P. B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, VIJAYAWADA- 520 010

DEPARTMENT OF COMMERCE & BUSINESS ADMINISTRATION

This is to certify that this is the bonafide record of the work done in the _____Lab By Mr. / Ms. _____bearing Roll No._____of class_____during the year 2021 – 2022.

No. Of Experiments recorded: _____

Head of the Department

Staff Member in Charge

Date:

Date:

External Examiner

Lab - 1

1. Sign in to Power Bi service

Power BI accounts

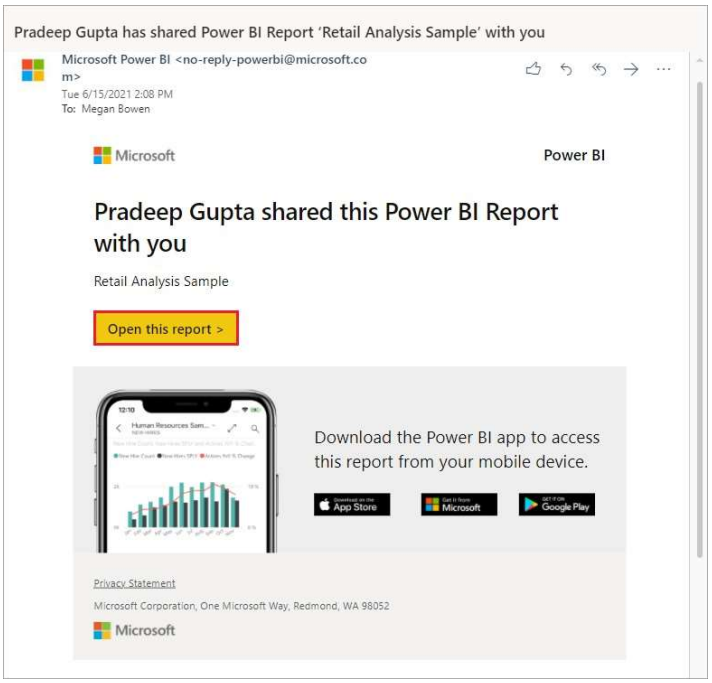
Before you can sign in to Power BI, you'll need an account. There are two ways to get a Power BI account. The first is when your organization purchases Power BI licenses for its employees. And the second is when individuals sign up for free trials or personal licenses. This article covers the first scenario.

Sign in for the first time

Step 1: open the Power BI service

The Power BI service runs in a browser.

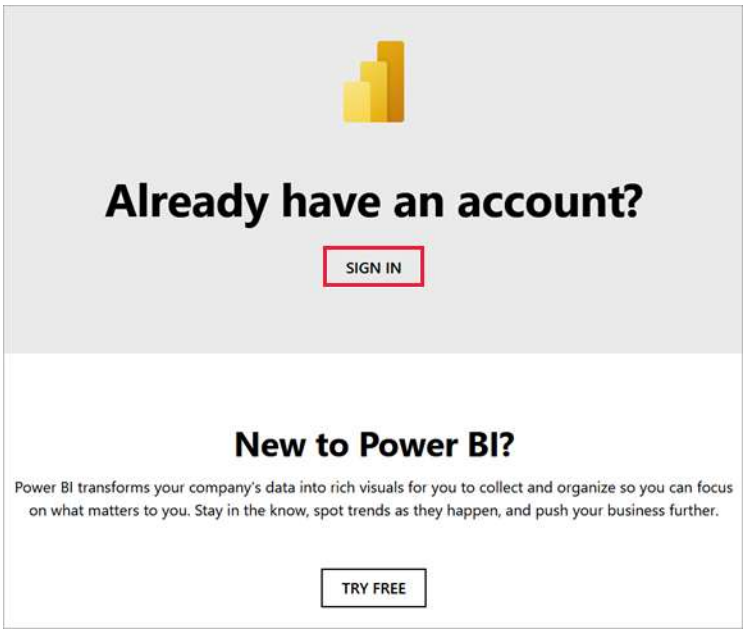
- If you've received an email from a colleague, with a link to a dashboard or report, select the link to **Open this report** or **Open this dashboard**.



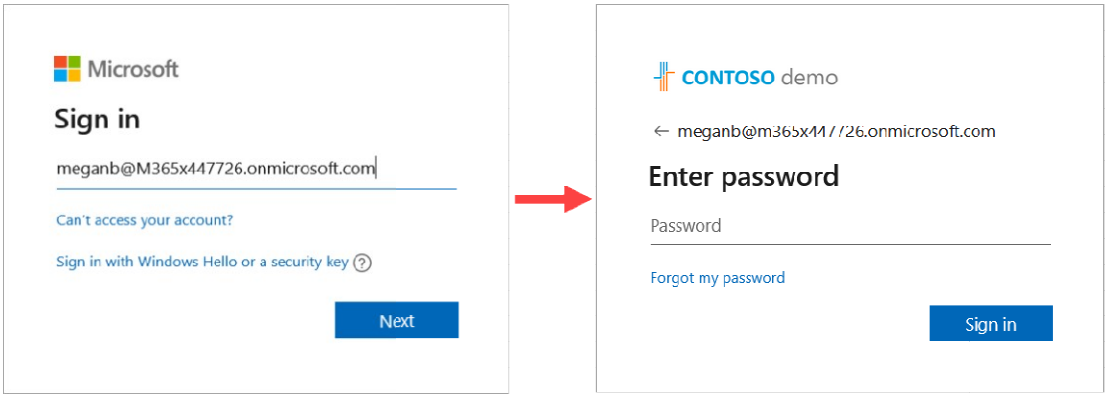
- Otherwise, open your favorite browser and type **app.powerbi.com**.

Step 2: type your email address

The first time you sign in, Microsoft asks if you already have a Microsoft 365 account. Select **SIGN IN**.



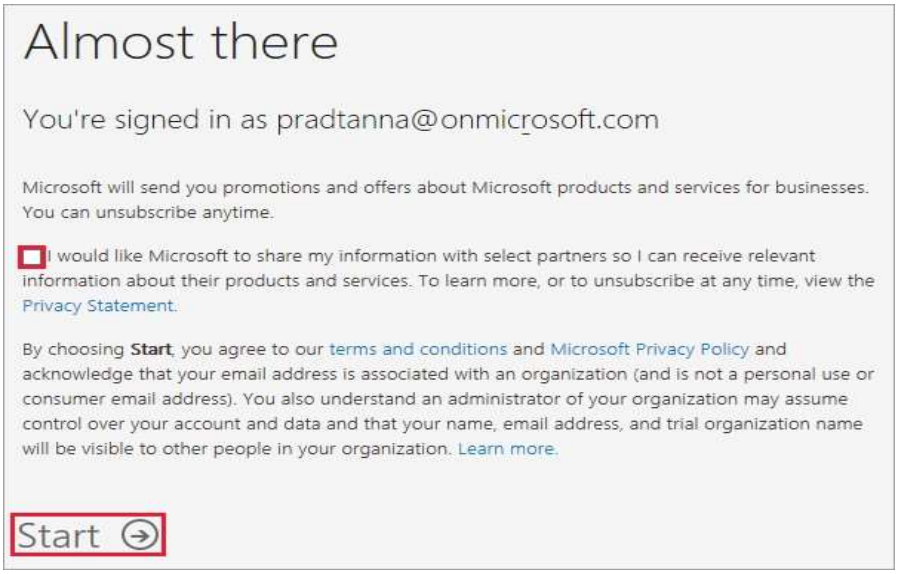
Enter your password. This is your Microsoft 365 account password. It is the same email and password that you use for other Microsoft products, such as Outlook and Office. Depending on how your account is set up, you may also be prompted to enter a code sent to your email or mobile device.



Sometimes, your global administrator will assign you a license and send you an email with this information. Look in your Inbox for a welcome email and follow the instructions to sign in for the first time. Use this same email account for your sign-in.

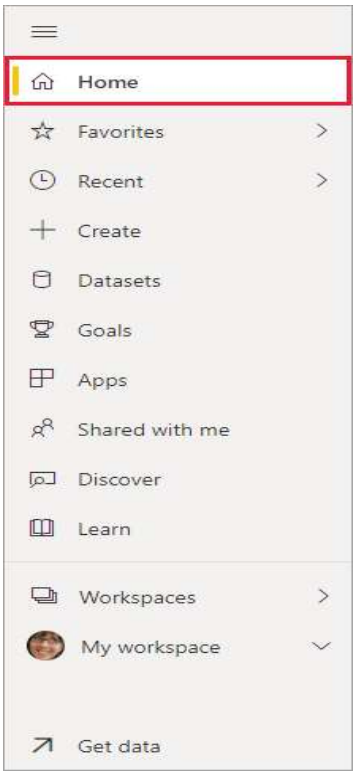
Step 3: Review the terms and conditions

Review the terms and conditions, and if you agree, select the checkbox and choose **Start**.

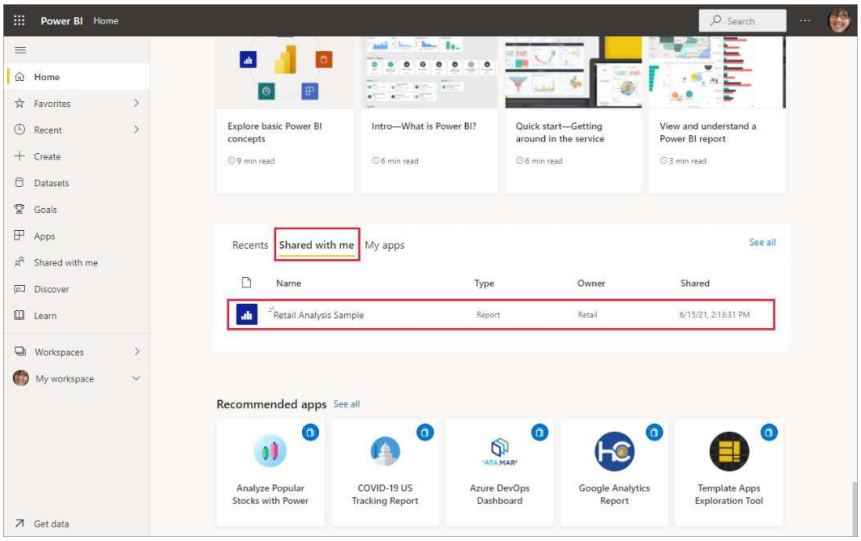


Step 4: review your Home landing page

On your first visit, Power BI opens your **Home** landing page. If **Home** doesn't open, select it from the nav pane.



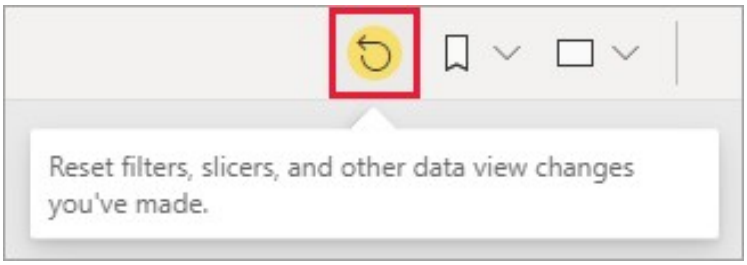
On Home, you'll see all the content that you have permission to use. At first, there may not be much content, but don't worry, that will change as you start to use Power BI with your colleagues. Remember that report that your colleague shared with you via email? It's on your Home landing page under the heading **Shared with me**.



If you don't want Power BI to open to Home, you can set a **Featured** dashboard or report to open instead.

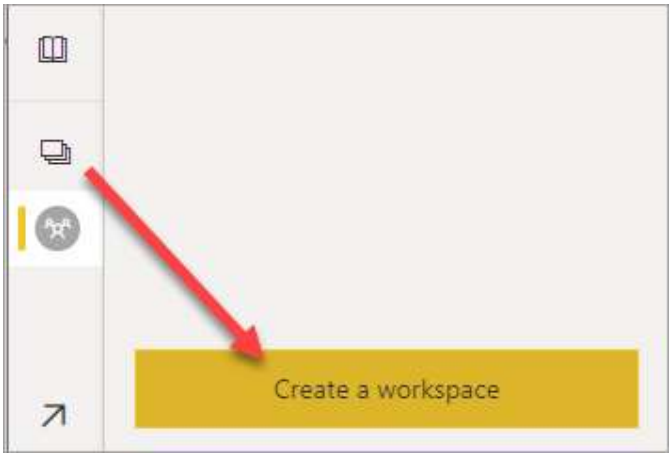
Safely interact with content

As a ***business user***, others will share content with you and you'll interact with that content to explore the data and make business decisions. As you filter, slice, subscribe, export, and resize, don't worry -- your work is not impacting the underlying dataset or the original shared content (dashboards and reports). Power BI is a safe space for you to explore and experiment. That doesn't mean you can't save your changes - you can. But those changes only affect **your** view of the content. And reverting to the original default view is as easy as clicking a button.



2. Create a Workspace

1. Select **Workspaces** > **Create workspace**.



2. Give the workspace a unique name. If the name isn't available, edit it to come up with a name that's unique.

When you create an app from the workspace, by default it will have the same name and icon as the workspace. You can change both when you create the app.

3. Here are some optional settings for your workspace. They're explained in more detail in the Workspace settings section later in this article:

- Upload a **Workspace image**. Files can be .png or .jpg format. File size has to be less than 45 KB.
- Specify a Workspace OneDrive to use a Microsoft 365 Group file storage location (provided by SharePoint).
- Add a Contact list, the names of people to contact for information about the workspace. By default, the workspace admins are the contacts.
- Allow contributors to update the app for the workspace
- Assign the workspace to a Premium capacity.
- Connect the workspace to an Azure Data Lake Gen2 storage account (in preview). Read about this functionality in the article Configuring dataflow storage to use Azure Data Lake Gen 2.

4. Select **Save**.

Power BI creates the workspace and opens it. You see it in the list of workspaces you're a member of.

3. Install Power Bi Desktop

With Power BI Desktop, you can build advanced queries, models, and reports that visualize data. You can also build data models, create reports, and share your work by publishing to the Power BI service. Power BI Desktop is a free download.

