Microsoft Power BI
Certification Training (DA-100)

Module 2 – Data Extraction

Agenda

01 Overview of Power BI Desktop

02 Data Sources in Power BI

03 Using Files as a Data Source

04 Updating Files in Power BI

05 Using a Database as a Data Source

06 Using SaaS Connectors

Agenda

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09 R Script

10 Power Query Editor

11 Areas in Power Query Editor

12 Advanced Editor

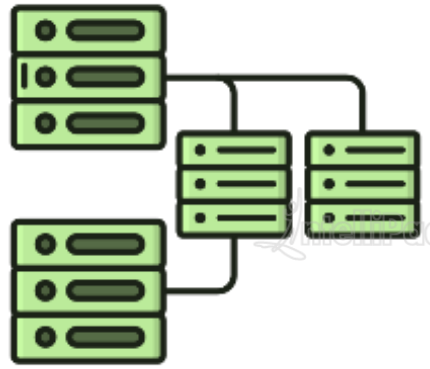
Overview of Power BI Desktop

Overview of Power BI Desktop

Power BI Desktop features a workspace for creating reports and comprises three key views in which we can work

Report View

Data View



Model View

Overview of Power BI Desktop

Report View

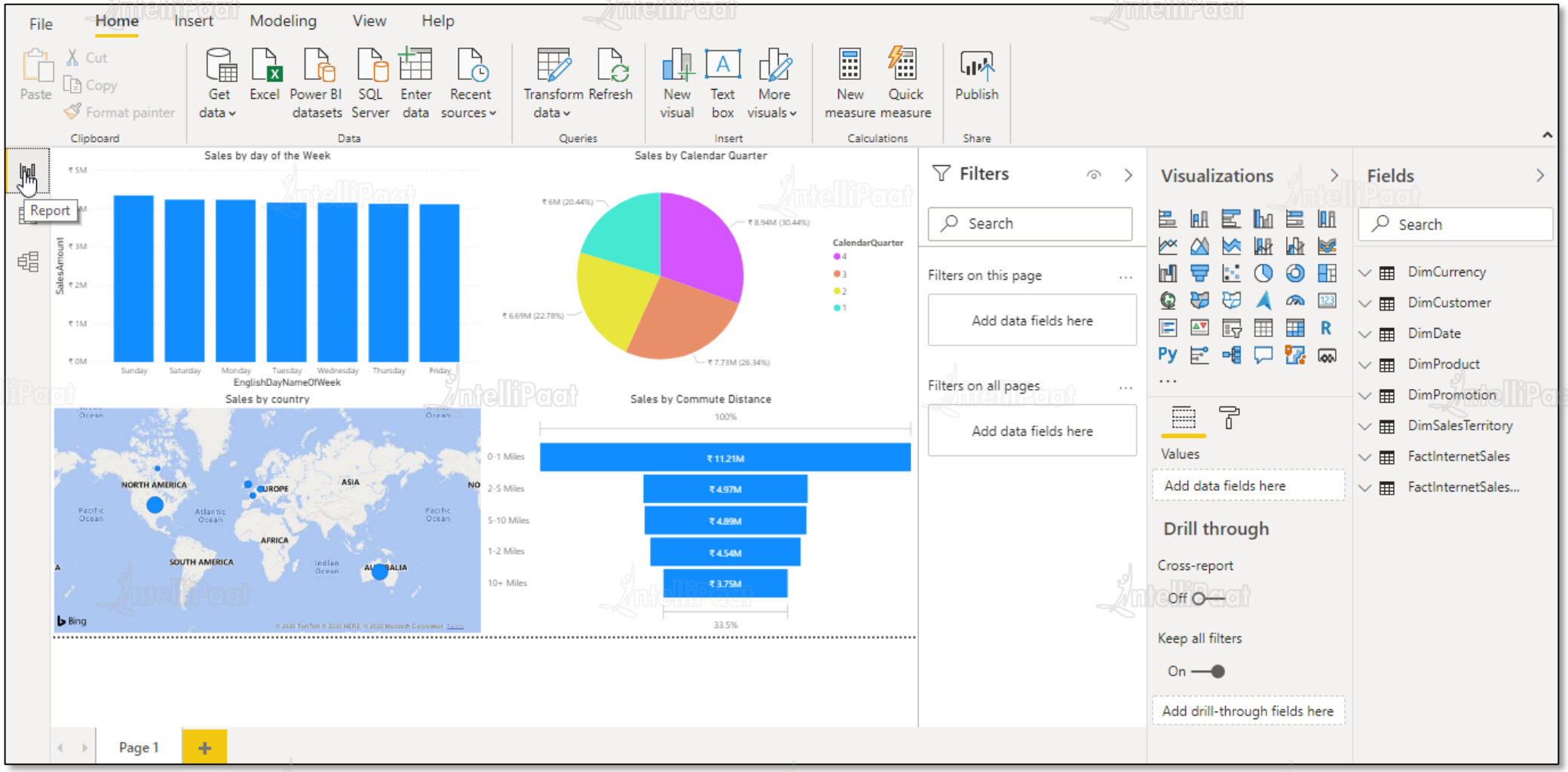
Data View

Model View

This is the main workspace where we add report items, such as bar charts, maps, and pie charts, and display data using these report items

