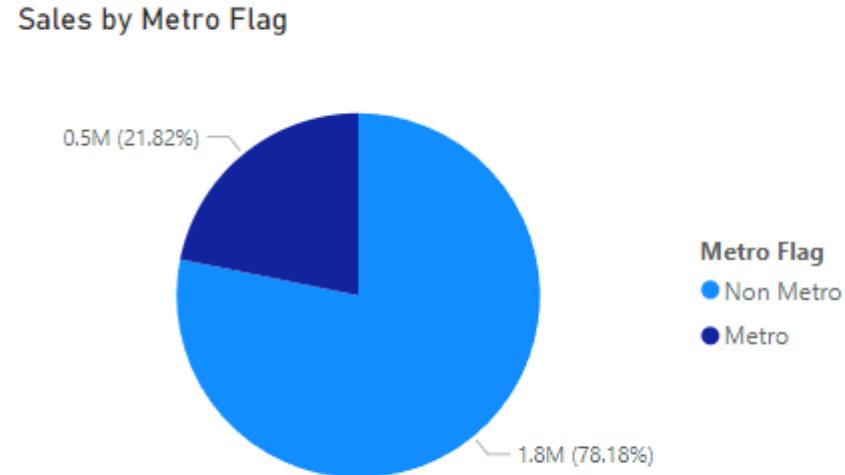
SWITCH

IF(Condition,op when true, op when false)

If statement for deriving metro flag

Metro Flag = IF(Orders[Region] = "Central", "Metro", "Non Metro")

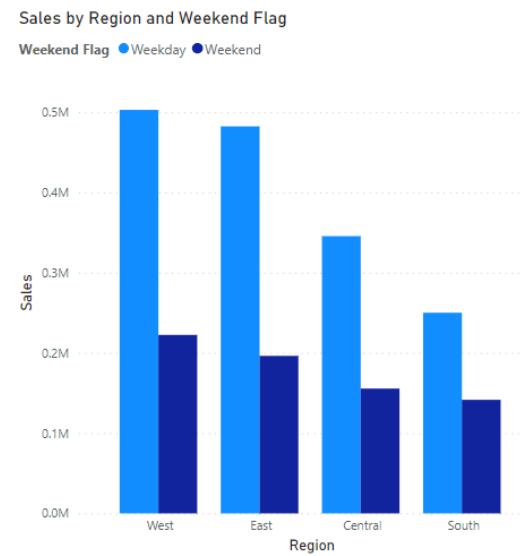
Region	Metro Flag	Sales
Central	Metro	5,01,239.89
East	Non Metro	6,78,781.24
South	Non Metro	3,91,721.91
West	Non Metro	7,25,457.82
Total		22,97,200.86



If statement to derive weekend and weekday flags

Weekend Flag = if(FORMAT(Orders[Order Date],"ddd") = "Sun" || FORMAT(Orders[Order Date],"ddd") = "Sat", "Weekend", "Weekday")

Weekend Flag = if(FORMAT(Orders[Order Date],"ddd") in {"Sun","Sat"} , "Weekend", "Weekday")



If statement to derive the profit tag

```
Profit Status = if(SUM(Orders[Profit]) >= 0 , "Profit", "Loss")
```

Sub-Category	Sales	Profit	Profit Status
Accessories	1,67,380.32	41,936.64	Profit
Appliances	1,07,532.16	18,138.01	Profit
Art	27,118.79	6,527.79	Profit
Binders	2,03,412.73	30,221.76	Profit
Bookcases	1,14,880.00	-3,472.56	Loss
Chairs	3,28,449.10	26,590.17	Profit
Copiers	1,49,528.03	55,617.82	Profit
Envelopes	16,476.40	6,964.18	Profit
Fasteners	3,024.28	949.52	Profit
Furnishings	91,705.16	13,059.14	Profit
Labels	12,486.31	5,546.25	Profit
Machines	1,89,238.63	3,384.76	Profit
Paper	78,479.21	34,053.57	Profit
Phones	3,30,007.05	44,515.73	Profit
Storage	2,23,843.61	21,278.83	Profit
Supplies	46,673.54	-1,189.10	Loss
Tables	2,06,965.53	-17,725.48	Loss
Total	22,97,200.86	2,86,397.02	Profit

Switch

```

Metro flag switch1 =
SWITCH(SELECTEDVALUE(orders[region]),"Central","Metro1","East","Metro2","West","Metro3","Non
Metro")

delivery report = SWITCH(SELECTEDVALUE(Orders[Category]),"Furniture","2-3 working
days","Office Supplies","By Tommrow","within a week")

Values analysis = switch(TRUE(),Sum(orders[sales])>=600000,"Above
Expectation",sum(Orders[Sales]) >= 500000,"Expected Sales met",sum(Orders[Sales]) >=
400000,"Average","low")

```

Region	Sum of Sales	Metro flag if else	Metro flag switch1
Central	5,01,239.89	Metro	Metro1
East	6,78,781.24	Non Metro	Metro2
South	3,91,721.91	Non Metro	Non Metro
Total	22,97,200.86		Non Metro

Category	delivery report
Furniture	2-3 working days
Office Supplies	By Tommrow
Technology	within a week
Total	within a week

Region	Sum of Sales	Values analysis
East	6,78,781.24	Above Expectation
West	7,25,457.82	Above Expectation
Central	5,01,239.89	Expected Sales met
Total	22,97,200.86	Above Expectation

- i. If statement on handling colours on tables
- ii. Using Hex codes in colouring the charts
- iii. Symbol Map and handling colouring codes
- iv. Filled Map and properties
- v. Multirow card
- vi. Funnel Chart
- vii. Waterfall Chart
- Vii. Introduction to slicers and its basic uses

If statement on handling colours

Profit Clr = if(SUM(Orders[Profit]) >= 0 , "green","yellow")

Profit %Age Clr:

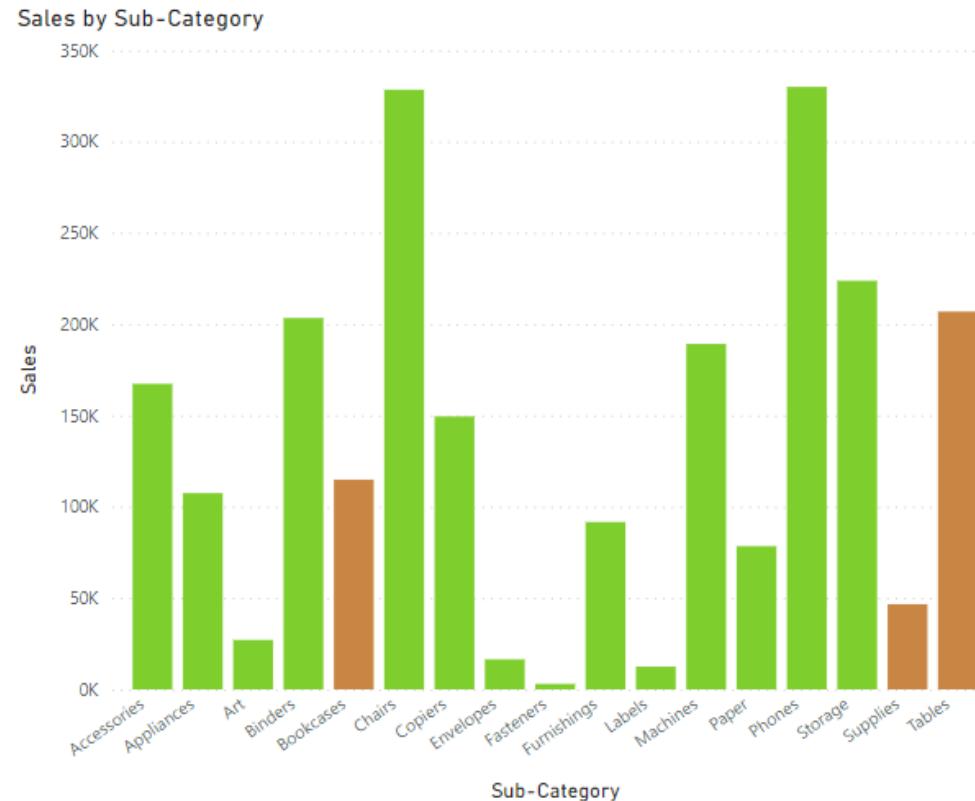
Profit %Age Clr = if([Profit %Age] >= 0 , "green","red")

Profit %Age Clr = if([Profit %Age] >= 0.15 , "green", if([Profit %Age] <0, "red", "yellow"))

Sub-Category	Sales	Profit	Profit %Age
Accessories	1,67,380.32	41,936.64	33.43%
Appliances	1,07,532.16	18,138.01	20.29%
Art	27,118.79	6,527.79	31.70%
Binders	2,03,412.73	30,221.76	17.45%
Bookcases	1,14,880.00	-3,472.56	-2.93%
Chairs	3,28,449.10	26,590.17	8.81%
Copiers	1,49,528.03	55,617.82	59.22%
Envelopes	16,476.40	6,964.18	73.21%
Fasteners	3,024.28	949.52	45.77%
Furnishings	91,705.16	13,059.14	16.60%
Labels	12,486.31	5,546.25	79.92%
Machines	1,89,238.63	3,384.76	1.82%
Paper	78,479.21	34,053.57	76.65%
Phones	3,30,007.05	44,515.73	15.59%
Storage	2,23,843.61	21,278.83	10.50%
Supplies	46,673.54	-1,189.10	-2.48%
Tables	2,06,965.53	-17,725.48	-7.89%

Using Hex codes in colouring

```
Profit Clr = if(SUM(Orders[Profit]) >= 0 , "#7ecf2d", "#c98544")
```