To get Power BI Desktop, you can use one of the two approaches.

- Install as an app from the Microsoft Store.
- Download directly, as an executable you download and install on your computer.

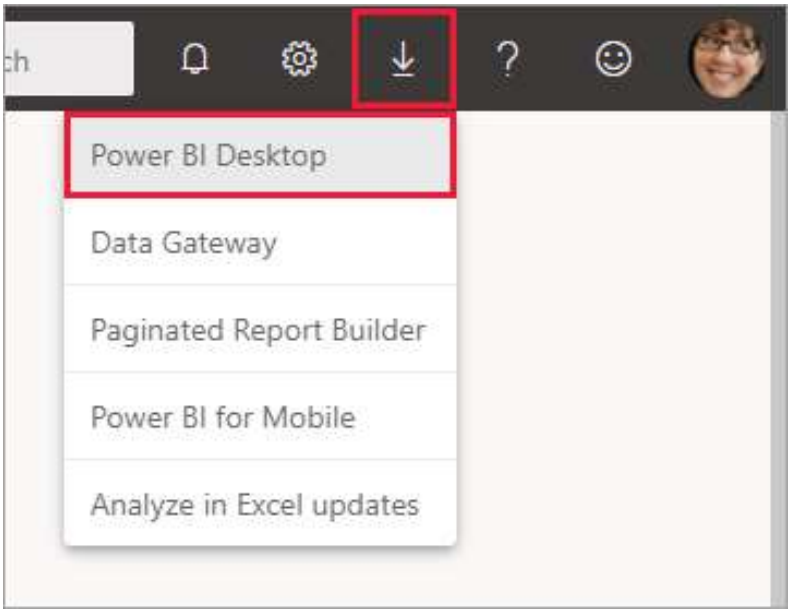
Either of the two approaches gets the latest version of Power BI Desktop onto your computer. However, there are some differences worth noting, as described in the following sections.

Install as an app from the Microsoft Store

There are a few ways to access the most recent version of Power BI Desktop from the Microsoft Store.

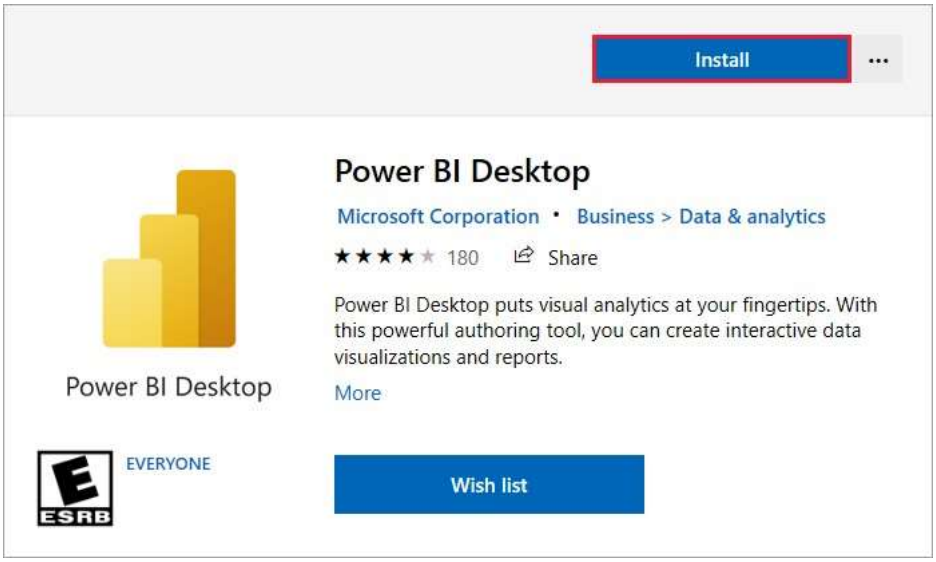
1. Use one of the following options to open the **Power BI Desktop** page of the Microsoft Store:

- Open a browser and go directly to the Power BI Desktop page of the Microsoft Store.
- From the Power BI service, in the upper right corner, select the **Download** icon and then choose **Power BI Desktop**.



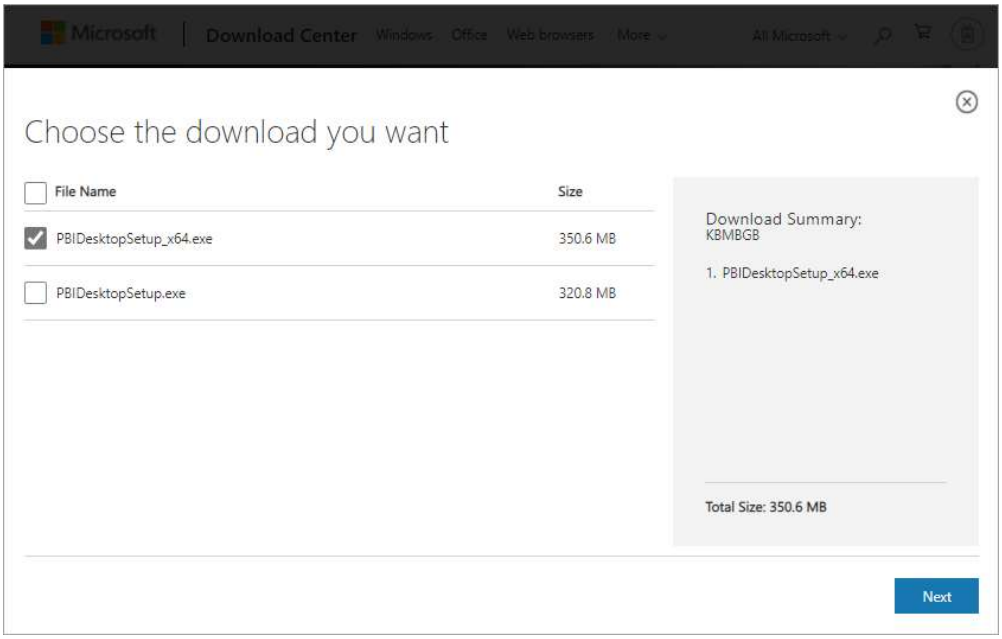
- Go to the Power BI Desktop product page, and then select **Download Free**.

2. After you've landed on the **Power BI Desktop** page of the Microsoft Store, select **Install**.



Download Power BI Desktop directly

To download the Power BI Desktop executable from the Download Center, select **Download** from the Download Center page. Then, specify a 32-bit or 64-bit installation file to download.



Install Power BI Desktop after downloading it

You're prompted to run the installation file after you've finished downloading it.

Power BI Desktop ships as a single .exe installation package that contains all supported languages, with a separate .exe file for the 32-bit and 64-bit versions. The .msi packages are discontinued, requiring the .exe executable for installation. This approach makes distribution, updates, and installation (especially for administrators) much easier and more convenient. You can also use command-line parameters to customize the installation process, as described in Using command-line options during installation.

After you launch the installation package, Power BI Desktop installs as an application and runs on your desktop.

4. Getting Data from existing Systems

Any company has a number of existing data sources that you can use in Power BI. You have seen that you can create a data model in Power BI by copying the content of tables that exist in other databases or files. You also have the option of refreshing this content dynamically, or you can directly query the data source whenever you access a report. By querying directly, you avoid the need to create a copy of the data that you must then synchronize periodically. In this section, you will see the available options with which you can connect Power BI to either your on-premises database or a database in the cloud.

Before looking at the details, here are a few terms with which you should be familiar:

• On-premises If you get data from a database that is physically stored in a server managed by your company, we say that the database is on-premises (often shortened to on-prem).

• Cloud If you get data from a Microsoft Azure service, you are using data in the cloud. Cloud computing accesses and uses shared compute and storage resources on the Internet.

• Relational database This is a database that stores data using tables that have relationships with one another. Typically, you query this by using the SQL language. Examples of on-premises relational databases that Power BI supports are Microsoft SQL Server, Microsoft Access, Oracle, IBM DB2, MySQL, PostgreSQL, Sybase, and Teradata. Cloud-based relational databases that Power BI supports include Azure SQL Database and Azure SQL Data Warehouse.

• Rich semantic model This is a database that stores both data and metadata, simplifying navigation by using tools such as Excel PivotTables and Power BI reports. A typical example is Microsoft SQL Server Analysis Services. Other supported providers are SAP HANA and SAP Business Warehouse.

• Power BI Personal Gateway This is a component installed on the user's computer that makes it possible to perform data refreshes on models published using the Power BI service. (Chapter 3 explains how to install this.) A Personal Gateway serves only one user, and only when the user's computer is turned on.

• Power BI Enterprise Gateway This is a component similar to the Personal Gateway that a system administrator installs on a server in your company. A single Enterprise Gateway can serve all the users of a company, and it is also available as soon as the server is turned on (servers are usually active 24/7). You can find more technical details about how to install it at https://powerbi.microsoft.com/documentati on/powerbi-gateway-enterprise/.

Lab - 2

1. Uploading Data to Power Bi

David has an Excel workbook that he wants to upload to Power BI to see what it has to offer. Because the data is stored in a local file on his laptop, he clicks the Get button on the Files tile (see Figure 1-5). This displays the screen in Figure 1-6, where he can then choose from among several upload options.

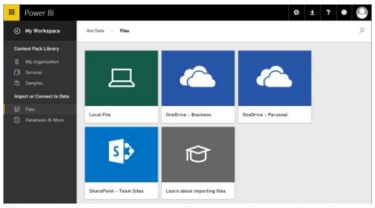


Figure 1-6: Some of the file uploading options in Power BI.

We will explore these options at greater length in the chapters that follow. For now, David chooses Local File, navigates to a file on his laptop named 2015 Sales.xlsx, and then clicks Open to upload the workbook to Power BI. After a few seconds, the Power BI dashboard displays the screen depicted in Figure 1-7.

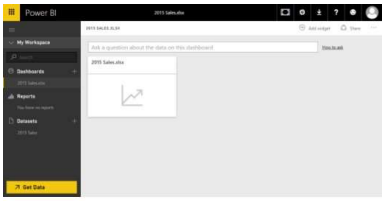


Figure 1-7: This is how the Power BI service looks after you load an Excel workbook.

Before going any further, we want to take a few moments to explain how the Power BI portal is organized. On the left side of the screen, in the pane labeled My Workspace, there are several items. Let's take a look at them:

- Dashboards This lists all of the dashboards you have created. After loading a single workbook, Power BI creates a dashboard for you, using the same name as that of the original workbook.

- Reports Here, you will see the reports based on your data. In Figure 1-7, there is no default report, but we'll follow along as David creates one very soon.

- Datasets This lists all of the data sources that you connected to Power BI. In our narrative thus far, the only workbook David loaded is 2015 Sales.

The Power BI experience is all about gaining insights from data. You begin with a dataset (2015 Sales, in this example), you then build reports on the data, and, finally, you organize visualizations of the reports into dashboards. You will learn how to perform all of these operations in detail in this book. For the moment, we want only for you to become acquainted with the basic operations.

Referring back to Figure 1-7, the central pane is positioned on the 2015 Sales dashboard and, because David has loaded the file but has not yet performed any analysis on the data it contains, the dashboard is essentially empty, showing only the Ask A Question box and the 2015 Sales.xlsx tile, which indicates that the dashboard is indeed connected to his Excel workbook.

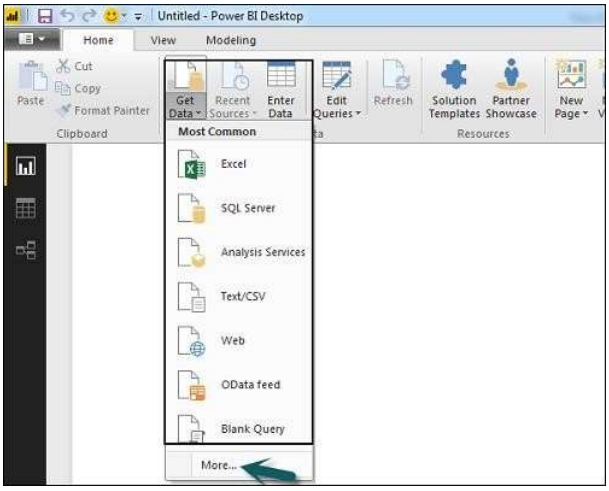
2. Introducing Data Sources of Power Bi

Power BI supports large range of data sources. You can click Get data and it shows you all the available data connections. It allows you to connect to different flat files, SQL database, and Azure cloud or even web platforms such as Facebook, Google Analytics, and Salesforce objects. It also includes ODBC connection to connect to other ODBC data sources, which are not listed.

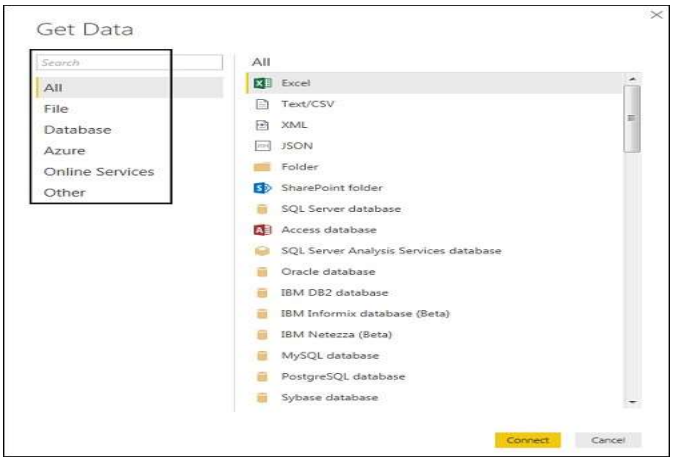
Following are the available data sources in Power BI −

- Flat Files
- SQL Database
- OData Feed
- Blank Query
- Azure Cloud platform
- Online Services
- Blank Query
- Other data sources such as Hadoop, Exchange, or Active Directory

To get data in Power BI desktop, you need to click the Get data option in the main screen. It shows you the most common data sources first. Then, click the More option to see a full list of available data sources.



