

**ANJALI RAJENDRA BANSODE**  
**TY-BScIT**  
**31010923007**  
**BUSINESS INTELLIGENCE JOURNAL**

<u>Sr No</u>	<u>PRACTICALS</u>
1	Import the legacy data from different sources such as (Excel, SQL Server, Oracle, etc) and load in the target system.
2	Perform the Extraction Transformation and Loading (ETL) process to construct the database in the SQL Server/ Power BI.
3	Create a cube with subtitle dimension and fact tables based on OLAP.
4	Apply the What-If Analysis for Data Visualization.
5	Perform the data classification using a classification algorithm.
6	K-Means clustering using R.
7	Predict using Linear Regression.
8	Perform Logistic regression on the given data warehouse data.
9	Create a sales dashboard with key metrics like Total Sales, Sales by Region, and Sales over Time.

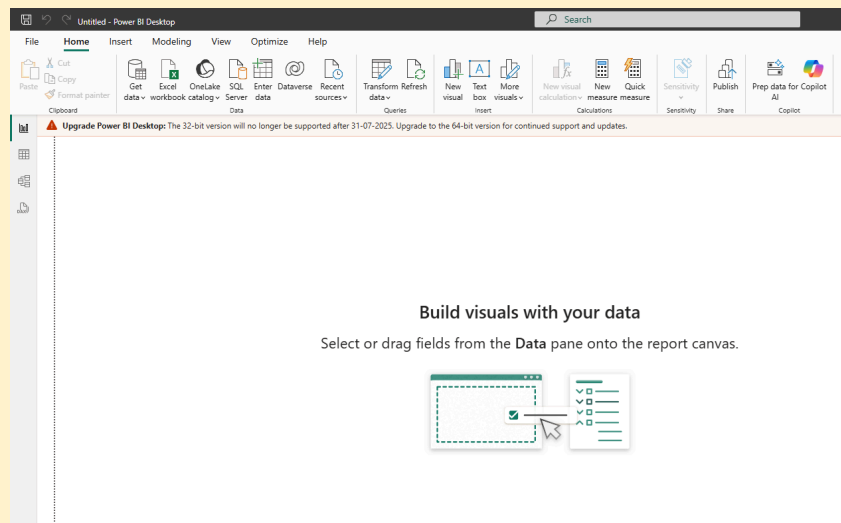
# PRACTICAL 1

AIM: Import the legacy data from different sources such as (Excel, SQL Server, Oracle, etc) and load in the target system.

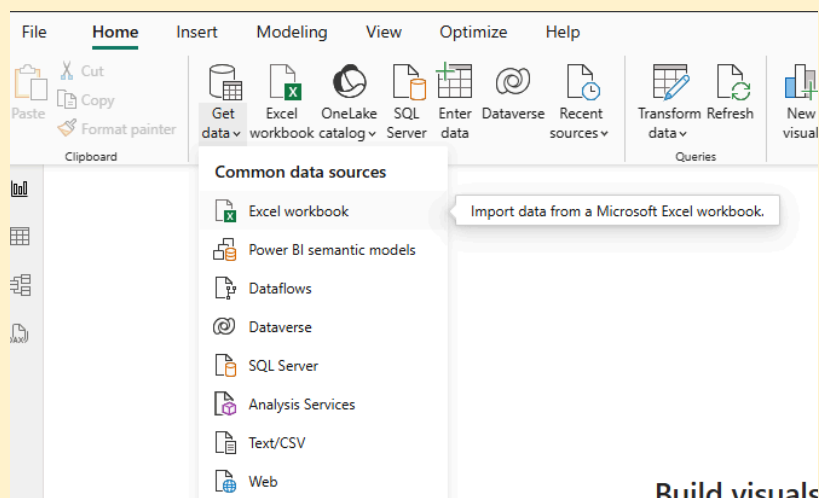
## A. IMPORTING EXCEL DATA TO POWER BI

Step 1: Download the Excel.

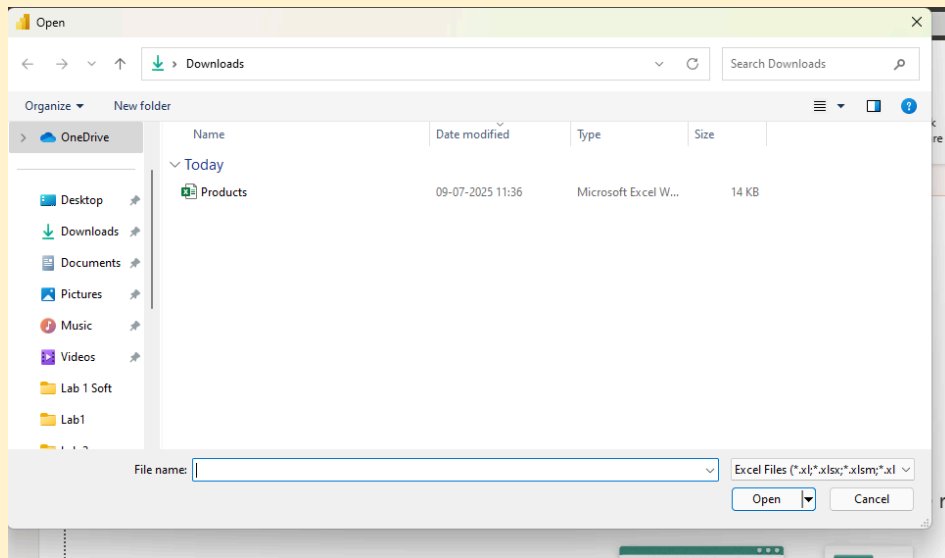
Step 2: Click on Get Data.



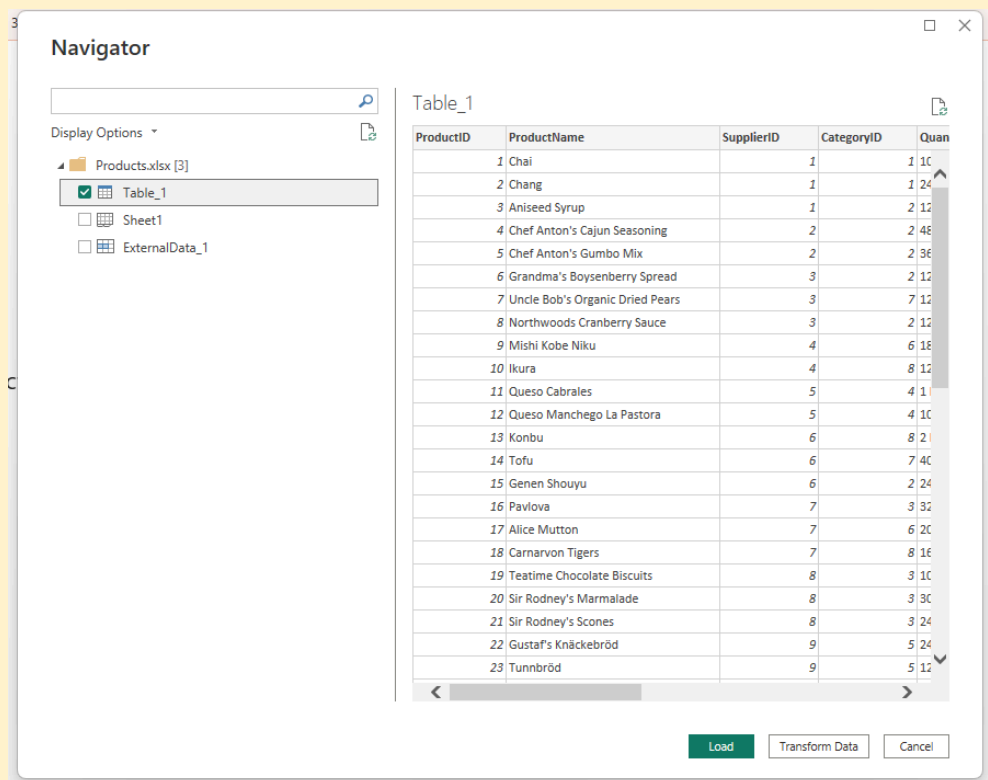
Step 3: Click Excel Workbook.



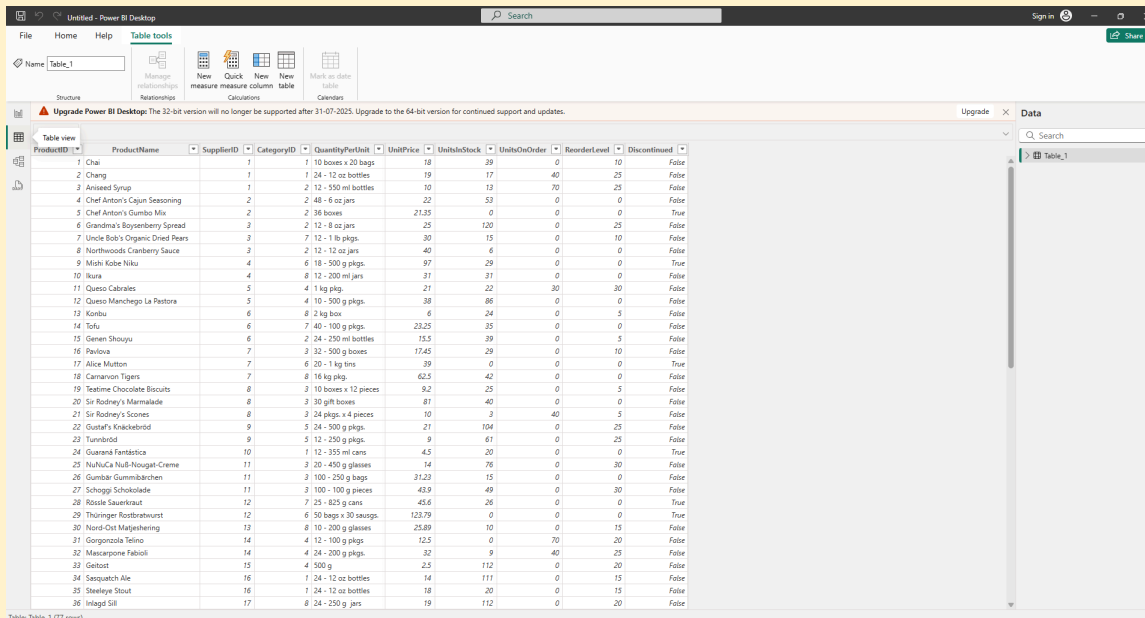
## Step 4: Select the downloaded Table.



## Step 5: Load the table.



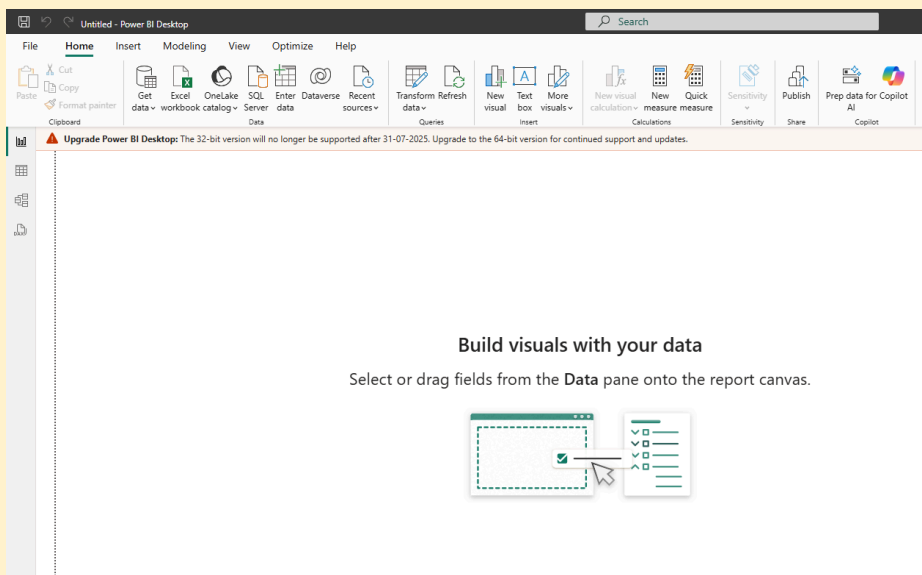
Step 6: Go to Table View on the left side of the page to view the table.



ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	False
2	Chang	1	1	24 - 12 oz bottles	19	17	40	25	False
3	Aniseed Syrup	1	2	12 - 550 ml bottles	10	13	70	25	False
4	Chef Anton's Cajun Seasoning	2	2	48 - 6 oz jars	22	53	0	0	False
5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	True
6	Grandma's Boysenberry Spread	3	2	12 - 8 oz jars	25	120	0	25	False
7	Uncle Bob's Organic Dried Pears	3	7	12 - 1 lb pkgs.	30	15	0	10	False
8	Northwoods Cranberry Sauce	3	2	12 - 12 oz jars	40	6	0	0	False
9	Mishi Kobe Niku	4	6	18 - 500 g pkgs.	97	29	0	0	True
10	Ruen	4	8	12 - 200 ml jars	31	0	0	0	False
11	Queso Cabrales	5	4	1 kg pkg.	21	22	30	20	False
12	Queso Manchego La Pastora	5	4	10 - 500 g pkgs.	38	86	0	0	False
13	Koribou	6	8	2 kg box	6	24	0	5	False
14	Tofu	6	7	40 - 100 g pkgs.	23.25	35	0	0	False
15	Garden of Eatin'	6	2	24 - 250 ml bottles	15.5	39	0	5	False
16	Pavlova	7	3	32 - 500 g boxes	17.45	29	0	10	False
17	Alice Mutton	7	6	20 - 1 kg tins	39	0	0	0	True
18	Cammanon Tigers	7	8	16 kg pkg.	62.5	42	0	0	False
19	Teatime Chocolate Biscuits	8	3	10 boxes x 12 pieces	9.2	25	0	5	False
20	Sir Rodney's Marmalade	8	2	30 gift boxes	81	40	0	0	False
21	Sir Rodney's Scones	8	3	24 pkgs. x 4 pieces	10	3	40	5	False
22	Gustaf's Knickerbrød	9	3	24 - 500 g pkgs.	21	104	0	25	False
23	Tunnbrød	9	3	12 - 250 g pkgs.	9	61	0	25	False
24	Guaraná Fantástica	10	1	12 - 355 ml cans	4.5	20	0	0	True
25	NuNuCa Nuß-Nougat-Creme	11	2	20 - 450 g glasses	14	76	0	30	False
26	Gumbär Gummbärchen	11	3	100 - 250 g bags	31.23	15	0	0	False
27	Schoggi Schokolade	11	3	100 - 100 g pieces	43.9	49	0	30	False
28	Rössle Sauerkraut	12	7	25 - 825 g cans	45.6	26	0	0	True
29	Thüringer Rostbratenst	12	6	50 bags x 30 sausgs.	123.79	0	0	0	True
30	Nord-Ost Majestherring	13	8	10 - 200 g glasses	25.89	10	0	15	False
31	Gorgonzola Telino	14	4	12 - 100 g pkgs.	12.5	0	70	20	False
32	Mascarpone Fabioli	14	4	24 - 200 g pkgs.	32	9	40	25	False
33	Gelbst	15	4	500 g	2.5	112	0	20	False
34	Sasquatch Ale	16	1	24 - 12 oz bottles	14	111	0	15	False
35	Steeleye Stout	16	1	24 - 12 oz bottles	18	20	0	15	False
36	Imagè Sill	17	8	24 - 250 g jars	19	112	0	20	False

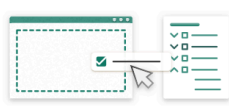
## B.IMPORTING ODATA TO POWER BI

Step 1: Click on Get Data.

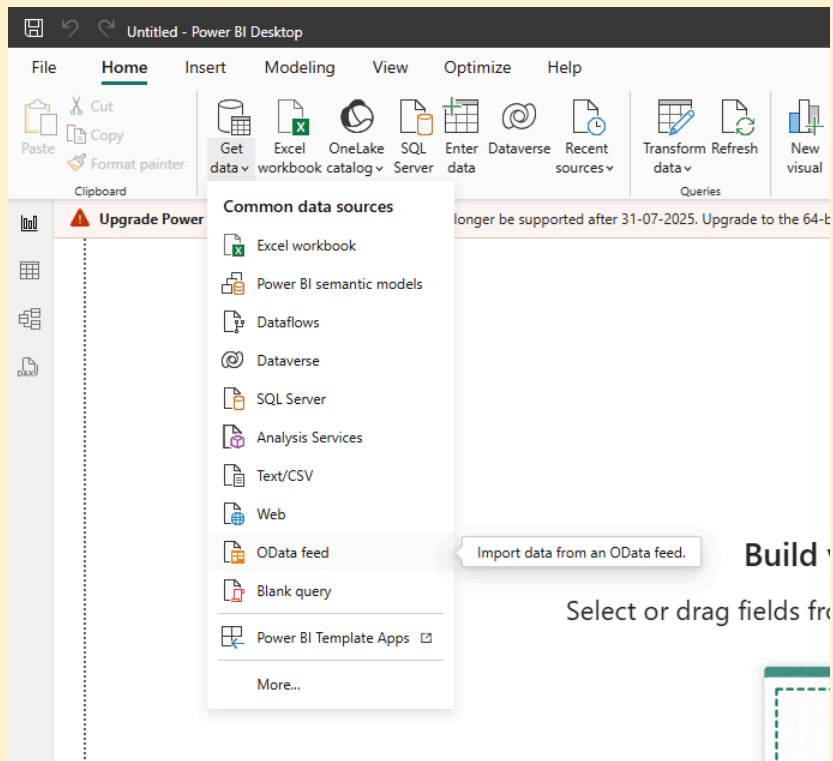


Build visuals with your data

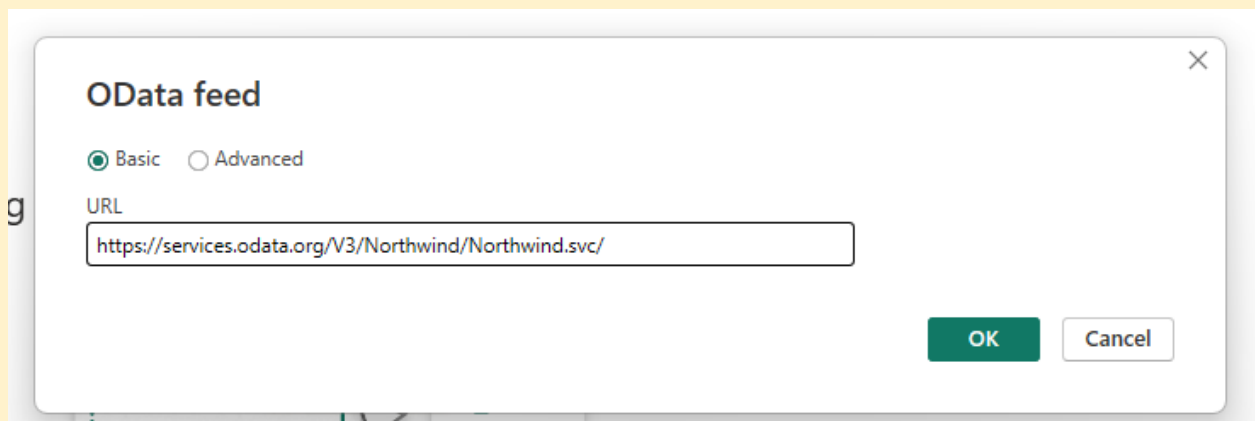
Select or drag fields from the Data pane onto the report canvas.