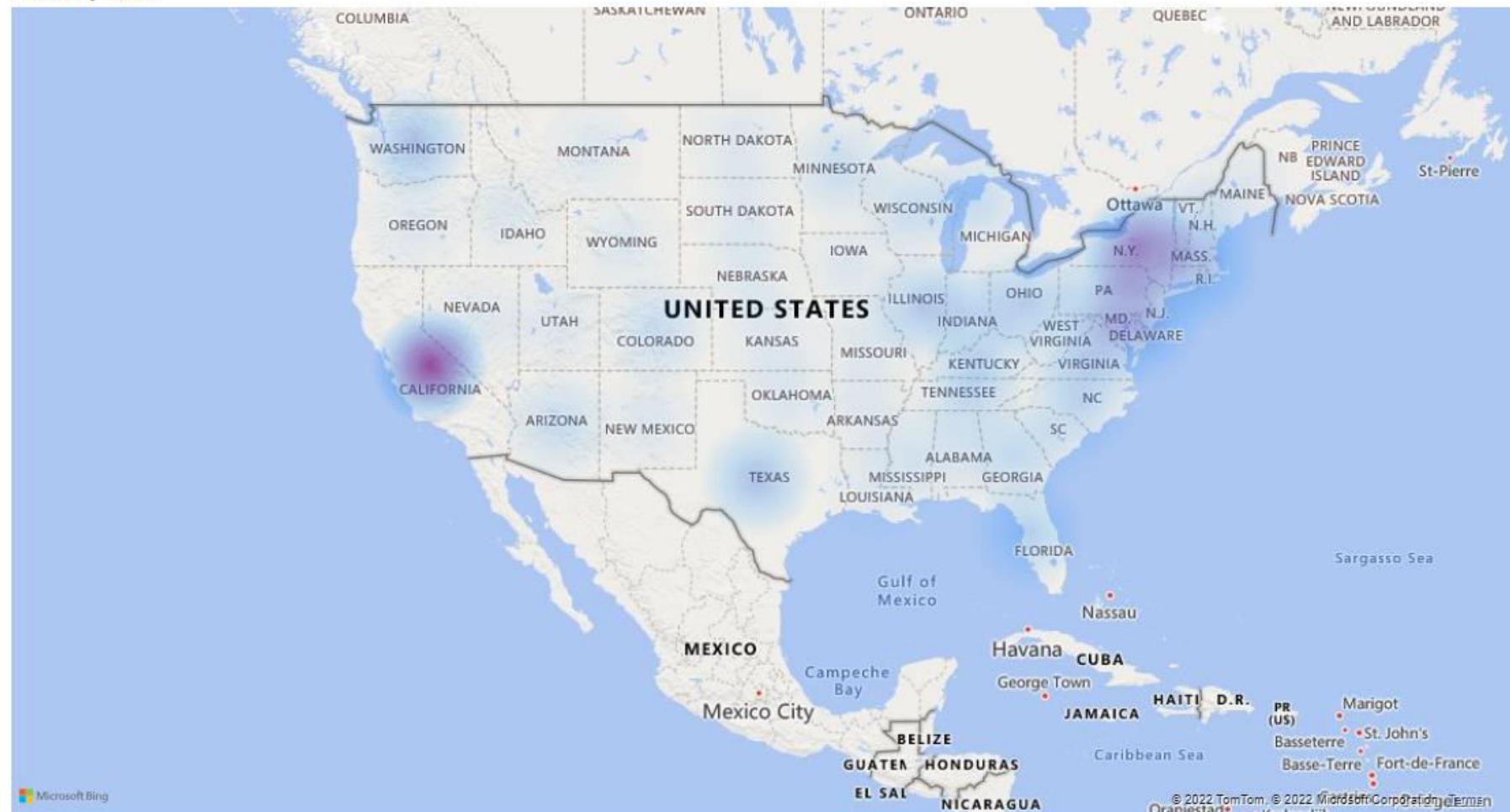


Map and handling colouring codes



Heat Map

Sales by State

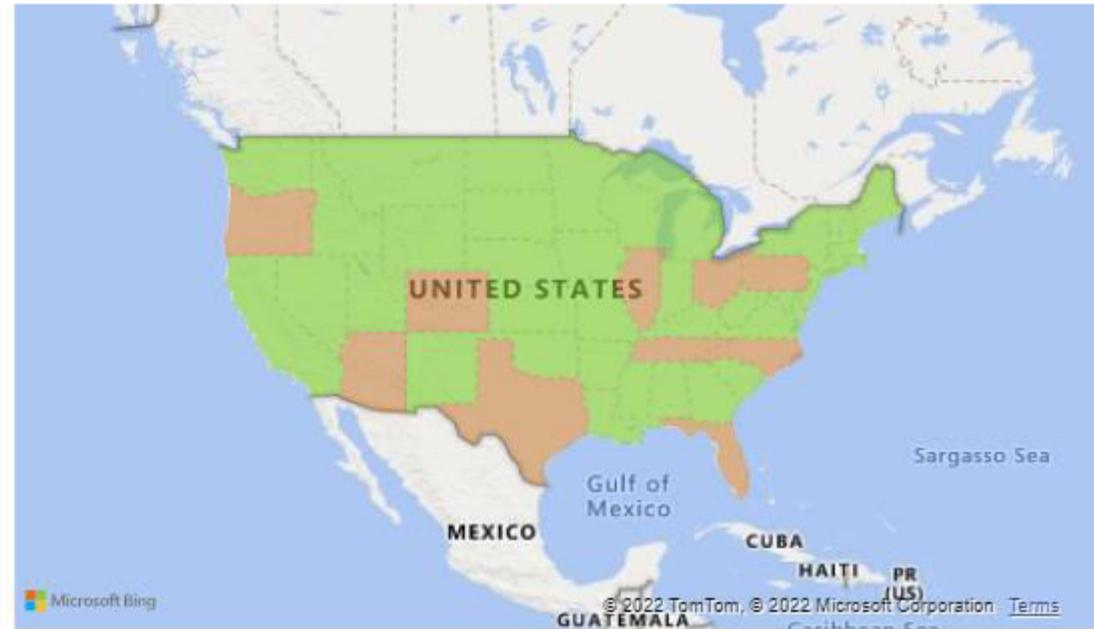


Filled Map and properties

State



State



Multirow card

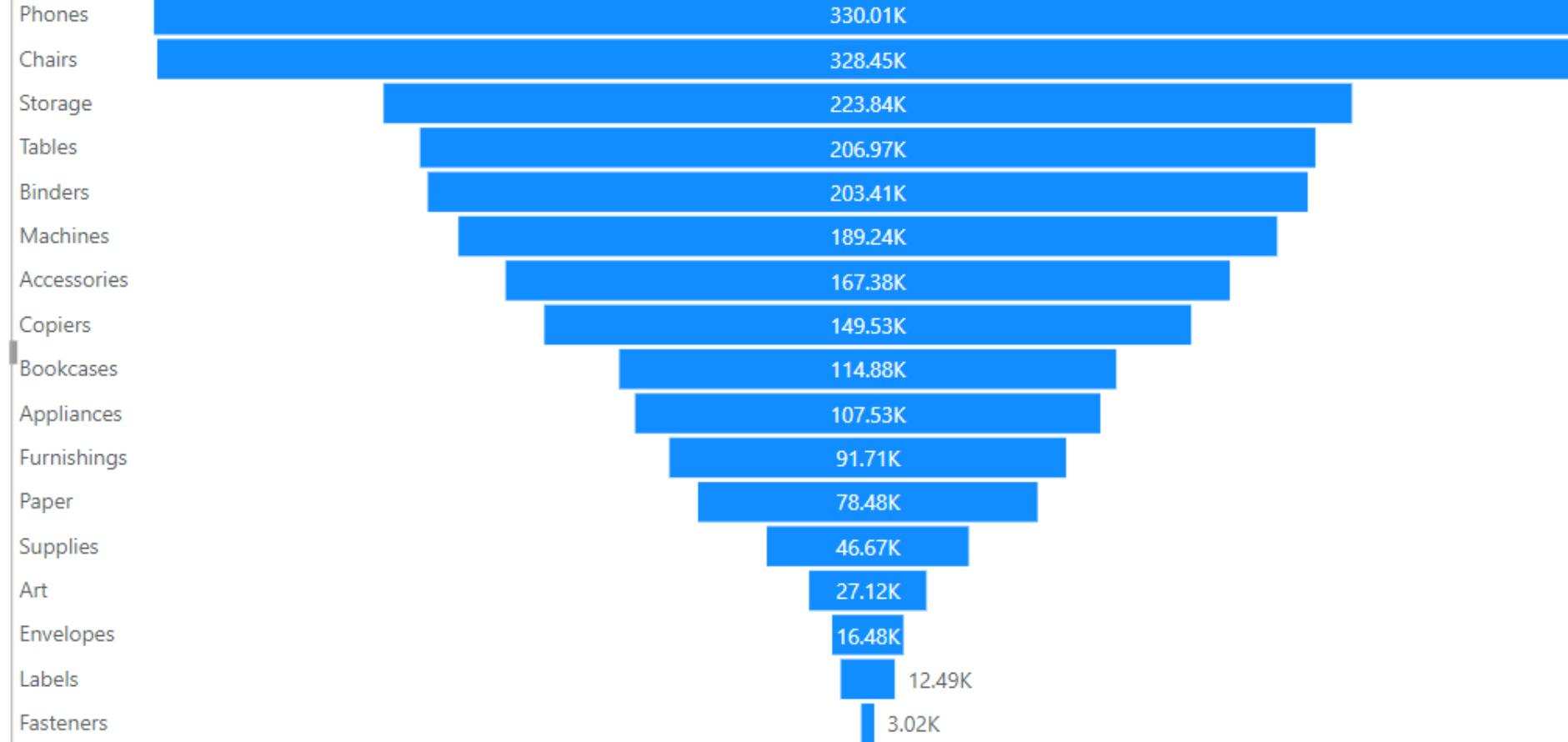
Sales KPIs			
22,97,200.86	2,86,397.02	37873	9994
Sales	Profit	Quantity	No of Sales

Sales KPIs	
22,97,200.86	2,86,397.02
Sales	Profit
37873	9994
Quantity	No of Sales

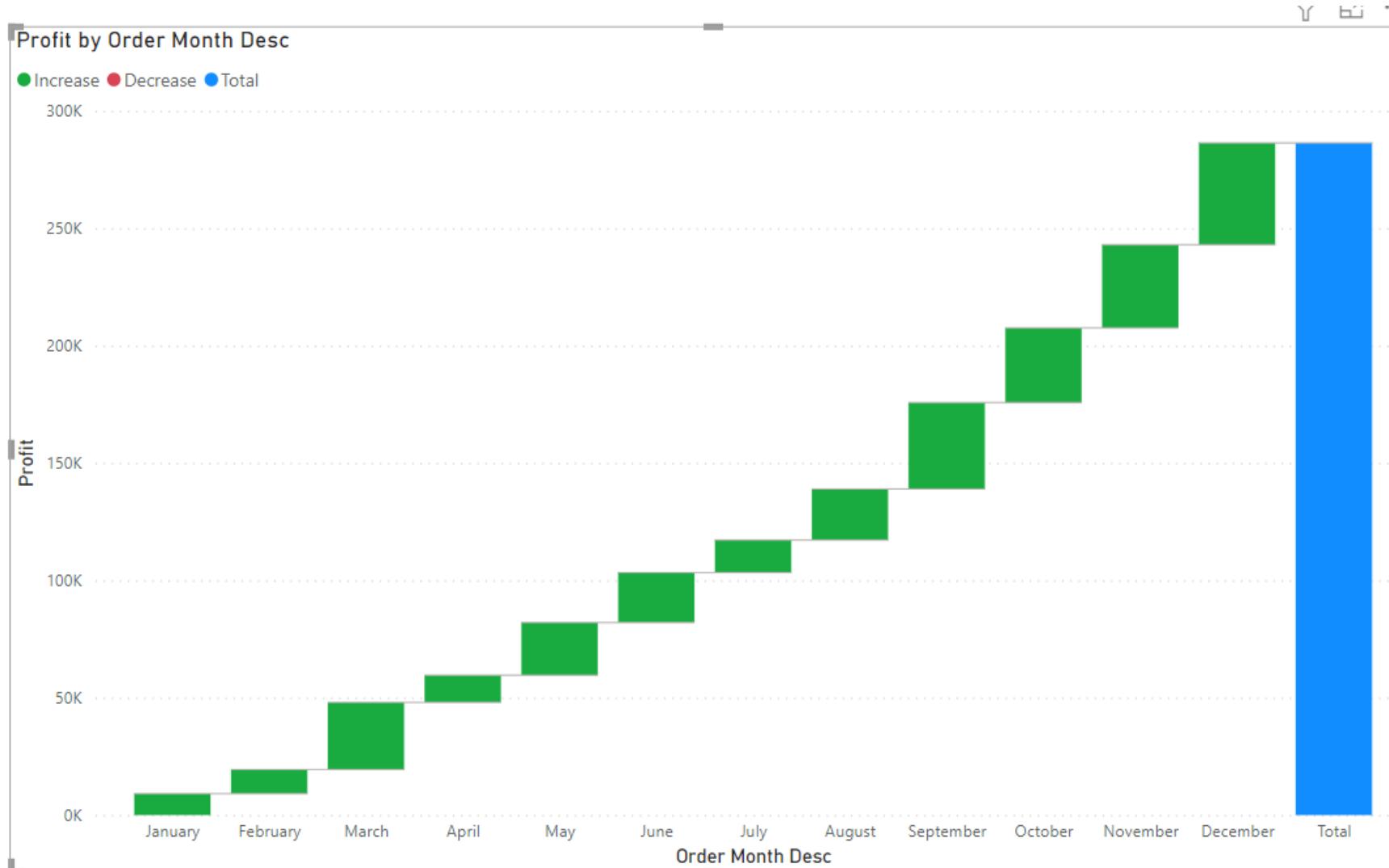
Funnel Chart

Sales by Sub-Category

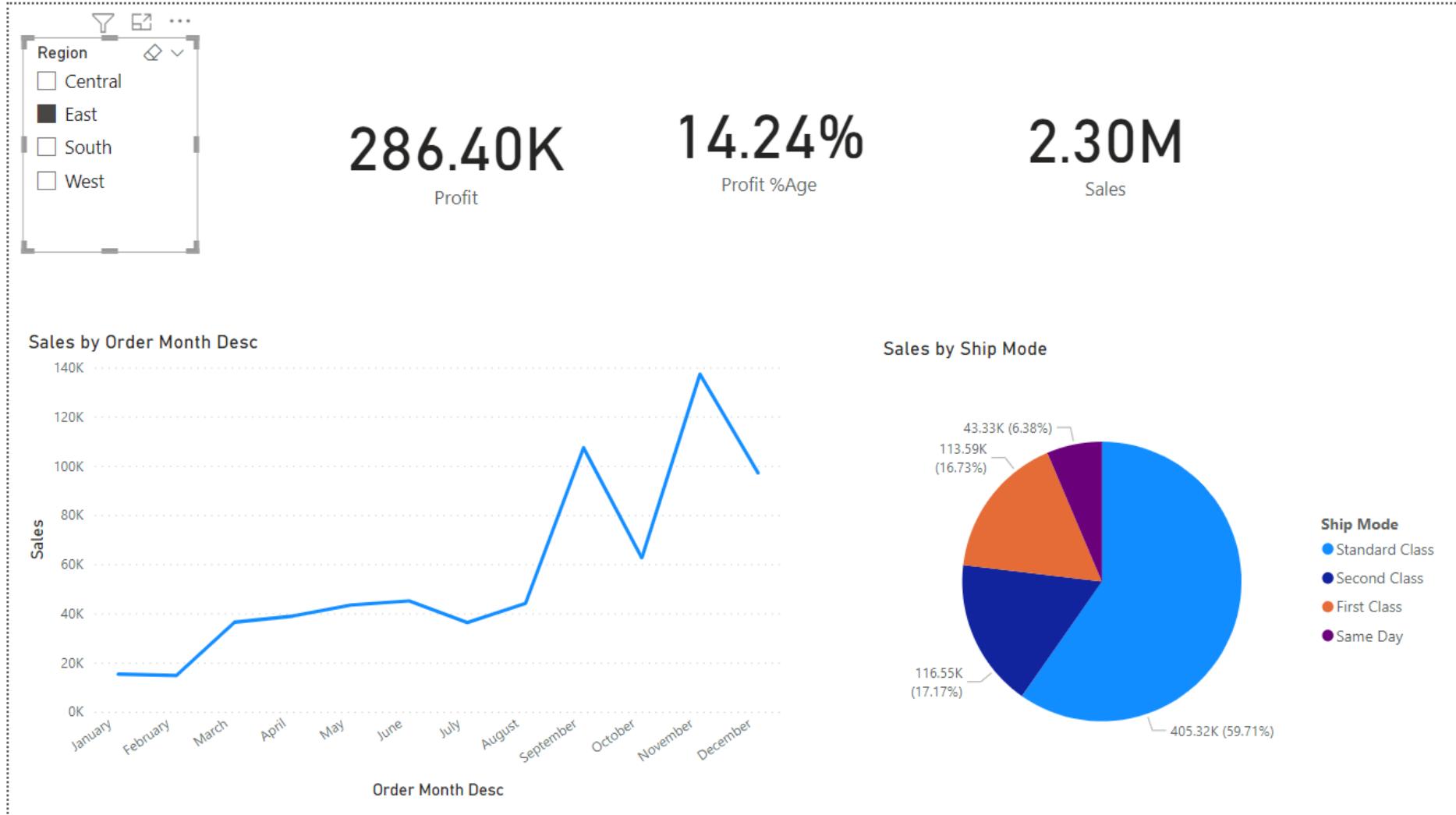
100%



Waterfall Chart



Introduction to slicers and its basic uses properties and handling interactivity with slicer



- i. Building weekend and year flags
- ii. Introduction to conditional aggregations
- iii. Working on the CALCULATE function
- iv. Calculate weekend and weekday sales
- v. Calculate Current Year and Previous Year Sales
- vi. Determining YoU Growth with the CY and PY Sales

Building Year Tag:

```
Year Tag = if(year(Orders[Order Date]) = year(TODAY()),"Current  
Year",if(year(Orders[Order Date]) = YEAR(TODAY()) - 1, "Previous Year","Other  
Years"))
```

Since data is not available for 2022, the formula is tweaked to make 2021 as the current. The tweaked formula is as mentioned below.

```
Year Tag = if(year(Orders[Order Date]) = year(TODAY())-1,"Current  
Year",if(year(Orders[Order Date]) = YEAR(TODAY()) - 2, "Previous Year","Other  
Years"))year flags
```

Introduction to conditional aggregations



Simple agg:

No of custs: count(custid)

Total sales = sum(sales)

Cond agg:

No of Males: count(custid) where gender = 'male'

No of Females: count(custid) where gender = 'female'

CALCULATE(agg_function,filters,...)