Overview of Power BI Desktop

Report View



Overview of Power BI Desktop

Report View

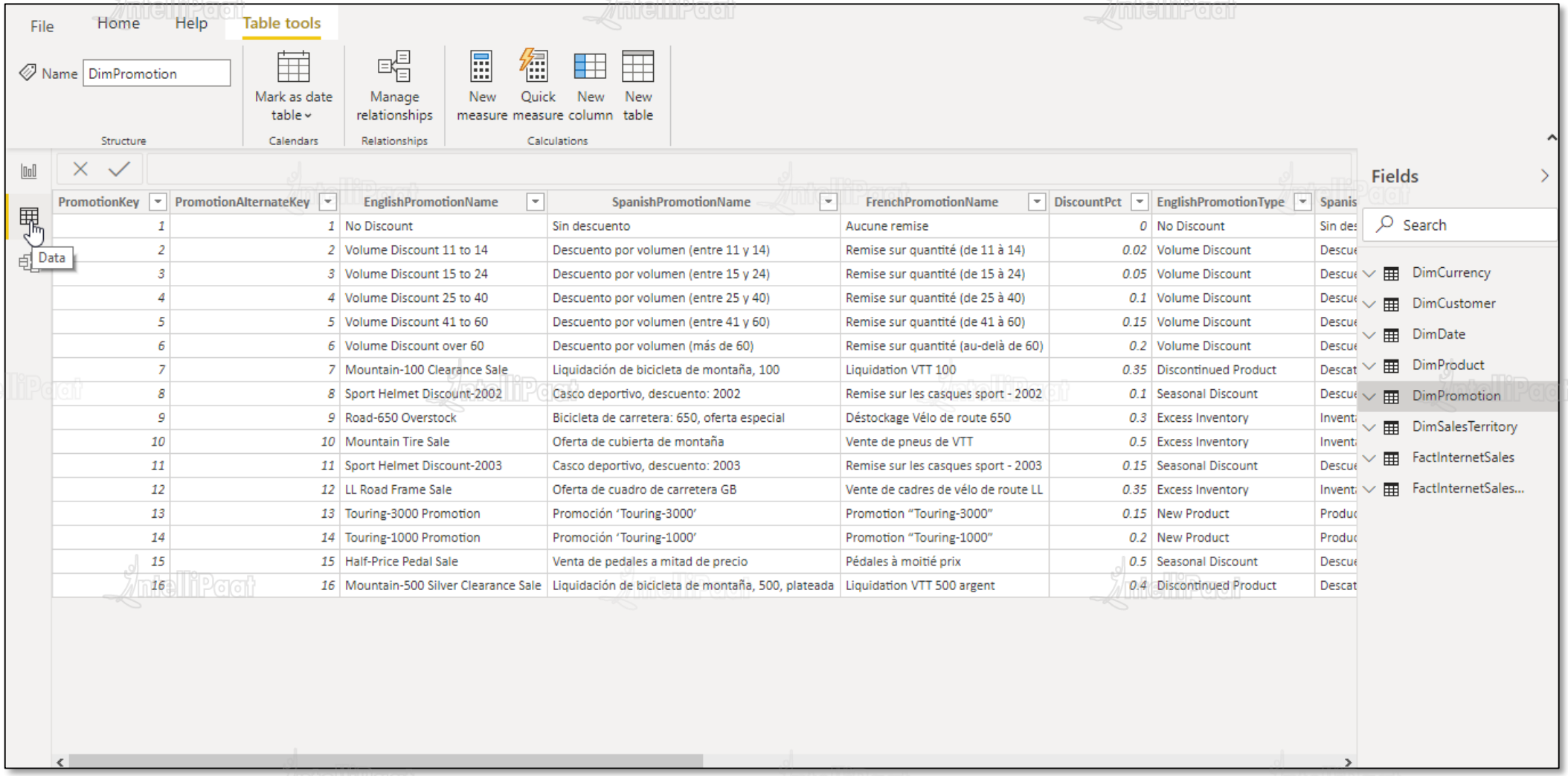
Data View

Model View

The data view is used to see imported datasets, in addition to shaping the data using transformations and M expressions

Overview of Power BI Desktop

Data View



PromotionKey	PromotionAlternateKey	EnglishPromotionName	SpanishPromotionName	FrenchPromotionName	DiscountPct	EnglishPromotionType	Spanis
1	1	No Discount	Sin descuento	Aucune remise	0	No Discount	Sin des
2	2	Volume Discount 11 to 14	Descuento por volumen (entre 11 y 14)	Remise sur quantité (de 11 à 14)	0.02	Volume Discount	Descue
3	3	Volume Discount 15 to 24	Descuento por volumen (entre 15 y 24)	Remise sur quantité (de 15 à 24)	0.05	Volume Discount	Descue
4	4	Volume Discount 25 to 40	Descuento por volumen (entre 25 y 40)	Remise sur quantité (de 25 à 40)	0.1	Volume Discount	Descue
5	5	Volume Discount 41 to 60	Descuento por volumen (entre 41 y 60)	Remise sur quantité (de 41 à 60)	0.15	Volume Discount	Descue
6	6	Volume Discount over 60	Descuento por volumen (más de 60)	Remise sur quantité (au-delà de 60)	0.2	Volume Discount	Descue
7	7	Mountain-100 Clearance Sale	Liquidación de bicicleta de montaña, 100	Liquidation VTT 100	0.35	Discontinued Product	Descat
8	8	Sport Helmet Discount-2002	Casco deportivo, descuento: 2002	Remise sur les casques sport - 2002	0.1	Seasonal Discount	Descue
9	9	Road-650 Overstock	Bicicleta de carretera: 650, oferta especial	Déstockage Vélo de route 650	0.3	Excess Inventory	Invent
10	10	Mountain Tire Sale	Oferta de cubierta de montaña	Vente de pneus de VTT	0.5	Excess Inventory	Invent
11	11	Sport Helmet Discount-2003	Casco deportivo, descuento: 2003	Remise sur les casques sport - 2003	0.15	Seasonal Discount	Descue
12	12	LL Road Frame Sale	Oferta de cuadro de carretera GB	Vente de cadres de vélo de route LL	0.35	Excess Inventory	Invent
13	13	Touring-3000 Promotion	Promoción 'Touring-3000'	Promotion "Touring-3000"	0.15	New Product	Produc
14	14	Touring-1000 Promotion	Promoción 'Touring-1000'	Promotion "Touring-1000"	0.2	New Product	Produc
15	15	Half-Price Pedal Sale	Venta de pedales a mitad de precio	Pédales à moitié prix	0.5	Seasonal Discount	Descue
16	16	Mountain-500 Silver Clearance Sale	Liquidación de bicicleta de montaña, 500, plateada	Liquidation VTT 500 argent	0.4	Discontinued Product	Descat