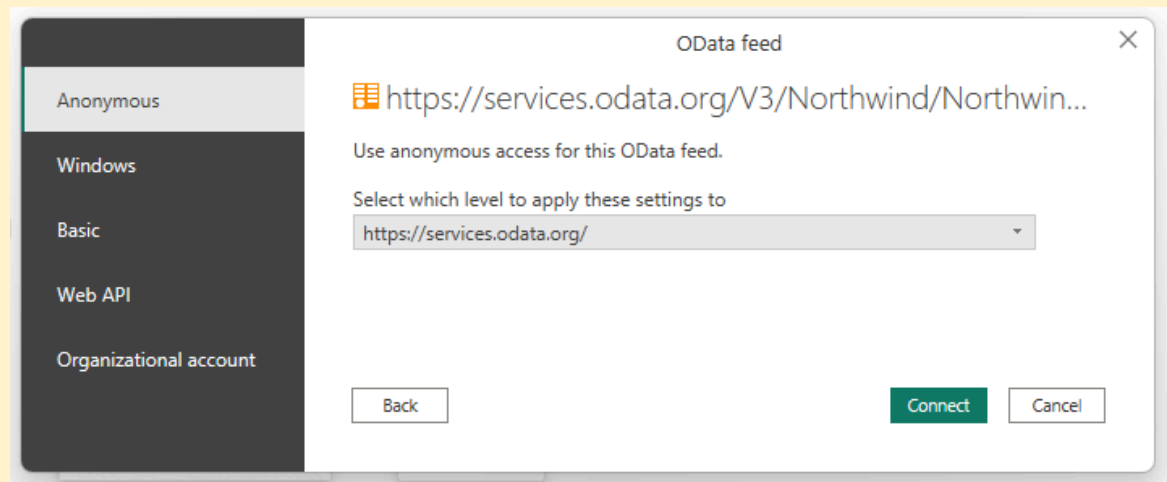
Step 2: Click on Odata.



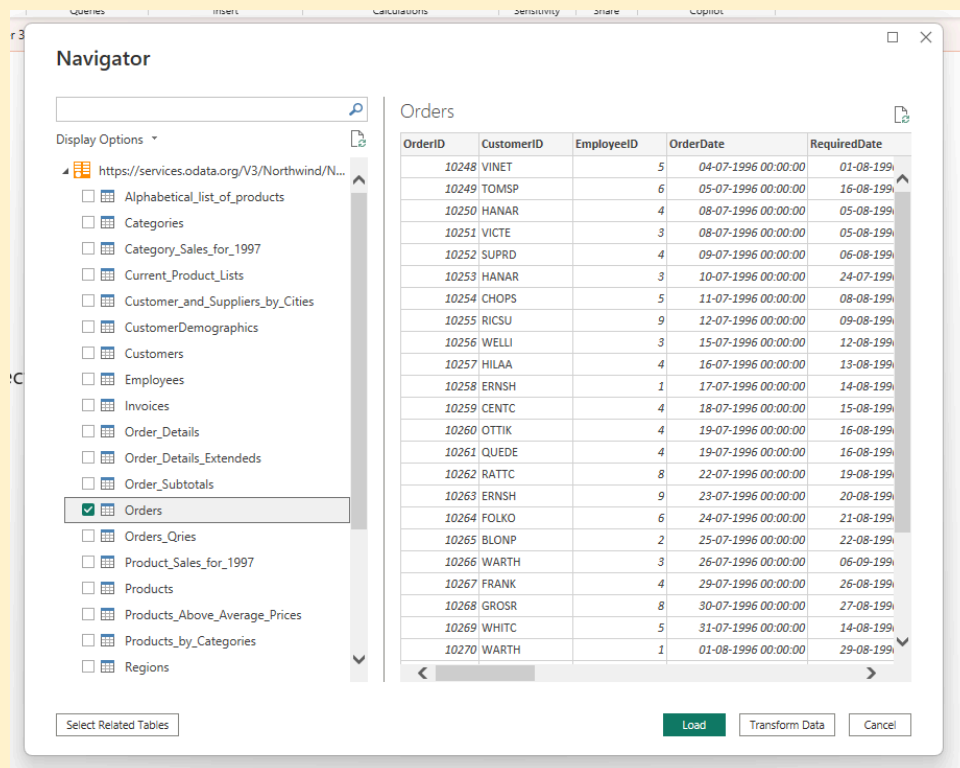
Step 3: Type the Link.



## Step 4: Click on Connect.



## Step 5: Click On Order Table and Load.



Step 6: Go to Table View on the left side of the page and select Orders on the right side of the page to view the table.

Upgrade Power BI Desktop: The 32-bit version will no longer be supported after 31-07-2025. Upgrade to the 64-bit version for continued support and updates.

OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate	ShippedDate	ShipVia	Freight	ShipName	ShipAddress	ShipCity	ShipRegion	ShipPostalCode	ShipCountry
10240	TONSP	6	05-07-1996 00:00:00	16-08-1996 00:00:00	15-07-1996 00:00:00	1	1161	Toms Spezialitäten	Leusener 48	Münster		44087	Germany
10260	OTTK	4	19-07-1996 00:00:00	16-08-1996 00:00:00	29-07-1996 00:00:00	1	55.09	Ottlieb Kasekaden	Mehlmuemmel 369	Köln		50739	Germany
10267	FRANK	4	29-07-1996 00:00:00	26-08-1996 00:00:00	06-08-1996 00:00:00	1	208.58	Frankenversand	Berliner Platz 43	München		80805	Germany
10272	QUICK	3	05-08-1996 00:00:00	02-09-1996 00:00:00	12-08-1996 00:00:00	3	76.07	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10277	MORSE	2	09-08-1996 00:00:00	06-09-1996 00:00:00	15-08-1996 00:00:00	3	125.77	Morgenstern-Gesamtkauf	Hewitt 22	Leipzig		04179	Germany
10279	LEHMS	8	13-08-1996 00:00:00	10-09-1996 00:00:00	16-08-1996 00:00:00	2	25.83	Lehmans Marktstand	Magezweg 7	Frankfurt a.M.		60528	Germany
10284	LEHMS	4	19-08-1996 00:00:00	16-09-1996 00:00:00	27-08-1996 00:00:00	1	76.56	Lehmans Marktstand	Magezweg 7	Frankfurt a.M.		60528	Germany
10290	QUICK	1	20-08-1996 00:00:00	17-09-1996 00:00:00	26-08-1996 00:00:00	2	76.83	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10296	QUICK	8	21-08-1996 00:00:00	18-09-1996 00:00:00	30-08-1996 00:00:00	3	229.24	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10301	WANDK	8	09-09-1996 00:00:00	07-10-1996 00:00:00	17-09-1996 00:00:00	2	45.08	Die Wandermöde Kuh	Adenauerallee 900	Stuttgart		70563	Germany
10312	WANDK	2	23-09-1996 00:00:00	21-10-1996 00:00:00	03-10-1996 00:00:00	2	40.26	Die Wandermöde Kuh	Adenauerallee 900	Stuttgart		70563	Germany
10312	QUICK	2	24-09-1996 00:00:00	22-10-1996 00:00:00	04-10-1996 00:00:00	2	1.98	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10323	KOENE	4	07-10-1996 00:00:00	04-11-1996 00:00:00	14-10-1996 00:00:00	1	4.88	Königlich Essen	Maubelstr. 90	Brandenburg		14776	Germany
10323	KOENE	1	09-10-1996 00:00:00	23-10-1996 00:00:00	14-10-1996 00:00:00	3	64.86	Königlich Essen	Maubelstr. 90	Brandenburg		14776	Germany
10337	FRANK	4	24-10-1996 00:00:00	21-11-1996 00:00:00	29-10-1996 00:00:00	3	108.26	Frankenversand	Berliner Platz 43	München		80805	Germany
10342	FRANK	4	30-10-1996 00:00:00	13-11-1996 00:00:00	04-11-1996 00:00:00	2	54.83	Frankenversand	Berliner Platz 43	München		80805	Germany
10343	LEHMS	4	31-10-1996 00:00:00	28-11-1996 00:00:00	06-11-1996 00:00:00	1	110.37	Lehmans Marktstand	Magezweg 7	Frankfurt a.M.		60528	Germany
10343	QUICK	2	04-11-1996 00:00:00	02-12-1996 00:00:00	11-11-1996 00:00:00	2	249.06	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10346	WANDK	4	07-11-1996 00:00:00	05-12-1996 00:00:00	15-11-1996 00:00:00	2	0.78	Die Wandermöde Kuh	Adenauerallee 900	Stuttgart		70563	Germany
10356	WANDK	6	18-11-1996 00:00:00	16-12-1996 00:00:00	27-11-1996 00:00:00	2	36.71	Die Wandermöde Kuh	Adenauerallee 900	Stuttgart		70563	Germany
10361	QUICK	1	22-11-1996 00:00:00	20-12-1996 00:00:00	09-12-1996 00:00:00	2	183.17	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10362	DRACD	4	26-11-1996 00:00:00	24-12-1996 00:00:00	04-12-1996 00:00:00	2	202.54	Drachenblut Delikatessen	Wölkeweg 21	Aachen		52066	Germany
10391	DRACD	3	23-12-1996 00:00:00	20-01-1997 00:00:00	31-12-1996 00:00:00	3	5.45	Drachenblut Delikatessen	Wölkeweg 21	Aachen		52066	Germany
10396	FRANK	1	27-12-1996 00:00:00	10-01-1997 00:00:00	06-01-1997 00:00:00	3	135.35	Frankenversand	Berliner Platz 43	München		80805	Germany
10407	OTTK	2	07-01-1997 00:00:00	04-02-1997 00:00:00	20-01-1997 00:00:00	2	91.48	Ottlieb Kasekaden	Mehlmuemmel 369	Köln		50739	Germany
10418	QUICK	4	17-01-1997 00:00:00	14-02-1997 00:00:00	24-01-1997 00:00:00	1	17.55	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10438	TONSP	3	06-02-1997 00:00:00	06-03-1997 00:00:00	14-02-1997 00:00:00	2	8.24	Toms Spezialitäten	Leusener 48	Münster		44087	Germany
10446	TONSP	6	14-02-1997 00:00:00	14-03-1997 00:00:00	19-02-1997 00:00:00	1	14.68	Toms Spezialitäten	Leusener 48	Münster		44087	Germany
10451	QUICK	4	18-02-1997 00:00:00	16-03-1997 00:00:00	19-02-1997 00:00:00	3	189.09	QUICK-Stop	Taucherstraße 10	Cuxenvalde		01307	Germany
10456	KOENE	8	25-02-1997 00:00:00	08-04-1997 00:00:00	28-02-1997 00:00:00	2	8.12	Königlich Essen	Maubelstr. 90	Brandenburg		14776	Germany
10457	KOENE	2	25-02-1997 00:00:00	25-03-1997 00:00:00	03-03-1997 00:00:00	1	11.57	Königlich Essen	Maubelstr. 90	Brandenburg		14776	Germany
10460	KOENE	3	07-03-1997 00:00:00	04-04-1997 00:00:00	12-03-1997 00:00:00	3	44.12	Königlich Essen	Maubelstr. 90	Brandenburg		14776	Germany
10468	FRANK	8	27-03-1997 00:00:00	24-04-1997 00:00:00	02-04-1997 00:00:00	2	4.93	Frankenversand	Berliner Platz 43	München		80805	Germany
10497	LEHMS	7	04-04-1997 00:00:00	02-05-1997 00:00:00	07-04-1997 00:00:00	1	36.21	Lehmans Marktstand	Magezweg 7	Frankfurt a.M.		60528	Germany
10501	BLAUS	9	09-04-1997 00:00:00	07-05-1997 00:00:00	16-04-1997 00:00:00	1	8.85	Blauser See Delikatessen	Fortstr. 57	Mannheim		68306	Germany
10506	KOENE	9	15-04-1997 00:00:00	13-05-1997 00:00:00	02-05-1997 00:00:00	2	21.19	Königlich Essen	Maubelstr. 90	Brandenburg		14776	Germany

Table: Orders (850 rows)

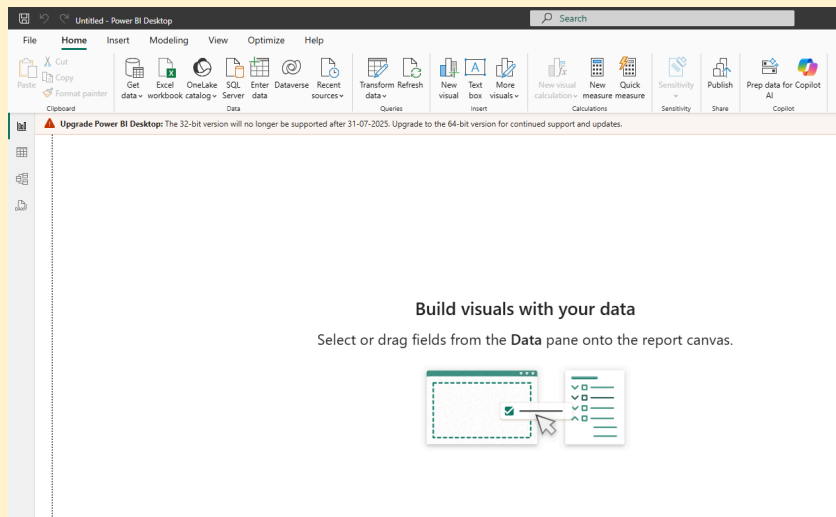


# PRACTICAL 2

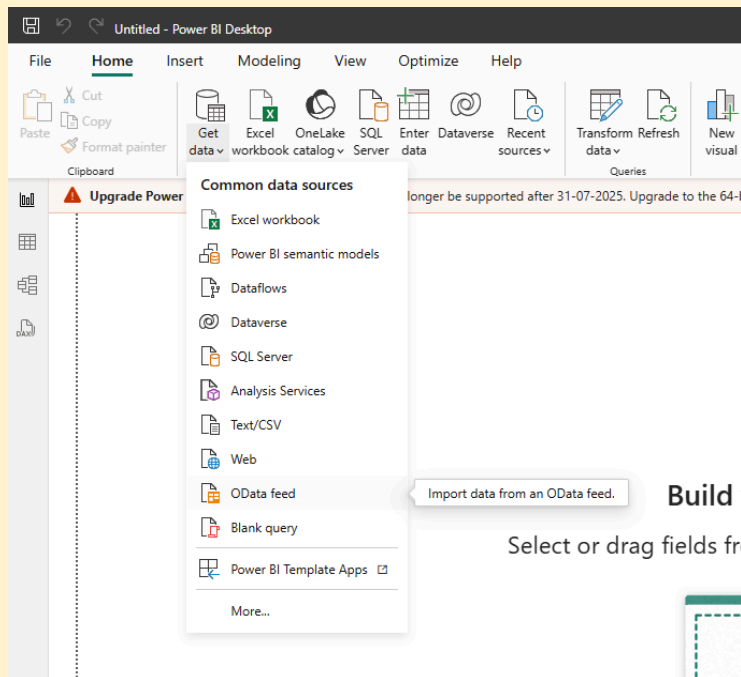
AIM: Perform the Extraction Transformation and Loading (ETL) process to construct the database in the SQL Server/ Power BI.

## A. ETL process in PowerBI

Step 1: Click on Get Data.

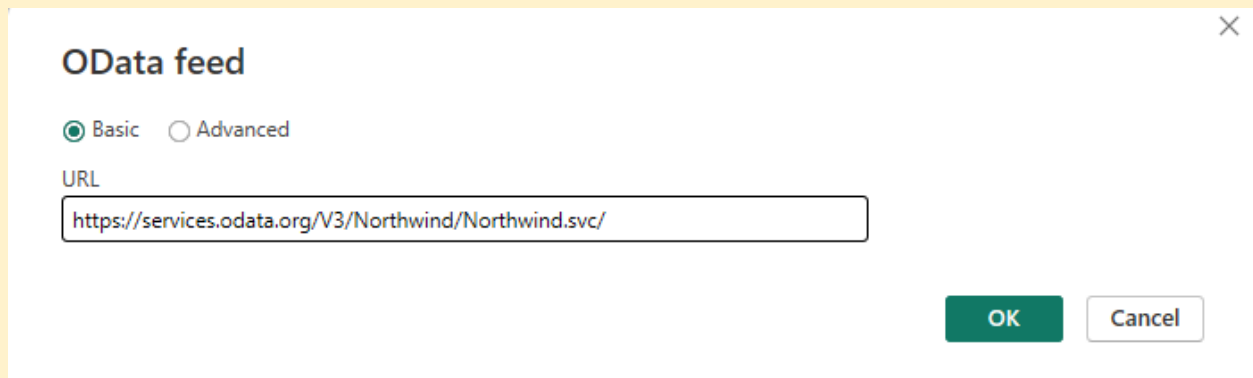


Step 2: Click on Odata.