Working on the CALCULATE function

Central Sales = CALCULATE(SUM(Orders[Sales]),Orders[Region]="Central")

central sales by using filter =

CALCULATE(sum(Orders[Sales]),FILTER(Orders,Orders[Region]="Central"))

Region	Sales	Central Sales
Central	5,01,239.89	5,01,239.89
East	6,78,781.24	5,01,239.89
South	3,91,721.91	5,01,239.89
West	7,25,457.82	5,01,239.89
Total	22,97,200.86	5,01,239.89

Region	Sum of Sales	central sales	central sales by using filter
Central	5,01,239.89	5,01,239.89	5,01,239.89
East	6,78,781.24	5,01,239.89	
South	3,91,721.91	5,01,239.89	
West	7,25,457.82	5,01,239.89	
Total	22,97,200.86	5,01,239.89	5,01,239.89

Calculate weekend and weekday sales

Weekend Sales = CALCULATE(SUM(Orders[Sales]),Orders[Weekend Flag] = "Weekend")

Weekday Sales = CALCULATE(SUM(Orders[Sales]),Orders[Weekend Flag] = "Weekday")

716.04K
Weekend Sales

1.58M
Weekday Sales

Sub-Category	Sales	Profit	Weekday Sales	Weekend Sales
Accessories	1,67,380.32	41,936.64	1,23,280.86	44,099.46
Appliances	1,07,532.16	18,138.01	75,899.10	31,633.06
Art	27,118.79	6,527.79	20,596.33	6,522.46
Binders	2,03,412.73	30,221.76	1,29,691.90	73,720.83
Bookcases	1,14,880.00	-3,472.56	85,362.90	29,517.10
Chairs	3,28,449.10	26,590.17	2,16,704.34	1,11,744.76
Copiers	1,49,528.03	55,617.82	1,16,878.52	32,649.51
Envelopes	16,476.40	6,964.18	13,073.43	3,402.97
Fasteners	3,024.28	949.52	2,157.25	867.03
Furnishings	91,705.16	13,059.14	65,347.21	26,357.95
Labels	12,486.31	5,546.25	9,040.08	3,446.23
Machines	1,89,238.63	3,384.76	1,11,892.61	77,346.02
Total	22,97,200.86	2,86,397.02	15,81,164.65	7,16,036.21

Calculate Current Year and Previous Year Sales

CY Sales = CALCULATE(SUM(Orders[Sales]),Orders[Year Tag] = "Current Year")

PY Sales = CALCULATE(SUM(Orders[Sales]),Orders[Year Tag] = "Previous Year")

609.21K
PY Sales

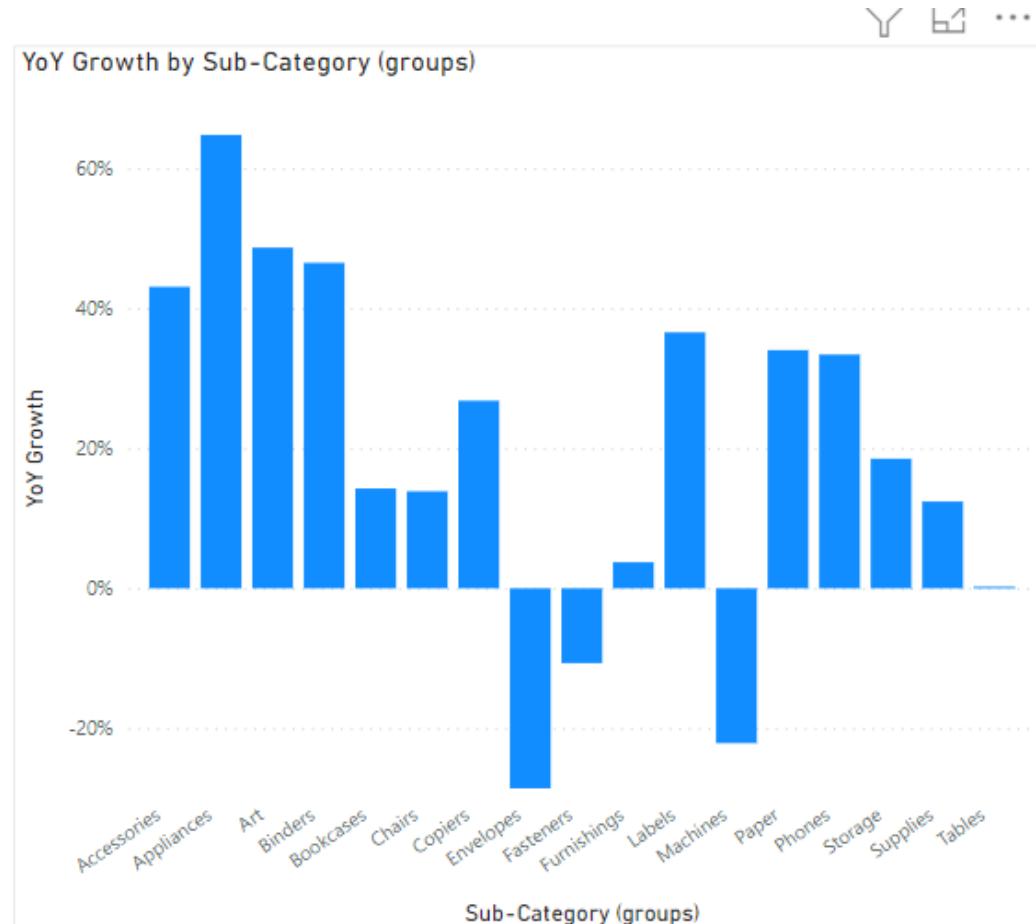
733.22K
CY Sales

Sub-Category	Sales	Profit	CY Sales	PY Sales
Accessories	1,67,380.32	41,936.64	59,946.23	41,895.85
Appliances	1,07,532.16	18,138.01	42,926.93	26,050.32
Art	27,118.79	6,527.79	8,863.07	5,960.91
Binders	2,03,412.73	30,221.76	72,788.05	49,683.33
Bookcases	1,14,880.00	-3,472.56	30,024.28	26,275.47
Chairs	3,28,449.10	26,590.17	95,554.35	83,918.65
Copiers	1,49,528.03	55,617.82	62,899.39	49,599.41
Envelopes	16,476.40	6,964.18	3,378.57	4,729.89
Fasteners	3,024.28	949.52	857.59	960.13
Furnishings	91,705.16	13,059.14	28,915.09	27,874.12
Labels	12,486.31	5,546.25	3,861.22	2,827.24
Machines	1,89,238.63	3,384.76	43,544.68	55,906.89
Total	22,97,200.86	2,86,397.02	7,33,215.26	6,09,205.60

Determining YoY Growth with the CY and PY Sales

YoY Growth = ([CY Sales]-[PY Sales])/[PY Sales]

Sub-Category	Sales	Profit	CY Sales	PY Sales	YoY Growth
Accessories	1,67,380.32	41,936.64	59,946.23	41,895.85	43.08%
Appliances	1,07,532.16	18,138.01	42,926.93	26,050.32	64.78%
Art	27,118.79	6,527.79	8,863.07	5,960.91	48.69%
Binders	2,03,412.73	30,221.76	72,788.05	49,683.33	46.50%
Bookcases	1,14,880.00	-3,472.56	30,024.28	26,275.47	14.27%
Chairs	3,28,449.10	26,590.17	95,554.35	83,918.65	13.87%
Copiers	1,49,528.03	55,617.82	62,899.39	49,599.41	26.81%
Envelopes	16,476.40	6,964.18	3,378.57	4,729.89	-28.57%
Fasteners	3,024.28	949.52	857.59	960.13	-10.68%
Furnishings	91,705.16	13,059.14	28,915.09	27,874.12	3.73%
Labels	12,486.31	5,546.25	3,861.22	2,827.24	36.57%
Machines	1,89,238.63	3,384.76	43,544.68	55,906.89	-22.11%
Paper	78,479.21	34,053.57	27,694.72	20,661.89	34.04%
Phones	3,30,007.05	44,515.73	1,05,340.52	78,962.03	33.41%
Storage	2,23,843.61	21,278.83	69,677.62	58,788.70	18.52%
Supplies	46,673.54	-1,189.10	16,049.41	14,277.58	12.41%
Total	22,97,200.86	2,86,397.02	7,33,215.26	6,09,205.60	20.36%



- i. Super aggregations
- ii. Scatter plot and their properties
- iii. Ribbon chart and properties
- iv. Filters on Visuals, Pages and All Pages
- v. Page navigations with images and buttons

All Functions

ALL()

ALLSELECTED()

ALLEXCEPT()

ALL – Returns all the rows in a table or all the values in a column, ignoring any filters which might have been applied.

Syntax- **ALL** ([<TableNameOrColumnName>] [, <ColumnName> [, <ColumnName> [, ...]]])

ALLSELECTED- Returns all the rows in a table or all the values in a column, ignoring any filters which might have been applied on the columns or the rows **but keeping all other explicit filters**

ALLEXCEPT- Returns all the rows in a table or all the values in a column, ignoring all context filters applied but taking into account the specified columns filter.

Super aggregations



Super aggregates:

Overall Sales = CALCULATE(SUM(Orders[Sales]),ALL(Orders))

Cat Sales = CALCULATE(SUM(Orders[Sales]),ALL(Orders[Sub-Category]))

Cat Cap = SUM(Orders[Sales])/orders[Cat Sales]

Overall Cap = SUM(Orders[Sales])/Orders[Overall Sales]

Category	Sub-Category	Sales	Cat Sales	Overall Sales	Cat Cap	Overall Cap
Furniture	Bookcases	1,14,880.00	7,41,999.80	22,97,200.86	15.48%	5.00%
Furniture	Chairs	3,28,449.10	7,41,999.80	22,97,200.86	44.27%	14.30%
Furniture	Furnishings	91,705.16	7,41,999.80	22,97,200.86	12.36%	3.99%
Furniture	Tables	2,06,965.53	7,41,999.80	22,97,200.86	27.89%	9.01%
Office Supplies	Appliances	1,07,532.16	7,19,047.03	22,97,200.86	14.95%	4.68%
Office Supplies	Art	27,118.79	7,19,047.03	22,97,200.86	3.77%	1.18%
Office Supplies	Binders	2,03,412.73	7,19,047.03	22,97,200.86	28.29%	8.85%
Office Supplies	Envelopes	16,476.40	7,19,047.03	22,97,200.86	2.29%	0.72%
Office Supplies	Fasteners	3,024.28	7,19,047.03	22,97,200.86	0.42%	0.13%
Office Supplies	Labels	12,486.31	7,19,047.03	22,97,200.86	1.74%	0.54%
Office Supplies	Paper	78,479.21	7,19,047.03	22,97,200.86	10.91%	3.42%
Office Supplies	Storage	2,23,843.61	7,19,047.03	22,97,200.86	31.13%	9.74%
Office Supplies	Supplies	46,673.54	7,19,047.03	22,97,200.86	6.49%	2.03%
Technology	Accessories	1,67,380.32	8,36,154.03	22,97,200.86	20.02%	7.29%
Technology	Copiers	1,49,528.03	8,36,154.03	22,97,200.86	17.88%	6.51%
Technology	Machines	1,89,238.63	8,36,154.03	22,97,200.86	22.63%	8.24%
Technology	Phones	3,30,007.05	8,36,154.03	22,97,200.86	39.47%	14.37%

all selected sales = CALCULATE(sum(Orders[Sales]),ALLSELECTED(Orders))

Category	Sub-Category	Sum of Sales	all selected sales
Furniture	Bookcases	1,14,880.00	13,57,236.89
Furniture	Furnishings	91,705.16	13,57,236.89
Furniture	Tables	2,06,965.53	13,57,236.89
Office Supplies	Appliances	1,07,532.16	13,57,236.89
Technology	Accessories	1,67,380.32	13,57,236.89
Technology	Copiers	1,49,528.03	13,57,236.89
Technology	Machines	1,89,238.63	13,57,236.89
Technology	Phones	3,30,007.05	13,57,236.89
Total		13,57,236.89	13,57,236.89

- | Sub-Category |
|---|
| <input checked="" type="checkbox"/> Accessories |
| <input checked="" type="checkbox"/> Appliances |
| <input type="checkbox"/> Art |
| <input type="checkbox"/> Binders |
| <input checked="" type="checkbox"/> Bookcases |
| <input type="checkbox"/> Chairs |
| <input checked="" type="checkbox"/> Copiers |
| <input type="checkbox"/> Envelopes |
| <input type="checkbox"/> Fasteners |
| <input checked="" type="checkbox"/> Furnishings |
| <input type="checkbox"/> Labels |
| <input checked="" type="checkbox"/> Machines |
| <input type="checkbox"/> Paper |
| <input checked="" type="checkbox"/> Phones |
| <input type="checkbox"/> Storage |
| <input type="checkbox"/> Supplies |
| <input checked="" type="checkbox"/> Tables |

all except =

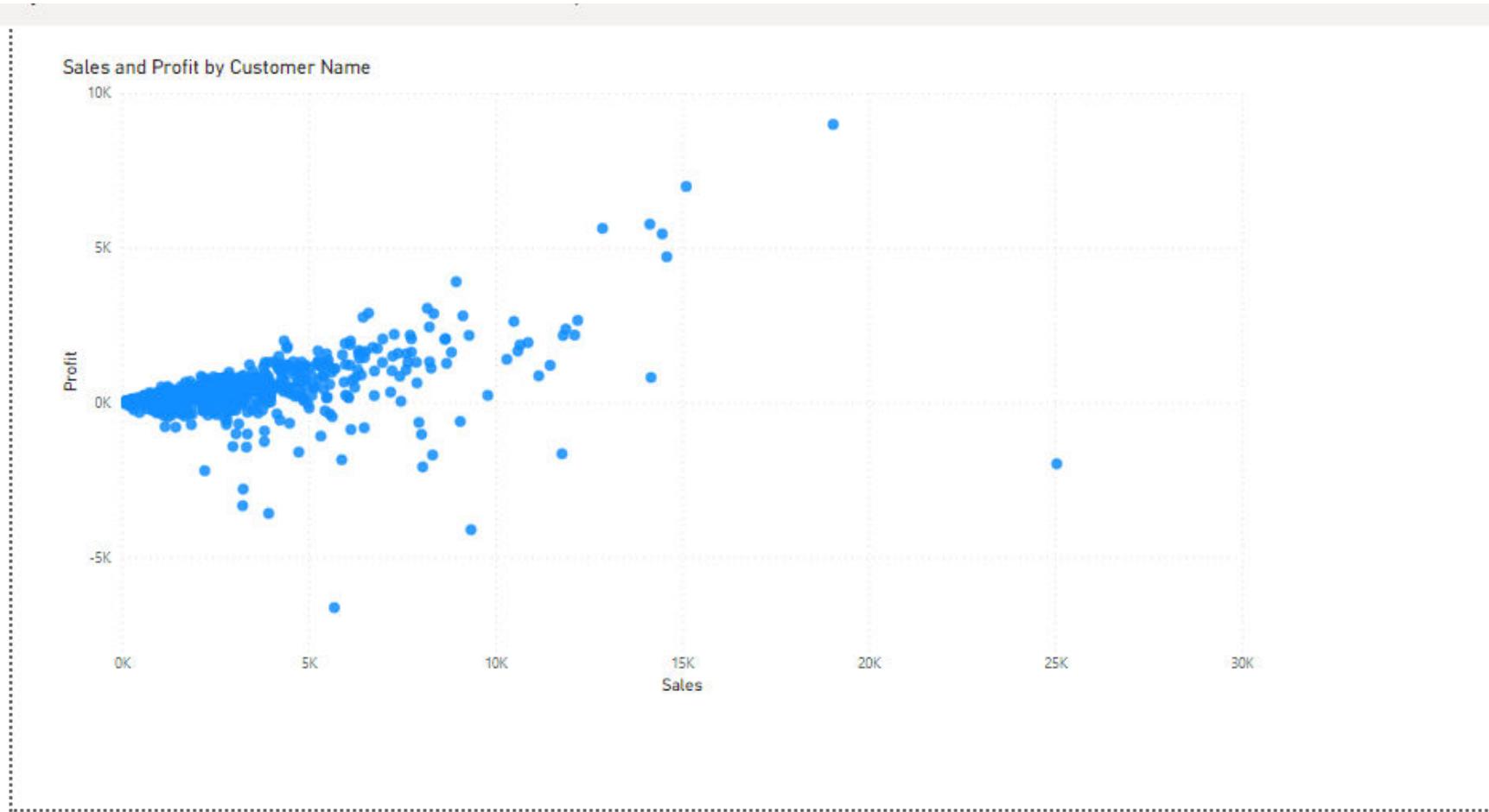
```
CALCULATE(sum(Orders[sales]), ALLEXCEPT(Orders, Orders[Category]))
```