Overview of Power BI Desktop

Report View

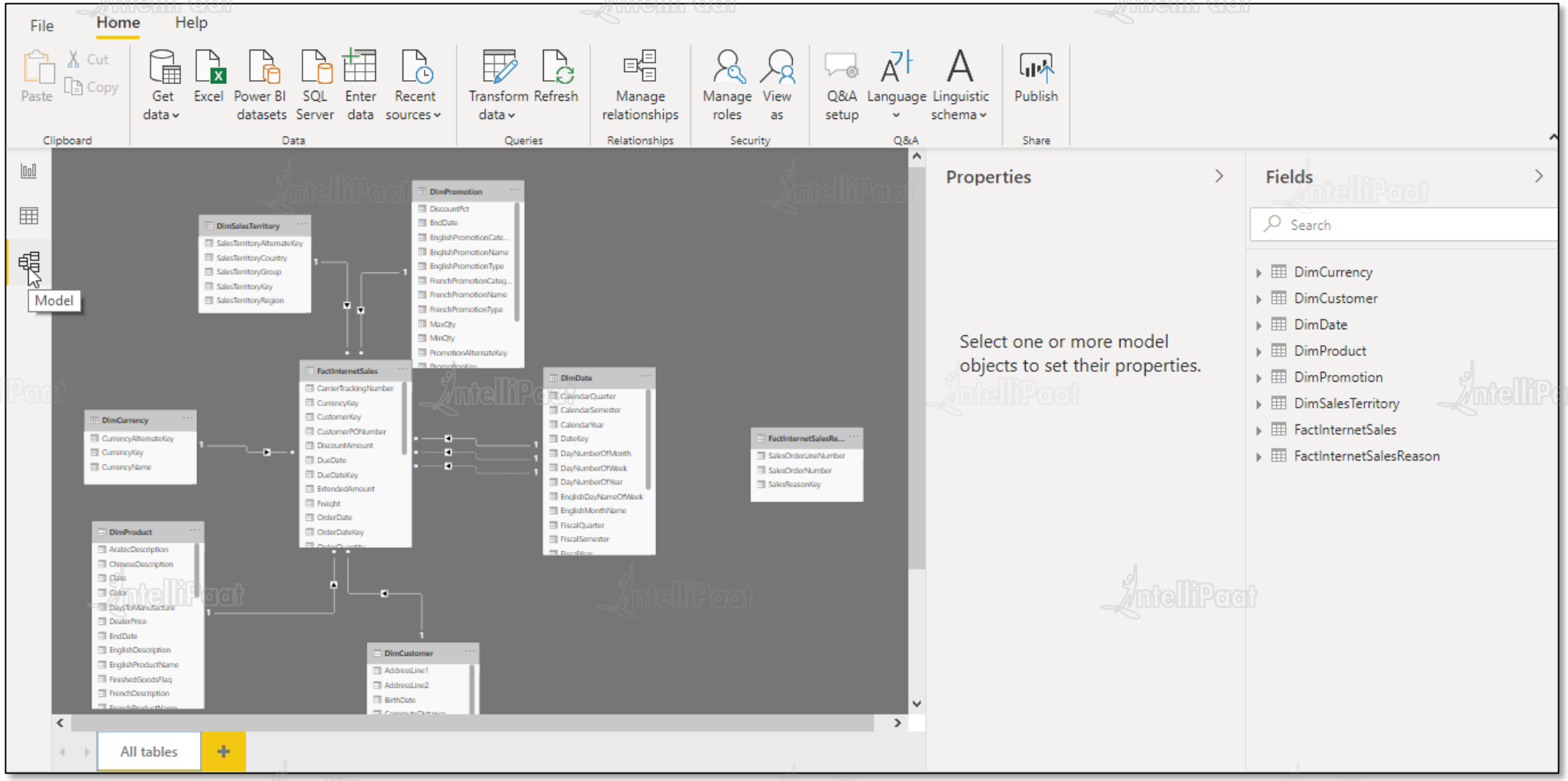
Data View

Model View

Power BI has an autodetect relationships feature, and we can also create relationships manually and set relationship properties

Overview of Power BI Desktop

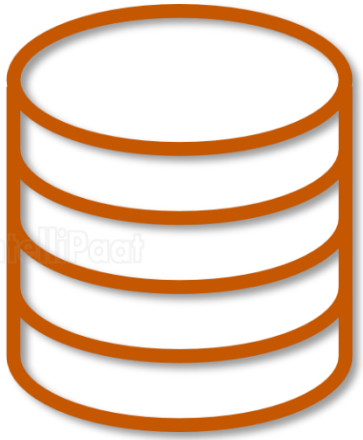
Model View



Data Sources in Power BI

Data Sources in Power BI

In Power BI Desktop, we have a wide choice of sources to import data from, including database, file, Azure, and SaaS connectors



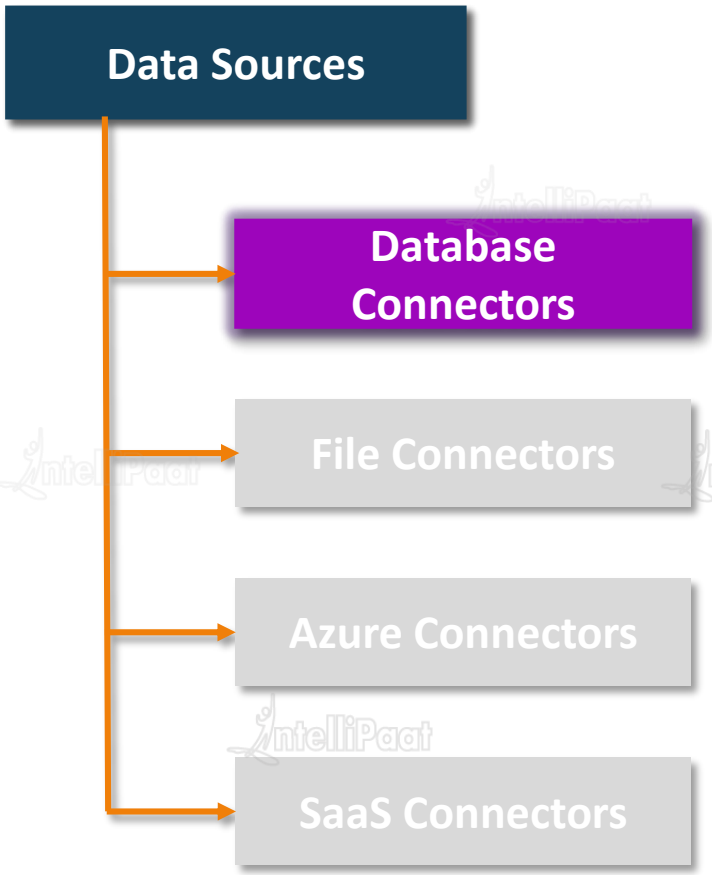
Database Connectors

File Connectors

Azure Connectors

SaaS Connectors

Data Sources in Power BI



Power BI supports the database connections for importing data from on-premises sources

Database connectors include:

MySQL

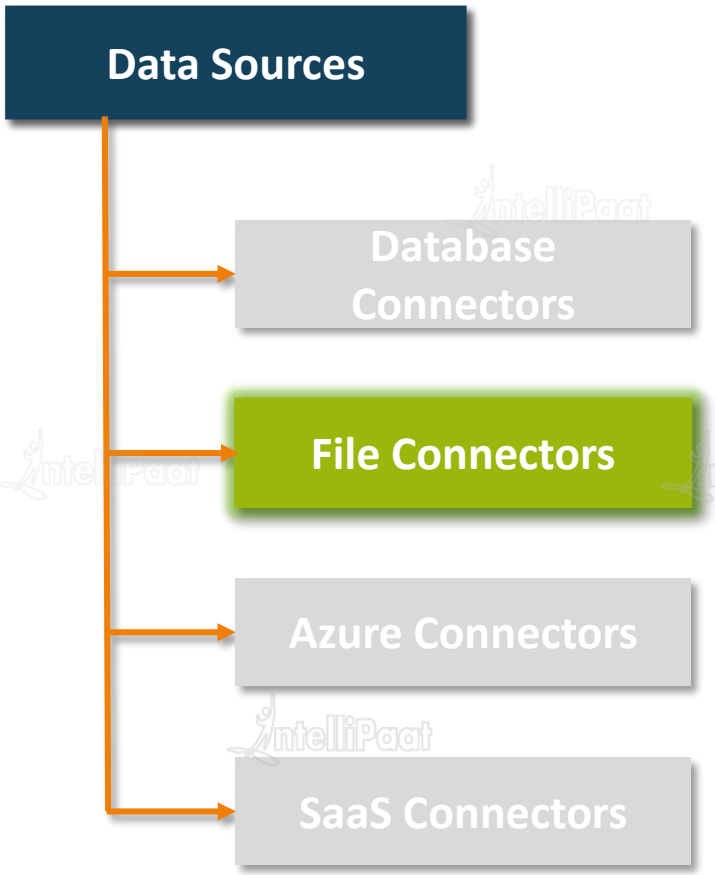
SQL Server

IBM Db2

Oracle

Teradata

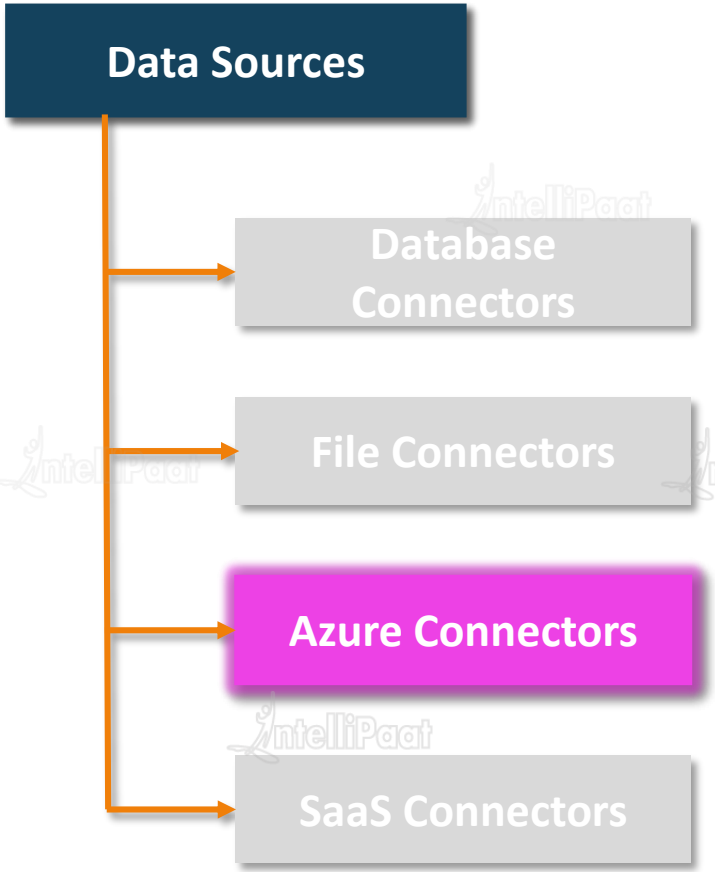
Data Sources in Power BI



Using a file connector, we can import either a single file or a folder to select multiple files. This is useful when we have a folder location used to store files created on a schedule

File connectors include:

Data Sources in Power BI

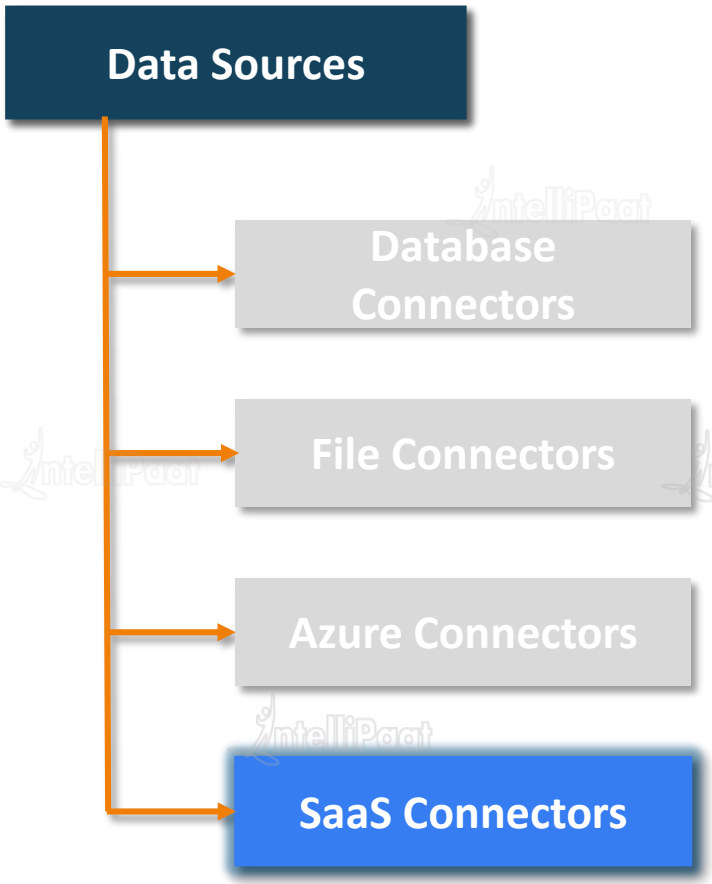


Using Azure connectors in Power BI, we can connect to the database in the Azure cloud

Azure connectors include:

- Azure SQL Data Warehouse
- Azure Blob Storage
- Azure Table Storage
- Azure SQL Database

Data Sources in Power BI



Power BI Desktop makes it easy to connect to external SaaS applications for analyzing data related to fields such as sales, marketing, finance, and social media

SaaS connectors include:

- Salesforce
- Google Analytics
- GitHub
- Facebook
- QuickBooks Online

Using Excel as a Data Source

Using Excel as a Data Source

In Power BI, we can connect to files from Power BI Desktop or from Power BI Service

Using Power BI, we can also connect to various file formats, folders, etc. and even import Power BI Report files with the .pbix extension

When we import data directly into Power BI Service, the maximum file size should be 250 MB