Step 3: Type the Link.

<https://services.odata.org/V3/Northwind/Northwind.svc/>



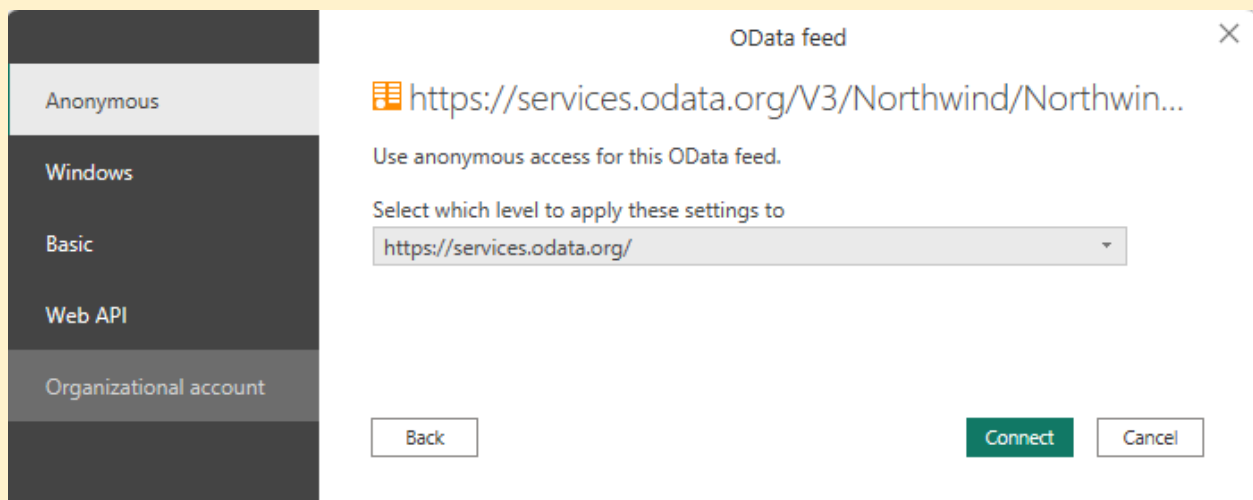
**OData feed**

☒ Basic ☐ Advanced


URL

**OK** **Cancel**

Step 4: Click on Connect.



**OData feed**

 <https://services.odata.org/V3/Northwind/Northwin...>

Use anonymous access for this OData feed.

Select which level to apply these settings to

**Back** **Connect** **Cancel**

Step 5: Click On Product Table and Load.

# Navigator

Display Options ▾

https://services.odata.org/V3/Northwind/N...

- Alphabetical\_list\_of\_products
- Categories
- Category\_Sales\_for\_1997
- Current\_Product\_Lists
- Customer\_and\_Suppliers\_by\_Cities
- CustomerDemographics
- Customers
- Employees
- Invoices
- Order\_Details
- Order\_Details\_Extended
- Order\_Subtotals
- Orders
- Orders\_Qries
- Product\_Sales\_for\_1997
- ☒ **Products**
- Products\_Above\_Average\_Prices
- Products\_by\_Categories
- Regions

## Products

ProductID	ProductName	SupplierID	CategoryID	Quan
1	Chai	1	1	10
2	Chang	1	1	24
3	Aniseed Syrup	1	2	12
4	Chef Anton's Cajun Seasoning	2	2	48
5	Chef Anton's Gumbo Mix	2	2	36
6	Grandma's Boysenberry Spread	3	2	12
7	Uncle Bob's Organic Dried Pears	3	7	12
8	Northwoods Cranberry Sauce	3	2	12
9	Mishi Kobe Niku	4	6	18
10	Ikura	4	8	12
11	Queso Cabrales	5	4	10
12	Queso Manchego La Pastora	5	4	10
13	Konbu	6	8	21
14	Tofu	6	7	40
15	Genen Shouyu	6	2	24
16	Pavlova	7	3	32
17	Alice Mutton	7	6	20
18	Carnarvon Tigers	7	8	16
19	Teatime Chocolate Biscuits	8	3	10
20	Sir Rodney's Marmalade	8	3	30
21	Sir Rodney's Scones	8	3	24
22	Gustaf's Knäckebröd	9	5	24
23	Tunnbröd	9	5	12

Select Related Tables

Load

Transfer Data

Cancel

Step 6: Go to Table View on the left side of the page and select Product on the right side of the page to view the table.

Unsaved - Power BI Desktop

File Home Help Table tools Column tools

Name ProductID Format Whole number Summarization Count Data type Whole number Data category Uncategorized Sort by column v Groups Data groups Manage relationships New column Calculations

Structure Formatting Properties

	ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
	1	Chai	1	1	10 boxes x 20 bags	18	39	0	10	False
	2	Chang	1	1	24 - 12 oz bottles	19	17	40	25	False
	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10	13	70	25	False
	4	Chef Anton's Cajun Seasoning	2	2	48 - 6 oz jars	22	53	0	0	False
	5	Chef Anton's Gumbo Mix	2	2	36 boxes	21.35	0	0	0	True
	6	Garden of Eatin' Organic Spread	3	2	12 - 8 oz jars	25	120	0	25	False
	7	Uncle Bob's Organic Dried Pears	3	7	12 - 1 lb pkgs.	30	15	0	10	False
	8	Northwoods Cranberry Sauce	3	2	12 - 12 oz jars	40	6	0	0	False
	9	Mishi Kobe Niku	4	6	18 - 500 g pkgs.	97	29	0	0	True
	10	Ikura	4	8	12 - 200 ml jars	31	31	0	0	False
	11	Queso Cabrales	5	4	1 kg pkg.	21	22	30	30	False
	12	Queso Manchego La Pastora	5	4	10 - 500 g pkgs.	38	86	0	0	False
	13	Konbu	6	8	2 kg box	6	24	0	5	False
	14	Tofu	6	7	40 - 100 g pkgs.	23.25	35	0	0	False
	15	Genen Shoyu	6	2	24 - 250 ml bottles	15.5	39	0	5	False
	16	Pavlova	7	3	32 - 500 g boxes	17.45	29	0	10	False
	17	Alice Mutton	7	6	20 - 1 kg tins	39	0	0	0	True
	18	Carnarvon Tigers	7	8	16 kg pkg.	62.5	42	0	0	False
	19	Teatime Chocolate Biscuits	8	3	10 boxes x 12 pieces	9.2	25	0	5	False
	20	Sir Rodney's Marmalade	8	30	30 gift boxes	81	40	0	0	False
	21	Sir Rodney's Scones	8	3	24 pkgs. x 4 pieces	10	3	40	5	False
	22	Gustaf's Knäckebröd	9	5	24 - 500 g pkgs.	21	104	0	25	False
	23	Tunnbröd	9	5	12 - 250 g pkgs.	9	61	0	25	False
	24	Guarani Fantástica	10	1	12 - 355 ml cans	4.5	20	0	0	True
	25	NuNuCa Nuß-Nougat-Creme	11	3	20 - 450 g glasses	14	76	0	30	False
	26	Gumbär Gummiwürchen	11	3	100 - 250 g bags	31.23	15	0	0	False
	27	Schoggi Schokolade	11	3	100 - 100 g pieces	43.9	49	0	30	False
	28	Rössle Sauerkraut	12	7	25 - 825 g cans	45.6	26	0	0	True
	29	Thüringer Rostbratwurst	12	6	50 bags x 30 sausgs.	123.79	0	0	0	True
	30	Nord-Ost Matjeshering	13	8	10 - 200 g glasses	25.89	10	0	15	False
	31	Gorgonzola Telino	14	4	12 - 100 g pkgs	12.5	0	70	20	False
	32	Mascarpone Fabioli	14	4	24 - 200 g pkgs.	32	9	40	25	False
	33	Geitost	15	4	500 g	2.5	112	0	20	False
	34	Sasquatch Ale	16	1	24 - 12 oz bottles	14	111	0	15	False
	35	Steeleye Stout	16	1	24 - 12 oz bottles	18	20	0	15	False
	36	Inlaga Sill	17	8	24 - 250 g jars	19	112	0	20	False
	37	Gravad lax	17	8	12 - 500 g pkgs.	26	11	50	25	False
	38	Alouka Blue Cheese	18	1	12 - 750 g bottles	34.9	17	0	15	False

Table Products (?? rows) | Columns: ProductID (?? distinct values)

Step6: Remove other column to only display columns of interest in Query Editor, select the ProductID, ProductName, QuantityPerUnit and UnitInStocks

.Click on Edit Query

.Select and Remove column

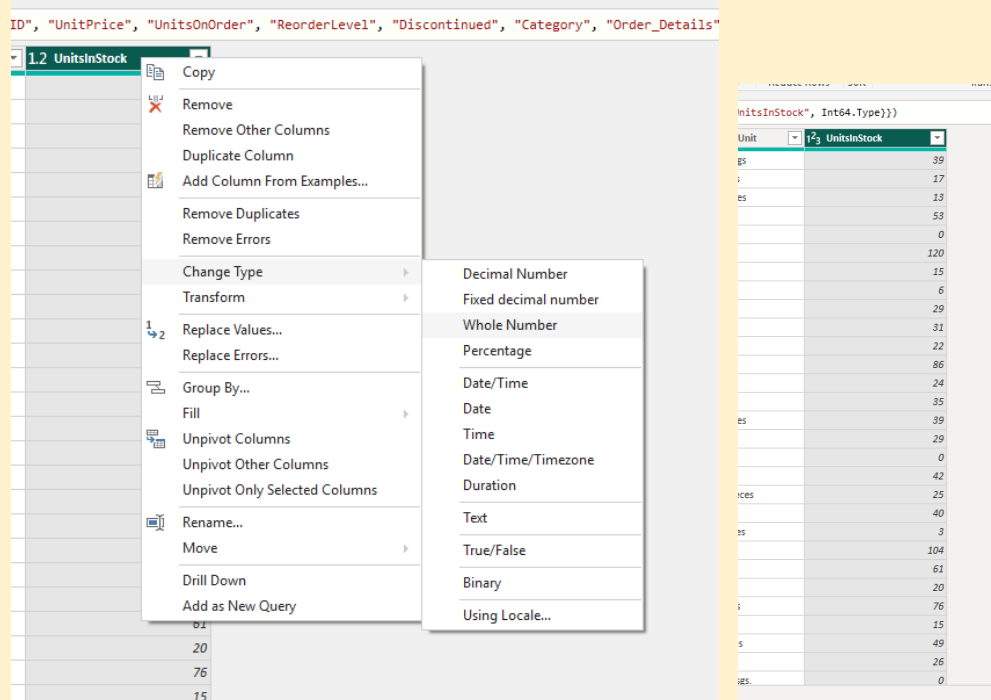
.Right click and change to Whole Numbers

Level	Discontinued
10	False
25	False
25	False
0	False
0	True
25	False
10	False
0	False
0	True
0	False
30	False
0	False
5	False
0	False
5	False
10	False
0	True
0	False
5	False
0	False
5	False

Table.RemoveColumns(Products\_table,{"SupplierID", "CategoryID", "UnitPrice", "UnitsOnOrder", ...

ProductID	ProductName	QuantityPerUnit	UnitInStock
1	Chai	10 boxes x 20 bags	39
2	Chang	24 - 12 oz bottles	17
3	Aniseed Syrup	12 - 550 ml bottles	13
4	Chef Anton's Cajun Seasoning	48 - 6 oz jars	53
5	Chef Anton's Gumbo Mix	36 boxes	0
6	Grandma's Boysenberry Spread	12 - 8 oz jars	120
7	Uncle Bob's Organic Dried Pears	12 - 1 lb pkgs.	15
8	Northwoods Cranberry Sauce	12 - 12 oz jars	6
9	Mishi Kobe Niku	18 - 500 g pkgs.	29
10	Ikura	12 - 200 ml jars	31
11	Queso Cabrales	1 kg pkg.	22
12	Queso Manchego La Pastora	10 - 500 g pkgs.	86
13	Konbu	2 kg box	24
14	Tofu	40 - 100 g pkgs.	35
15	Genen Shoyu	24 - 250 ml bottles	39
16	Pavlova	32 - 500 g boxes	29
17	Alice Mutton	20 - 1 kg tins	0
18	Carnarvon Tigers	16 kg pkg.	42
19	Teatime Chocolate Biscuits	10 boxes x 12 pieces	25
20	Sir Rodney's Marmalade	30 gift boxes	40
21	Sir Rodney's Scones	24 pkgs. x 4 pieces	3
22	Gustaf's Knäckebröd	24 - 500 g pkgs.	104
23	Tumbröd	12 - 250 g pkgs.	61
24	Guaraná Fantástica	12 - 355 ml cans	20
25	NuNuCa Nut- Nogat-Creme	20 - 450 g glasses	76
26	Gumbär Gummiährchen	100 - 250 g bags	15
27	Schoggi Schokolade	100 - 100 g pieces	49
28	Rössle Sauerkraut	25 - 825 g cans	26
29	Thüringer Rostbratwurst	50 knes x 30 sausges.	0

COLUMNS, 77 ROWS Column profiling based on top 1000 rows



Step7: Query editor window will appear

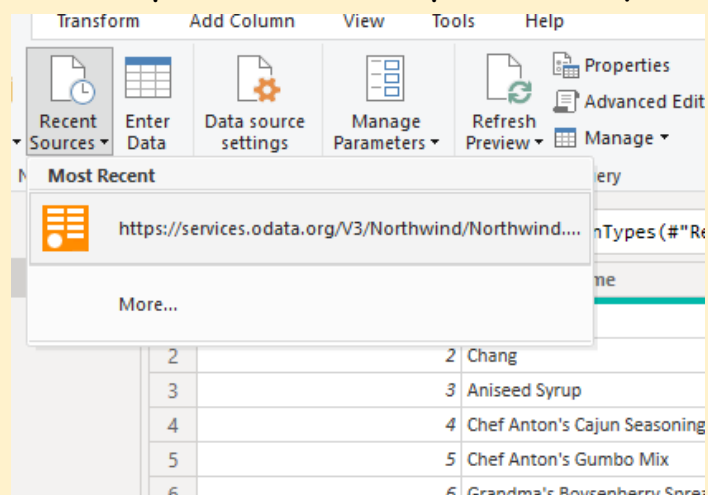
.In the query view, scroll to the order\_detail column

.In the order\_detail column, select the expand icon

.In the expand drop down:

.select (Select all column) to clear the columns

.Select productID,unitprice and quantity



### Navigator

Display Options ▾

- ☒ https://services.odata.org/V3/Northwind/N...
- ☐ Alphabetical\_list\_of\_products
- ☐ Categories
- ☐ Category\_Sales\_for\_1997
- ☐ Current\_Product\_Lists
- ☐ Customer\_and\_Suppliers\_by\_Cities
- ☐ CustomerDemographics
- ☐ Customers
- ☐ Employees
- ☐ Invoices
- ☐ Order\_Details
- ☐ Order\_Details\_Extendeds
- ☐ Order\_Subtotals
- ☒ Orders
- ☐ Orders\_Queries
- ☐ Product\_Sales\_for\_1997
- ☐ Products
- ☐ Products\_Above\_Average\_Prices
- ☐ Products\_by\_Categories
- ☐ Regions

### Orders

OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate
10248	VINET	5	04-07-1996 00:00:00	01-08-1996
10249	TOMSP	6	05-07-1996 00:00:00	16-08-1996
10250	HANAR	4	08-07-1996 00:00:00	05-08-1996
10251	VICTE	3	08-07-1996 00:00:00	05-08-1996
10252	SUPRD	4	09-07-1996 00:00:00	06-08-1996
10253	HANAR	3	10-07-1996 00:00:00	24-07-1996
10254	CHOPS	5	11-07-1996 00:00:00	08-08-1996
10255	RICSU	9	12-07-1996 00:00:00	09-08-1996
10256	WELLI	3	15-07-1996 00:00:00	12-08-1996
10257	HILAA	4	16-07-1996 00:00:00	13-08-1996
10258	ERNSH	1	17-07-1996 00:00:00	14-08-1996
10259	CENTC	4	18-07-1996 00:00:00	15-08-1996
10260	OTTIK	4	19-07-1996 00:00:00	16-08-1996
10261	QUEDE	4	19-07-1996 00:00:00	16-08-1996
10262	RATTC	8	22-07-1996 00:00:00	19-08-1996
10263	ERNSH	9	23-07-1996 00:00:00	20-08-1996
10264	FOLKO	6	24-07-1996 00:00:00	21-08-1996
10265	BLONP	2	25-07-1996 00:00:00	22-08-1996
10266	WARTH	3	26-07-1996 00:00:00	06-09-1996
10267	FRANK	4	29-07-1996 00:00:00	26-08-1996
10268	GROSR	8	30-07-1996 00:00:00	27-08-1996
10269	WHITC	5	31-07-1996 00:00:00	14-08-1996
10270	WARTH	1	01-08-1996 00:00:00	29-08-1996

Select Related Tables

OK

Cancel

Employee

Order\_Details

Search Columns to Expand

Expand

Aggregate

☒ (Select All Columns)

☐ OrderID

☒ ProductID

☒ UnitPrice

☒ Quantity

☐ Discount

☐ Order

☐ Product

☒ Use original column name as prefix

OK

Cancel

Table: ExpandTableColumn(Orders\_table, "Order\_Details", ("ProductID", "UnitPrice", "Quantity", "Order\_Details.ProductID", "Order\_Details.UnitPrice", "Order\_Details.Quantity"))