Category	Sub-Category	Sum of Sales	all except
Furniture	Bookcases	1,14,880.00	7,41,999.80
Furniture	Chairs	3,28,449.10	7,41,999.80
Furniture	Furnishings	91,705.16	7,41,999.80
Furniture	Tables	2,06,965.53	7,41,999.80
Office Supplies	Appliances	1,07,532.16	7,19,047.03
Office Supplies	Art	27,118.79	7,19,047.03
Office Supplies	Binders	2,03,412.73	7,19,047.03
Office Supplies	Envelopes	16,476.40	7,19,047.03
Office Supplies	Fasteners	3,024.28	7,19,047.03
Office Supplies	Labels	12,486.31	7,19,047.03
Office Supplies	Paper	78,479.21	7,19,047.03
Office Supplies	Storage	2,23,843.61	7,19,047.03
Office Supplies	Supplies	46,673.54	7,19,047.03
Technology	Accessories	1,67,380.32	8,36,154.03
Technology	Copiers	1,49,528.03	8,36,154.03
Technology	Machines	1,89,238.63	8,36,154.03
Total		22,97,200.86	22,97,200.86

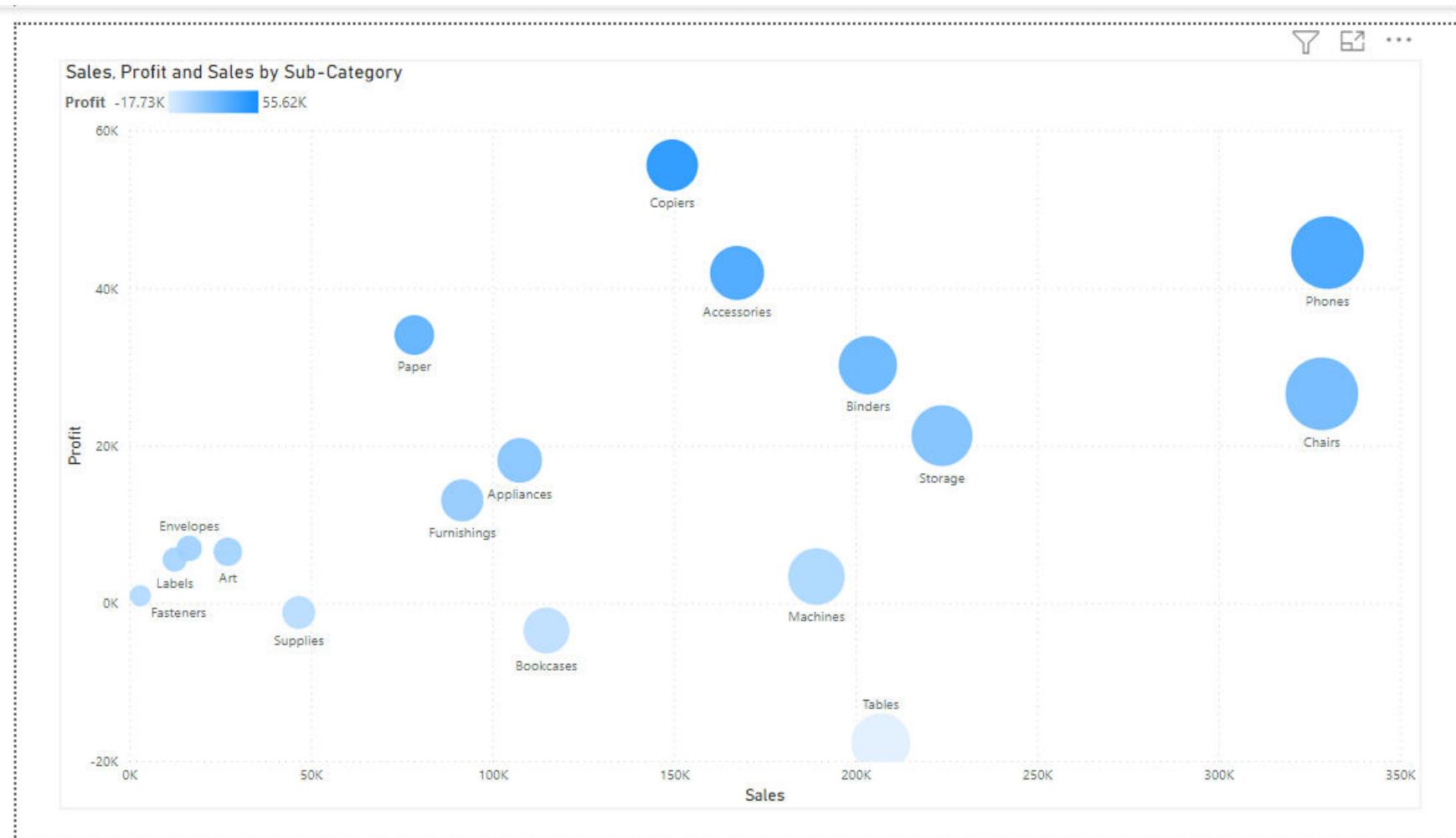
Category
 Furniture
 Office Supplies
 Technology

Sub-Category
 Accessories
 Appliances
 Art
 Binders
 Bookcases
 Chairs
 Copiers

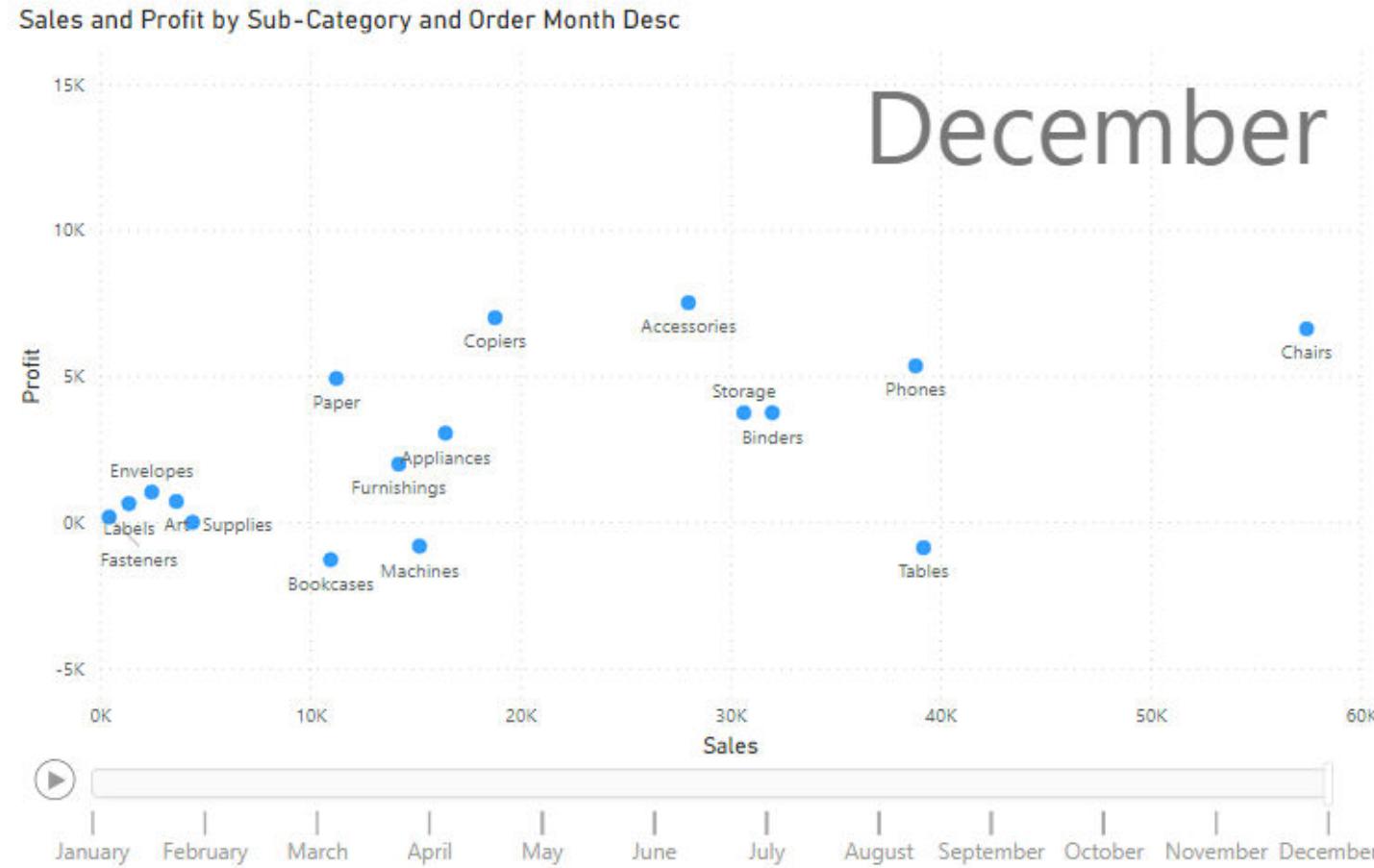
ii. Scatter plot and their properties



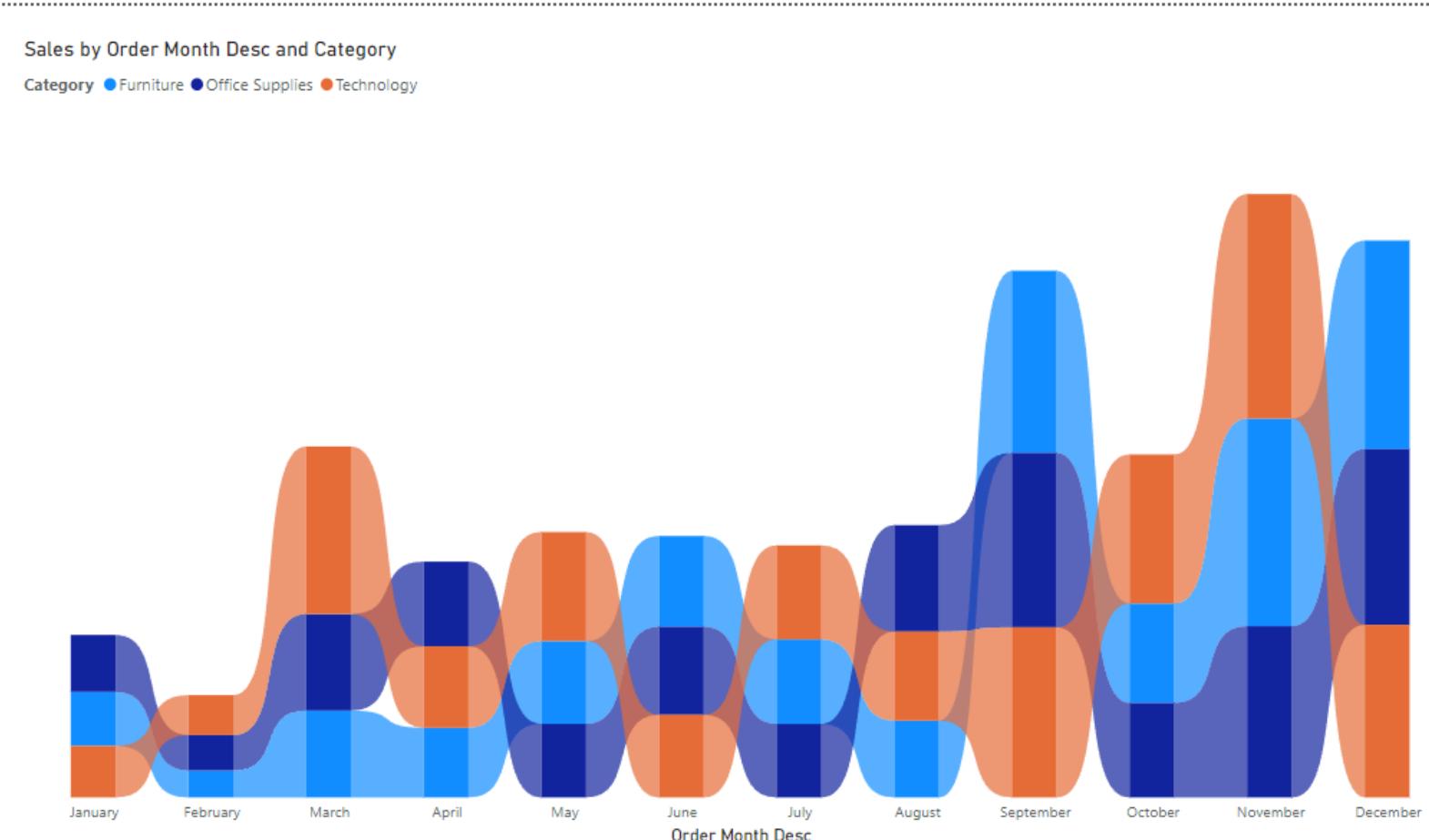
. Scatter plot and their properties



Scatter plot and their properties



Ribbon chart and properties



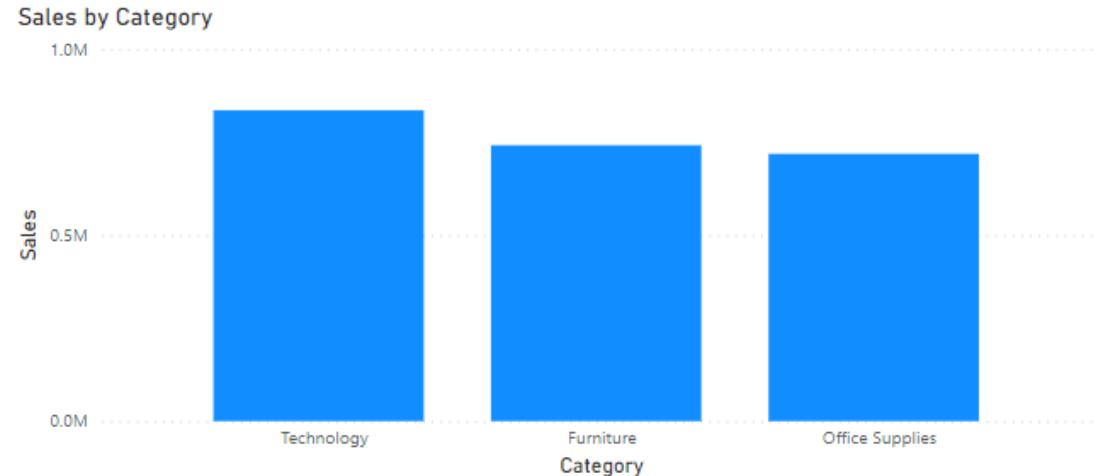
Filters on Visuals, Pages and All Pages



Page navigations with images and buttons



Sales Analysis



- i. introduction to rank, rank on single and multi dims
- ii. rank with all and all selected
- iii.adding ref lines to a chart and colour coding based on ref line
- iv. Parameters introduction, controlling ref line and chart colour based on parameters
- v. TopN ranking based on parameter and dynamic titles based on Top N rank value