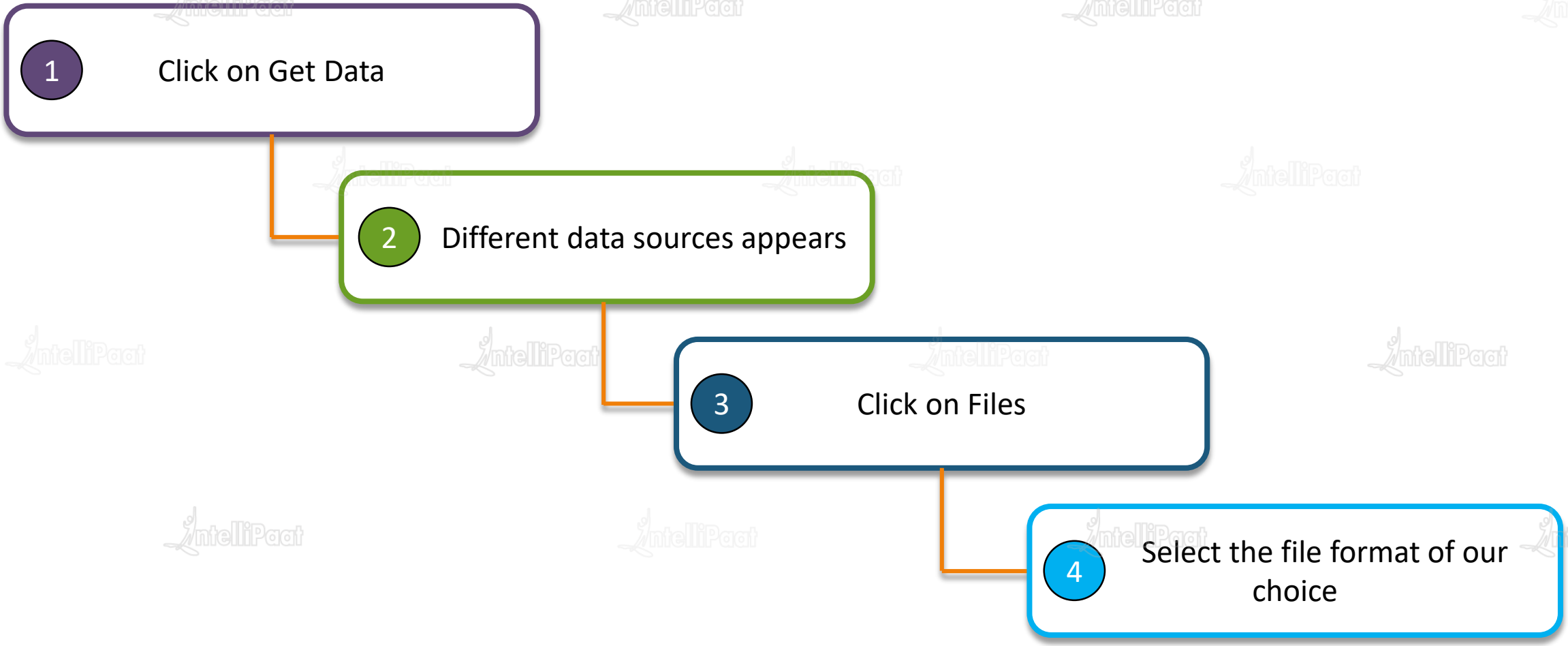
Using Excel as a Data Source

There are two approaches in extracting an Excel file as a Data Source:

- Connect to an Excel workbook and use its contents as a dataset for Power BI reports and dashboards. We can edit our data using Power Query Editor

- Import a whole Excel workbook and explore it in the same way we would do when using Excel Online, but here we cannot edit our data

Using Excel as a Data Source



Demo: Importing Data from Excel

Updating Files in Power BI

Updating Files in Power BI

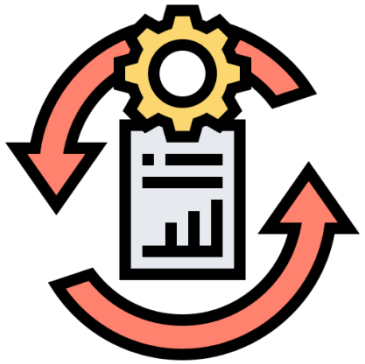
Uploading a File

This applies to CSV, Power BI Desktop files, and Excel

We upload a local file to Power BI to build reports and dashboards; then, we make changes to the file and upload it again, providing the file name as the same, and then Power BI will update the file

Data Refresh

Data Refresh in Power BI works based on the subscription types and on the data sources

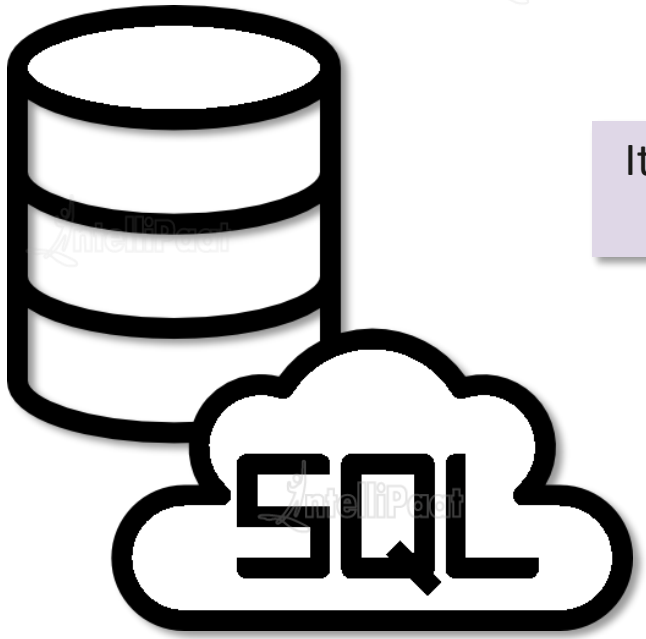


- For free users, data can be refreshed daily with a maximum of 10,000 rows/hour
- For pro users, data can be refreshed hourly up to 1 million rows/hour