When you click “More..” tab as shown in the above screenshot, you can see a new navigation window, where on the left side it shows a category of all available data sources. You also have an option to perform a search at the top.



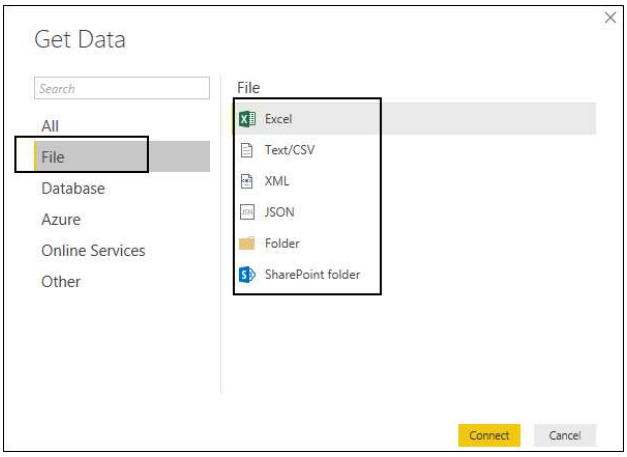
Following are the various **data sources** listed −

All

Under this category, you can see all the available data sources under Power BI desktop.

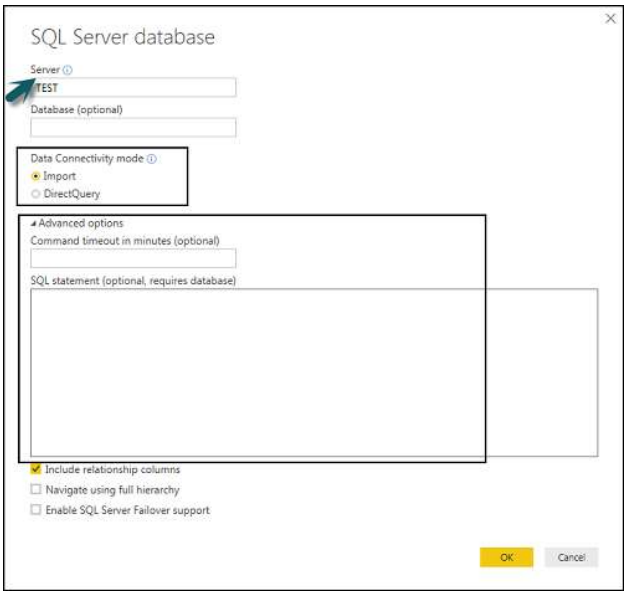
File

When you click File, it shows you all flat file types supported in Power BI desktop. To connect to any file type, select the file type from the list and click Connect. You have to provide the location of the file.



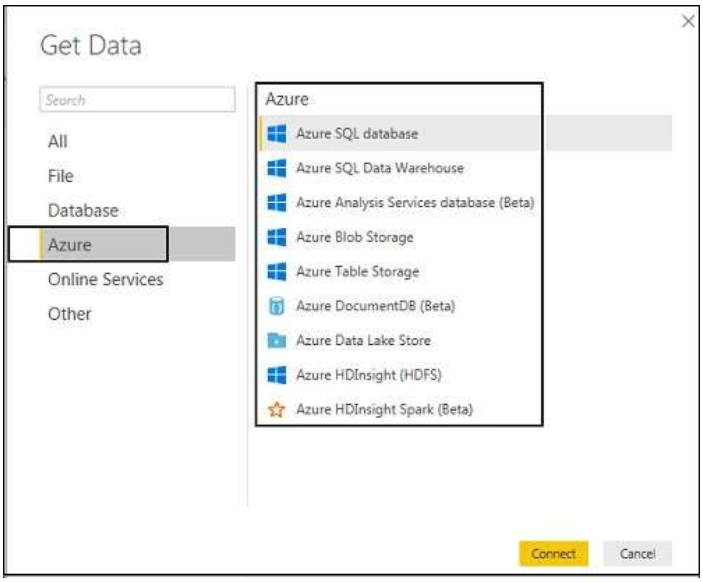
Database

When you click the Database option, it shows a list of all the database connections that you can connect to.



Azure

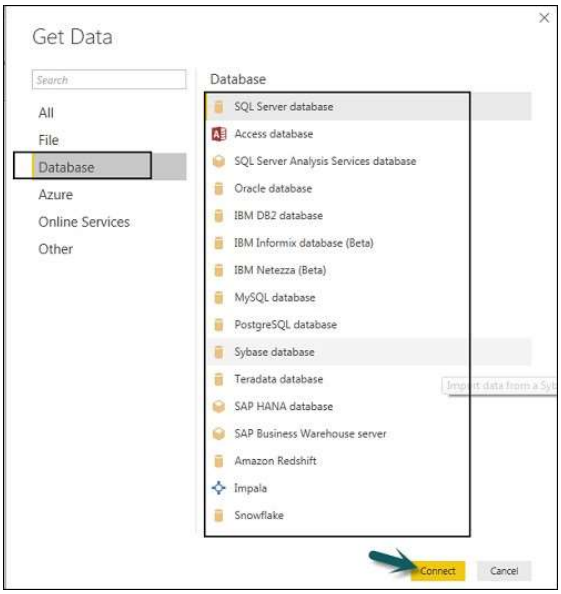
Using the Azure option, you can connect to the database in Azure cloud. Following screenshot shows the various options available under Azure category.



Online Services

Power BI also allows you to connect to different online services such as Exchange, Salesforce, Google Analytics, and Facebook.

Following screenshots shown the various options available under Online Services.



To connect to any database, select a Database type from the list as shown in the above screenshot. Click Connect.

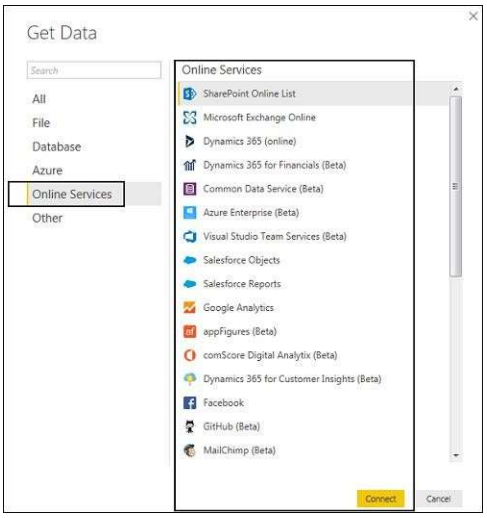
You have to pass Server name/ User name and password to connect. You can also connect via a direct SQL query using Advance options. You can also select Connectivity mode- Import or DirectQuery.

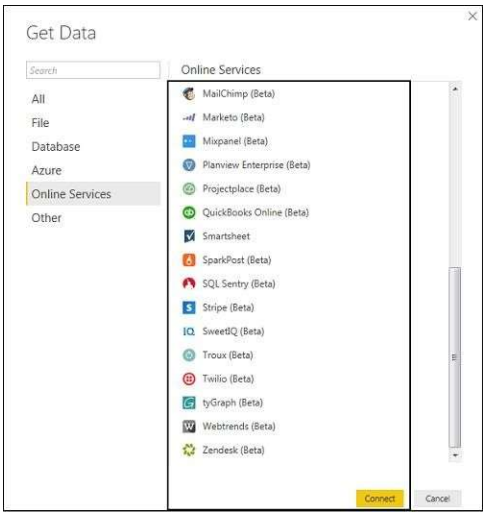
Note – You can't combine import and DirectQuery mode in a single report.

Import vs DirectQuery

DirectQuery option limits the option of data manipulation and the data stays in SQL database. DirectQuery is live and there is no need to schedule refresh as in the Import method.

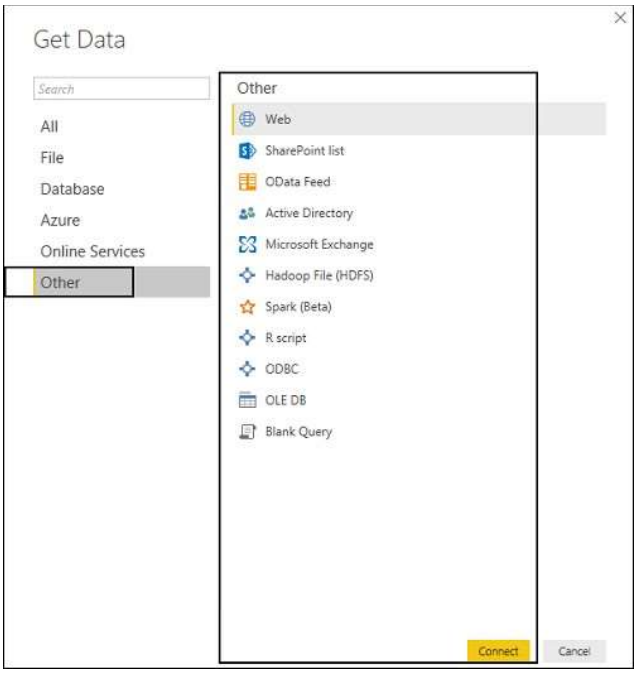
Import method allows to perform data transformation and manipulation. When you publish the data to PBI service, limit is 1GB. It consumes and pushes data into Power BI Azure backend and data can be refreshed up to 8 times a day and a schedule can be set up for data refresh.





Other

Following screenshot shows the various options available under other category.



3. Introducing Natural Language Queries

With Power BI, you have the ability to carry out analysis of your data by asking it questions, in plain English—no special code or syntax is required. This feature is called natural-language queries, and with it, you can ask Power BI to perform tasks in much the same way you would ask one of your colleagues. Let's take a look at an example of how David uses natural-language queries in Power BI.

In the central pane, in the question box, David types a simple query: "Show sales 2015 by brand." Power BI understands the query and presents a bar chart (see Figure 1-8) in which the brands are displayed alphabetically and the length of the bars is proportional to the corresponding sales for each brand in 2015.

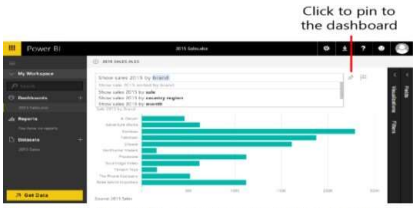


Figure 1-8: Power BI understands queries in natural language and displays the data you request.

Not only did Power BI understand David's query, but, after performing an analysis of his dataset, it also suggests other meaningful queries in a list that appeared when he began to type the query. For David's data, that analysis revealed that he might also be interested in viewing sales in 2015 by country/region or by month, so Power BI suggests those as alternate queries

Also in Figure 1-8, notice the highlighted pushpin icon to the right of the question box. You can click this to "pin" the currently displayed visualization to the dashboard; this way, you can easily see it when you connect to Power BI. When you click the pushpin button, Power BI opens the Pin To Dashboard dialog box shown in Figure 1-9.

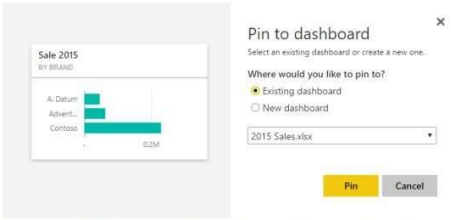


Figure 1-9: Using the Pin To Dashboard dialog box, you can choose to pin a visualization to an existing or a new dashboard.

To save the newly created bar chart to the dashboard, click Pin. Figure 1-10 shows how Power BI presents the dashboard with the pinned bar chart. (You need to go back to the dashboard to see it.)

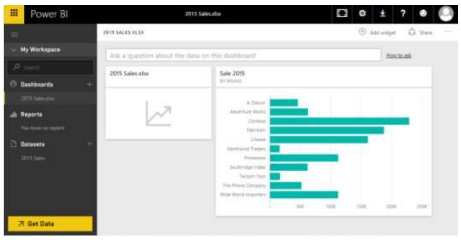


Figure 1-10: The dashboard is a container for visualizations created on top of datasets.

Using natural-language queries is quite impressive, but it is only one of the many ways in which Power BI can analyze your data.

Lab - 3

1. Visualizations in Power Bi

What is Data Visualization?

Data Visualization is a process of taking raw data and transforming it into graphical or pictorial representations such as charts, graphs, diagrams, pictures, and videos which explain the data and allow you to gain insights from it. So, users can quickly analyze the data and prepare reports to make business decisions effectively.

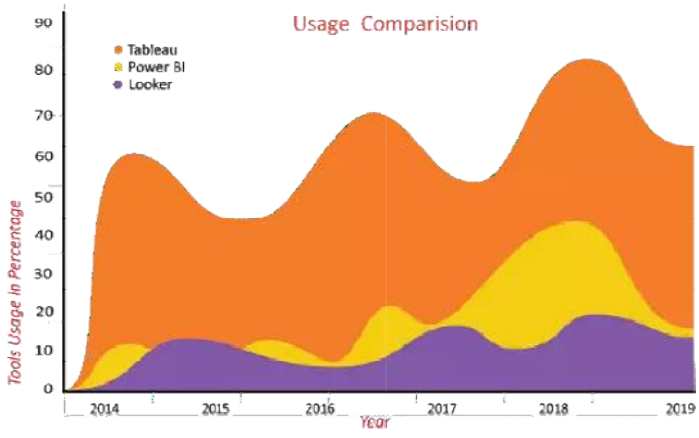
Here are the chart types in Power BI:

1. Area Charts

The area chart depends on line charts to display quantitative graphical data. The area between the axis and lines is commonly filled with colors, textures, and patterns. You can compare more than two quantities with area charts. It shows the trend changes over time and can be used to attract the attention of the users to know the total changes across the trends.

For Instance:

The below Area chart clearly shows you how the usage of Tableau, Power BI, and Looker varies over the past six years.



2. Line Charts

Line charts are mostly used charts to represent the data and are characterized by a series of data points connected by a straight line. Each point in the line corresponds to a data value in the given category. It shows the exact value of the plotted data. Line charts should only be used to measure the trends over a period of time, e.g. dates, months, and years

For Instance:

The below line chart shows the popularity of the Microsoft Power BI keyword in Google search across the world. It's clearly indicating that the popularity of Power BI has been increasing gradually since its inception.