Introduction to rank, rank on single and multi dims

Rank:

Sales Amount = sum(order[Sales])

Sub Cat Rnk = RANKX(ALL(Orders[Sub-Category]),Orders[Sales Amount],,,DESC,Dense)

Overall Rank = RANKX(ALL(Orders[Category],Orders[Sub-Category]),Orders[Sales Amount],,,DESC,Dense)

over all rnk skip = RANKX(all(Orders[Sub-Category],Orders[Category],Orders[Region]),[sales amount],,,DESC,Skip)

over all rnk value = RANKX(all(Orders[Sub-Category],Orders[Category]),[sales amount],90000,DESC,Skip)

Category	Sub-Category	Sum of Sales	sub cat rnk	over all rnk	over all rnk skip	over all rnk value
Furniture	Bookcases	1,14,880.00	3	9	1	12
Furniture	Chairs	3,28,449.10	1	2	1	12
Furniture	Tables	2,06,965.53	2	4	1	12
Office Supplies	Appliances	1,07,532.16	3	10	1	12
Office Supplies	Binders	2,03,412.73	2	5	1	12
Office Supplies	Storage	2,23,843.61	1	3	1	12
Technology	Accessories	1,67,380.32	3	7	1	12
Technology	Copiers	1,49,528.03	4	8	1	12
Technology	Machines	1,89,238.63	2	6	1	12
Technology	Phones	3,30,007.05	1	1	1	12
Furniture	Furnishings	91,705.16	4	11	5	12
Office Supplies	Paper	78,479.21	4	12	7	12
Office Supplies	Supplies	46,673.54	5	13	19	12
Office Supplies	Art	27,118.79	6	14	37	12
Office Supplies	Envelopes	16,476.40	7	15	46	12
Office Supplies	Labels	12,486.31	8	16	48	12
Office Supplies	Fasteners	3,024.28	9	17	62	12
Total		22,97,200.86	1	1	1	12

rank with all and all selected

All Selected Rank:

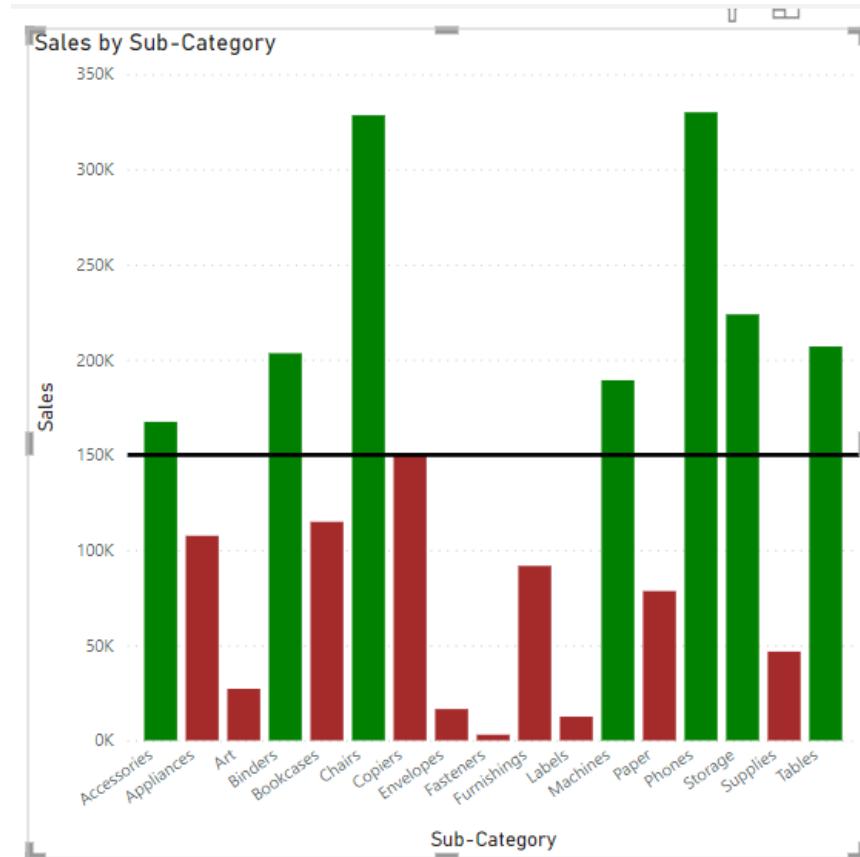
Sub Cat Rnk v1 = RANKX(ALLSELECTED(Orders[Sub-Category]),Orders[Sales Amount],,DESC,Dense)

Sub-Category	Sales	Sub Cat Rnk	Sub Cat Rnk v1
Machines	1,89,238.63	6	1
Copiers	1,49,528.03	8	2
Appliances	1,07,532.16	10	3
Supplies	46,673.54	13	4

- Sub-Category
- Accessories
 - Appliances
 - Art
 - Binders
 - Bookcases
 - Chairs
 - Copiers
 - Envelopes
 - Fasteners
 - Furnishings
 - Labels
 - Machines
 - Paper
 - Phones
 - Storage
 - Supplies
 - Tables

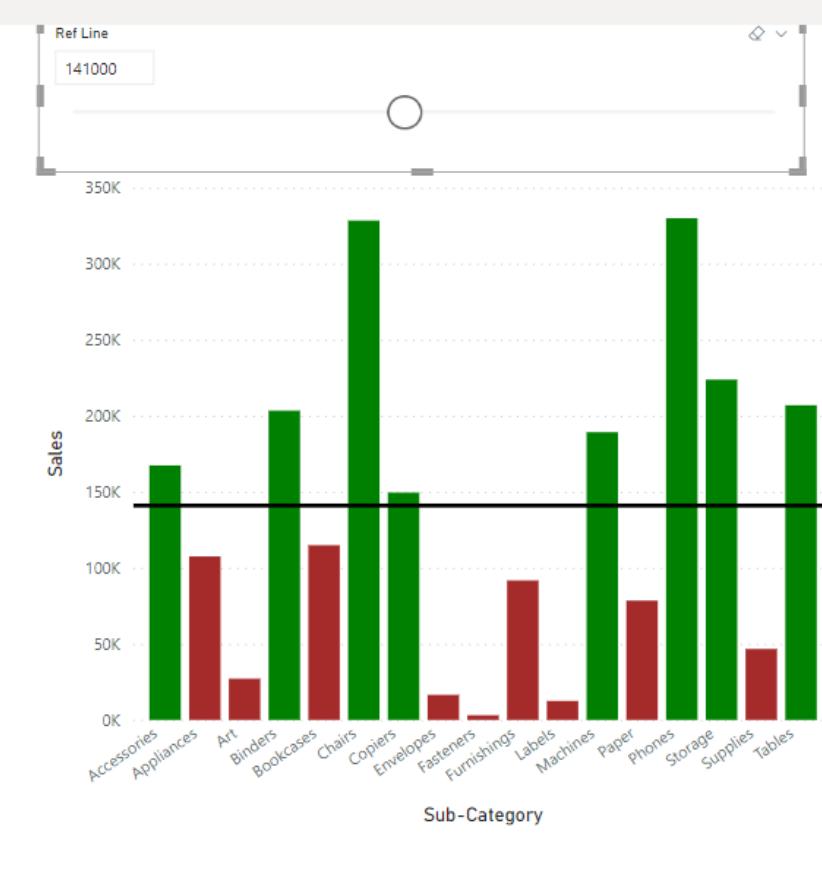
adding ref lines to a chart and colour coding based on ref line

Ref Line Tag = `IF(SUM(Orders[Sales]) >= 150000, "green", "brown")`



Parameters introduction, controlling ref line and chart colour based on parameters

```
Ref Line Tag Dyn = IF(SUM(Orders[Sales]) >= 'Ref Line'[Ref Line Value], "green", "brown")
```



TopN ranking based on parameter and dynamic titles based on Top N rank value



Selected Sales = IF(Orders[Sub Cat Rnk] <= 'Top N'[Top N Value], SUM(Orders[Sales]), BLANK())

Selected Sub Cat Rnk = IF(Orders[Sub Cat Rnk] <= 'Top N'[Top N Value], Orders[Sub Cat Rnk], BLANK())

Title Top N = "Top " & 'Top N'[Top N Value] &
" Sub Cat on Sales"

TopN ranking based on parameter and dynamic titles based on Top

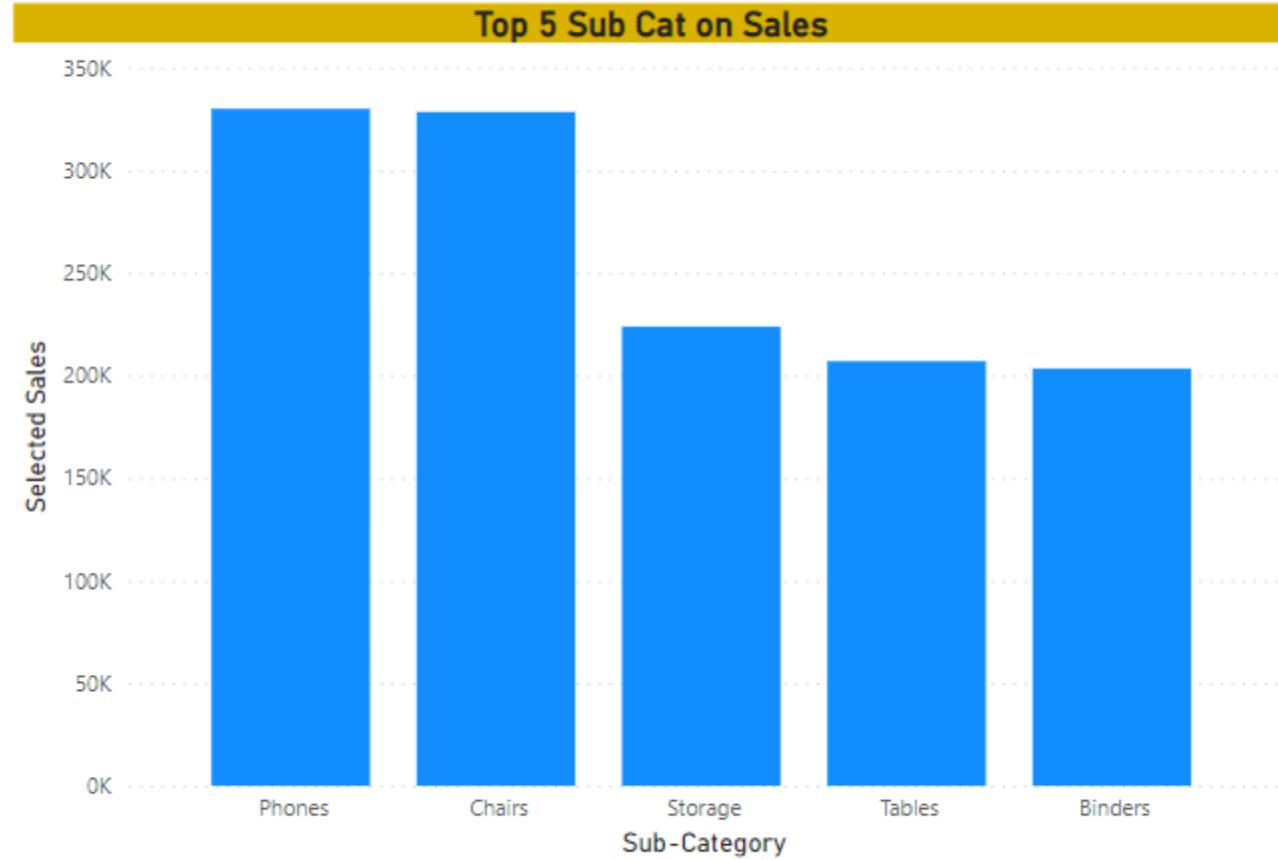


Top 5 Sub Cat on Sales

Sub-Category	Selected Sales	Selected Sub Cat Rnk
Phones	3,30,007.05	1
Chairs	3,28,449.10	2
Storage	2,23,843.61	3
Tables	2,06,965.53	4
Binders	2,03,412.73	5

Top N

5

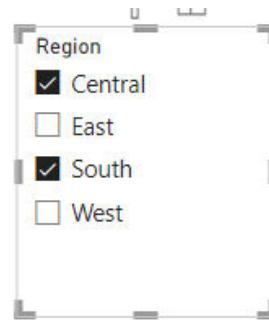


- i. Is filtered
- ii. Dynamic titles from selectors on cards and on chart titles
- iii. Working with the concatentex to get multiple values seperated by commas in the title
- iv. Introduction to drills
- vi. Drill down and drill up
- vii. Drill through feature

Dynamic Title:

```
Region Sel Title = "Analysis for " &  
if(ISFILTERED(Orders[Region]),VALUES(Orders[Region]),"All Regions")
```

```
Region Sel Title = "Analysis for " &  
if(ISFILTERED(Orders[Region]),CONCATENATEX(VALUES(Orders[  
Region]),Orders[Region],", ",""),"All Regions")
```