Using a Database as a Data Source

Using a Database as a Data Source

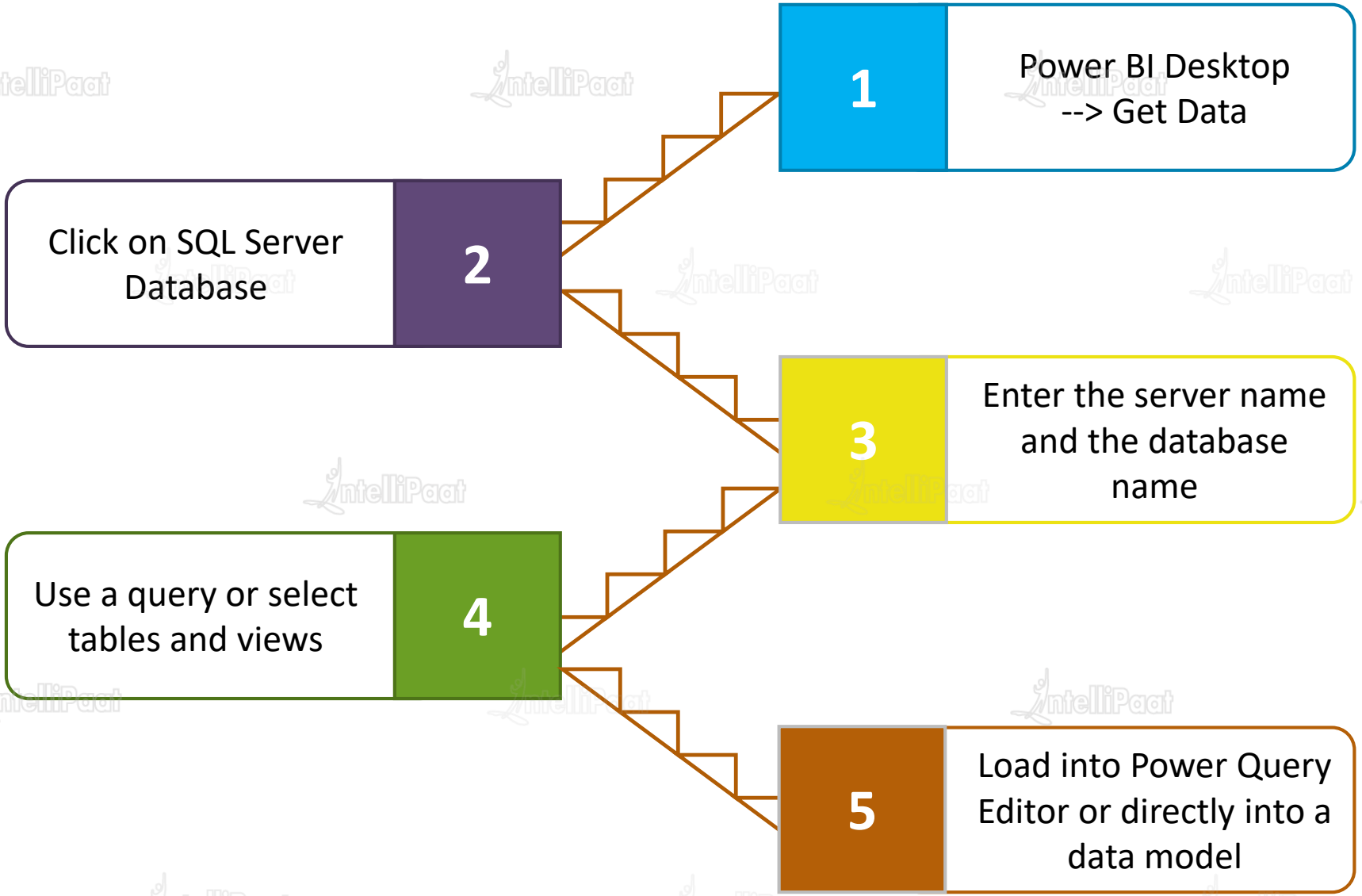
Microsoft SQL Server is one of the database sources available in Power BI, which is a popular relational database management system (RDBMS)



It can handle multiple user connections and a high volume of data transactions, and it can run both in the cloud and on-premises

The steps for connecting SQL Server to Power BI is the same as connecting other databases such as Oracle, MySQL, or IBM Db2

Using a Database as a Data Source



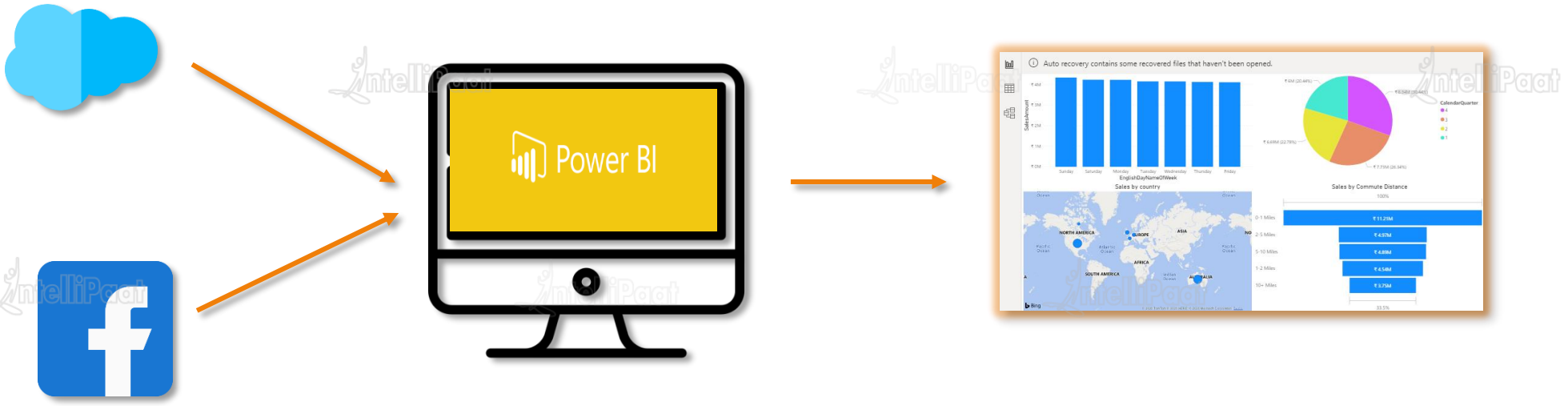
Demo: Importing Data from SQL Server

Using SaaS Connectors

Using SaaS Connectors

From Power BI Desktop, we can import data from third-party online solutions and combine the data in reports and dashboards

For example, we can create a report from Facebook that shows marketing data combined with the sales data that is from Salesforce



Other Data Sources

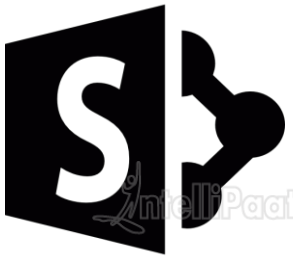
Other Data Sources

Web

Python Script

R Script Connector

OData Feed

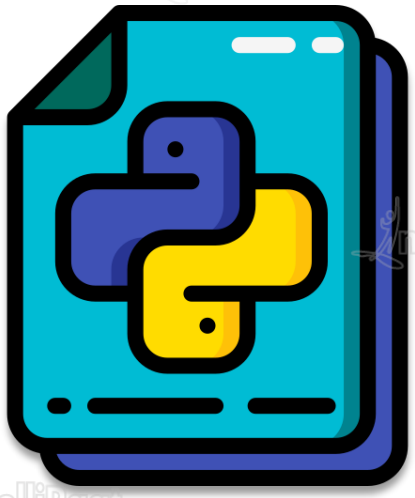


SharePoint

Python Script

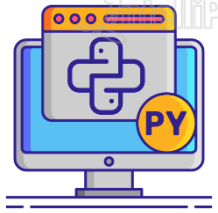
Python Script

We can directly run Python scripts in Power BI Desktop by importing the datasets into the Power BI data model and adding visualizations to them