3. Bar Charts

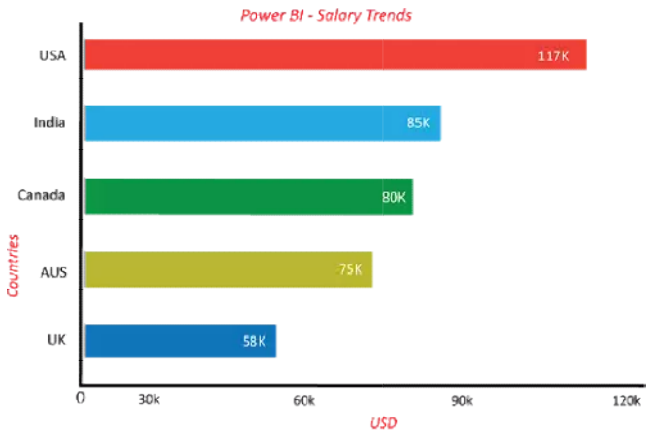
In the list of Power BI visualization types, next, we are going to discuss bar charts.

Bar charts are mostly used graphs because they are simple to create and easy to understand. Bar charts are also called horizontal charts that represent the absolute data. They are useful to display the data that include negative values because it is possible to position the bars above and below the x-axis.

For Instance:

We have shown you the Power BI Developer Salary trends (Based on neuvvo.com) in different countries using the bar chart.

The above image shows the comparison of Power BI developer Salary trends in 5 different countries (UK, India, Canada, Australia, USA).



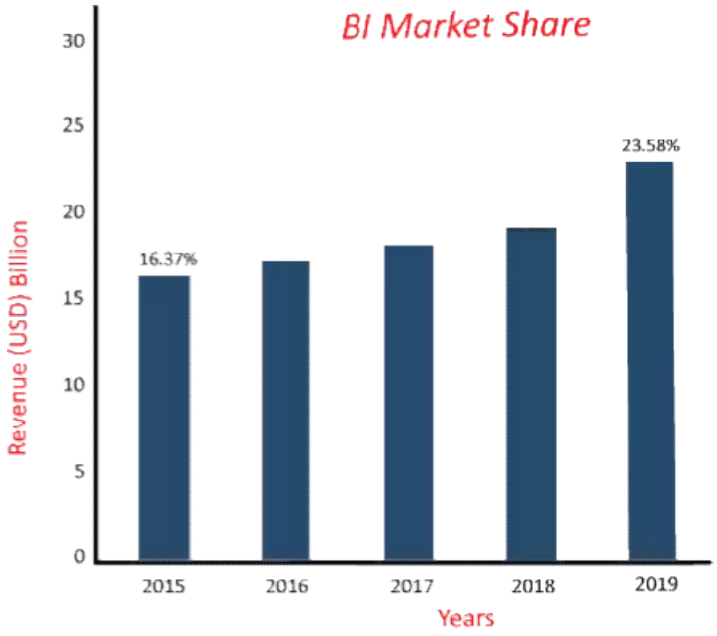
4. Column Charts

Column charts are similar to bar charts, and the only difference between these two is, column chart divides the same category data into the clusters and compares within the clusters. Also, it compares the data from other clusters.

For Instance:

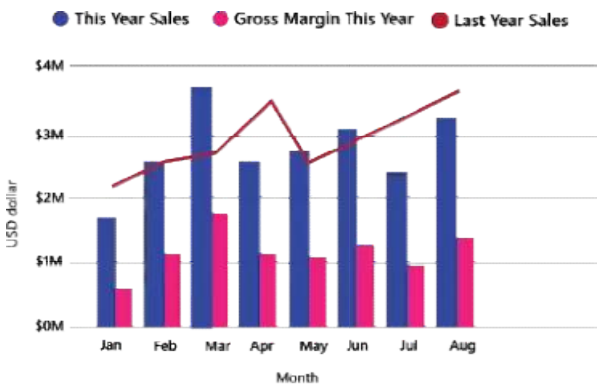
Let us consider one example in which we compared the BI market share with the past years.

If you have observed the below column chart, it is clear that the BI market share has been increasing gradually.



5. Combo Charts

A combo chart is a combination of both the column charts and line charts that help you to make a quicker comparison of the data. The combo chart shows the relationship between two measures in a single visualization. It also helps to compare multiple measures with different values.



For Instance:

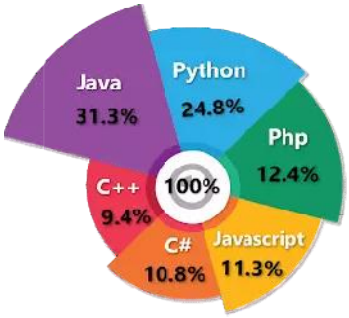
In the above combo chart, you can see the comparison between last year's and current year's sales of a product and also the current year's gross margin. With the help of this combo chart, an organization can quickly analyze the data about the product to make business decisions quickly.

6. Pie Charts

A pie chart is a circular statistical chart, and it shows the whole data in parts. Each portion of a pie chart represents the percentages, and the sum of all parts should be equal to 100%. The whole data can be divided into slices to show the numerical propositions of each part of the data. Pie charts are mostly used to represent the same category of data. It helps users to understand the data quickly. They are widely used in education, the business world, and communication media.

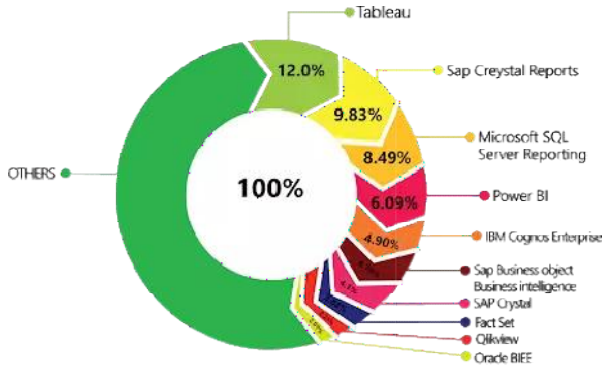
For Instance:

In the below Pie chart, it is clear that which programming language is on the top list in 2019.



7. Doughnut Charts

Doughnuts are similar to pie charts, and it is named doughnut chart because it looks similar to a doughnut. You can easily understand the data because doughnut charts show the whole data into the proposition. It is the most useful chart when you need to display various propositions that make up the final value.

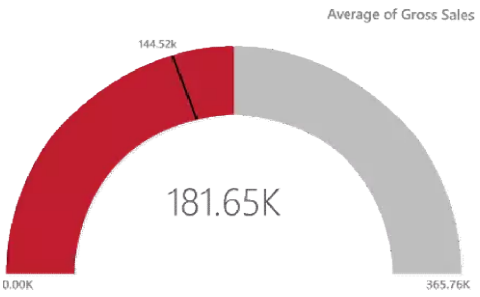


For Instance:

Let us consider an example, top BI tools market share across the globe.

8. Gauge Charts

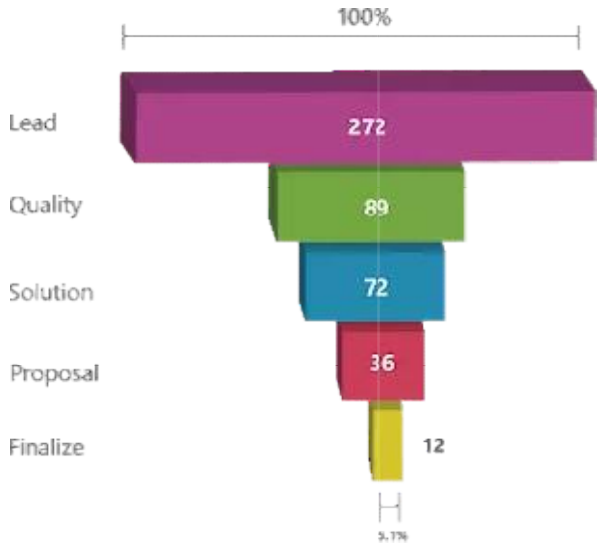
A gauge chart is also known as a speedometer or dial chart. It uses the needle to read the data, and it shows the information on a dial. The gauge chart, it represents the value of each needle as it reads the data according to the axis or colored data. These charts are useful to compare the values between the variables either by using multiple needles on the same gauge or different gauges.



For Instance: The above gauge chart shows you the average gross sales of the company.

9. Funnel Charts

The funnel chart is a type of chart which is used to visualize the data that flows from one phase to another phase. In the funnel chart, the whole data is considered as 100%, and in each phase, it is represented as numerical propositions of the data.



For Instance:

The above Funnel charts show the flow of each phase. In the below image you can see the total leads per day is 272, the quality leads are 89, solution leads are 72, proposal leads are 36, and finalize leads are 12.

10. Scatter Charts

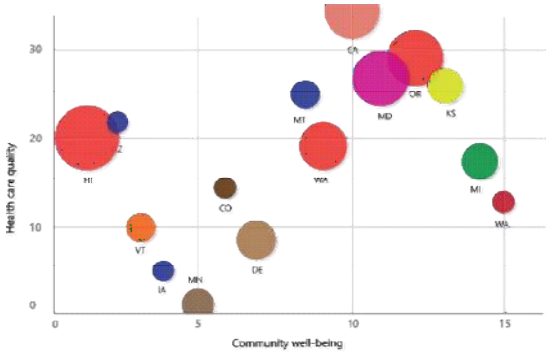
Scatter charts are used to visualize the data using the dots that represent the values obtained from two different variables, such as the x-axis and y-axis. These charts are used to show the relationship between two different variables. It is also called a correlation plot because it shows how two variables are correlated to each other.

11. Bubble Charts

Bubble charts show the data in the form of a circle. The values of the variables are represented by the x-axis and y-axis. The size of the circle represents the measure of the variables.

For Instance:

In the below bubble chart, you can observe that on X-axis, the community is measured, and quality is measured on Y-axis. Each bubble represents the size of the community.



12. Waterfall Charts

A waterfall chart is used to show how initial values are increasing and decreasing gradually by a series of values to arrive at the final value.

For Instance:

Let us consider an example in which you can plot your company's annual profit in different countries, and you can add different sources of income and losses to know the net profit of your company.

13. Maps

Maps are divided into three types, and they are listed below:

- Regional Maps
- Point Maps
- Flow Maps

A). Regional Maps:

Regional maps use different colors to represent the distribution of a specific range of values on the map.

B). Point Maps

A point map is used to represent the geographical distribution of data by plotting the same size points on the geographical background. It helps the user to grasp the overall distribution of the data, but it is a tough task if you want to observe specific data.

C). Flow Maps

A flow map is a type of map that is particularly designed to show specific themes connected with a particular geographical area. It is used in cartography to show the movements of the objects between two or more areas.

14. Slicers Charts

Slicers charts are visual filters. Using slicers, you can filter or sort your data by clicking on the type of data you want. In the below example, you can see all-region sales. In case if you want to see particular region sales, then click on that region, and it shows the specific region's sales.

15. Tree Maps

Treemaps display hierarchical data set in a nested rectangle. At each level, hierarchy is represented by a color. The size of the space in the rectangle depends on the data values. The rectangular boxes are arranged in size from top left to bottom right.

For Instance:

For example, you are analyzing your sales, and you have top-level branches for clothes categories: Rural, Mix, Youth, and Urban. Power BI treemaps split your categories into rectangle boxes (leaves); these boxes would be shaped and sized based on the number of sold.

16. Matrix Chart

A Matrix chart shows the relation between two or more variables in a data set. It is mainly made up of columns and rows to represent the data in the grid format. At least two variables are required to create a matrix chart if there is any third or fourth variable, and color or other dimensions that can be added to the matrix to represent the data.

For Instance:

The below matrix chart represents the company's revenue in different years with other factors.

Calendar Year	1	2	3	4	Total
2005			$4,647,156.86	$6,684,652.11	$11,331,808.97
2006	$5,860,884.49	$6,167,832.57	$10,277,073.05	$8,368,983.06	$30,674,773.18
2007	$6,679,873.81	$8,357,874.87	$13,670,536.66	$13,285,444.49	$41,993,729.83
2008	$11,386,315.07	$14,371,806.64	$50,840.63		$25,808,962.35
Total	$23,927,073.37	$28,897,514.09	$28,645,607.20	$28,339,079.67	$109,809,274.32

17. Tables

A table is a grid that contains the related data in a series of rows and columns. Tables are useful if you are comparing the same category for many values.

For Instance:

In the below example, you can see the same category having multiple measures to compare.