Analysis for South, Central

892.96K

Sales

86.46K

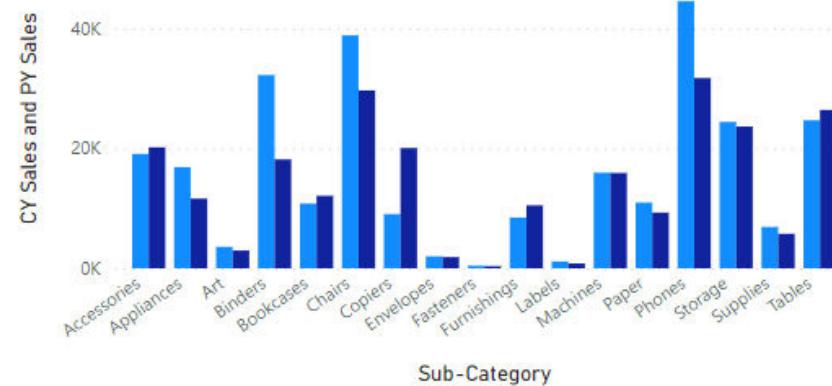
Profit

15K

Quantity

Analysis for South, Central

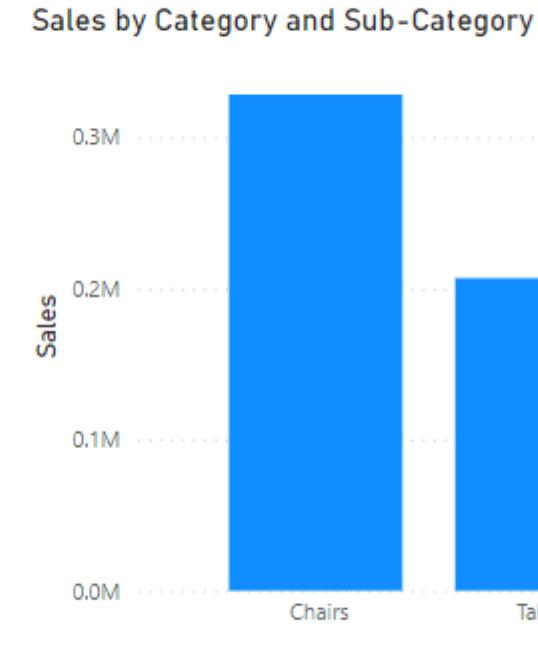
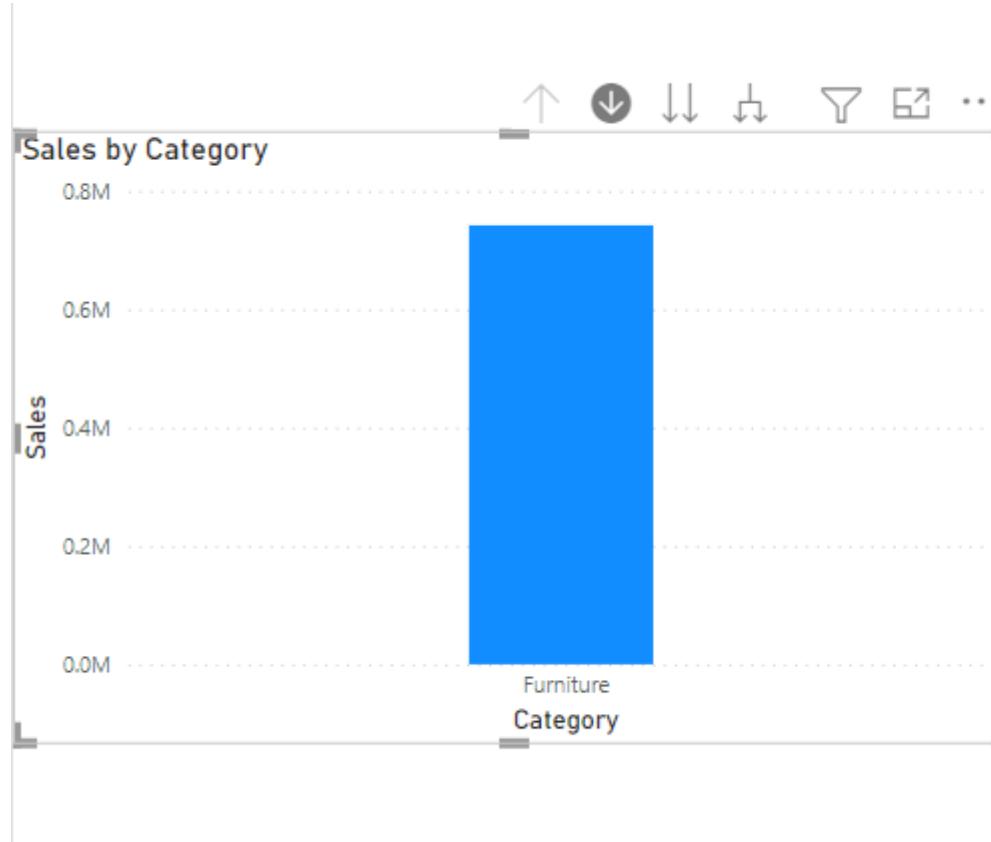
CY Sales ● PY Sales



Analysis for South, Central



Introduction to drills, Drill down and drill up, Drill through feature



Drill through feature

The screenshot illustrates the drill-through feature in a Power BI report. On the left, a bar chart titled "Sales and Sub Cat Rnk v1 by Region" shows sales for three regions: Central, East, and South. A context menu is open over the East bar, with "Drill through" selected. This menu also includes options like "Show as a table", "Include", "Exclude", "Analyze", "Group", "Summarize", and "Copy". To the right of the chart is a pie chart titled "Sales by Category" showing sales distribution across Furniture, Technology, and Office Supplies. At the bottom, a navigation bar includes tabs for Ref Lines, Top N Rnk, Dyn Slicer Title, Drill Down, Index Page (which is highlighted), Cat vs Sales, Sub Cat vs Sales, and Page 2. On the far right, the Power BI ribbon shows various icons and settings, with a yellow box highlighting the "Region is West" filter under the "Values" section.

Sales and Sub Cat Rnk v1 by Region

Region

Filters

Region is (All)

Sales is (All)

Sub C is (All)

Show as a table

Include

Exclude

Drill through

Analyze

Group

Summarize

Copy

Cat vs Sales

Sub Cat vs Sales

Cat vs Sales

Sales by Category

Category

Furniture

Technology

Office Supplies

Ref Lines

Top N Rnk

Dyn Slicer Title

Drill Down

Index Page

Cat vs Sales

Sub Cat vs Sales

Page 2

Search

Add data fields here

Filters on this page

Filters on all pages

Add data fields here

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Region is West

Group by - Table

GROUPBY does not do an implicit [CALCULATE](#) for any extension columns that it adds.

GROUPBY permits a new function, [CURRENTGROUP](#), to be used inside aggregation functions in the extension columns that it adds. GROUPBY is used to perform multiple aggregations in a single table scan.

```
group by = GROUPBY(Orders,Orders[Category],Orders[City],"Total Sale",SUMX(CURRENTGROUP(),Orders[sales]))
```

The screenshot shows a Power BI report with a table visualization. The table has three columns: 'Orders_Category' (dropdown menu), 'Orders_City' (dropdown menu), and 'Total Sale' (dropdown menu). The data is grouped by 'Orders_Category'. The table contains 1,198 rows. The first few rows of data are:

Orders_Category	Orders_City	Total Sale
Office Supplies	Los Angeles	48821.514
Office Supplies	San Francisco	42253.152
Office Supplies	San Diego	7735.516
Office Supplies	San Jose	3084.928
Office Supplies	Inglewood	1844.928
Office Supplies	Anaheim	3812.25
Office Supplies	Long Beach	4726.582
Office Supplies	Mission Viejo	365.32
Office Supplies	Salinas	580.634
Office Supplies	Oakland	1698.192
Office Supplies	Antioch	19.44
Office Supplies	Escondido	94.548
Office Supplies	Pasadena	1627.67
Office Supplies	Vallejo	172.21
Office Supplies	Brentwood	3772.876
Office Supplies	Redlands	846.212
Office Supplies	Fresno	949.752
Office Supplies	Vacaville	423.28
Office Supplies	Apple Valley	251.76
Office Supplies	Woodland	24.678
Office Supplies	San Mateo	75.18
Office Supplies	Santa Ana	590.26
Office Supplies	Stockton	502.12
Office Supplies	Manteca	329.83
Office Supplies	Danville	1177.234
Office Supplies	Redondo Beach	137.848
Office Supplies	Moreno Valley	377.786

SUMMARIZE will summarize the huge number of data rows into one table with a provided criteria column.

For example, you may have multiple city sales values. Still, each city has multiple rows of transactions, so using the SUMMARIZE function, we can create a summary table where each city will have only one-row transactions with the summarized line.

```
summarize = SUMMARIZE(Orders,Orders[Category],Orders[City],"Total  
Sale",SUMX(Orders,Orders[sales]))
```

SUMMARIZE



```
summarize = SUMMARIZE(Orders,Orders[Category],Orders[City],"Total Sale",SUMX(Orders,Orders[sales]))
```

X ✓ 1 group by = GROUPBY(Orders,Orders[Category],Orders[City],"Total Sale",SUMX(CURRENTGROUP(),Orders[sales]))

Orders_Category	Orders_City	Total Sale
Office Supplies	Los Angeles	48821.514
Office Supplies	San Francisco	42253.152
Office Supplies	San Diego	7735.516
Office Supplies	San Jose	3084.328
Office Supplies	Inglewood	1844.928
Office Supplies	Anaheim	3812.25
Office Supplies	Long Beach	4726.582
Office Supplies	Mission Viejo	365.32
Office Supplies	Salinas	580.634
Office Supplies	Oakland	1698.192
Office Supplies	Antioch	19.44
Office Supplies	Escondido	94.548
Office Supplies	Pasadena	1627.67
Office Supplies	Vallejo	172.21
Office Supplies	Brentwood	3772.876
Office Supplies	Redlands	846.212
Office Supplies	Fresno	949.752
Office Supplies	Vacaville	423.28
Office Supplies	Apple Valley	251.76
Office Supplies	Woodland	24.678
Office Supplies	San Mateo	75.18
Office Supplies	Santa Ana	590.26
Office Supplies	Stockton	502.12
Office Supplies	Manteca	329.83
Office Supplies	Danville	1177.234
Office Supplies	Redondo Beach	137.848
Office Supplies	Moreno Valley	377.786

:group by (1,198 rows)

SUMMARIZE COLUMN-We can have filter conditions

Summarize Column

```
=SUMMARIZECOLUMNS(Orders[Category],Orders[Sales],filter(Orders,Orders[Category]="Office Supplies"))
```

```
summarize column = SUMMARIZECOLUMNS(Orders[Category], "Total  
sales", sumx(Orders,Orders[Sales]), "highets sales", maxx(Orders,Orders[Sales]))
```

A date dimension is an essential table in a data model that allows us to analyze performance more effectively across different time periods. It should be included in every dimensional model that contains a date or requires date intelligence as part of the analysis.

calender dim = CALENDAR(date(2023,1,1),date(2023,12,31))

calender dim = CALENDAR(today()-365,today()+365)

Calender dim = CALENDERAUTO()

Relationship

The screenshot shows the Power BI Desktop interface with the 'Relationships' tab selected in the ribbon. The main area displays two tables: 'Orders' and 'Date_dim'. A relationship is established between them, with the 'Customer ID' field in 'Orders' connected to the 'Customer ID' field in 'Date_dim'. The relationship type is one-to-many, indicated by a small '1' at the Date_dim end and an asterisk (*) at the Orders end. The 'Date' field in 'Date_dim' is also visible. On the right side, the 'Properties' pane is open, showing settings for cards and fields. The bottom navigation bar includes buttons for 'All tables' and a '+' icon.

Calculating MTD, QTD, YTD, Running and Cumulative Total in Power BI



```
qty_ytd = TOTALYTD(sum(Orders[Quantity]),Date_dim[Date].[Date])
```

```
qty_qtd = TOTALQTD(sum(Orders[Quantity]),Date_dim[Date].[Date])
```

```
qty_mtd = TOTALMTD(sum(Orders[Quantity]),Date_dim[Date].[Date])
```

The screenshot shows the Power BI Desktop interface with three tables displayed on the left:

- MTD**: Shows data from March 1 to March 18, 2018. The total quantity is 585.
- QTD**: Shows data from January 1 to March 18, 2018. The total quantity is 1028.
- YTD**: Shows data from January 1 to March 18, 2018. The total quantity is 1028.

The right side of the screen shows the **Visualizations** pane, which includes:

- Build visual**: A grid of visualization icons.
- Fields**: A search bar with the query "qt" and a list of fields under "Orders":
 - qty_mtd
 - qty_qtd
 - qty_ytd
- Values**: A section for adding data fields, with "Add data fields here" and "Add drill-through fields here".
- Drill through**: A switch set to "Off".
- Cross-report**: A switch set to "On".
- Keep all filters**: A switch set to "On".

The status bar at the bottom indicates "Page 1 of 1", "84%", "Update available (click to download)", and the system clock "15:14".

Time intelligent functions

DAX time intelligent functions are PARALLELPERIOD, DATEADD and SAMEPERIODLASTYEAR

PARALLELPERIOD

PARALLELPERIOD returns a table that contains a column of dates that represents a period parallel to the dates in the specified **dates** column, in the current context, with the dates shifted a number of intervals either forward in time or back in time.

PARALLELPERIOD(<dates>,<number_of_intervals>,<interval>)

- Dates – A column that contains dates.
- Number_of_intervals – an integer that specifies the number of intervals to add to or subtract from the dates.
- Interval – the interval by which to shift the dates. The value for interval can be one of the following, **year, quarter or month**.

We can see that PARALLELPERIOD look at a set of dates have a number of intervals that it looks backwards or forward and goes backwards or forward based on a set interval of a year, quarter or month

DATEADD

DATEADD returns a table that contains a column of dates, shifted either forward or backwards in time by the specified number of intervals from the dates in the current context.

DATEADD(<dates>,<number_of_intervals>,<interval>)

- Dates – A column that contains dates.
- Number_of_intervals – an integer that specifies the number of intervals to add to or subtract from the dates.
- Interval – the interval by which to shift the dates. The value for interval can be one of the following, **year, quarter, month or day**.

We can see that DATEADD look at a set of dates have a number of intervals that it looks backwards or forward and goes backwards or forward based on a set interval of a year, quarter or month.

SAMEPERIODLASTYEAR

Returns a table that contains a column of dates shifted one year back in time from the dates in the specified **dates** column, in the current context.

SAMEPERIODLASTYEAR(<dates>)

- Dates – A column that contains dates.

SAMEPERIODLASTYEAR returns a single column table of dates values. **SAMEPERIODLASTYEAR** is specific to a year interval.

Same period last year =

```
CALCULATE(sum(Orders[Sales]),SAMEPERIODLASTYEAR(Date_dim[Date].[Date]))
```

Parallel period last month =

```
CALCULATE(sum(Orders[Sales]),PARALLELPERIOD(Date_dim[Date].[Date],-1,MONTH))
```

Parallel period last year =

```
CALCULATE(sum(Orders[Sales]),PARALLELPERIOD(Date_dim[Date].[Date],-1,YEAR))
```

Date add month = `CALCULATE(sum(Orders[Sales]),DATEADD(Date_dim[Date].[Date],-1,MONTH))`

Date add DAY = `CALCULATE(sum(Orders[Sales]),DATEADD(Date_dim[Date].[Date],-1,DAY))`

Time intelligent functions

Year	Quarter	Month	Sum of Sales	Same period last year	Parallel period last month	Parallel period last year	Date add month	Date add DAY
2018	Qtr 1	January	14,236.90				13,946.23	
2018	Qtr 1	February	4,519.89		14,236.89		14,236.89	4,810.56
2018	Qtr 1	March	55,691.01		4,519.89		4,519.89	53,731.46
2018	Qtr 2	April	28,295.35		55,691.01		55,691.01	29,206.16
2018	Qtr 2	May	23,648.29		28,295.35		28,295.35	23,923.33
2018	Qtr 2	June	34,595.13		23,648.29		23,648.29	34,629.20
2018	Qtr 3	July	33,946.39		34,595.13		34,595.13	34,686.02
2018	Qtr 3	August	27,909.47		33,946.39		33,946.39	27,816.95
2018	Qtr 3	September	81,777.35		27,909.47		27,909.47	80,882.34
2018	Qtr 4	October	31,453.39		81,777.35		81,777.35	27,078.90
2018	Qtr 4	November	78,628.72		31,453.39		31,453.39	83,771.59
2018	Qtr 4	December	69,545.62		78,628.72		78,628.72	64,511.50
2019	Qtr 1	January	18,174.08	14,236.89	69,545.62	4,84,247.50	69,545.62	23,328.09
2019	Qtr 1	February	11,951.41	4,519.89	18,174.08	4,84,247.50	18,174.08	11,499.41
2019	Qtr 1	March	38,726.25	55,691.01	11,951.41	4,84,247.50	11,951.41	39,076.80
2019	Qtr 2	April	34,195.21	28,295.35	38,726.25	4,84,247.50	38,726.25	32,824.23
2019	Qtr 2	May	30,131.69	23,648.29	34,195.21	4,84,247.50	34,195.21	26,525.24
2019	Qtr 2	June	24,797.29	34,595.13	30,131.69	4,84,247.50	30,131.69	29,975.43
2019	Qtr 3	July	28,765.33	33,946.39	24,797.29	4,84,247.50	24,797.29	25,053.16
2019	Qtr 3	August	36,898.33	27,909.47	28,765.33	4,84,247.50	28,765.33	38,008.70
2019	Qtr 3	September	64,595.92	81,777.35	36,898.33	4,84,247.50	36,898.33	67,197.72
2019	Qtr 4	October	31,404.92	31,453.39	64,595.92	4,84,247.50	64,595.92	28,193.91
2019	Qtr 4	November	75,972.56	78,628.72	31,404.92	4,84,247.50	31,404.92	77,385.18
Total			22,97,200.86	22,97,200.86	22,97,200.86	22,97,200.86	22,97,200.86	22,97,200.86

Year
 2018
 2019
 2020
 2021
 2022

ROW LEVEL SECURITY

Row-level security in Power BI can be used to restrict data access for given users. Filters restrict data access at the row level, and you can define filters within roles. Be aware that in the Power BI service, members of a workspace have access to datasets in the workspace.