OrderID	CustomerID	EmployeeID	OrderDate	RequestDate	ShipDate	ShipVia	Freight
10248	VINET	5	04-07-1996 00:00:00	05-07-1996 00:00:00	16-07-1996 00:00:00	3	32.38 Vins et alcools Chevalier
2	10248	VINET	5	04-07-1996 00:00:00	01-08-1996 00:00:00	5	32.38 Vins et alcools Chevalier
3	10248	VINET	5	04-07-1996 00:00:00	01-08-1996 00:00:00	3	32.38 Vins et alcools Chevalier
4	10249	TOMSP	6	05-07-1996 00:00:00	16-08-1996 00:00:00	1	11.61 Toms Spezialitäten
5	10249	TOMSP	6	05-07-1996 00:00:00	16-08-1996 00:00:00	1	11.61 Toms Spezialitäten
6	10250	HANAR	4	08-07-1996 00:00:00	05-08-1996 00:00:00	2	65.83 Hanari Carnes
7	10250	HANAR	4	08-07-1996 00:00:00	05-08-1996 00:00:00	2	65.83 Hanari Carnes
8	10250	HANAR	4	08-07-1996 00:00:00	05-08-1996 00:00:00	2	65.83 Hanari Carnes
9	10251	VICTE	3	08-07-1996 00:00:00	05-08-1996 00:00:00	1	41.34 Victuailles en stock
10	10251	VICTE	3	08-07-1996 00:00:00	05-08-1996 00:00:00	1	41.34 Victuailles en stock
11	10251	VICTE	3	08-07-1996 00:00:00	05-08-1996 00:00:00	1	41.34 Victuailles en stock
12	10252	SUPRD	4	09-07-1996 00:00:00	06-08-1996 00:00:00	2	51.3 Suprêmes délices
13	10252	SUPRD	4	09-07-1996 00:00:00	06-08-1996 00:00:00	2	51.3 Suprêmes délices
14	10252	SUPRD	4	09-07-1996 00:00:00	06-08-1996 00:00:00	2	51.3 Suprêmes délices
15	10253	HANAB	3	10-07-1996 00:00:00	24-07-1996 00:00:00	2	58.17 Hanari Carnes
16	10253	HANAB	3	10-07-1996 00:00:00	24-07-1996 00:00:00	2	58.17 Hanari Carnes
17	10253	HANAB	3	10-07-1996 00:00:00	24-07-1996 00:00:00	2	58.17 Hanari Carnes
18	10254	CHOPS	5	11-07-1996 00:00:00	08-08-1996 00:00:00	2	22.98 Chop-suey Chinese
19	10254	CHOPS	5	11-07-1996 00:00:00	08-08-1996 00:00:00	2	22.98 Chop-suey Chinese
20	10254	CHOPS	5	11-07-1996 00:00:00	08-08-1996 00:00:00	2	22.98 Chop-suey Chinese
21	10255	RICSU	9	12-07-1996 00:00:00	09-08-1996 00:00:00	3	148.33 Richter Supermarkt
22	10255	RICSU	9	12-07-1996 00:00:00	09-08-1996 00:00:00	3	148.33 Richter Supermarkt
23	10255	RICSU	9	12-07-1996 00:00:00	09-08-1996 00:00:00	3	148.33 Richter Supermarkt
24	10255	RICSU	9	12-07-1996 00:00:00	09-08-1996 00:00:00	3	148.33 Richter Supermarkt
25	10256	WELLI	3	15-07-1996 00:00:00	12-08-1996 00:00:00	2	13.97 Wellington Importadora
26	10256	WELLI	3	15-07-1996 00:00:00	12-08-1996 00:00:00	2	13.97 Wellington Importadora
27	10257	HILAA	4	16-07-1996 00:00:00	13-08-1996 00:00:00	3	81.91 HILARION-Abastos
28	10257	HILAA	4	16-07-1996 00:00:00	13-08-1996 00:00:00	3	81.91 HILARION-Abastos
29	10257	HILAA	4	16-07-1996 00:00:00	13-08-1996 00:00:00	3	81.91 HILARION-Abastos
30	10258	ERNSH	1	17-07-1996 00:00:00	14-08-1996 00:00:00	1	140.51 Ernst Handel
31	10258	ERNSH	1	17-07-1996 00:00:00	14-08-1996 00:00:00	1	140.51 Ernst Handel
32	10258	ERNSH	1	17-07-1996 00:00:00	14-08-1996 00:00:00	1	140.51 Ernst Handel
33	10259	CENTC	4	18-07-1996 00:00:00	15-08-1996 00:00:00	3	2.25 Centro comercial Moctezuma
34	10259	CENTC	4	18-07-1996 00:00:00	15-08-1996 00:00:00	3	2.25 Centro comercial Moctezuma
35	10260	OTTIK	4	19-07-1996 00:00:00	16-08-1996 00:00:00	1	55.09 Ottilies Käsladen
36	10260	OTTIK	4	19-07-1996 00:00:00	16-08-1996 00:00:00	1	55.09 Ottilies Käsladen
37	10260	OTTIK	4	19-07-1996 00:00:00	16-08-1996 00:00:00	1	55.09 Ottilies Käsladen
38	10260	OTTIK	4	19-07-1996 00:00:00	16-08-1996 00:00:00	1	55.09 Ottilies Käsladen

Step8: Calculate the lines total for each order\_details row

.In the add column ribbon tab, click add custom column

.In the custom column dialog box , in the custom column formula textbox, enter: [order\_table.unitprice]\*[order\_detail.Quantatiy]

by selecting from available columns and click on insert for each column

.In the new column name textbox, enter linetotal

.Click ok

Table: ExpandTableColumn(Orders\_table, "Order\_Details", {"ProductID", "UnitPrice", "Quantity", "Order\_Details.ProductID", "Order\_Details.UnitPrice", "Order\_Details.Quantity"})

OrderID	CustomerID	ProductID	UnitPrice	Quantity	Order_Details.ProductID	Order_Details.UnitPrice	Order_Details.Quantity
1	10248	VINET	32.38	1	10248	32.38	1
2	10248	VINET	32.38	1	10248	32.38	1
3	10248	VINET	32.38	1	10248	32.38	1
4	10249	TOMSP	11.61	1	10249	11.61	1
5	10249	TOMSP	11.61	1	10249	11.61	1
6	10250	HANAR	65.83	2	10250	65.83	2

## Custom Column

Add a column that is computed from the other columns.

New column name

Custom column formula ⓘ

Available columns

OrderID

CustomerID

EmployeeID

OrderDate

RequiredDate

ShippedDate

ShipVia

<< Insert

[Learn about Power Query formulas](#)

✓ No syntax errors have been detected.

OK

Cancel

Query Set	
PROPER	APPLIED
Name	Source
Orders	Navi
All Proper	Expa
	✕ Add

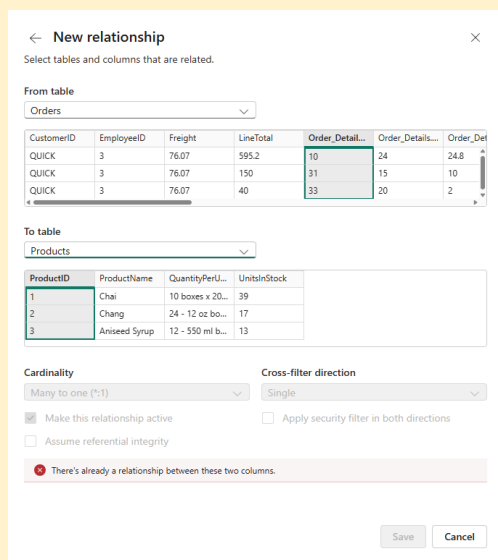
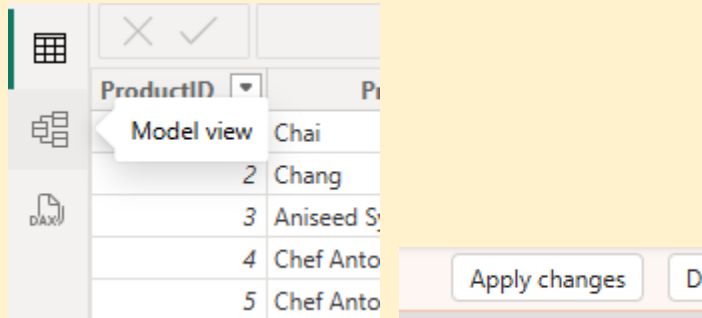
  

ABC	LineTotal
123	
168	
98	
174	
167.4	
1696	
77	
1484	
252	
100.8	
234	
336	
2592	
50	
1088	
200	
604.8	
640	
54	
403.2	
168	
304	
486.5	
380	
1320	
393	
124.8	
877.5	
86.4	
156	
760	
1105	
153.6	
80	
20.8	
123.2	
780	
591	



Step9:once the data is loaded, select the manage relationship button on home ribbon from untitled powerBI desktop windows

- Click on model-> manage relationship



Manage relationships

+ New relationship

Autodetect

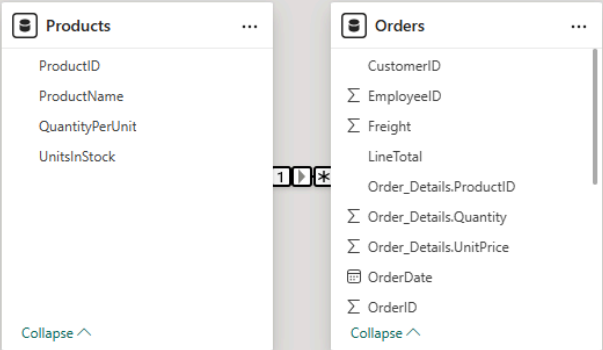
Edit

Delete

Filter

<input checked="" type="checkbox"/>	From: table (column) ↑	Relationship	To: table (column)	Status
<input checked="" type="checkbox"/>	Orders (Order_Details.ProductID)		Products (ProductID)	Active <div>...</div>

Close



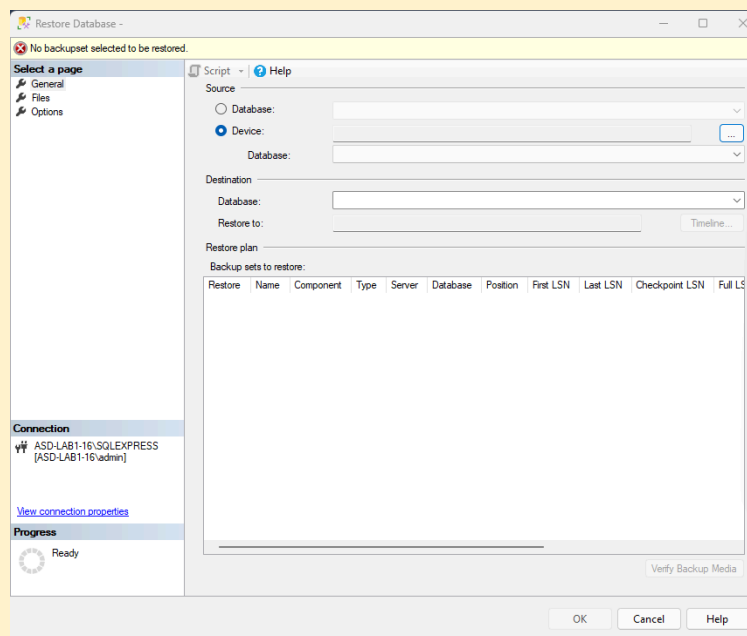
## B. ETL Process Using SQL Server

Step1: Open Microsoft SQL

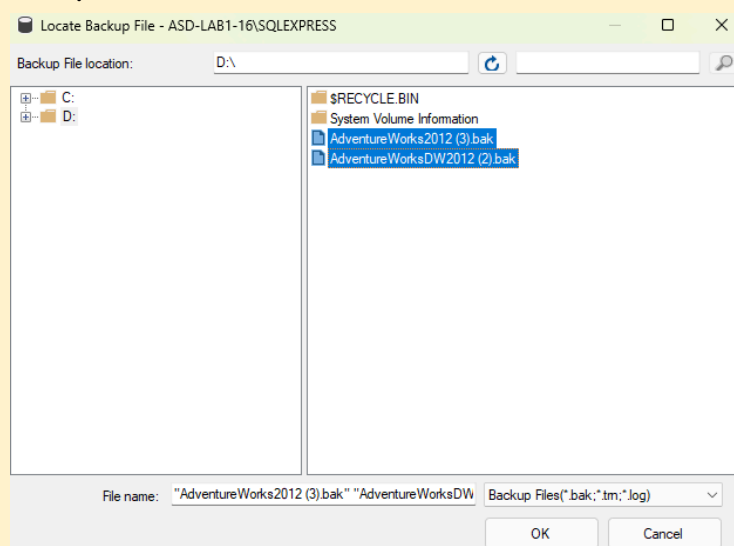
Step2: Download the 2 files and save them in D Drive

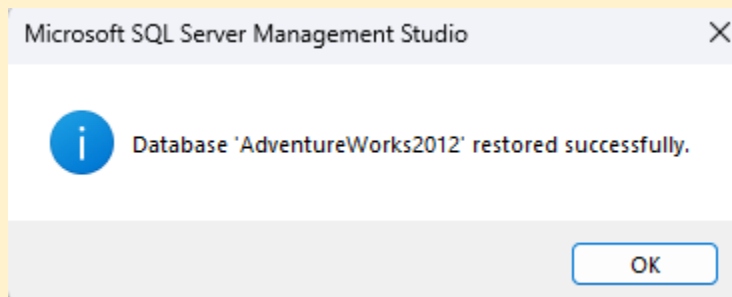
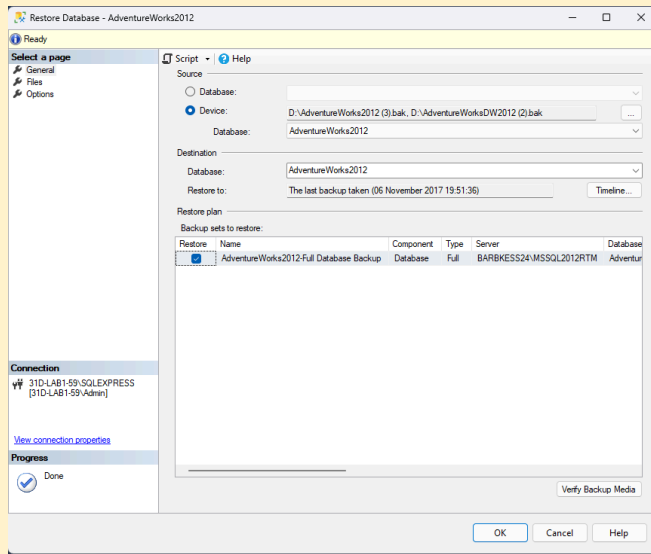
Step3: Right click on Databases and select restore database.

Step4: Select Devices and click on 3 Dots

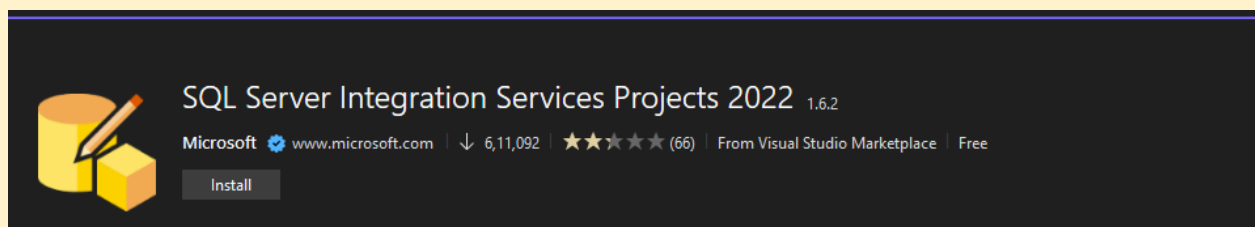


Step 5: Select the files

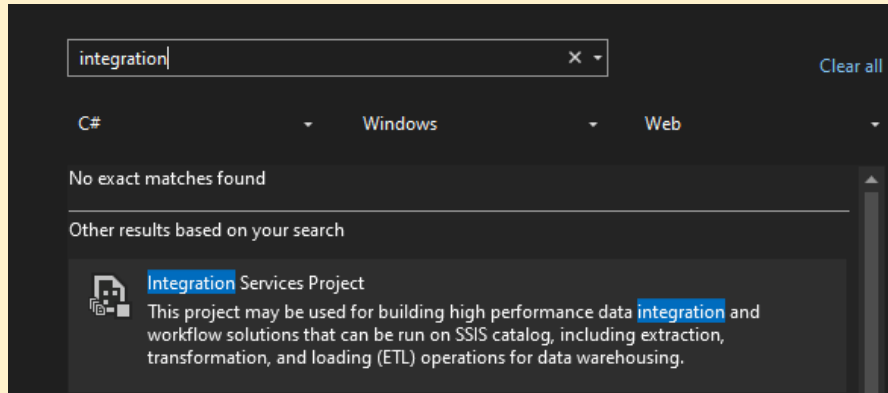




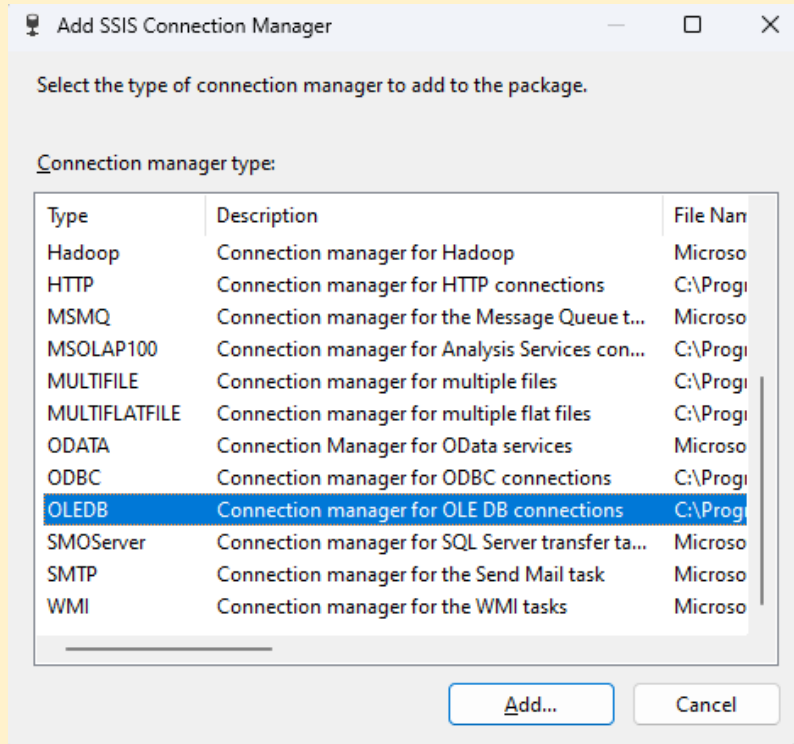
Step6:Open Visual Studio and Open any Project then Click on Extensions and Install SQL Server Integration Services Project 2022. (Make Sure VIsual Studio is CLOSED when installing otherwise it will throw an error)(If some task occurs after installing, Click Ctrl+Alt+Del and then Task Manager and Then Stop the Task)



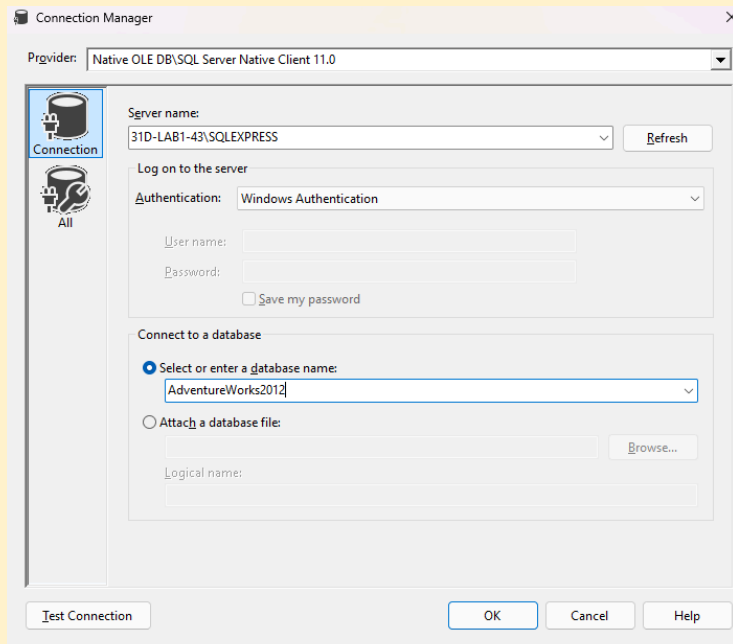
Step7: Create a New Project in Visual Studio and Search Integration Services Project (C#,Windows,Web) and Create a Project.