Category	This Year Sales Status	Average Unit Price	Last Year Sales	This Year Sales	This Year Sales Goal
010-Womens	●	$7.30	$2,680,662	$1,787,958	$2,680,662
020-Mens	●	$7.12	$4,453,133	$4,452,421	$4,453,133
030-Kids	●	$5.30	$2,726,892	$2,705,490	$2,726,892
040-Juniors	●	$7.00	$3,105,550	$2,930,385	$3,105,550
050-Shoes	●	$13.84	$3,640,471	$3,574,900	$3,640,471
060-Intimate	●	$4.28	$955,370	$852,329	$955,370
070-Hosiery	●	$3.69	$573,604	$486,106	$573,604
080-Accessories	●	$4.84	$1,273,096	$1,379,259	$1,273,096
090-Home	●	$1.93	$2,913,647	$3,053,326	$2,913,647
100-Groceries	●	$1.47	$810,176	$829,776	$810,176
Total	●	**$5.49**	**$23,132,601**	**$22,051,952**	**$23,132,601**

Lab - 4

Getting data from web

1. open web and search for "Indian states and capitals" click on proper search link and copy the URL

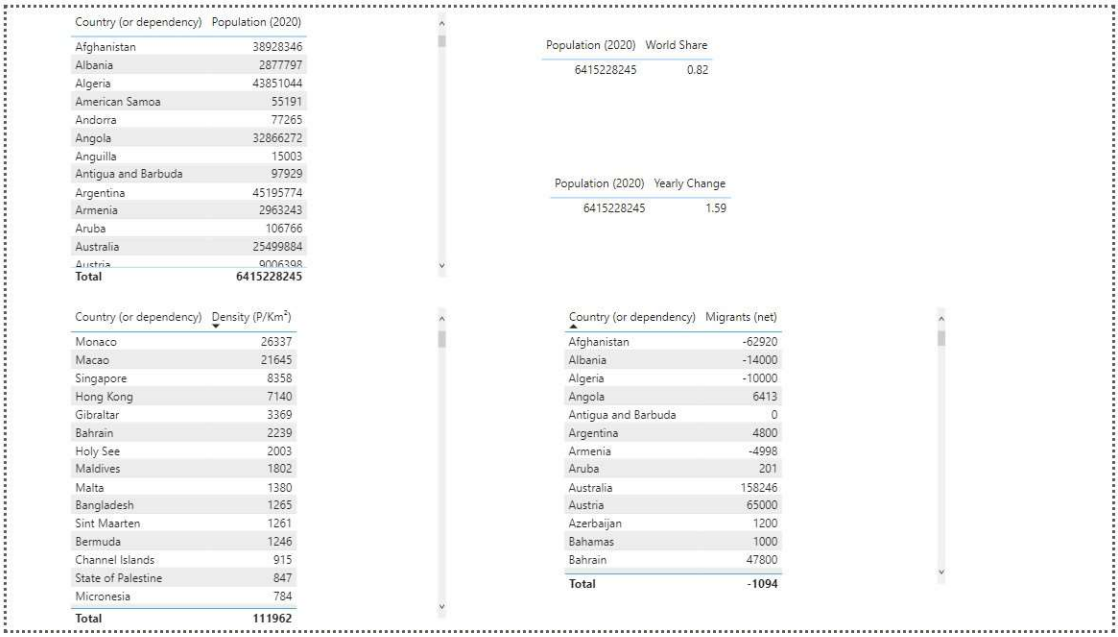
2. in power bi click on get data and then search for "web" and paste the URL

3. select the required tables from the web and click and load

4. in visualization select "table" and place the required field into the values and check output on focus

Task : https://www.worldometers.info/world-population/population-by-country/

Output



Country (or dependency)	Population (2020)
Afghanistan	38928346
Albania	2877797
Algeria	43851044
American Samoa	55191
Andorra	77265
Angola	32866272
Anguilla	15003
Antigua and Barbuda	97929
Argentina	45195774
Armenia	2963243
Aruba	106766
Australia	25499884
Austria	9006398
Total	**6415228245**

Population (2020)	World Share
6415228245	0.82

Population (2020)	Yearly Change
6415228245	1.59

Country (or dependency)	Density (P/Km²)
Monaco	26337
Macao	21645
Singapore	8358
Hong Kong	7140
Gibraltar	3369
Bahrain	2239
Holy See	2003
Maldives	1802
Malta	1380
Bangladesh	1265
Sint Maarten	1261
Bermuda	1246
Channel Islands	915
State of Palestine	847
Micronesia	784
Total	**111962**

Country (or dependency)	Migrants (net)
Afghanistan	-62920
Albania	-14000
Algeria	-10000
Angola	6413
Antigua and Barbuda	0
Argentina	4800
Armenia	-4998
Aruba	201
Australia	158246
Austria	65000
Azerbaijan	1200
Bahamas	1000
Bahrain	47800
Total	**-1094**

Getting data from Northwind ODATA feed T3_IMF

ODATA

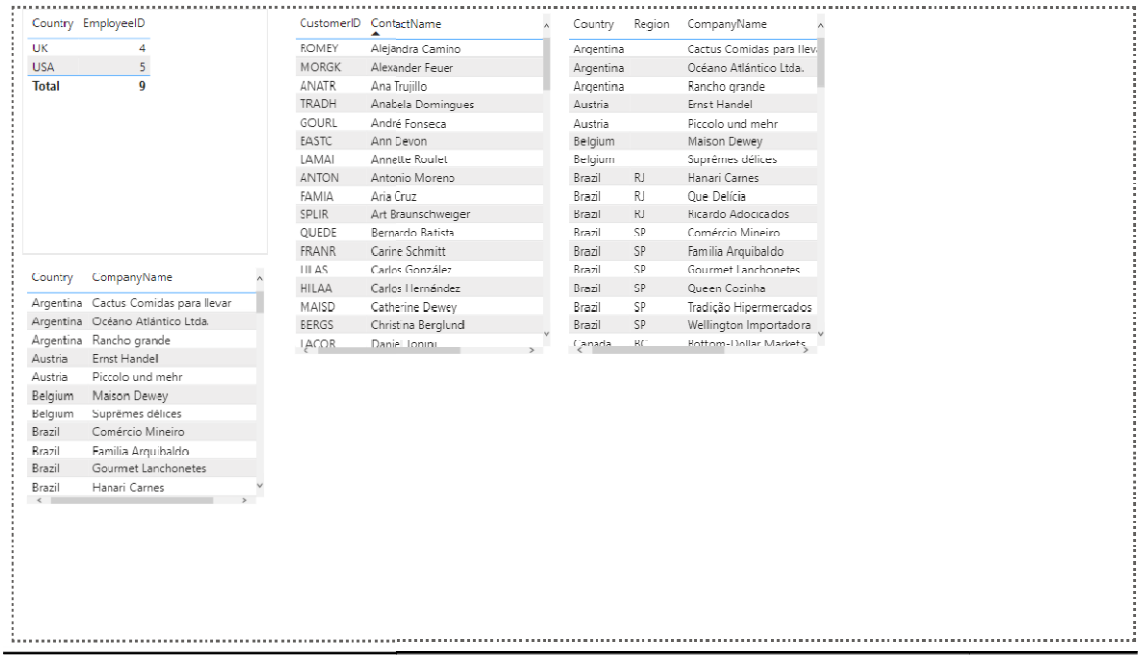
1. click on get data and search for "ODATA" and double click on it

2. in web search "North Wind dataset ODATA feed" and click on first search and copy the url and paste the url into ODATA connector in power bi

3. select the customer,employees and order invoice tables and click on load

4. explore visulaization

Output



Country	EmployeeID
UK	4
USA	5
Total	**9**

CustomerID	ContactName
ROMEY	Alejandra Camino
MORGK	Alexander Feuer
ANATR	Ana Trujillo
TRADH	Anabela Domingues
GOURL	André Fonseca
EASTC	Ann Devon
LAMAI	Annette Roulet
ANTON	Antonio Moreno
FAMIA	Aria Cruz
SPLIR	Art Braunschweiger
QUEDE	Bernardo Batista
FRANR	Carine Schmitt
HILAA	Carlos Hernández
MAISD	Catherine Dewey
BERGS	Christina Berglund

Country	Region	CompanyName
Argentina		Cactus Comidas para llev
Argentina		Océano Atlántico Ltda.
Argentina		Rancho grande
Austria		Ernst Handel
Austria		Piccolo und mehr
Belgium		Maison Dewey
Belgium		Suprêmes délices
Brazil	RJ	Hanari Carnes
Brazil	RJ	Que Delícia
Brazil	RJ	Ricardo Adocicados
Brazil	SP	Comércio Mineiro
Brazil	SP	Familia Arquibaldo
Brazil	SP	Gourmet Lanchonetes
Brazil	SP	Queen Cozinha
Brazil	SP	Tradição Hipermercados
Brazil	SP	Wellington Importadora

Country	CompanyName
Argentina	Cactus Comidas para llevar
Argentina	Océano Atlántico Ltda.
Argentina	Rancho grande
Austria	Ernst Handel
Austria	Piccolo und mehr
Belgium	Maison Dewey
Belgium	Suprêmes délices
Brazil	Comércio Mineiro
Brazil	Familia Arquibaldo
Brazil	Gourmet Lanchonetes
Brazil	Hanari Carnes

IMF

1. open google and search for IMF World Economic outlook data base

2. click on the first available link and in that site under download
World Economic Outlook Database

3. click on All countries ,select All and click on continue

4. select subject as GDP current prices by US dollars and click and continue

5. click on prepare Report and copy the URL

6. open powerbi click on get data and select web and double click on the web connector and paste the URL

7. in web view select the required table and click on edit,it will opens query editor

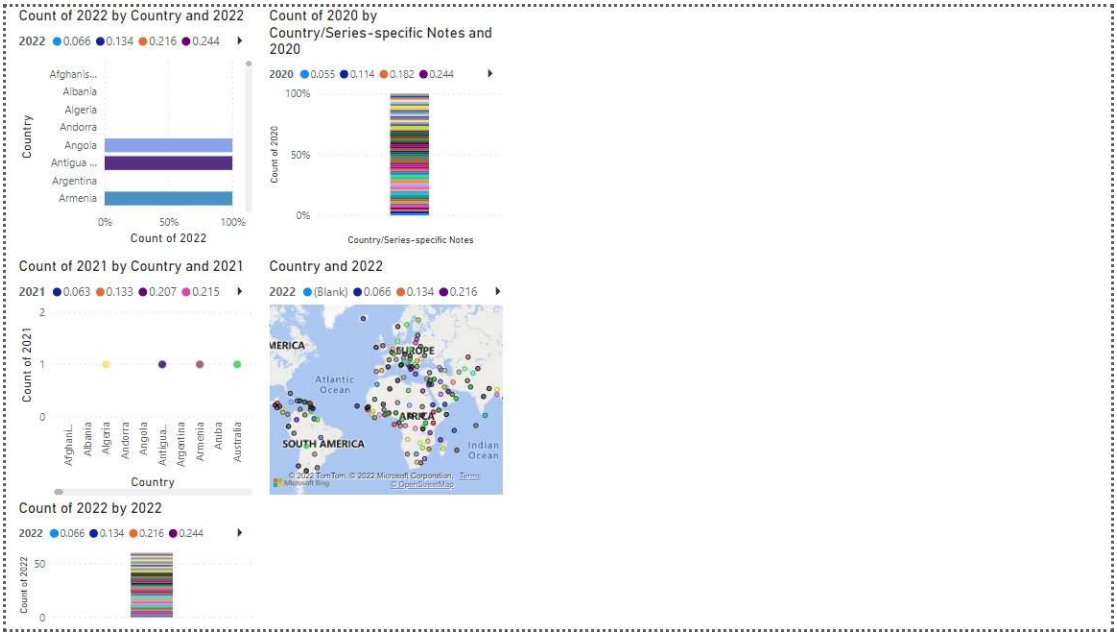
8. Remove unwanted rows in home tab select reduce rows and then remove rows

and then select remove top rows and select number of rows as 1 and click on ok

9. To take the first row as a header click on transform tb and select use first row as header

10. In home tab select manage columns,then select remove columns and then select remove columns which will remove the empty columns

Output



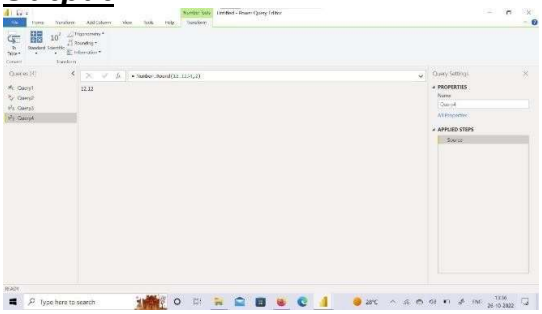
Lab - 5

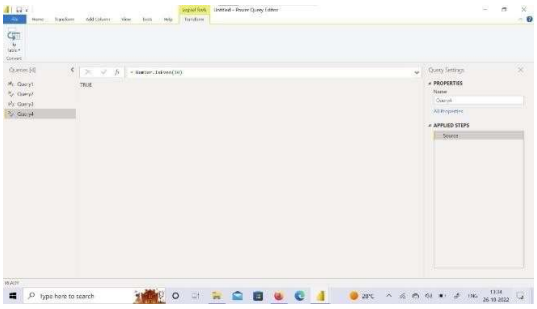
Functions & list dates in Power Bi

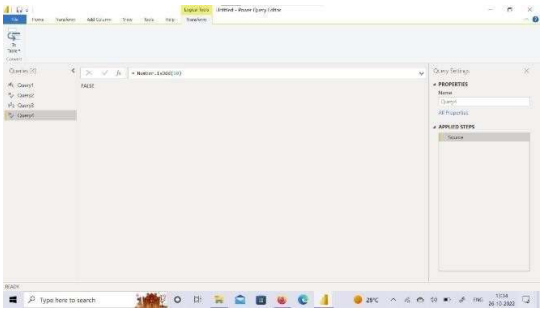
Functions

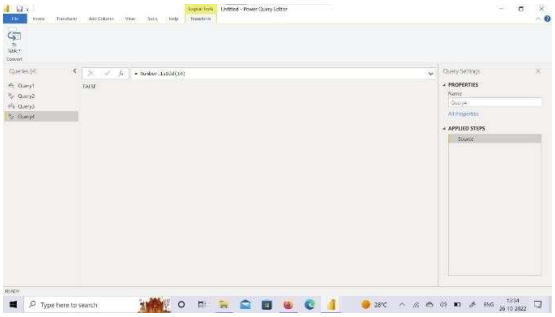
Round(12.1234,2)
Round(12.1254,2)
Is Even(10)
Is Even(11)
Is Odd(9)
SIGN(-9)
Round Up(12.34)
Round Down(12.12)