The screenshot shows the Power BI Desktop interface with the 'Modeling' tab selected. On the left, there's a visual titled 'Sum of Sales by Region' showing four bars for West, East, Central, and South regions. In the center, the 'Manage roles' dialog is open, showing a single role named 'ROW LEVEL SECURITY'. To the right of the dialog, a 'Table filter DAX expression' builder is open, displaying the formula: [Region] = "East". Below this, a list of fields from the 'Orders' table is shown, including Region, Product ID, Category, Sub-Category, Product Name, Sales, Quantity, Discount, Profit, Demography_code_R, Demography_code_mid, and Order Year. A search bar at the top of the list says 'sales'. On the far right, the 'Fields' pane is open, showing various sales-related measures like 'all selected sales', 'cat sales', 'overall sales', 'Sales', 'Sales amount', 'selected sales', 'sub sales', 'Weekday Sales', 'Weekend Sales', and summarized columns like 'highets sales' and 'Total sales'. The bottom of the screen shows the Windows taskbar with various pinned icons.

Static level Security

The image displays two side-by-side screenshots of the Microsoft Power BI Desktop application interface.

Screenshot 1 (Left): Shows a bar chart titled "Sum of Sales by Region". The Y-axis is labeled "Region" and lists "West", "East", "Central", and "South". The X-axis is labeled "Sum of Sales" and ranges from 0.0M to 0.4M. A context menu is open over the "West" bar, titled "View as roles". It contains three options: "None", "Other user", and "ROW LEVEL SECURITY". The "ROW LEVEL SECURITY" option is checked. The Power BI ribbon at the top shows the "Modeling" tab is selected. The status bar at the bottom indicates "Page 1" and "Drill through".

Screenshot 2 (Right): Shows the same bar chart after applying Row Level Security. The "West" bar is now completely blue. A yellow banner at the top of the screen reads "Now viewing as: ROW LEVEL SECURITY". The "Stop viewing" button is visible in the top right corner of the banner. The Power BI ribbon and status bar are identical to the first screenshot.

Static level Security

team_14 - Power BI Desktop

Search

Sign in

File Home Insert Modeling View Help Format Data / Drill

Cut Copy Format painter Paste Clipboard Get data workbook hub Data Server Enter data Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert New measure Quick measure Calculations Sensitivity Share Publish

Auto recovery contains some recovered files that haven't been opened.

Now viewing as: ROW LEVEL SECURITY

View recovered files Stop viewing

Sum of Sales by Region

Region East

Enter your email address

Power BI Desktop and the Power BI service work better together. Sign in to enhance your collaboration and access organizational content.

shobha.p@aroha.co.in

Continue Cancel

0.0M 0.1M 0.2M 0.3M 0.4M 0.5M 0.6M 0.7M Sum of Sales

Visualizations Fields

Build visual

sales

Orders

- all selected sales
- cat sales
- overall sales
- \sum Sales
- sales amount
- selected sales
- sub sales
- Weekday Sales
- Weekend Sales

Y-axis

Region

X-axis

Sum of Sales

Legend

Add data fields here

Small multiples

Add data fields here

Tooltips

Add data fields here

Drill through

Page 1

Drill down Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1

Page 63 of 63

84% Update available (click to download)

Windows Taskbar icons

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Static level Security

Screenshot of the Power BI workspace interface showing static level security applied to datasets.

The browser tab bar shows multiple open tabs related to Power BI and RLS. The main Power BI interface displays the "My workspace" page with a sidebar containing navigation links like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, and My workspace (which is currently selected).

A prominent banner at the top of the workspace says: "We updated the look of workspaces. Take a tour, and we'll show you how to get around." with a "Start tour" button.

The main content area lists datasets and reports in a table:

All	Name	Type	Owner	Refreshed	Next refresh	Endorsement	Sensitivity
	asd	Report	shobha P	12/1/22, 2:46:49 PM	—	—	—
	asd	Dataset	shobha P	12/1/22, 2:46:49 PM	N/A	—	—
	Customer Profitability Sample	Dashboard	shobha P	—	—	—	—
	Customer Profitability Sample	Report	shobha P	12/1/22, 2:51:05 PM	—	—	—
	Customer Profitability Sample	Workbook	My workspace	12/1/22, 2:51:05 PM	—	—	—
	Customer Profitability Sample	Dataset	shobha P	12/1/22, 2:51:05 PM	N/A	—	—
	Financial Sample	Workbook	My workspace	12/1/22, 2:54:24 PM	—	—	—
	Human Resources Sample	Dashboard	shobha P	—	—	—	—
	Human Resources Sample	Report	shobha P	12/1/22, 2:53:14 PM	—	—	—

The bottom taskbar includes icons for Windows Start, Search, Task View, Edge, File Explorer, File, Print, and Power BI.

Static level Security



Screenshot of the Microsoft Power BI 'My workspace' interface, showing a list of datasets and dataflows.

The left sidebar shows navigation links: Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, and My workspace (which is selected).

The main area displays a table of datasets and dataflows:

Name	Owner	Refreshed	Next refresh	Endorsement	Sensitivity
Human Resources Sample	shobha P	12/1/22, 2:53:14 PM	N/A	—	—
refe	shobha P	5/5/23, 3:54:34 PM	N/A	—	—
sales analysis	shobha P	12/1/22, 11:41:03 AM	N/A	—	—
sample	shobha P	1/30/23, 12:51:43 PM	N/A	—	—
SASI POWER BI (1)	shobha P	4/5/23, 9:28:39 AM	N/A	—	—
superstore simple report	shobha P	3/15/23, 1:10:04 PM	N/A	—	—
Team_11_Sales_analysis	shobha P	12/28/22, 11:10:47 AM	N/A	—	—
team_14	shobha P	5/19/23, 12:20:52 PM	N/A	—	—

Actions available for each item include: Analyze in Excel, Create report, Auto-create report, Create paginated report, Delete, Quick insights, Security, Rename, Open data model, Settings, Download this file, Manage permissions, and View lineage.

Static level Security

The screenshot shows the Microsoft Power BI 'My workspace' interface. On the left is a vertical navigation bar with icons for Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, and My workspace (which is selected). The main area displays a list of datasets under the 'Datasets + dataflows' tab. A context menu is open over the dataset named 'team_14'. The menu options include: Analyze in Excel, Create report, Auto-create report, Create paginated report, Delete, Quick insights, Security, Rename, Open data model, Settings, Download this file, Manage permissions, and View lineage. The dataset 'team_14' has the following details: Owner: shobha P, Refreshed: 5/19/23, 12:20:52 PM, Next refresh: N/A, Endorsement: —, Sensitivity: —.

ADD and SAVE

The screenshot shows the 'Row-Level Security' settings in Power BI. The left sidebar includes icons for Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, and My workspace. The main area displays 'ROW LEVEL SECURITY (0)' and 'Members (0)'. A search bar at the top right shows '(133) DreamHost'. The URL in the address bar is <https://app.powerbi.com/groups/me/rowlevelscurity/6809259>. The 'Add' button is highlighted in green.

Static level Security

The screenshot shows the 'Row-Level Security' settings in Power BI. On the left, a sidebar menu includes options like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, and My workspace. The main area displays a 'ROW LEVEL SECURITY (1)' card with a 'Members (1)' tab selected. A tooltip 'Test as role who belong to this role' points to the 'Enter email addresses' input field. Below it, a list shows 'shobha P' with a delete 'X' icon. At the bottom are 'Save' and 'Cancel' buttons.

Static level Security

Row-level security | Row-level security | Static and Dynam... | Net Banking - On... | Kotak Net Bankin... | team_14 - Power | team_14 - Power | (133) DreamHost | + | https://app.powerbi.com/groups/me/reports/2196af9d-88bb-4656-9cbf-a49392307354/ReportSection314e18c1657946b4b51b | G | L | S | E | M | D | : |

Back to Row-Level Security Now viewing as: ROW LEVEL SECURITY

Power BI My workspace team_14 | Data updated 5/19/23 Trial: 48 days left Search

Home Create Browse Data hub Metrics Apps Deployment pipelines Learn Workspaces My workspace team_14

Pages File Export Share Chat in Teams Get insights Subscribe to report ...

Sales Analysis 1 sales analysis 2 small multiples clustered barchart clustered column chart 100% stacked bar chart line chart1 line chart2 Area chart 1 Stacked Area chart 2 pie chart donut chart Table & Matrix Table properties on sp... gradient on tables

Sum of Sales by Region

Region East Sum of Sales 0.6M

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DYNAMIC SECURITY



A screenshot of Microsoft Excel showing a table with four rows of data. The table has columns A through U. Row 1 contains the header 'user email id' in cell A1 and 'Region' in cell B1. Rows 2, 3, and 4 contain data: row 2 has 'shobha.p@aroha.co.in' in cell A2 and 'West' in cell B2; row 3 has 'shobha.p@aroha.co.in' in cell A3 and 'East' in cell B3; row 4 has 'sruthi@aroha.co.in' in cell A4 and 'West' in cell B4. The 'HOME' tab is selected in the ribbon. The 'Styles' group on the ribbon shows a color palette with 'Normal' (green), 'Bad' (red), 'Good' (light green), and 'Neutral' (yellow) applied to the table. The formula bar shows 'L17'. The ribbon also includes tabs for FILE, INSERT, PAGE LAYOUT, FORMULAS, DATA, REVIEW, VIEW, DEVELOPER, POWER QUERY, and POWERPIVOT.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	user email id	Region																			
2	shobha.p@aroha.co.in	West																			
3	shobha.p@aroha.co.in	East																			
4	sruthi@aroha.co.in	West																			

DYNAMIC SECURITY

DYNAMIC SECURITY

The screenshot shows the Microsoft Power BI Desktop application interface. The top navigation bar includes 'File', 'Home' (selected), and 'Help'. The 'Home' tab has several sections: 'Clipboard' (Paste, Cut, Copy), 'Data' (Get data, Excel, Data hub, SQL Server, Enter data, Recent sources), 'Queries' (Transform, Refresh data, Manage relationships, Relationships, Security, Q&A setup, Language schema, Sensitivity, Share), and 'Fields' (Sensitivity, Publish). A message bar at the top indicates 'Auto recovery contains some recovered files that haven't been opened.' and 'Now viewing as: ROW LEVEL SECURITY. Object-level security is not applied in the Model View.' A 'View recovered files' button is available. The main workspace displays a data model diagram with three tables: 'Orders', 'Ref line', and 'Access Management'. The 'Orders' table has fields like Category, City, conc, Country/Region, Customer ID, Customer Name, Demography_code_I, Demography_code_mid, and Demography_code_R. The 'Ref line' table has fields Ref line and Ref line Value. The 'Access Management' table has fields Region and user email id. A 'Collapse ^' button is present under each table. On the right, a 'Properties' pane is open, showing settings for cards: 'Show the database in the header when applicable' (No), 'Show related fields when card is collapsed' (Yes), and 'Pin related fields to top of card' (No). A search bar and a list of related items are also visible. The bottom navigation bar includes 'All tables' and a '+' button, along with standard system icons.

DYNAMIC SECURITY



team_14 - Power BI Desktop

File Home Help

Paste Cut Copy Get Excel Data SQL Enter Dataverse Recent Transform Refresh Manage Q&A Language Sensitivity Publish

Clipboard Data

Now viewing as: ROW LEVEL SECURITY. C

Orders

- Category
- City
- conc
- Country/Region
- Customer ID
- Customer Name
- Demography_code_I
- Demography_code_mid
- Demography_code_R

Dynamic row level security

Create Delete

Tables

Access Management

- group by
- Orders
- Ref line
- summarize
- summarize column
- TOP N

Table filter DAX expression

[user_email_id] = USERPRINCIPALNAME()

Fields

Search

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

All tables +

100% Update available (click to download)

Windows taskbar icons

DYNAMIC SECURITY



team_14 - Power BI Desktop

File Home Insert Modeling View Help Table tools Measure tools

Name: Measure Format: \$ % Auto Data category: Uncategorized New Quick measure measure Calculations

Structure Formatting Properties

Auto recovery contains some recovered files that haven't been opened.

1 user name = USERPRINCIPALNAME()

Build visuals with your data
Select or drag fields from the Fields pane onto the report canvas.

sales

Orders

- all selected sales
- cat sales
- overall sales
- Sales
- sales amount
- selected sales
- sub sales
- Weekday sales
- Weekend sales

Values

- summarize column
- highest sales
- Total sales

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2

Page 64 of 64

Update available (click to download)

ENG 1256

team_14 - Power BI Desktop

File Home Insert Modeling View Help Format Data / Drill

Paste Cut Copy Get data Excel workbook hub Data SQL Server Data Recent sources Transform Refresh data New visual Text box Insert More visuals New Quick measure measure Calculations Sensitivity Share

Auto recovery contains some recovered files that haven't been opened.