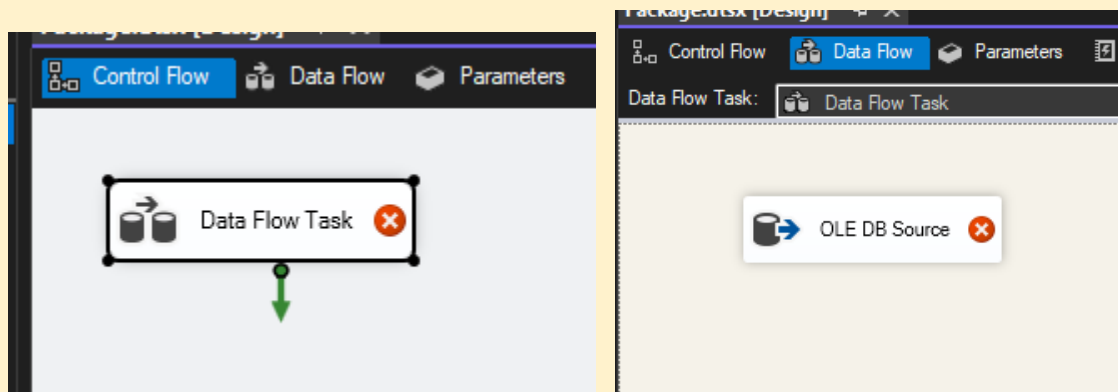
Step8: Right Click on Connection Manager in Solution Explorer and select new connection manager and Select OLEDB(Object Linking and Embedding Database) and click add

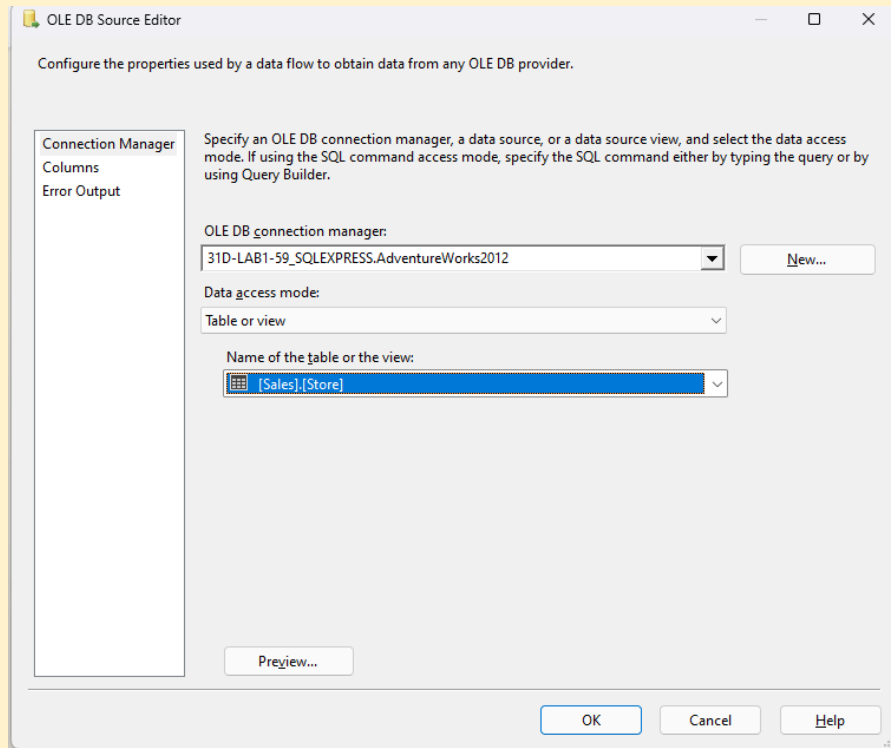


Step9: Click on New-Add Server Name(Right Click on Database and Properties)-Select or Enter a Database Name and select AdventureWorks2012- Test Connection- If succeeded, Click Ok

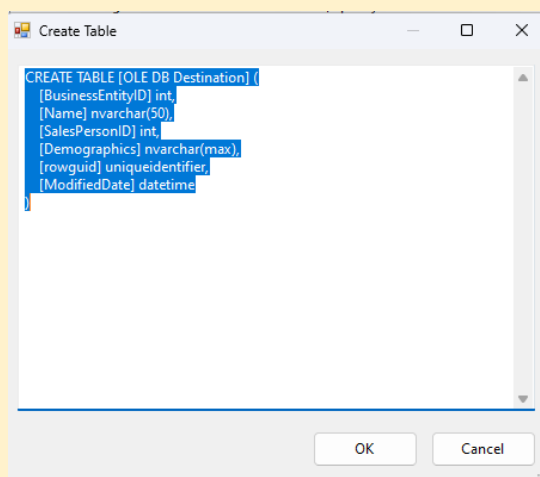
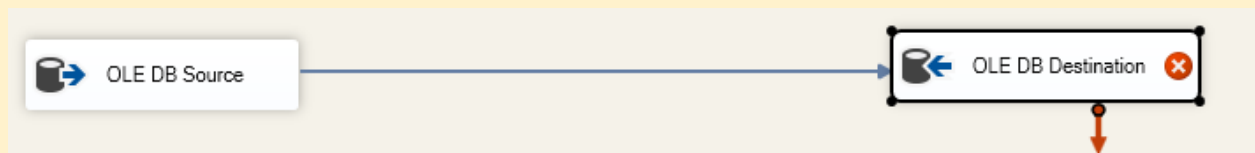


Step10: Drag and Drop Data Flow Task in Control Flow, Go to Data Flow and Drag and Drop OLE DB Source(Other Sources)-OK





Step11: Drag and Drop OLEDB Destination- Double Click OLEDB Destination - Select New(2nd Row) -Ok-Click on Mapping-Check the mapping-Check



OLE DB Destination Editor

Configure the properties used to insert data into a relational database using an OLE DB provider.

Specify an OLE DB connection manager, a data source, or a data source view, and select the data access mode. If using the SQL command access mode, specify the SQL command either by typing the query or by using Query Builder. For fast-load data access, set the table update options.

Connection Manager: 31D-LAB1-59\_SQLEXPRESS.AdventureWorks2012

Data access mode: Table or view - fast load

Name of the table or the view: [OLE DB Destination]

☐ Keep identity ☒ Table lock

☐ Keep nulls ☒ Check constraints

Rows per batch:

Maximum insert commit size: 2147483647

View Existing

Map the columns on the Mappings page.

OK Cancel Help

OLE DB Destination Editor

Configure the properties used to insert data into a relational database using an OLE DB provider.

Connection Manager: Mappings

Available Input Columns:

Name
BusinessEntityID
Name
SalesPersonID
Demographics
rowguid

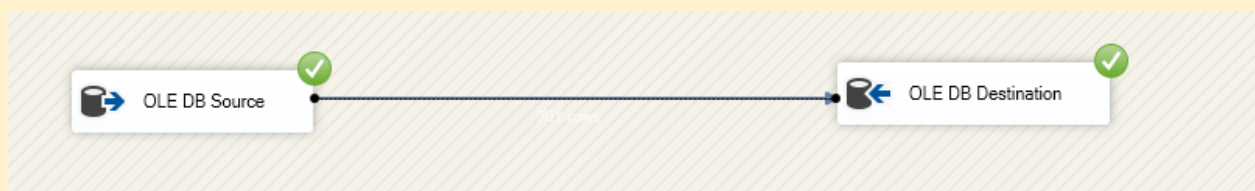
Available Destination Columns:

Name
BusinessEntityID
Name
SalesPersonID
Demographics
rowguid

Input Column	Destination Column
BusinessEntityID	BusinessEntityID
Name	Name
SalesPersonID	SalesPersonID
Demographics	Demographics
rowguid	rowguid
ModifiedDate	ModifiedDate

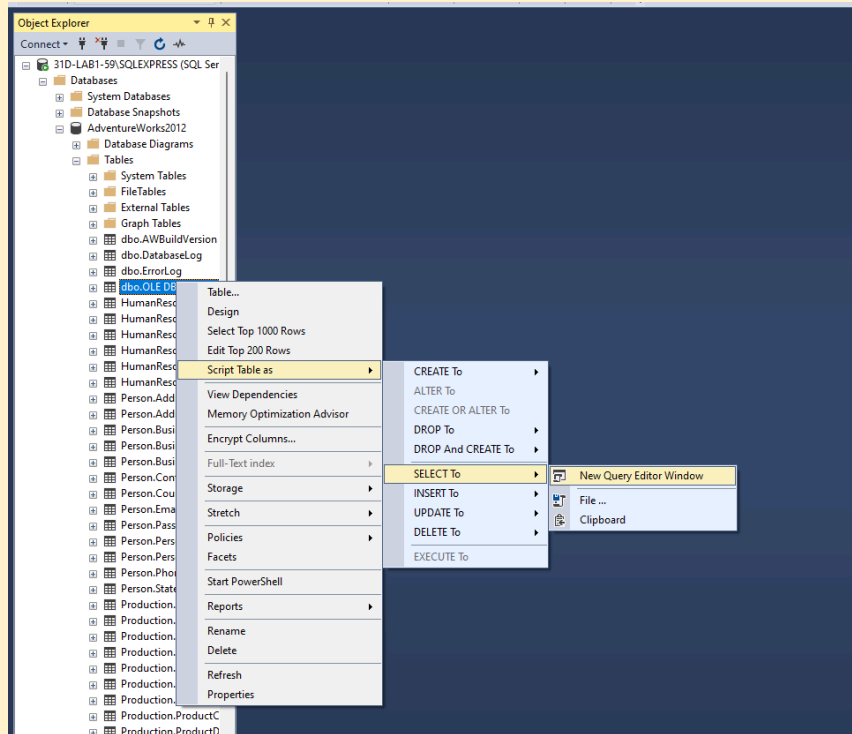
OK Cancel Help

Step12: Click on Start and Get the output for Front End





## Step13:Databases-AdventureWorks2012-Tables-[dbo].[OLE DB Destination]-Right Click-Script table as- SELECT to-New Query



```
SQLQuery1.sql - 31...AB1-59\Admin (54) X
USE [AdventureWorks2012]
GO

SELECT [BusinessEntityID]
      ,[Name]
      ,[SalesPersonID]
      ,[Demographics]
      ,[rowguid]
      ,[ModifiedDate]
FROM [dbo].[OLE DB Destination]
GO
```

100 %						
Results Messages						
	BusinessEntityID	Name	SalesPersonID	Demographics	rowguid	ModifiedDate
1	292	Next-Door Bike Store	279	<StoreSurvey xmlns="http://schemas.microsoft.co...	A22517E3-848D-4EBE-B9D9-7437F3432304	2014-09-12 11:15:07.497
2	294	Professional Sales and Service	276	<StoreSurvey xmlns="http://schemas.microsoft.co...	B50CA50B-C601-4A13-B07E-2C63862D71B4	2014-09-12 11:15:07.497
3	296	Riders Company	277	<StoreSurvey xmlns="http://schemas.microsoft.co...	337C3688-1339-4E1A-A08A-B54B23566E49	2014-09-12 11:15:07.497
4	298	The Bike Mechanics	275	<StoreSurvey xmlns="http://schemas.microsoft.co...	7894F278-F0C8-4D16-BD75-213FDBF13023	2014-09-12 11:15:07.497
5	300	Nationwide Supply	286	<StoreSurvey xmlns="http://schemas.microsoft.co...	C3FC9705-A8C4-4F3A-9550-EB2FA4B7B64D	2014-09-12 11:15:07.497
6	302	Area Bike Accessories	281	<StoreSurvey xmlns="http://schemas.microsoft.co...	368BE6DD-30E5-498B-9A86-71FD49C58F4E	2014-09-12 11:15:07.497
7	304	Bicycle Accessories and Kits	283	<StoreSurvey xmlns="http://schemas.microsoft.co...	35F40636-5105-49D5-863E-27E231189150	2014-09-12 11:15:07.497
8	306	Clamps & Brackets Co.	275	<StoreSurvey xmlns="http://schemas.microsoft.co...	64D06BFC-D060-405C-8C60-C067FE7C67DF	2014-09-12 11:15:07.497
9	308	Valley Bicycle Specialists	277	<StoreSurvey xmlns="http://schemas.microsoft.co...	59386B0C-652E-4668-B44B-4E1711793330	2014-09-12 11:15:07.497
10	310	New Bikes Company	279	<StoreSurvey xmlns="http://schemas.microsoft.co...	47E4B6BD-5CD1-45A3-A231-79D930381C56	2014-09-12 11:15:07.497
11	312	Vinyl and Plastic Goods Corporation	282	<StoreSurvey xmlns="http://schemas.microsoft.co...	DC610525-E373-49B1-B786-EA040EC25C06	2014-09-12 11:15:07.497
12	314	Top of the Line Bikes	288	<StoreSurvey xmlns="http://schemas.microsoft.co...	E290E93F-A980-4BA3-86C3-9858F15C8A6D	2014-09-12 11:15:07.497
13	316	Fun Toys and Bikes	281	<StoreSurvey xmlns="http://schemas.microsoft.co...	6CDCF941-4192-49C7-994A-5ADBA534E095	2014-09-12 11:15:07.497
14	318	Great Bikes	283	<StoreSurvey xmlns="http://schemas.microsoft.co...	956FBC35-5E0D-4175-8045-E0BE380BA340	2014-09-12 11:15:07.497
15	320	Metropolitan Sales and Rental	275	<StoreSurvey xmlns="http://schemas.microsoft.co...	0CB4FEF2-5047-40F7-8848-B59F7A3F3EEC	2014-09-12 11:15:07.497
16	322	Irregulars Outlet	288	<StoreSurvey xmlns="http://schemas.microsoft.co...	CDE66279-83D8-4340-A83C-E86E15514AC4	2014-09-12 11:15:07.497
17	324	Valley Toy Store	282	<StoreSurvey xmlns="http://schemas.microsoft.co...	6A1BEA56-DCB7-45CF-8C92-3705E12EB2AA	2014-09-12 11:15:07.497
18	326	Worthwhile Activity Store	279	<StoreSurvey xmlns="http://schemas.microsoft.co...	BAD63717-99BD-4581-8160-0F1723BE42CB	2014-09-12 11:15:07.497
19	328	Purchase Mart	275	<StoreSurvey xmlns="http://schemas.microsoft.co...	A3140349-57A3-46AA-BF32-D7F4753A06D6	2014-09-12 11:15:07.497
20	330	Major Sport Suppliers	283	<StoreSurvey xmlns="http://schemas.microsoft.co...	3B5F8572-43B0-42F5-86FF-E379D0769F28	2014-09-12 11:15:07.497
21	332	Family's Favorite Bike Shop	278	<StoreSurvey xmlns="http://schemas.microsoft.co...	712DF7B6-A6E4-4059-A1B8-6D39A80AB712	2014-09-12 11:15:07.497
22	334	Global Plaza	279	<StoreSurvey xmlns="http://schemas.microsoft.co...	9A1E91D8-509B-4D96-BD77-7427C7F0C47B	2014-09-12 11:15:07.497
23	336	Imported and Domestic Cycles	276	<StoreSurvey xmlns="http://schemas.microsoft.co...	25C229C0-4E7A-42D2-ACB1-A2118361B2F1	2014-09-12 11:15:07.497
24	338	Systematic Sales	281	<StoreSurvey xmlns="http://schemas.microsoft.co...	DF9126A5-9C95-44A2-A31F-F759EA33EEA7	2014-09-12 11:15:07.497
25	340	eCommerce Bikes	279	<StoreSurvey xmlns="http://schemas.microsoft.co...	1EC47823-4B39-4609-AAEC-6EE68CC74F81	2014-09-12 11:15:07.497
26	342	Mountain Toy Store	277	<StoreSurvey xmlns="http://schemas.microsoft.co...	52EFC841-97C5-4AC1-B707-FA3717B0BC48	2014-09-12 11:15:07.497
27	344	Retail Sales and Service	275	<StoreSurvey xmlns="http://schemas.microsoft.co...	38F9BE1B-9137-4E4E-985D-06F6C5E02330	2014-09-12 11:15:07.497
28	346	Designated Distributors	282	<StoreSurvey xmlns="http://schemas.microsoft.co...	5DC17A1C-F618-4B6E-BEA2-BFF96CA6BA8B	2014-09-12 11:15:07.497
29	348	Bold Bike Accessories	276	<StoreSurvey xmlns="http://schemas.microsoft.co...	AC7A83F1-196B-4BBF-A6E0-3165D4C84454	2014-09-12 11:15:07.497
30	350	Twin Cycles	286	<StoreSurvey xmlns="http://schemas.microsoft.co...	4E917578-1942-4BAB-8E63-932052FDACEC	2014-09-12 11:15:07.497

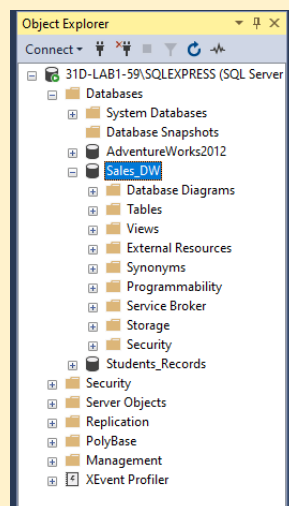
# PRACTICAL 3

AIM: Create a cube with subtitle dimension and fact tables based on OLAP.