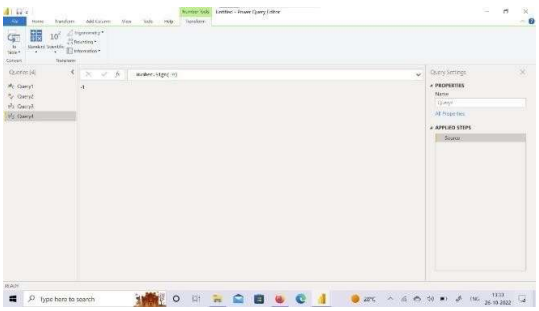
Output

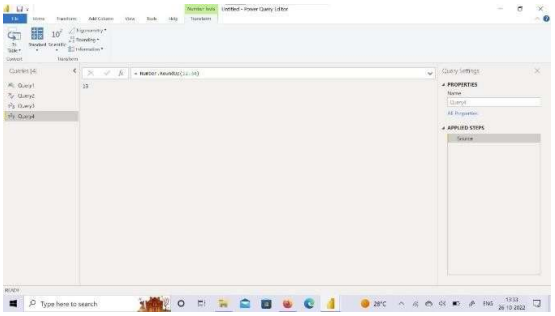


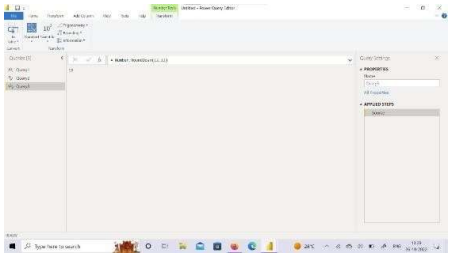












List dates

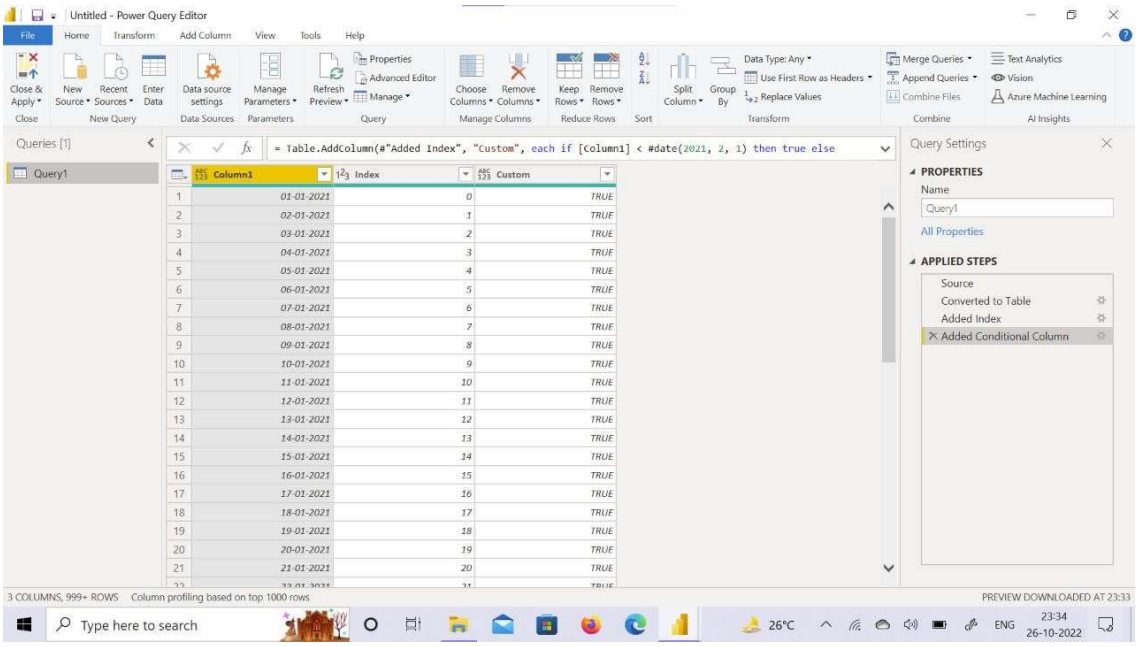
1. select blank query
2. in fx write follwing date generation code

= List.Dates(#date(2021,01,01),Number.From(DateTime.LocalNow())-
Number.From(#date(2015,01,01)),#duration(1,0,0,0))

3. convert in to Table
4. close and apply

Go to Transform Data
select Add column and add index column
After that add conditional column by set conditions.

Output



Group By and Unpivot in Power Bi

Group By

create a text file and load the data

PRODUCT,TRXN_DATE,SALES
A,11-FEB-2019,120
A,11-FEB-2019,140
B,11-FEB-2019,200
B,11-FEB-2019,120
A,11-FEB-2019,190
B,11-FEB-2019,170

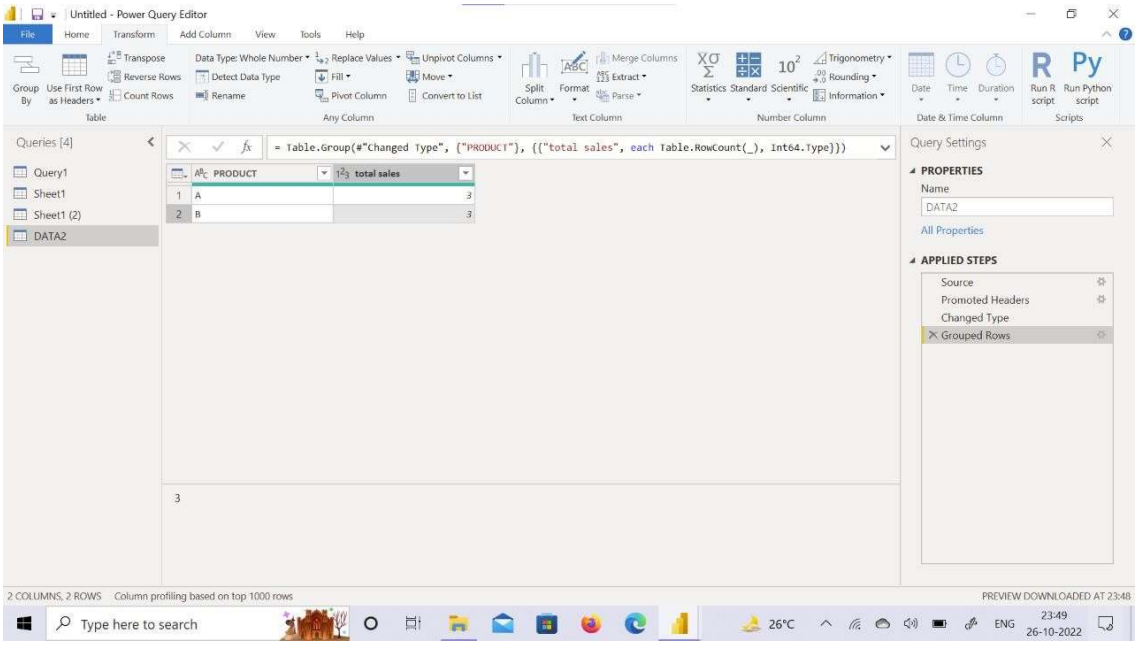
open in query editor

click on transform tab and then select group by and group by product

enter new column name as tot sales

click ok

Output



Unpivot

year,1994,1995,1996,1997,1998
Unit Sales,286322,253787,155483,246491,130602
Total Revenue,1145288,761361,310966,65301,66301

1. create a text file with the above data and from power bi connect it and open the query editor

2. in transform tab select first row as header

3. select columns other than year columns and in tranform tab select unpivot other columns

4. select first column which contains unit sales ,total revenue and click on pivot set the values column as value column ,then click ok

5. Rename the column to year,sales and revenue

Transpose:

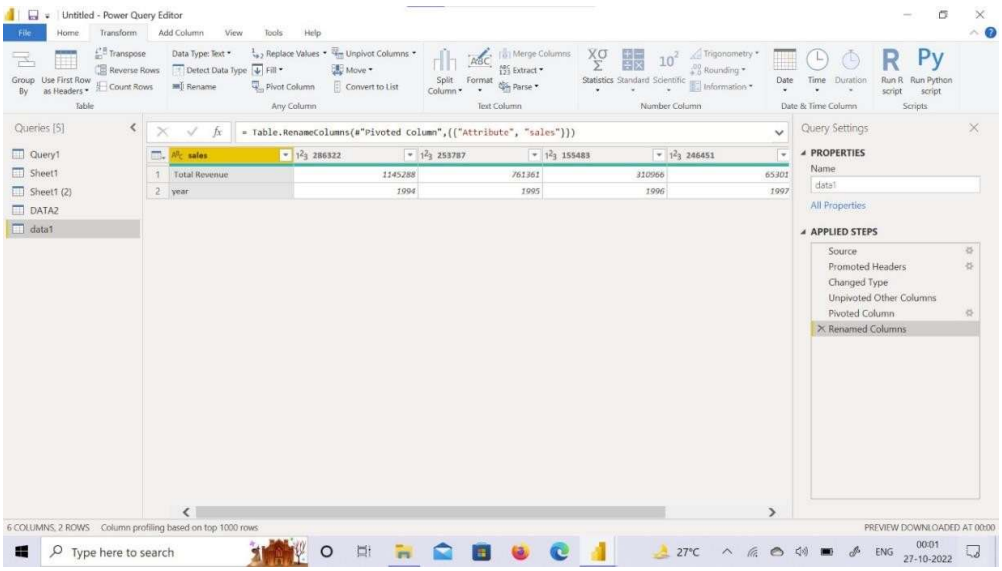
implementing above task using transpose also

1. connect data
2. in transfom tab clcik on transpose and select use first row as header
3. renaming the columns to year,sales and revenue
4. add the following row in to the file
Total Revenue,11000,34000,56000,78000
and save the file

5. Referesh the home tab

6. it will automatically displays total revenue

Output



Lab - 6

Merging queries in Power Bi

1. Merge employee and department tables

2. select both tables in to query editor

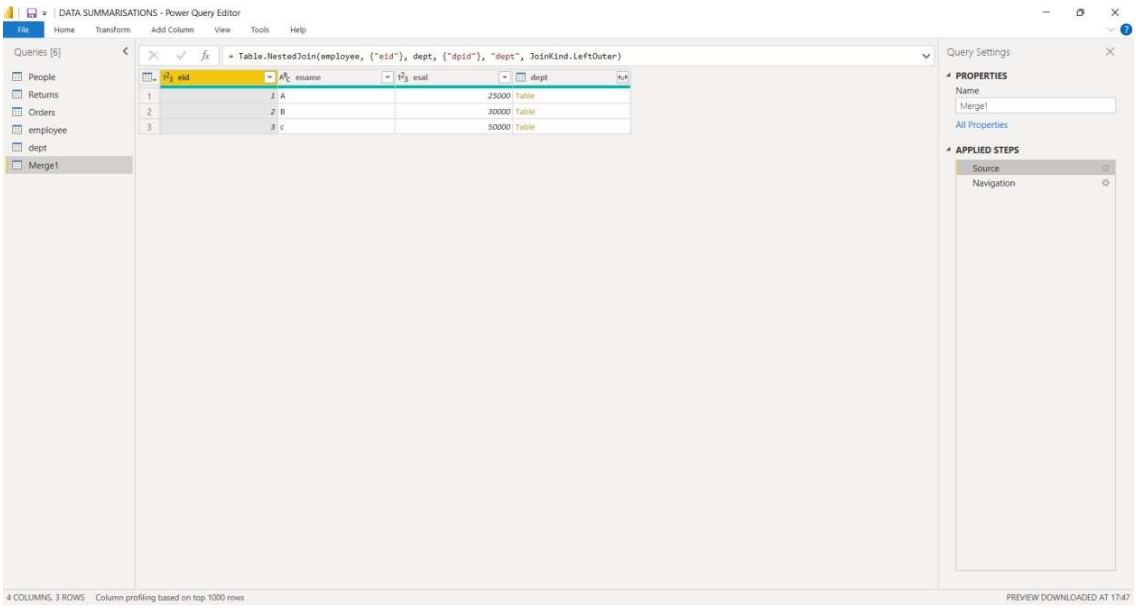
3. under home tab select Merge Queries as New

4. select emp,dept tables and select common keys

5. select type of join query

6. click ok

Output



Lab - 7

Data Compute in Power Bi

load employee data

go to transform

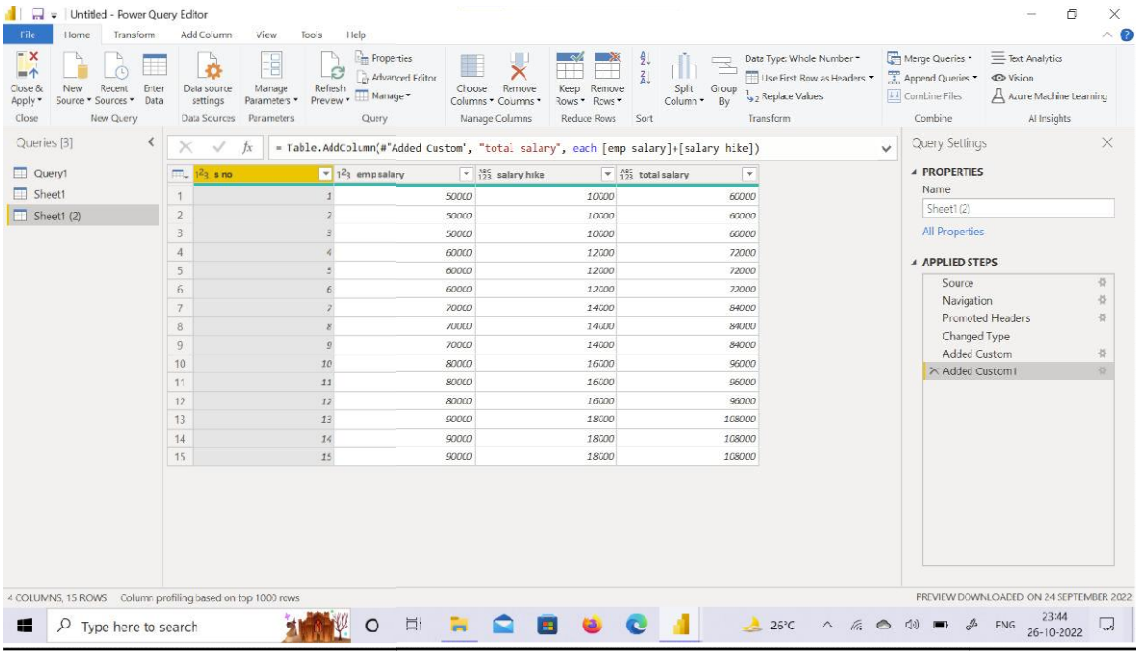
select custom column

compute salaryhike 20% salaryhike = [salary]*20/100

compute Total salary = [salary]+[salaryhike]

finally export data

Output



	s no	emp salary	salary hike	total salary
1	1	50000	10000	60000
2	2	50000	10000	60000
3	3	50000	10000	60000
4	4	60000	12000	72000
5	5	60000	12000	72000
6	6	60000	12000	72000
7	7	70000	14000	84000
8	8	70000	14000	84000
9	9	70000	14000	84000
10	10	80000	16000	96000
11	11	80000	16000	96000
12	12	80000	16000	96000
13	13	90000	18000	108000
14	14	90000	18000	108000
15	15	90000	18000	108000