LAPTOP-52QQ52J\Deepak M

user name

Filters

Build visual

Access Management

- user id

Orders

- user name

Fields

user name

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2

Page 64 of 64

Update available (click to download)

ENG 1257

DYNAMIC SECURITY



team_14 - Power BI Desktop

File Home Insert Modeling View Help Format Data / Drill

Cut Copy Format painter Paste Clipboard Get data Excel Data SQL Enter Dataverse Recent sources Data Transform Refresh data New visual Text box More visuals Insert New measure Quick measure Calculations Sensitivity Share Publish

Auto recovery contains some recovered files that haven't been opened.

user name LAPTOP-S2QQS2\Deepak M

Visualizations Fields

Build visual

Filters

Access Management user email id

Orders user name

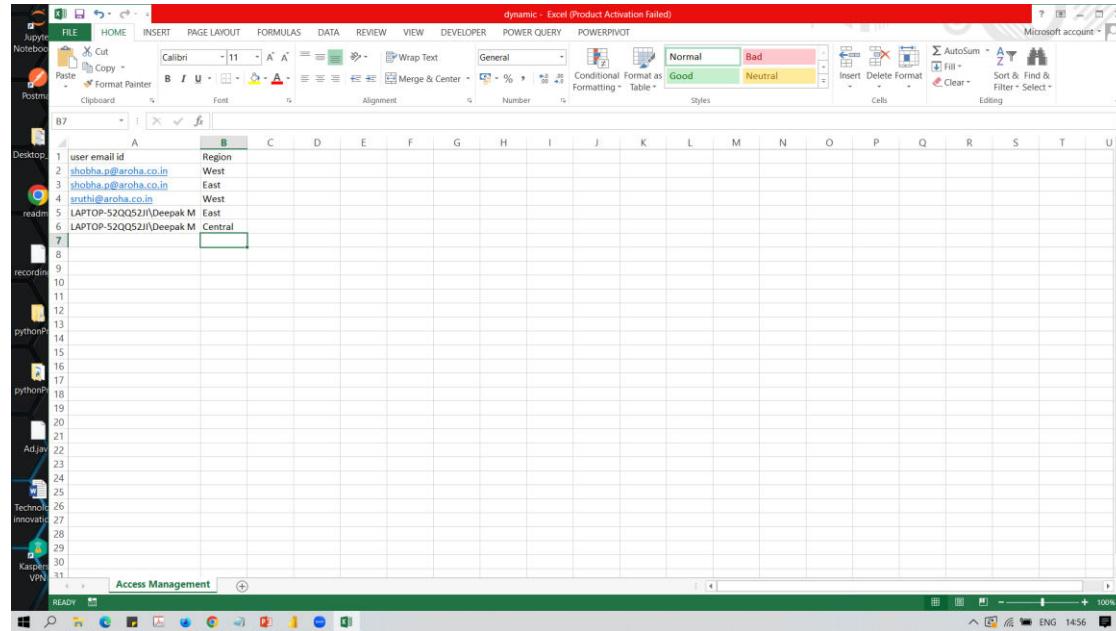
Columns user name

Drill through Cross-report off Keep all filters On Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2 +

Page 64 of 64 84% Update available (click to download)

DYNAMIC SECURITY



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	user_email_id		Region																		
2	shobha.p@aroha.co.in		West																		
3	shobha.p@aroha.co.in		East																		
4	anathi@aroha.co.in		West																		
5	LAPTOP-52QQ52\Deepak M		East																		
6	LAPTOP-52QQ52\Deepak M		Central																		
7																					
8																					
9																					
10																					
11																					
12																					
13																					
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31																					

DYNAMIC SECURITY

team_14 - Power BI Desktop

File Home Insert Modeling View Help

Cut Copy Format painter Paste Get data workbook hub Data SQL Server Enter Dataverse Recent sources Transform Refresh data New visual Text box More New Quick measure measure Calculations Sensitivity Sensitivity Publish Share

Get the latest data by refreshing all visuals in this report.

View recovered files Stop viewing

Now viewing as: Dynamic row level security

Sum of Sales by Region

Region East

Sum of Sales

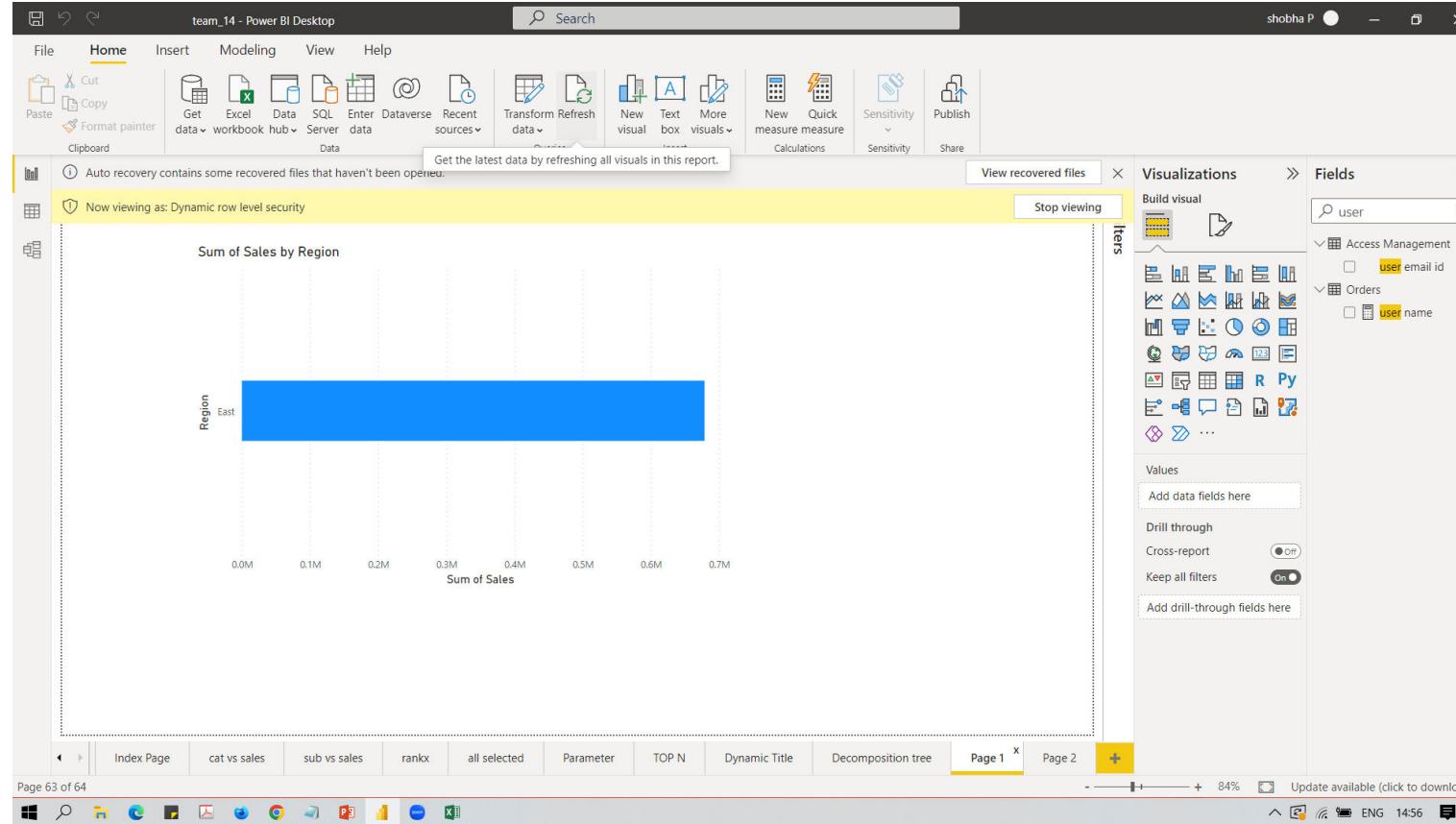
0.0M 0.1M 0.2M 0.3M 0.4M 0.5M 0.6M 0.7M

Access Management user email id Orders user name

Values Add data fields here Drill through Cross-report Off Keep all filters On Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2 +

Page 63 of 64 Update available (click to download)



DYNAMIC SECURITY



team_14 - Power BI Desktop

Search

shobha P

File Home Insert Modeling View Help

Cut Copy Format painter Paste Clipboard Get data workbook hub Data SQL Server Data source Enter Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert New measure Quick measure Sensitivity Calculations Sensitivity Share Publish

Auto recovery contains some recovered files that haven't been opened.

Now viewing as: Dynamic row level security

Stop viewing

View recovered files

Sum of Sales by Region

Region

East

Central

Sum of Sales

0.0M 0.1M 0.2M 0.3M 0.4M 0.5M 0.6M 0.7M

Visualizations Fields

user

Access Management user email id

Orders user name

Values Add data fields here

Drill through

Cross-report Off

Keep all filters On

Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2 +

Page 63 of 64

84% Update available (click to download)

Windows taskbar icons

DYNAMIC SECURITY



team.14 - Power BI Desktop

File Home Insert Modeling View Help

Clipboard Get data workbook hub Data SQL Server Enter data Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert Quick measure measure Sensitivity Publish

Auto recovery contains some recovered files that haven't been opened.

Now viewing as: Dynamic row level security

Stop viewing

Publish this report online in the Power BI service. View recovered files

Sum of Sales by Region

Region

East

Central

Sum of Sales

0.0M 0.1M 0.2M 0.3M 0.4M 0.5M 0.6M 0.7M

Fields

user

Access Management

user email id

Orders

user name

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2 +

Page 63 of 64

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DYNAMIC SECURITY



The screenshot shows the Power BI Desktop interface with a bar chart titled "Sum of Sales by Region". The chart compares sales between the East and Central regions. A modal dialog box titled "Publish to Power BI" is open, prompting the user to "Select a destination". The "My workspace" option is selected. The Power BI ribbon is visible at the top, and the Fields pane on the right shows a search for "user" with results from "Access Management" and "Orders" tables. The status bar at the bottom indicates "Page 63 of 64".

DYNAMIC SECURITY

team_14 - Power BI Desktop

File Home Insert Modeling View Help

Paste Cut Copy Format painter Clipboard

Get data Excel workbook hub Data Server Data Enter Data Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert Quick measure measure Calculations Sensitivity Sensitivity Publish Share

Auto recovery contains some recovered files that haven't been opened.

Now viewing as: Dynamic row level security

Stop viewing

View recovered files

Sum of Sales by Region

Region

East

Central

Sum of Sales

Replace this dataset?

You already have a dataset named 'team_14' in Power BI.

Replacing this dataset may impact:

1 report

View the impact of this change on the content in the Power BI service.

View impact Replace Cancel

Visualizations

Fields

user

Access Management

Orders

user email id

user name

Build visual

Values

Add data fields here

Drill through

Cross-report

Keep all filters

Add drill-through fields here

Index Page cat vs sales sub vs sales rankx all selected Parameter TOP N Dynamic Title Decomposition tree Page 1 Page 2 +

Page 63 of 64

84% Update available (click to download)

Windows taskbar icons

DYNAMIC SECURITY



Screenshot of the Power BI Home page:

The browser tab bar shows multiple open tabs, including 'Row-level', 'Power BI', and '(134) Dre'. The main content area displays a greeting 'Good afternoon, shobha' and a subtitle 'Find and share actionable insights to make data-driven decisions'. A callout bubble says 'Re My workspace: You frequently open this'. Below this, there are five cards: 'My workspace' (pink), 'team_14' (blue), 'Financial Sample' (white), 'SASI POWER BI (1)' (blue), and 'Explore basic P' (white). A navigation bar on the left includes links for Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, My workspace, and team_14. The 'Recent' tab is selected in the navigation bar. A table below lists recent items:

DYNAMIC SECURITY



A screenshot of the Microsoft Power BI 'My workspace' interface. The left sidebar shows navigation options like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, and My workspace (which is selected). The main content area displays a list of datasets and dataflows under the 'Datasets + dataflows' tab. A context menu is open over the 'Human Resources Sample' dataset, listing options such as Analyze in Excel, Create report, Auto-create report, Create paginated report, Delete, Quick insights, Security, Rename, Open data model, Settings, Download this file, Manage permissions, and View lineage. The menu also includes a 'Start tour' button. At the bottom of the screen, a taskbar is visible with various application icons.

Name	Owner	Refreshed	Next refresh	Endorsement	Sensitivity
Human Resources Sample	shobha P	12/1/22, 2:53:14 PM	N/A	—	—
refe	shobha P	5/5/23, 3:54:34 PM	N/A	—	—
sales analysis	shobha P	12/1/22, 11:41:03 AM	N/A	—	—
sample	shobha P	1/30/23, 12:51:43 PM	N/A	—	—
SASI POWER BI (1)	shobha P	4/5/23, 9:28:39 AM	N/A	—	—
superstore simple report	shobha P	3/15/23, 1:10:04 PM	N/A	—	—
Team_11_Sales_analysis	shobha P	12/28/22, 11:10:47 AM	N/A	—	—
team_14	shobha P	5/19/23, 3:00:35 PM	N/A	—	—

DYNAMIC SECURITY



The screenshot shows the 'Row-Level Security' page in the Power BI service. The left sidebar includes options like Home, Create, Browse, Data hub, Metrics, Apps, Deployment pipelines, Learn, Workspaces, My workspace, and team_14. The main area displays 'Members (0)' under 'People or groups who belong to this role', with a search bar containing 'shobha P'. A large green 'Add' button is present. At the bottom are 'Save' and 'Cancel' buttons. The top navigation bar shows various open tabs and the URL <https://app.powerbi.com/groups/me/rowlevelsecurity/6809259>. The top right corner indicates a 'Trial: 48 days left'.

DYNAMIC SECURITY



https://app.powerbi.com/groups/me/rowlevelsecurity/6809259

Power BI My workspace > Row-Level Security

Row-Level Security

ALL Region (0) Dynamic row level security (1)

Members (1)

People or groups who belong to this role

Enter email addresses

Add

shobha P ×

Save Cancel

Windows taskbar icons: File Explorer, Edge, Task View, Power BI, Excel, Word, etc.

System tray icons: Network, Battery, ENG, 15:02, etc.

DYNAMIC SECURITY



Screenshot of the Power BI Row-Level Security settings page.

The URL in the browser is <https://app.powerbi.com/groups/me/rowlevelsecurity/6809259>.

The left sidebar shows the following navigation:

- Home
- Create
- Browse
- Data hub
- Metrics
- Apps
- Deployment pipelines
- Learn
- Workspaces
- My workspace
- team_14

The main content area displays the "Row-Level Security" settings for a "Dynamic row level security" role:

- Members (1)**: shobha P
- People or groups who belong to this role**: shobha P
- Add** button
- Save** and **Cancel** buttons

The browser taskbar at the bottom shows various open tabs and system status icons.

DYNAMIC SECURITY



https://app.powerbi.com/groups/me/reports/2196af9d-88bb-4656-9cbf-a49392307354/ReportSection314e18c1657946b4b51b

Power BI My workspace team_14 | Data updated 5/19/23 Trial: 48 days left

Back to Row-Level Security Now viewing as: Dynamic row level security

Pages

- Sales Analysis 1
- sales analysis 2
- small multiples
- clustered barchart
- clustered column chart
- 100% stacked bar chart...
- line chart1
- line chart2
- Area chart 1
- Stacked Area chart 2
- pie chart
- donut chart
- Table & Matrix
- Table properties on sp...
- gradient on tables

Sum of Sales by Region

Region	Sum of Sales
West	~0.7M
East	~0.65M

Filters

83%

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