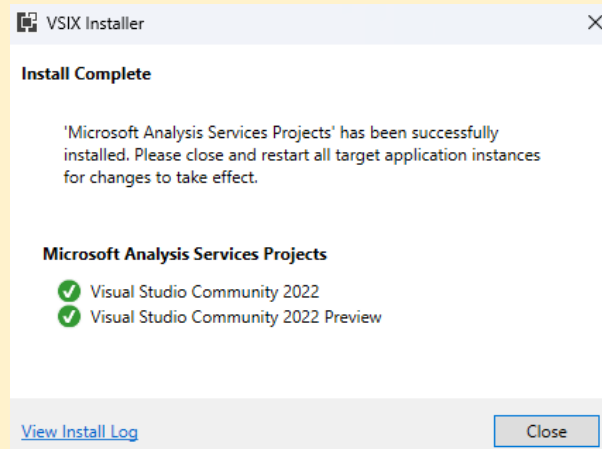
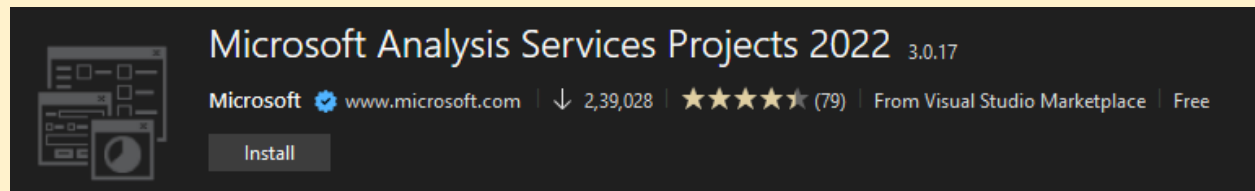
Step1: Creating a Data Warehouse.

New Query-write the code

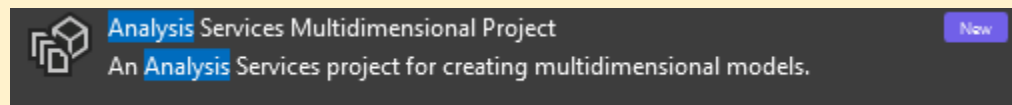
DateKey	Date	FullDate/USA	DayOfMonth	DaySuffix	DayName	DayOfWeek/USA	DayOfWeek/UK	DayOfWeekInMonth	DayOfWeekInYear	DayOfQuarter	DayOfYear	WeekOfMonth	WeekOfQuarter	WeekOfYear	Month	MonthName	MonthOfQuarter
1	20130101	2013-01-01 00:00:00.000	01/01/2013	01/01/2013	1	1st	Tuesday	3	2	1	1	1	1	1	1	January	1
2	20130102	2013-01-02 00:00:00.000	02/01/2013	01/02/2013	2	2nd	Wednesday	4	3	1	1	2	1	1	1	January	1
3	20130103	2013-01-03 00:00:00.000	03/01/2013	01/03/2013	3	3rd	Thursday	5	4	1	1	3	1	1	1	January	1
4	20130104	2013-01-04 00:00:00.000	04/01/2013	01/04/2013	4	4th	Friday	6	5	1	1	4	1	1	1	January	1
5	20130105	2013-01-05 00:00:00.000	05/01/2013	01/05/2013	5	5th	Saturday	7	6	1	1	5	1	1	1	January	1
6	20130106	2013-01-06 00:00:00.000	06/01/2013	01/06/2013	6	6th	Sunday	1	7	1	1	6	2	1	2	January	1
7	20130107	2013-01-07 00:00:00.000	07/01/2013	01/07/2013	7	7th	Monday	2	1	1	1	7	2	1	2	January	1
8	20130108	2013-01-08 00:00:00.000	08/01/2013	01/08/2013	8	8th	Tuesday	3	2	2	2	8	2	2	2	January	1
9	20130109	2013-01-09 00:00:00.000	09/01/2013	01/09/2013	9	9th	Wednesday	4	3	2	2	9	2	2	2	January	1
10	20130110	2013-01-10 00:00:00.000	10/01/2013	01/10/2013	10	10th	Thursday	5	4	2	2	10	2	2	2	January	1
11	20130111	2013-01-11 00:00:00.000	11/01/2013	01/11/2013	11	11th	Friday	6	5	2	2	11	2	2	2	January	1
12	20130112	2013-01-12 00:00:00.000	12/01/2013	01/12/2013	12	12th	Saturday	7	6	2	2	12	2	2	2	January	1
13	20130113	2013-01-13 00:00:00.000	13/01/2013	01/13/2013	13	13th	Sunday	1	7	2	2	13	3	2	3	January	1
14	20130114	2013-01-14 00:00:00.000	14/01/2013	01/14/2013	14	14th	Monday	2	1	2	2	14	3	2	3	January	1
15	20130115	2013-01-15 00:00:00.000	15/01/2013	01/15/2013	15	15th	Tuesday	3	2	3	3	15	3	3	3	January	1
16	20130116	2013-01-16 00:00:00.000	16/01/2013	01/16/2013	16	16th	Wednesday	4	3	3	3	16	3	3	3	January	1
17	20130117	2013-01-17 00:00:00.000	17/01/2013	01/17/2013	17	17th	Thursday	5	4	3	3	17	3	3	3	January	1
18	20130118	2013-01-18 00:00:00.000	18/01/2013	01/18/2013	18	18th	Friday	6	5	3	3	18	3	3	3	January	1
19	20130119	2013-01-19 00:00:00.000	19/01/2013	01/19/2013	19	19th	Saturday	7	6	3	3	19	3	3	3	January	1
20	20130120	2013-01-20 00:00:00.000	20/01/2013	01/20/2013	20	20th	Sunday	1	7	3	3	20	4	3	4	January	1
21	20130121	2013-01-21 00:00:00.000	21/01/2013	01/21/2013	21	21st	Monday	2	1	3	3	21	4	3	4	January	1
22	20130122	2013-01-22 00:00:00.000	22/01/2013	01/22/2013	22	22nd	Tuesday	3	2	4	4	22	4	4	4	January	1
23	20130123	2013-01-23 00:00:00.000	23/01/2013	01/23/2013	23	23rd	Wednesday	4	3	4	4	23	4	4	4	January	1
24	20130124	2013-01-24 00:00:00.000	24/01/2013	01/24/2013	24	24th	Thursday	5	4	4	4	24	4	4	4	January	1
25	20130125	2013-01-25 00:00:00.000	25/01/2013	01/25/2013	25	25th	Friday	6	5	4	4	25	4	4	4	January	1
26	20130126	2013-01-26 00:00:00.000	26/01/2013	01/26/2013	26	26th	Saturday	7	6	4	4	26	4	4	4	January	1
27	20130127	2013-01-27 00:00:00.000	27/01/2013	01/27/2013	27	27th	Sunday	1	7	4	4	27	5	4	5	January	1
28	20130128	2013-01-28 00:00:00.000	28/01/2013	01/28/2013	28	28th	Monday	2	1	4	4	28	5	4	5	January	1
29	20130129	2013-01-29 00:00:00.000	29/01/2013	01/29/2013	29	29th	Tuesday	3	2	4	4	29	5	4	5	January	1



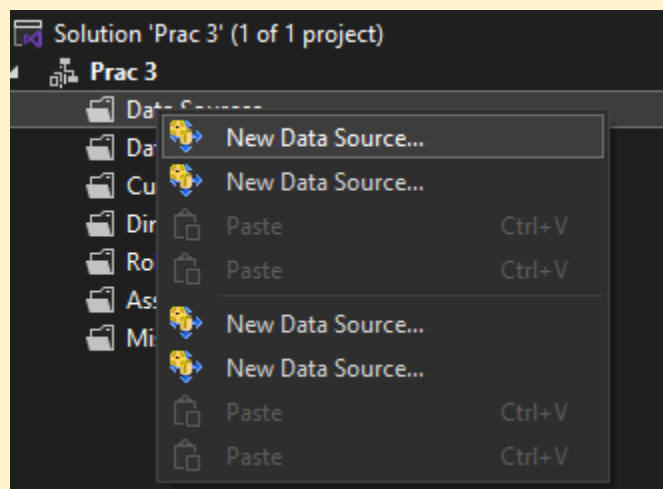
## Step2: Install Analysis services download in Visual Studio 2022

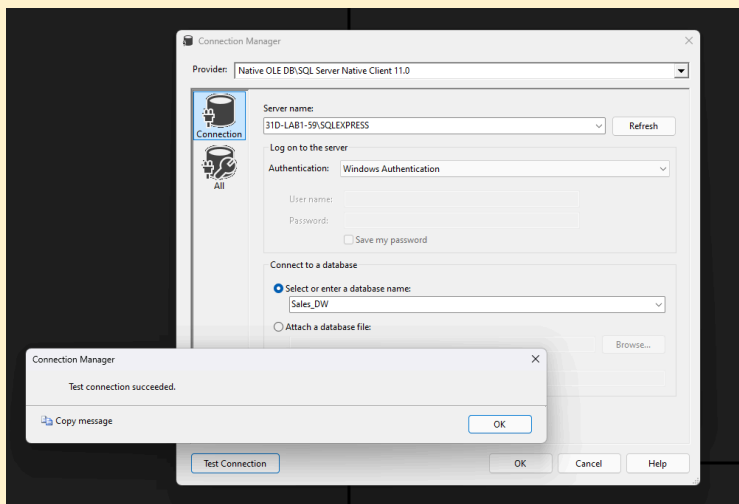
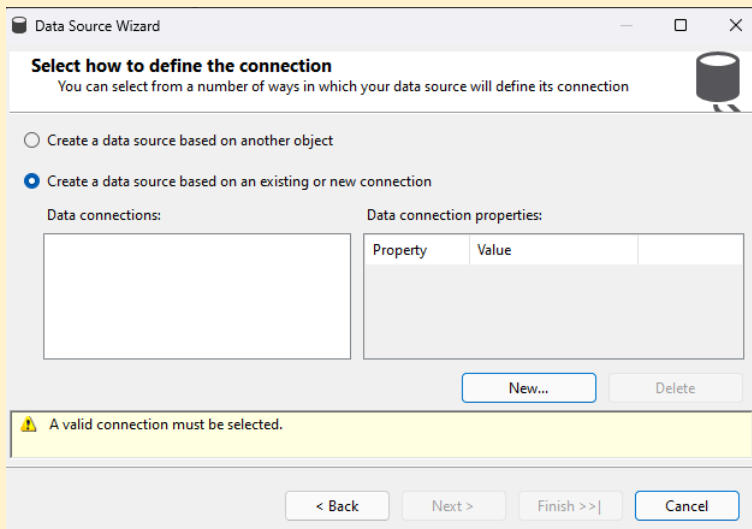
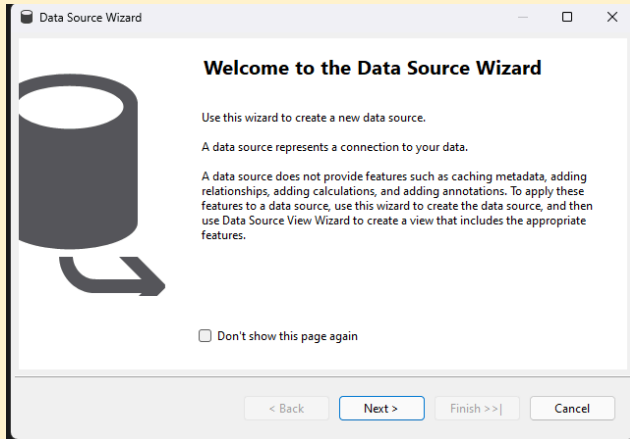


## While creating a new project select



Step 3: Right Click on Data Source-New Data Source-Next-New-Add Server name-Select Sales\_DW as database name- Test Connection- Ok-Next-Inherit-Next-Finish





**Data Source Wizard**

**Select how to define the connection**  
You can select from a number of ways in which your data source will define its connection

☐ Create a data source based on another object

☒ Create a data source based on an existing or new connection

Data connections:

31D-LAB1-59\SQLEXPRESS.Sales_DW
---------------------------------

Data connection properties:

Property	Value
Data Source	31D-LAB1-59\SQLEXP...
Initial Catalog	Sales_DW
Integrated Se...	SSPI
Provider	SQLNCLI11.1

New... Delete

< Back Next > Finish >>| Cancel

**Data Source Wizard**

**Impersonation Information**  
You can define what Windows credentials Analysis Services will use to connect to the data

☐ Use a specific Windows user name and password

User name:

Password:

☐ Use the service account

☐ Use the credentials of the current user

☒ Inherit

< Back Next > Finish >>| Cancel

**Data Source Wizard**

**Completing the Wizard**  
Provide a name and then click Finish to create the new data source.

Data source name:

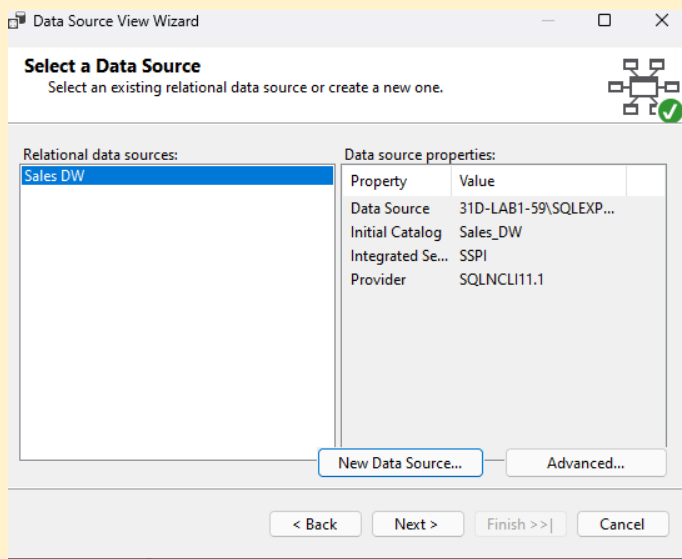
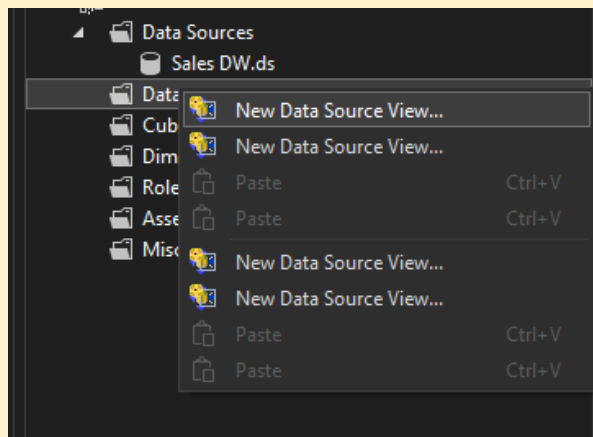
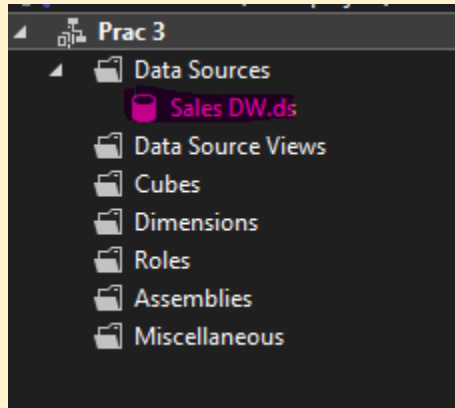
Sales DW

Preview:

Connection string:  
Provider=SQLNCLI11.1;Data Source=31D-LAB1-59\SQLEXPRESS;Integrated Security=SSPI;Initial Catalog=Sales\_DW

< Back Next > Finish Cancel

Step4: [SalesDW.ds](#) is created-Right Click on Data Source View-New Data Source View-Next-Selecty factProductSales(dbo)->-to included objects-Add Related Tables-Next



Data Source View Wizard

### Select Tables and Views

Select objects from the relational database to be included in the data source view.

Available objects:

Name	Type
DimCustomer (dbo)	Table
DimDate (dbo)	Table
DimProduct (dbo)	Table
DimSalesPerson (dbo)	Table
DimStores (dbo)	Table
DimTime (dbo)	Table

Filter:

☐ Show system objects

Included objects:

Name	Type
FactProductSales (dbo)	Table

Add Related Tables

< Back   Next >   Finish >> |   Cancel

Data Source View Wizard

### Select Tables and Views

Select objects from the relational database to be included in the data source view.