Append Query in Power Bi

1. create two tables

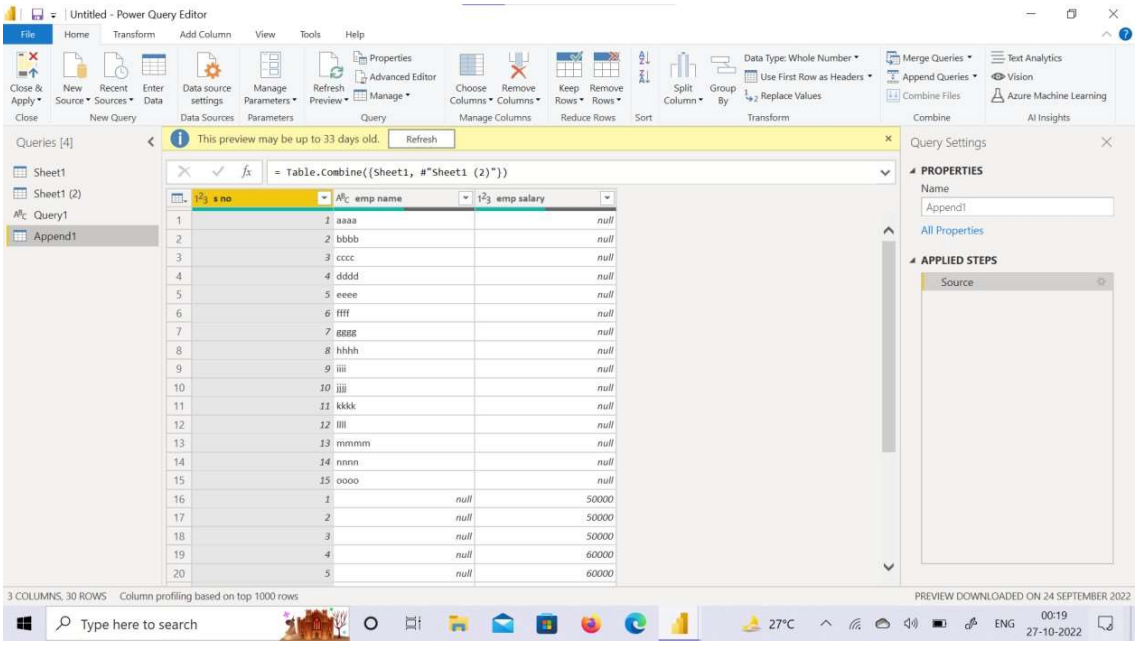
2. open query editor

3. click on first table , in home tab under combine options
select append queries as new

4. In Append window select primary table as table1
and table to append as table2

and chek the output

Output



Lab - 8

Charts in Power Bi

clustered column chart

orders data

x- axis: sub category

y-axis

sales

profit

Data labels - on

slicer - Region

Trend Analysis - Line chart

Display month wise return quantity

select line chart

drag date in axis

select date hierarchy and remove quarter and day and year

drag sales in to y axis

data labels on

also check with profit

---

pie chart

select sales and sub category

---

combination chart using Line and Bar

line and clustered column chart

x- axis order date month

column y axis sales , profit

line y axis sales , profit

data labels on

series labels on

To compare current year sales with previous year sales for each region

1. create new measure Total.sales

Total.Sales= Sum(Orders[Sales])

2. Drag region in to rows and order date in to columns keep only year

3. Drag Total.Sales into values

4. create a new measure PY.values

PY.Sales=CALCULATE([TOTAL.Sales],PREVIUOSYEAR(Orders[Order Date].[Date]))

5. create a new table drag Py.sales and Total.sales in to values

Order date- Year into Axis

6. select slicer into view and drag region into slicer

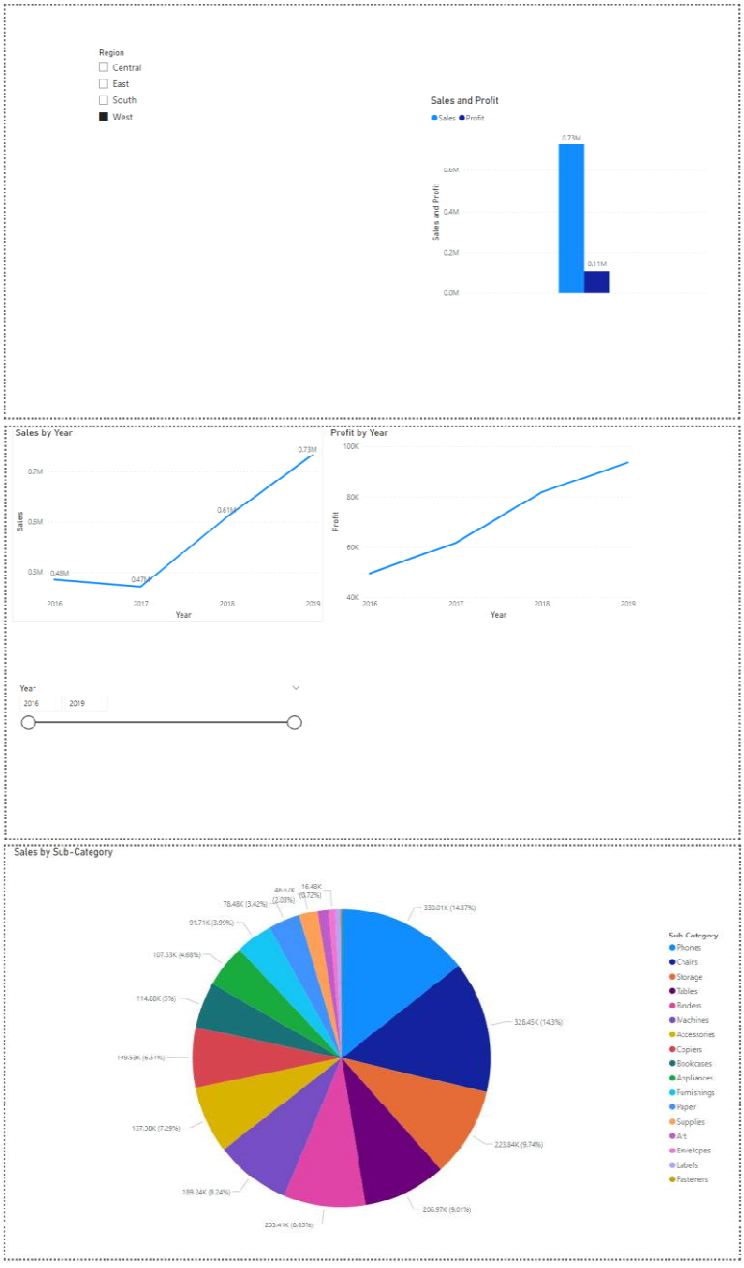
7. default view will be in Text , Use line chart in the viz

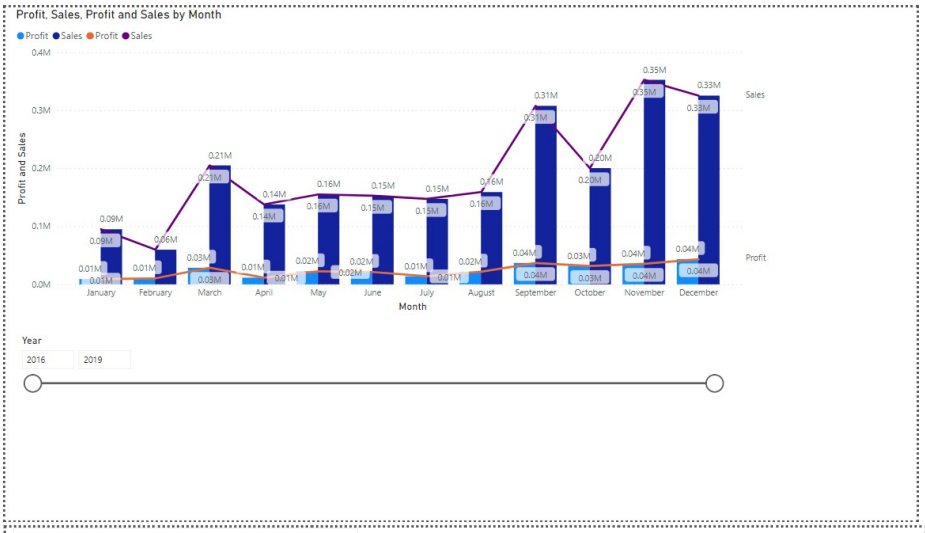
8. select any region to filter based on region selection

9. copy the line chart and paste it beside and change it to bar chart

---

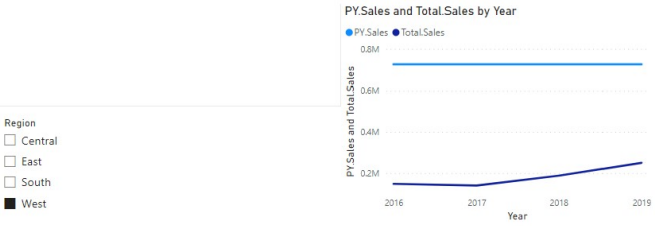
Output





Region	Year	Total.Sales
West	2016	1,47,883.03
West	2017	1,39,966.25
West	2018	1,87,480.18
West	2019	2,50,128.37
Total		**7,25,457.82**

PY.Sales	Total.Sales	Year
7,25,457.82	1,47,883.03	2016
7,25,457.82	1,39,966.25	2017
7,25,457.82	1,87,480.18	2018
7,25,457.82	2,50,128.37	2019
7,25,457.82	**7,25,457.82**	



Average.Sales	Year	Total.Sales
242.97	2016	4,84,247.50
223.85	2017	4,70,532.51
235.49	2018	6,09,205.60
221.38	2019	7,33,215.26
229.86		**22,97,200.86**

Maximum.Sales	Total.Sales	Year
22,638.48	4,84,247.50	2016
6,354.95	4,70,532.51	2017
17,499.95	6,09,205.60	2018
13,999.96	7,33,215.26	2019
22,638.48	**22,97,200.86**	

Minimum.Sales	Total.Sales	Year
0.85	4,84,247.50	2016
0.98	4,70,532.51	2017
0.84	6,09,205.60	2018
0.44	7,33,215.26	2019
0.44	**22,97,200.86**	

Data Modeling in Power Bi

A company ABC has 200 grocery stores spread over eight states. Each of the stores has different departments like Daily Needs, Cosmetics, Frozen Foods, dairy etc. Each store has roughly around 20000 individual products on its shelves. The individual products are called stock keeping units(SKUs). About 6000 SKUs come from outside manufacturers and have bar codes imprinted on the product package. These bar codes are called Universal Product Codes(UPCs). Data is collected by Point of Sale (POS) system at 2 places: front door where customer takeaway is measured and backdoor where vendors make deliveries.

At the grocery store, management is concerned with the logistics of ordering, stocking and selling products while maximizing profits. Several promotional schemes such as temporary price reductions, ads in newspapers, displays etc, also keep rising.

Design a data model for analyzing the operations of this grocery chain.

SOLUTION:

Step 1: Gathering Business requirements:

Management wants to better understand customer purchases as captured by the POS system. The model should allow analyzing what products are selling in which stores on what days under what promotional conditions. Also, this a warehousing environment, so a dimensional model is needed.