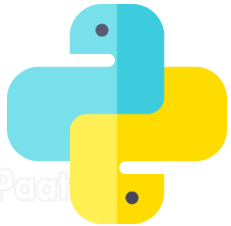
1. To run Python scripts in Power BI Desktop, install Python and the required Python packages
2. In Power BI Desktop, enable Python scripting
3. Run our Python script and import data from Power BI Desktop
   Get data > Others > Python Script
4. Click on Connect; copy the Python script to the Python script dialog box, and click on OK

Python Script



Python in Query Editor

Python can also be used for data cleansing, performing advanced data shaping, analytics, etc. in Power BI Query Editor



Python IDE

We can also use an external Python IDE to create Python scripts and use those scripts in Power BI Desktop

Python Visuals

We can also create Python visuals in Power BI Desktop

R Script

R Script

The R programming language has been integrated with the Transact-SQL language that helps Data Scientists develop applications in R and deploy them in a SQL Server production environment

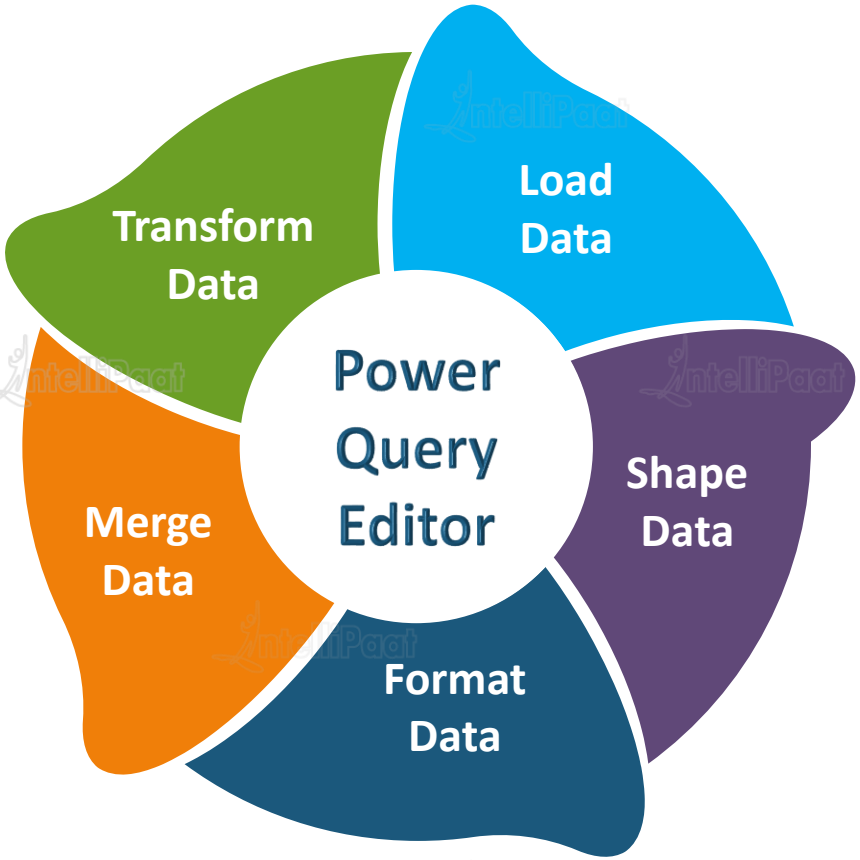
To integrate R and SQL, a service was introduced known as SQL Server R Services

This service helps us run R scripts, create data models, and import results to Power BI Desktop

Power Query Editor

Power Query Editor

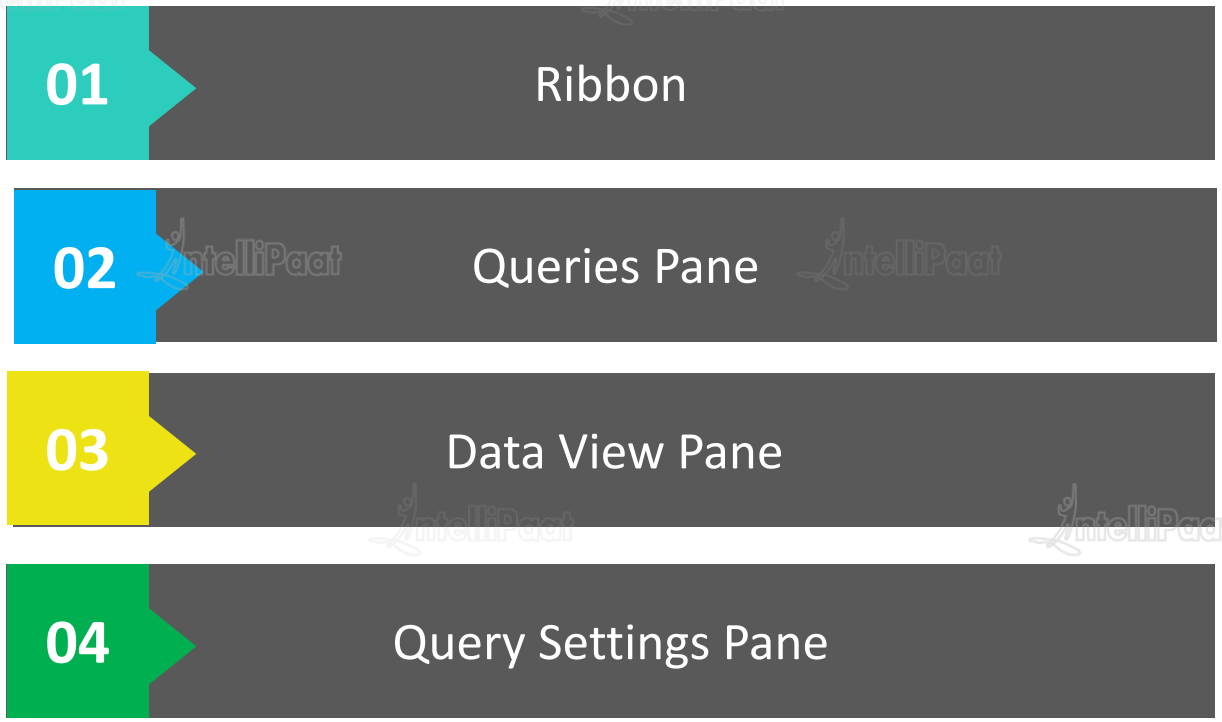
Power Query Editor helps us load data from a wide number of data sources and apply transformations on it



Areas in Power Query Editor

Areas in Power Query Editor

Four areas in Power Query Editor are:



Areas in Power Query Editor

01 Ribbon

02 Queries Pane

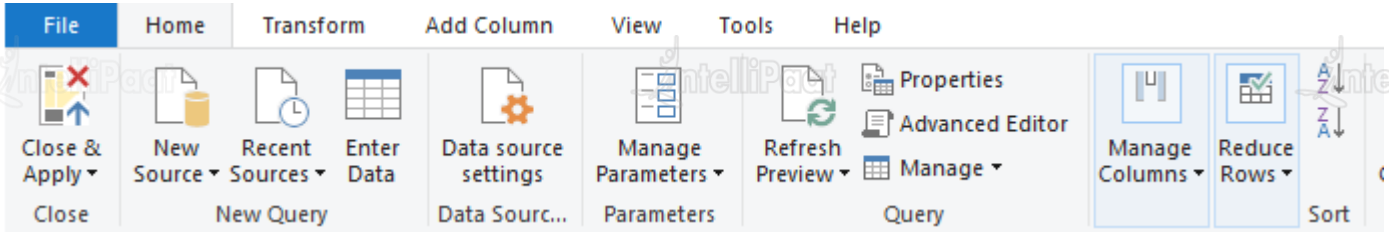
03 Data View Pane

04 Query Settings Pane

Ribbon

The ribbon in Power Query Editor has six tabs:

- Home
- Transform
- Add Column
- View
- Tools
- Help



Areas in Power Query Editor

01 Ribbon

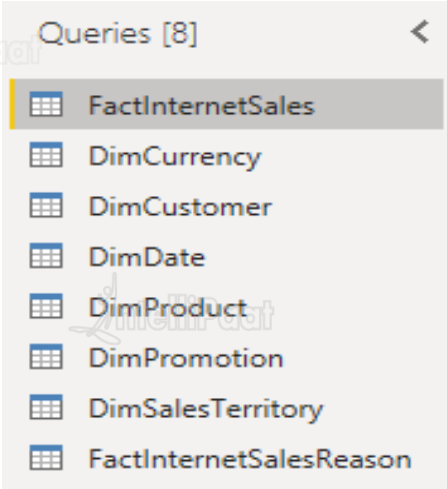
02 Queries Pane

03 Data View Pane

04 Query Settings Pane

Queries Pane

The Queries pane will show the active queries and their names. When we select a query from this pane, data will be displayed on the Data View pane



Areas in Power Query Editor

01 Ribbon

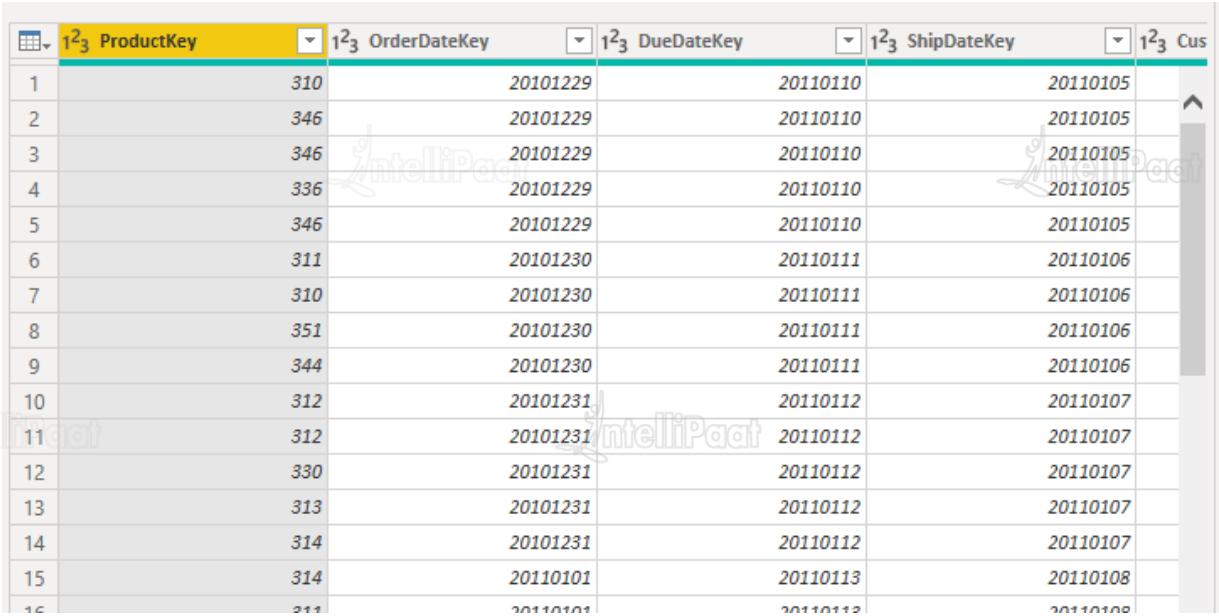
02 Queries Pane

03 Data View Pane

04 Query Settings Pane

Data View Pane

In this pane, the data from the selected query is displayed where we can shape, transform, or merge the data to meet our needs



	ProductKey	OrderDateKey	DueDateKey	ShipDateKey	Cus
1	310	20101229	20110110	20110105	
2	346	20101229	20110110	20110105	
3	346	20101229	20110110	20110105	
4	336	20101229	20110110	20110105	
5	346	20101229	20110110	20110105	
6	311	20101230	20110111	20110106	
7	310	20101230	20110111	20110106	
8	351	20101230	20110111	20110106	
9	344	20101230	20110111	20110106	
10	312	20101231	20110112	20110107	
11	312	20101231	20110112	20110107	
12	330	20101231	20110112	20110107	
13	313	20101231	20110112	20110107	
14	314	20101231	20110112	20110107	
15	314	20110101	20110113	20110108	

Areas in Power Query Editor

01 Ribbon

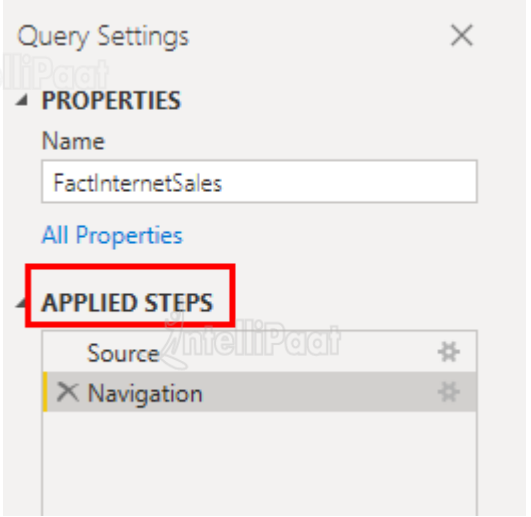
02 Queries Pane

03 Data View Pane

04 Query Settings Pane

Query Settings Pane

This pane shows the steps associated with a query. All the operations that we perform on the data are captured by APPLIED STEPS in the Query Settings pane



Advanced Editor

Advanced Editor

Using Advanced Editor, we can see the code that Power Query Editor uses with each step, and we can also create our own code

To launch Advanced Editor, go to View > Advanced Editor

Demo: Overview of Query Editor

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