Available objects:

Name	Type
DimCustomer (dbo)	Table
DimDate (dbo)	Table
DimProduct (dbo)	Table
DimSalesPerson (dbo)	Table
DimStores (dbo)	Table
DimTime (dbo)	Table

Filter:

☐ Show system objects

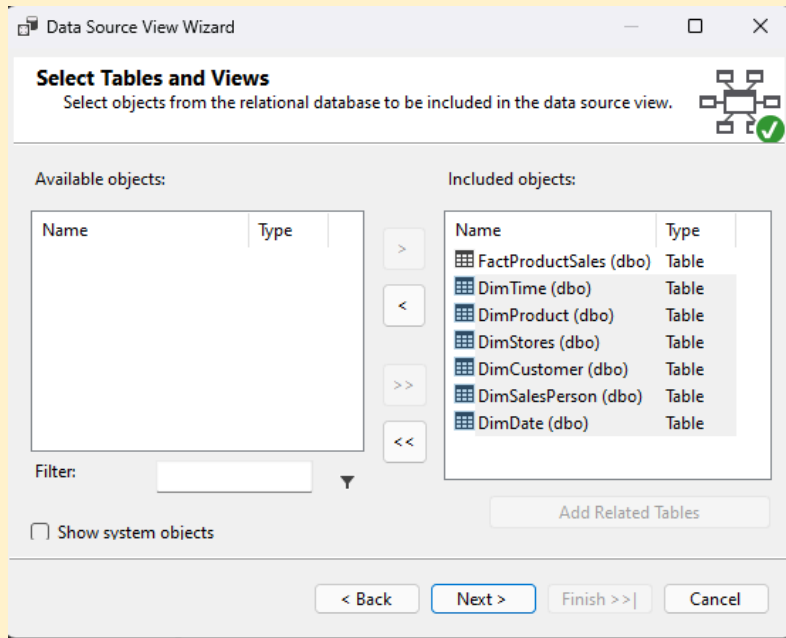
Included objects:

Name	Type
FactProductSales (dbo)	Table

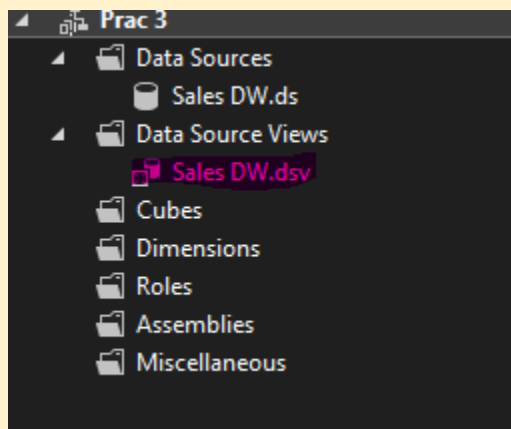
Add Related Tables

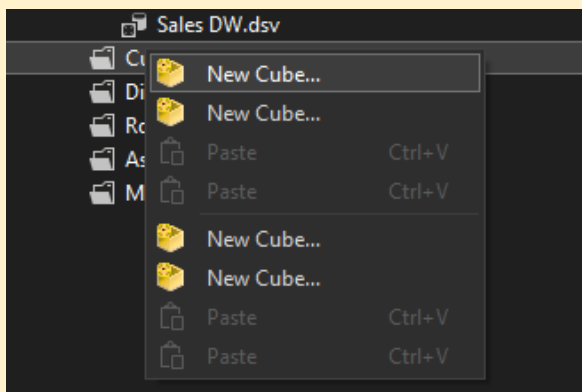
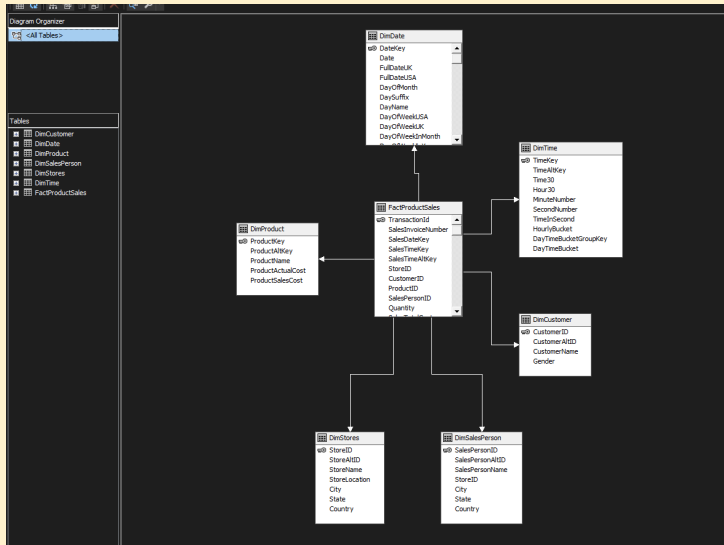
< Back   Next >   Finish >> |   Cancel





Step5: SalesDW.dsv is created-Open that(Diagram is created)-Right Click on Cube-New Cube-Use existing tables-Next-Select FactProductsales-NextSelect all-Select all-Next-Finish





**Cube Wizard**

**Select Creation Method**  
Cubes can be created by using existing tables, creating an empty cube, or generating tables in the data source.

How would you like to create the cube?

☒ Use existing tables

☐ Create an empty cube

☐ Generate tables in the data source

Template:  
(None)

Description:  
Create a cube based on one or more tables in a data source.

< Back   Next >   Finish >>   Cancel

Cube Wizard

### Select Measure Group Tables

Select a data source view or diagram and then select the tables that will be used for measure groups.

Data source view:  
Sales DW

Measure group tables:

☒ FactProductSales

☐ DimTime

☐ DimProduct

☐ DimStores

☐ DimCustomer

☐ DimSalesPerson

☐ DimDate

Cube Wizard

### Select Measures

Select measures that you want to include in the cube.

☒ Measure

☒ Fact Product Sales

☒ Sales Invoice Number

☒ Sales Time Alt Key

☒ Quantity

☒ Sales Total Cost

☒ Product Actual Cost

☒ Deviation

☒ Fact Product Sales Count

Cube Wizard

Select New Dimensions

Select new dimensions to be created, based on available tables.

✓

Dimension

✓

Dim Stores

✓

DimStores

✓

Dim Date

✓

DimDate

✓

Dim Sales Person

✓

DimSalesPerson

✓

Dim Time

✓

DimTime

✓

Dim Product

✓

DimProduct

✓

Dim Customer

✓

DimCustomer

< Back

Next >

Finish >>|

Cancel

Cube Wizard

Completing the Wizard

Name the cube, review its structure, and then click Finish to save the cube.

Cube name:

Sales DW|

Preview:

Measure groups

Fact Product Sales

Sales Invoice Number

Sales Time Alt Key

Quantity

Sales Total Cost

Product Actual Cost

Deviation

Fact Product Sales Count

Dimensions

Dim Stores

Dim Date

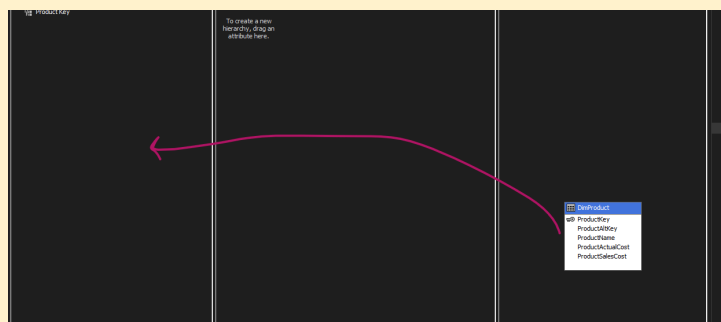
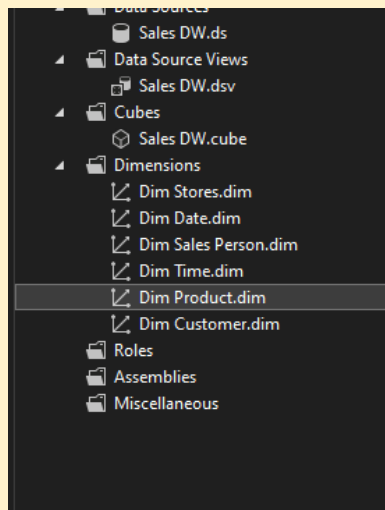
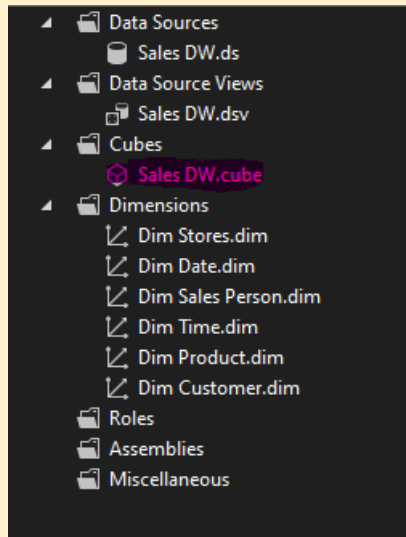
< Back

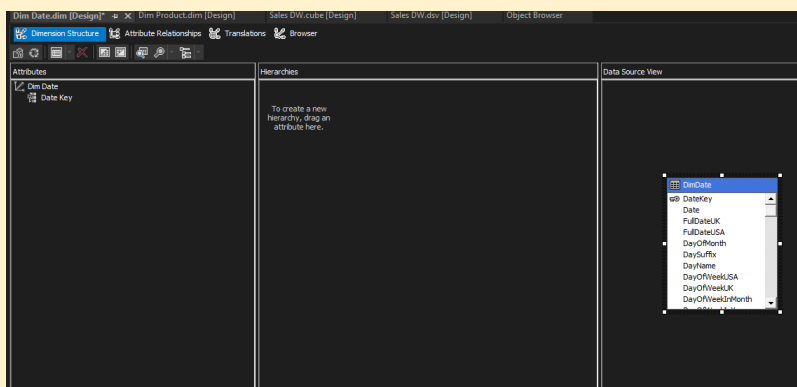
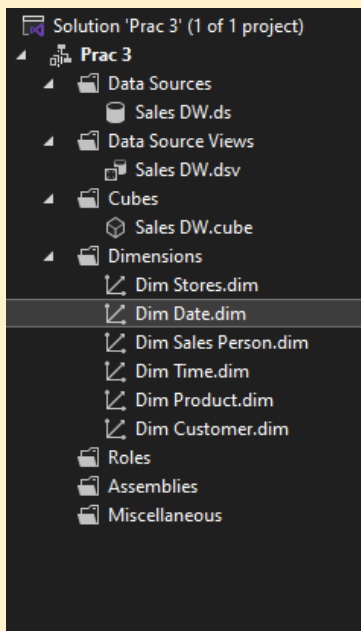
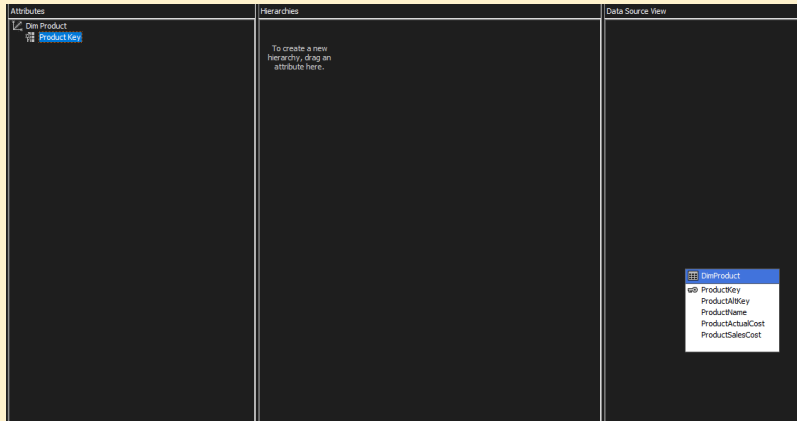
Next >

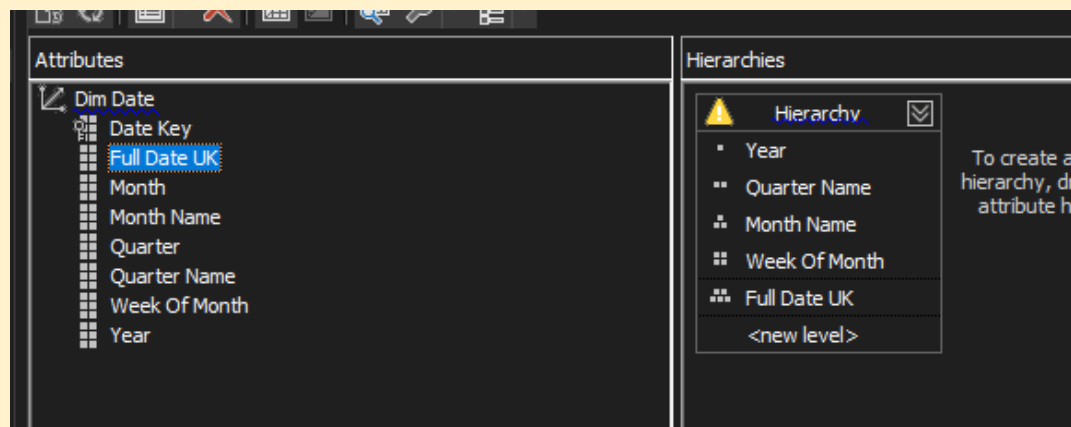
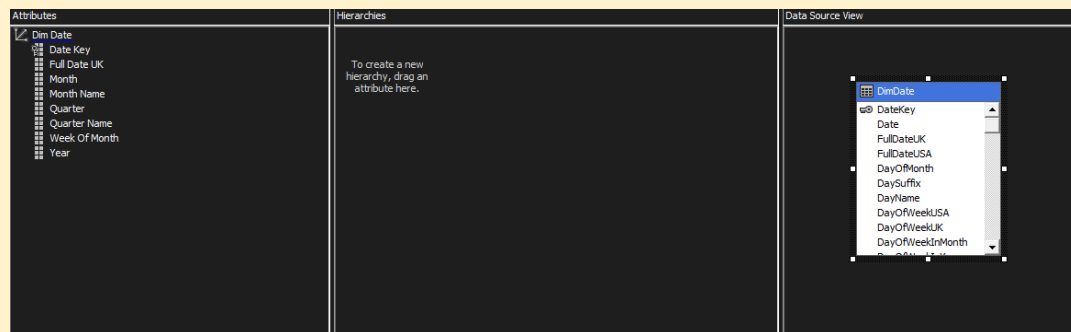
Finish

Cancel

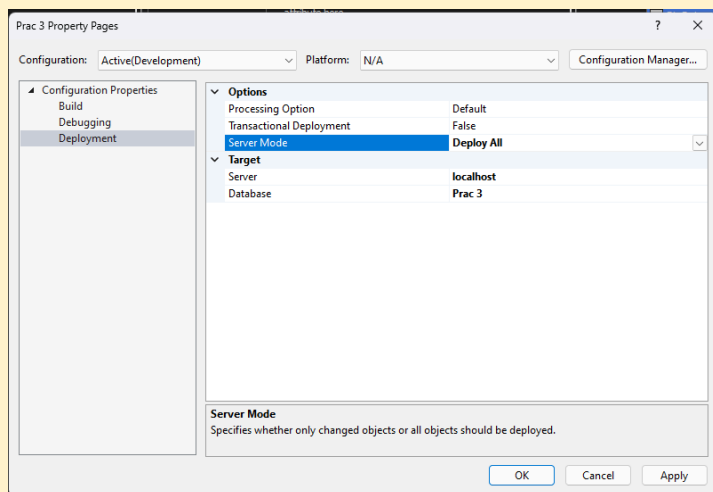
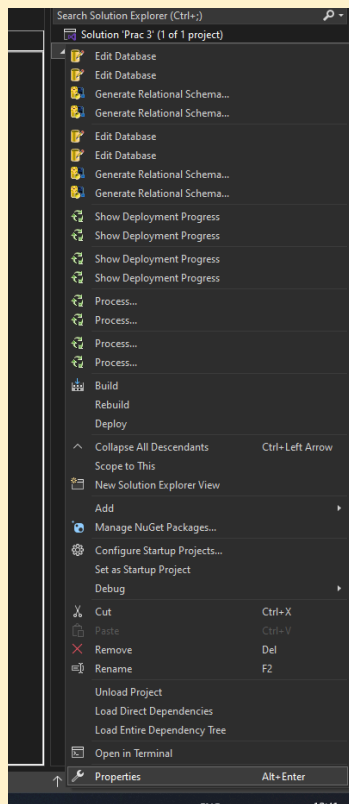
Step6:SalesDW.cube is created-Dim Product.dim-Drag the window to Attributes-Product key is created-Dim.Date.dim-Drag and Drop Full Date UK,Month,Month Name,Quater,Quater Name,Week of Month,Year Individually





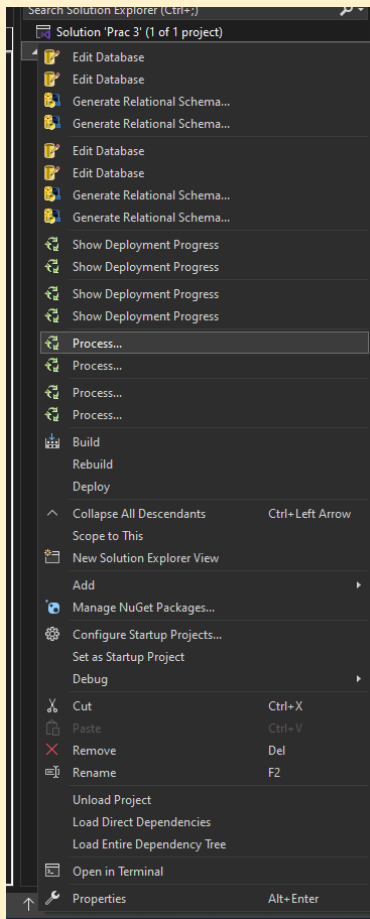


## Step7: Select Project Name-Properties-Deployment-Deploy All in Server Mode-Apply-Ok





## Step7: Select Project Name-Process-Run



Step8: The code will throw error because of port error

# PRACTICAL 4

AIM: Apply the What-If Analysis for Data Visualization.