Step 2: Identification of Entities:

In the case of a dimensional model, we need to identify our fact and dimension entities. Before developing the model, the grain of data that is required needs to be clarified. In this particular case, we need the grain is individual line item on a POS transaction. As per the requirement, we need to see data about a particular product in a particular store, on a particular day under a particular promotional scheme. This gives us an idea of the dimensions we require:

Date Dimension

Product Dimension

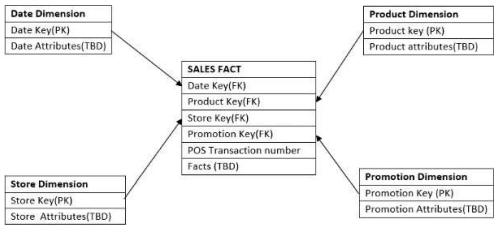
Store Dimension

Promotion Dimension

The quantities to be calculated(e.g sales quantity, profit etc) will be captured in a **Sales Fact table.**

Step 3: Conceptual Data Model:

A preliminary data model will be made based on the information gathered about entities. In our case, it will look as follows:



*TBD = To be decided *PK=Primary Key *FK=Foreign key

Step 4: Finalization of attributes and Design of Logical Data Model

Now, the attributes of the identified Fact and Dimension tables need to be finalized. In our case, the following attributes are finalized:

Date Dimension:

Date Dimension:

Date Key(PK)
Date
Full Date Description
Day of Week
Calendar Month
Calendar Year
Fiscal Year Month
Holiday Indicator
Weekday Indicator

Sample data in Date Dimension will look as follows:

Date Key	Date	Full Date Description	Day of Week	Calendar Month	Calendar Year	Fiscal Year Month	Holiday Indicator	Weekday Indicator
1	01/01/2002	January 1,2002	Tuesday	January	2002	F2002-01	Holiday	Weekday
2	02/01/2002	January 2,2002	Wednesday	January	2002	F2002-01	Non-Holiday	Weekday

Product:

Product Dimension:

Product key(PK)
Product Description
SKU Number(natural key)
Brand Description
Category Description
Department Description
Package Type Description
Package Size
Fat Content
Weight

Store:

Store Dimension:
Store Key(PK)
Store Name
Store Number(natural Key)
Store Street Address
Store City
Store Country
Store State Store Zip Code
Store Manager
Store Region

Promotion:

Promotion Dimension:

Promotion Key(PK)
Promotion name
Price Reduction Type
Promotion Media Type
Ad Type
Display Type
Promotion Cost
Promotion Start Date
Promotion End Date

Sales Fact:

Transaction Number

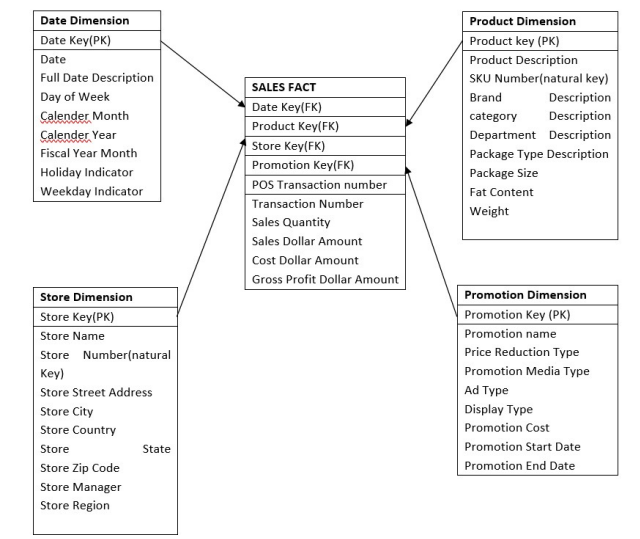
Sales Quantity: (e.g no. of cans of veg noodle soups)

Sales Dollar Amount: Sales Quantity * Unit Price

Cost Dollar Amount: Dollar cost for the product charged by vendor

Gross Profit Dollar Amount: Sales Dollar Amt — Cost Dollar Amt

The **logical data model** will look like:



Step 5: Creation of Physical tables in database:

With the help of the data modeling tool or by writing custom scripts, the physical tables can now be created in the database.

Data Modeling is one of the most important tasks in the design of a software application. It lays the foundation of how the data will be organized, stored, retrieved and presented.

Lab – 9

Data Summarization in Power Bi

Data summarization

group by

after calculate sum,avg,max,min...

new table

summarize1 = SUMMARIZE(Orders,Orders[Sub-Category],"Totalsales",SUM(Orders[Sales]))

Perform Data grouping on orders data at the city level and state level get tota;
sales and profit

summarize2 =
SUMMARIZE(Orders,Orders[City],Orders[Region],"totsales",sum(Orders[Sales]),"totprofit",sum(Orders[Profit]))

---

sales only greater than 20000

summarize2 =
SUMMARIZE(Orders,Orders[City],Orders[Region],"totsales",sum(Orders[Sales])>20000,"totprofit",sum(Orders[Profit]))

CALCULATE TABLE:
based on filters

syntax:

CALCULATETABLE(TABLE,[FILTER1],[FILTER2],. ..)

Orders[India]=CALCULATETABLE(Orders,Orders[Country]="India",Orders[Sales]>5000)

Get data only consumer segment Data in central ,EMCA regions, with quantity > 10 in first class Ship Mode.

Orders_T2=CALCULATE(Orders,Orders[Segment]="Consumer",Order[Region] in {"Central","EMCA"},
Orders[Ship Mode]="First class",
Orders[Quantity] >10)

Display Top 10 customers from US ,UK, Japan and combine All the customers into Single Table

create three tables

indiacustomers= SELECTCOLUMNS(CALCILATETABLE(Orders,Orders[Country]="india"),
"Cust Name",Orders[Customer Name],
"Profits",Orders[Profit])

us customers

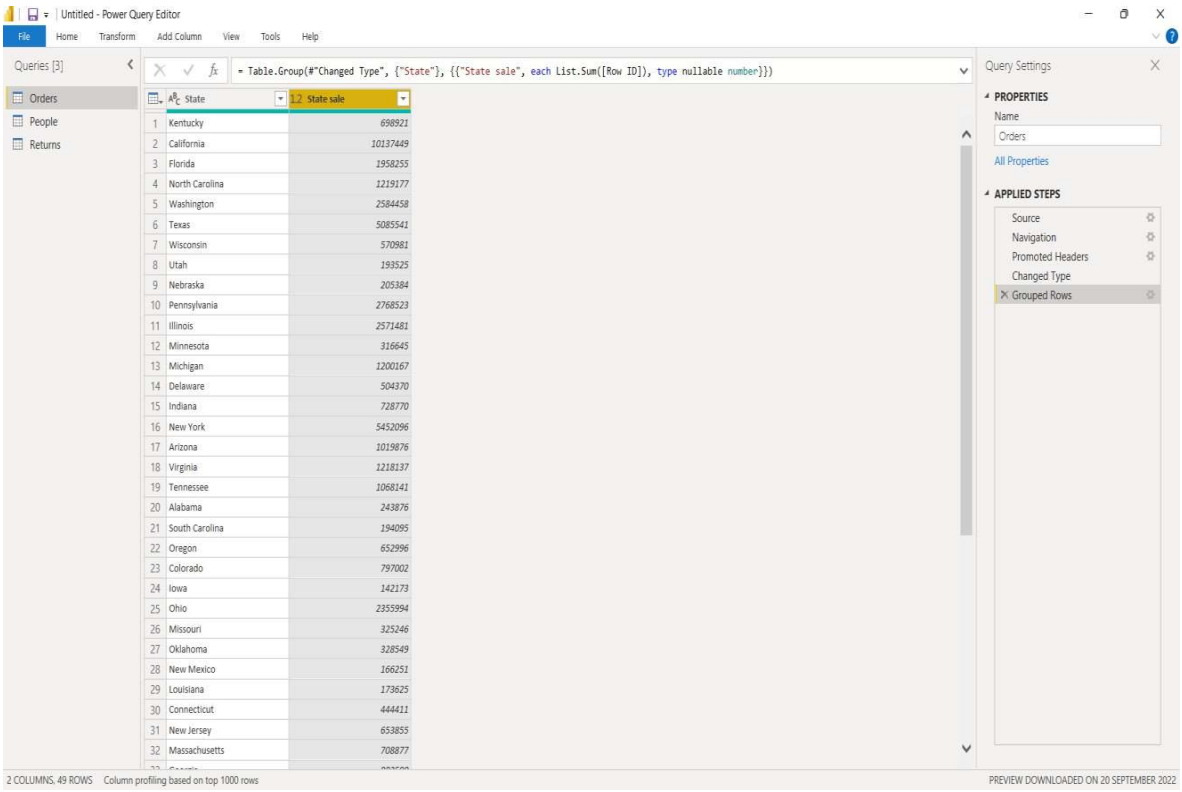
uk customers

.....-

create three measures on above three tables

Total.profits(IC)=SUM('Indian Customers'[Profits])

Output



Lab – 10

Understanding the applications of Power Bi

organization works with a lot of data, but if you have a hard time connecting it to important insights, you aren't maximizing its value. Microsoft Power BI helps you fix this problem through a powerful business intelligence tool that focuses on visualization. You don't have to try hard to understand spreadsheet columns demanding your attention. Instead, you get clear charts, graphs, diagrams and other reporting visuals. You identify trends, discover patterns and quickly get up to speed on new data sets. Here are a few ways Microsoft Power BI can work for your organization.

1. Automate KPIs in Microsoft Power BI

You have important key performance indicators (KPIs) scattered across multiple applications. You can't draw conclusions from these metrics when they're siloed off in individual software. Power BI brings this data together into one panel, so you have an organization-wide view of the information that matters.

2. Visualize Sales Versus Marketing Leads

Do you have problems with your sales team meeting their quota? The problem may not originate from their department – it could be the quality or quantity of leads from marketing. Even your best account representatives can't do their job properly if they don't start with the right prospects. Microsoft Power BI lets you visualize the relationship between these two critical metrics.

3. Conduct a Marketing Health Check

You invest heavily in your online marketing to attract customers while they're researching solutions to their unique problems, but they're falling out of the funnel before they convert. What's going wrong between their click through and the sale? Power BI brings this relevant data into a chart so you can track user behavior throughout their journey. Your campaign may have significant problems or simply missed the mark with the target demographic.

4. Gain a Real-Time Look at Your Company's Financial Performance

Financial setbacks have a long-lasting impact on your organization, especially if it's completely out of nowhere. Microsoft Power BI gives you insight into the company's performance at multiple levels. You can look into a team's profitability, your top-selling products, the revenue generated by a particular department and many other views. This data comes into Power BI in real-time, so sudden drops get immediate attention. You get the chance to fix the problem before it snowballs into a massive concern.

5. Create Consistent Reporting Standards

How many software packages exist in your organization? Every department from accounting to sales relies on specialty applications for their day-to-day job duties. You don't always get a reporting feature in these programs, and if you do, the format varies significantly from app to app. Using Microsoft Power BI to pull in data and generate reports gives you consistent standards across the organization. It takes less time for managers to understand the information when it's presented in the same format and style every time.

6. Stay Ahead of Inventory Shortages

Does your business work with physical inventory, whether you're selling products to the general public or you need to keep track of your office's printer paper? Power BI stays on top of your inventory numbers, so you know when to bring in more units, the sell-through or usage rate and other critical information.

Lab - 11

Create a Power Bi Dashboard for IPL data analysis

1. Open excel
2. click get data
3. click on text/csv
4. Load deliveries and matches from ipl folder
5. Click on “format your report page” in visualizations
6. wallpaper->browse->select image->click open->image fit(click on fit)
7. Add visualizations

   Clustered bar chart

   Clustered column chart

   Pie chart

   Multi row card

   Table

Output

Lab - 12

Create a Power Bi dashboard for Corona Cases analysis

1. click on get data

2. click on web

3. Enter https://www.worldometers.info/coronavirus/

4. click ok

5. In html tables-> select Table 2

6. load data

7. next click transform data->remove unwanted columns

8. change type of column

9. click on close and apply

10. Next apply visualizations

    Card Visualization

    -Total deaths

    -Total Recovered

    -Total Tests

    -New cases

    -New Recovered

    -Total Cases

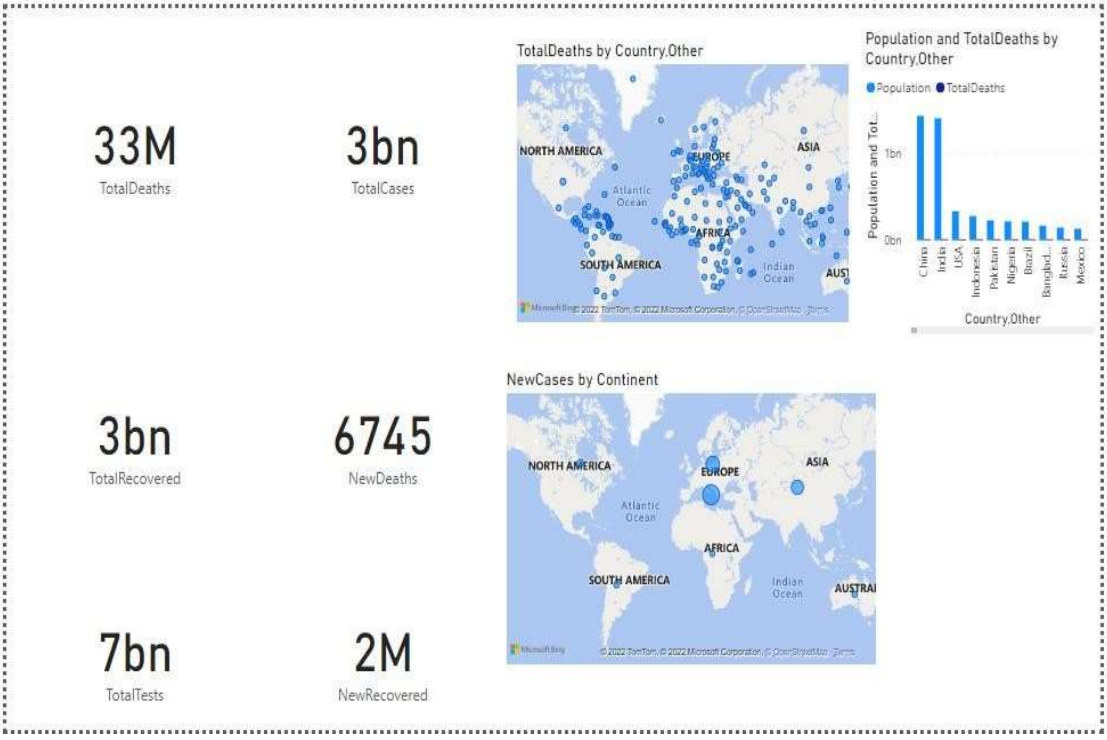
11. next select map visualization->select country and total deaths and apply

12. again select map visualization->select continent and new cases and apply

13. click on clustered column chart->select country population and total deaths and apply

14. check the final output.

Output


33M
TotalDeaths
3bn
TotalCases
TotalDeaths by Country.Other
NORTH AMERICA
EUROPE
ASIA
Atlantic Ocean
AFRICA
SOUTH AMERICA
Indian Ocean
Population and TotalDeaths by Country.Other
Population
TotalDeaths
Population and Tot...
1bn
0bn
China
India
USA
Indonesia
Pakistan
Nigeria
Brazil
Bangladesh
Russia
Mexico
Country.Other
3bn
TotalRecovered
6745
NewDeaths
NewCases by Continent
NORTH AMERICA
EUROPE
ASIA
Atlantic Ocean
AFRICA
SOUTH AMERICA
Indian Ocean
7bn
TotalTests
2M
NewRecovered