Step1: Total books(100) %Sold for Highest Price(60.00%) Highest [Unit Price(50)] and Lowest [Unit Price(20)]

	A	B	C	D	E	F	G	H
1	TOTAL BOOKS	%SOLD FOR HIGHEST PRICE				NO. OF BOOKS	UNIT PRICE	
2	100	60.00%			HIGHEST	60	50	
3					LOWEST	40	20	
4					TOTAL PRICE		3800	
5								
6								
7								

	A	B	C	D	E	F	G
1	TOTAL BOOKS	%SOLD FOR HIGHEST PRICE				NO. OF BOOKS	UNIT PRICE
2	100	60.00%			HIGHEST	60	50
3					LOWEST	40	20
4					TOTAL PRICE		3800
5							
6							
7							

	A	B	C	D	E	F	G	H
1	TOTAL BOOKS	%SOLD FOR HIGHEST PRICE				NO. OF BOOKS	UNIT PRICE	
2	100	60.00%			HIGHEST	60	50	
3					LOWEST	40	20	
4					TOTAL PRICE		3800	
5								
6								
7								

## Step2: Data-What-If analysis-Scenario manager

The screenshot shows the Microsoft Excel ribbon with the following tabs: File, Home, Insert, Draw, Page Layout, Formulas, Data, Review, View, Automate, and Help. The **Data** tab is active, displaying various tools categorized as follows:

- Queries & Connections:** Get Data (From File, From Web, From Table/Range, From Recent Sources), Existing Connections, Refresh All, Properties, Range, Workbook Links.
- Data Types:** Stocks, Currencies, Geography.
- Sort & Filter:** Sort, Filter, Clear, Reapply, Advanced.
- Data Tools:** Queries & Connections, Text to Columns, Flash Fill, Remove Duplicates, Validation, Consolidate, Data Model, What-If Analysis, Forecast Sheet, Group, Ungroup.

The formula bar shows the active cell G4 containing the formula  $=F2*G2+F3*G3$ . Below the ribbon, the spreadsheet grid is visible, showing columns A through S and rows 1 through 6. Row 1 contains headers: TOTAL BOOKS, %SOLD FOR HIGHEST PRICE, NO. OF BOOKS, UNIT PRICE, and several blank cells. Row 2 contains numerical values corresponding to these headers.

Scenario Manager

Scenarios:

No Scenarios defined. Choose Add to add scenarios.

Add...

Delete

Edit...

Merge...

Summary...

Changing cells:

Comment:

Show Close

### Step3: Add a scenario

Add Scenario

Scenario name:

60%

Changing cells:

B2

Ctrl+click cells to select non-adjacent changing cells.

Comment:

Protection

☒ Prevent changes

☐ Hide

OK Cancel

Scenario Values

Enter values for each of the changing cells.


1:      \$B\$2    0.6

Add      OK      Cancel

Step4: Add 4 more(70%,80%,90%,100%)

Edit Scenario ? X

Scenario name:  
70%

Changing cells:  
B2 

Ctrl+click cells to select non-adjacent changing cells.

Comment:

Protection

☒ Prevent changes  
☐ Hide

OK Cancel

Scenario Values ? X


Enter values for each of the changing cells.

1:      \$B\$2    0.7

OK Cancel

Edit Scenario ? X

Scenario name:  
80%

Changing cells:  
B2 

Ctrl+click cells to select non-adjacent changing cells.

Comment:

Protection

☒ Prevent changes  
☐ Hide

OK Cancel

Scenario Values ? X

Enter values for each of the changing cells.

1:      \$B\$2    0.8

OK Cancel

Edit Scenario ? X

Scenario name:  
90%

Changing cells:  
B2

Ctrl+click cells to select non-adjacent changing cells.

Comment:  
|

Protection  
☒ Prevent changes  
☐ Hide

OK Cancel

Scenario Values ? X

Enter values for each of the changing cells.

1:      \$B\$2    0.9

OK Cancel

Edit Scenario ? X

Scenario name:

100%

Changing cells:

B2

Ctrl+click cells to select non-adjacent changing cells.

Comment:

Protection

☒ Prevent changes

☐ Hide

OK Cancel

Scenario Values ? X

Enter values for each of the changing cells.

1:      \$B\$2    1.0

OK Cancel

Scenario Manager ? X

Scenarios:

60%  
70%  
80%  
90  
100%

Add...  
Delete  
Edit...  
Merge...  
Summary...

Changing cells: \$B\$2

Comment:

Show Close

## Step5:Summary

Scenario Summary ? X

Report type

☒ Scenario summary

☐ Scenario PivotTable report

Result cells:

=G\$4

OK Cancel

## Step6:Output

Scenario Summary						
	Current Values:	60%	70%	80%	90%	100%
Changing Cells:						
\$B\$2	60.00%	60.00%	70.00%	80.00%	90.00%	100.00%
Result Cells:						
\$G\$4	3800	3800	4100	4400	4700	5000

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

## PRACTICAL 5

AIM: Perform the data classification using classification algorithm.

Step1: Open RStudio and create a new script

Step2: Code1

```
rainfalls<-c(799,1174,865,1334,635,918,686,998,784,985,882,1071)
1)
rainfalls.timeseries<-ts(rainfalls, start=c(2022,1), frequency=12)
print(rainfalls.timeseries)
```

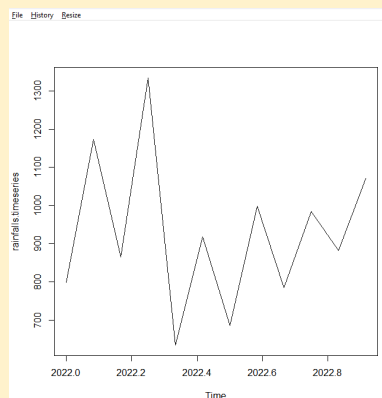
```
rainfalls<-c(799,1174,865,1334,635,918,686,998,784,985,882,1071)
rainfalls.timeseries<-ts(rainfalls, start=c(2022,1), frequency=12)
print(rainfalls.timeseries)
```

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	799	1174	865	1334	635	918	686	998	784	985	882	1071

Step3: Code2

```
png(file="rainfall")
plot(rainfalls.timeseries)
dev.off()
plot(rainfalls.timeseries)
```

```
> #Q2
> png(file="rainfall")
> plot(rainfalls.timeseries)
> dev.off()
null device
1
> plot(rainfalls.timeseries)
```





## PRACTICAL 6

### AIM: K-Means clustering using R.

## Step1: Code1

## #Q3

```
newiris<-iris
```

```
newiris$Species<-NULL
```

```
kc<-kmeans(newiris,3)
```

kc

[illegible]

## Step2: Code2

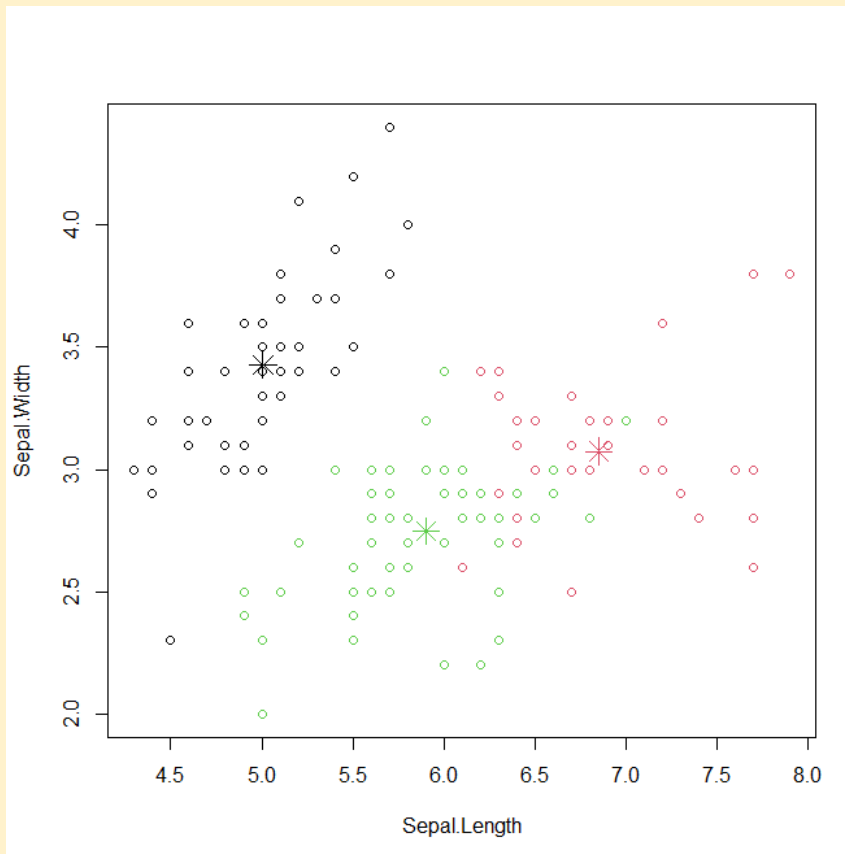
```
table(iris$Species, kc$cluster)
```

```
> table(iris$Species, kc$cluster)
```

	1	2	3
setosa	0	0	50
versicolor	2	48	0
virginica	36	14	0

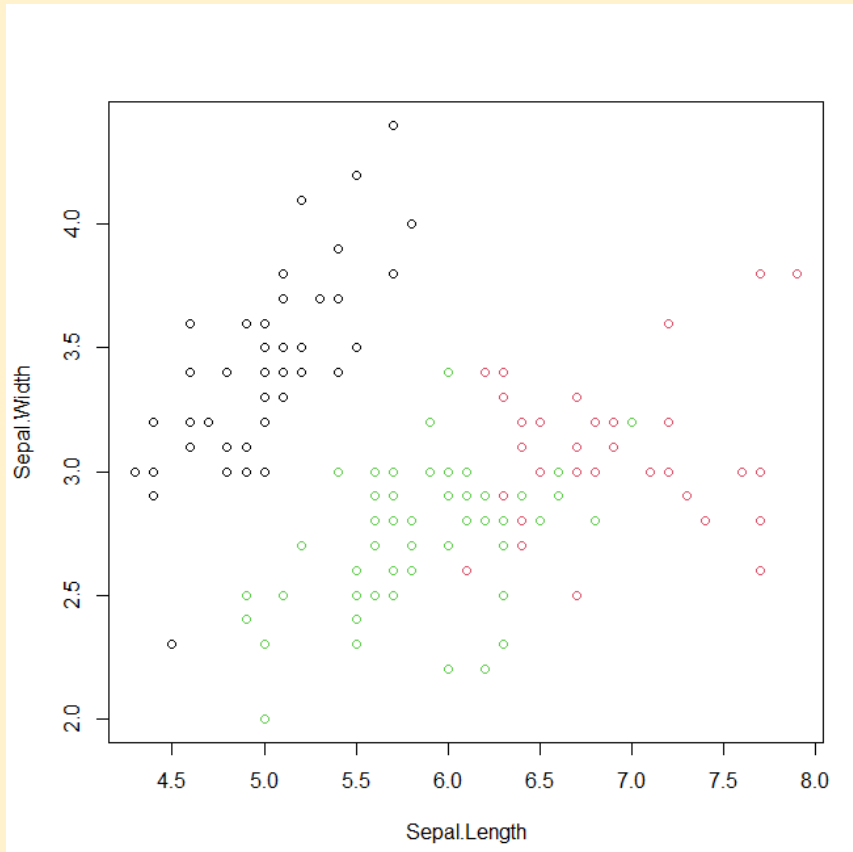
Step3: Code3

```
plot(newiris[c("Sepal.Length","Sepal.Width")],  
     col=kc$cluster)  
points(kc$centers[,c("Sepal.Length","Sepal.Width")],col=1:3,pch=8  
,cex=2)  
#dev.off()
```



#### Step4: Code4

```
plot(newiris[c("Sepal.Length", "Sepal.Width")],  
     col=kc$cluster)
```



## PRACTICAL 7

AIM: Predict using Linear Regression.

Step1: Code1

```
x<-c(151,174,138,186,128,136,179,163,152,131)
```

```
y<-c(63,81,56,91,47,57,76,72,62,48)
```

```
relation<-lm(y~x)
```

```
print(relation)
```

```
> x<-c(151,174,138,186,128,136,179,163,152,131)
> y<-c(63,81,56,91,47,57,76,72,62,48)
> relation<-lm(y~x)
> print(relation)
```

```
Call:
lm(formula = y ~ x)
```

```
Coefficients:
(Intercept)          x
   -38.4551         0.6746
```

Step2:Code2

```
x<-c(151,174,138,186,128,136,179,163,152,131)
```

```
y<-c(63,81,56,91,47,57,76,72,62,48)
```

```
relation<-lm(y~x)
```

```
print(summary(relation))
```

```
> x<-c(151,174,138,186,128,136,179,163,152,131)
> y<-c(63,81,56,91,47,57,76,72,62,48)
> relation<-lm(y~x)
> print(summary(relation))
```

```
Call:
lm(formula = y ~ x)
```

```
Residuals:
    Min       1Q   Median       3Q      Max
-6.3002 -1.6629  0.0412  1.8944  3.9775
```

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -38.45509     8.04901   -4.778  0.00139 **
x             0.67461     0.05191   12.997 1.16e-06 ***
```

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
Residual standard error: 3.253 on 8 degrees of freedom
Multiple R-squared:  0.9548,    Adjusted R-squared:  0.9491
F-statistic: 168.9 on 1 and 8 DF,  p-value: 1.164e-06
```

# PRACTICAL 8

AIM: Perform Logistic regression on the given data warehouse data.

Step1: Download the quality.csv file in C drive-In R write the code

Code:

```
quality <- read.csv("C:/quality.csv")
```

```
str(quality)
```

```
table(quality$PoorCare)
```

```
98/131
```

```
install.packages("caTools")
```

```
library(caTools)
```

```
set.seed(88)
```

```
C:\Users\Admin\AppData\Local\Temp\RtmpME51y1\downloaded_packages
> quality <- read.csv("C:/quality.csv")
> str(quality)
'data.frame': 131 obs. of 14 variables:
 $ MemberID      : int  1 2 3 4 5 6 7 8 9 10 ...
 $ InpatientDays  : int  0 1 0 0 8 2 16 2 2 4 ...
 $ ERVisits       : int  0 1 0 1 2 0 1 0 1 2 ...
 $ OfficeVisits   : int  18 6 5 19 19 9 8 8 4 0 ...
 $ Narcotics      : int  1 1 3 0 3 2 1 0 3 2 ...
 $ DaysSinceLastERVisit: num 731 411 731 158 449 ...
 $ Pain           : int  10 0 10 34 10 6 4 5 5 2 ...
 $ TotalVisits    : int  18 8 5 20 29 11 25 10 7 6 ...
 $ ProviderCount  : int  21 27 16 14 24 40 19 11 28 21 ...
 $ MedicalClaims  : int  93 19 27 59 51 53 40 28 20 17 ...
 $ ClaimLines     : int  222 115 148 242 204 156 261 87 98 66 ...
 $ StartedonCombination: logi FALSE FALSE FALSE FALSE FALSE ...
 $ AcuteDrugGapSmall : int  0 1 5 0 0 4 0 0 0 0 ...
 $ PoorCare       : int  0 0 0 0 0 1 0 0 1 0 ...
> table(quality$PoorCare)
 0  1
98 33
> 98/131
[1] 0.7480916
> install.packages("caTools")
WARNING: Rtools is required to build R packages but is not currently installed. Please download and install the
appropriate version of Rtools before proceeding:

https://cran.rstudio.com/bin/windows/Rtools/
Installing package into 'C:/Users/Admin/AppData/Local/R/win-library/4.2'
(as 'lib' is unspecified)

There is a binary version available but the source version is later:
  binary source needs_compilation
caTools 1.18.2 1.18.3          TRUE

Binaries will be installed
warning in install.packages :
the 'wininet' method is deprecated for http:// and https:// URLs
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/caTools_1.18.2.zip'
Content type 'application/zip' length 246195 bytes (240 KB)
downloaded 240 KB

package 'caTools' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
C:\Users\Admin\AppData\Local\Temp\RtmpME51y1\downloaded_packages
> library(caTools)
warning message:
package 'caTools' was built under R version 4.2.3
> set.seed(88)
> |
```

Step2:Run this code with the above code

Code:

```
split=sample.split(quality$PoorCare,SplitRatio=0.75)
```

split

```
> split=sample.split(quality$PoorCare,SplitRatio=0.75)
> split
[1] TRUE TRUE TRUE TRUE FALSE TRUE FALSE TRUE FALSE FALSE TRUE FALSE TRUE TRUE TRUE TRUE TRUE
[18] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE FALSE TRUE TRUE TRUE TRUE FALSE FALSE FALSE TRUE
[35] TRUE TRUE FALSE TRUE TRUE TRUE TRUE FALSE FALSE TRUE TRUE FALSE TRUE FALSE TRUE FALSE TRUE
[52] FALSE FALSE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE FALSE TRUE TRUE
[69] TRUE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE FALSE TRUE
[86] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE
[103] TRUE FALSE TRUE TRUE TRUE FALSE TRUE FALSE FALSE TRUE TRUE FALSE TRUE TRUE TRUE FALSE TRUE
[120] TRUE FALSE TRUE TRUE FALSE TRUE TRUE FALSE TRUE TRUE TRUE FALSE
```

Step3:Run this code

Code:

```
qualityTrain=subset(quality,split==TRUE)
```

```
qualityTest=subset(quality,split==FALSE)
```

```
nrow(qualityTrain)
```

```
> qualityTrain=subset(quality,split==TRUE)
> qualityTest=subset(quality,split==FALSE)
> nrow(qualityTrain)
[1] 99
>
```

Step4:Run this code

Code:

```
QualityLog=glm(PoorCare~OfficeVisits+Narcotics,
```

```
data=qualityTrain,family=binomial)
```

```
summary(QualityLog)
```

```
> QualityLog=glm(PoorCare~OfficeVisits+Narcotics, data=qualityTrain,family=binomial)
> summary(QualityLog)

Call:
glm(formula = PoorCare ~ officeVisits + Narcotics, family = binomial,
    data = qualityTrain)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.06303  -0.63155  -0.50503  -0.09689   2.16686

Coefficients:
            Estimate Std. Error z value Pr(>|z|)
(Intercept) -2.64613    0.52357  -5.054 4.33e-07 ***
OfficeVisits  0.08212    0.03055   2.688  0.00718 **
Narcotics     0.07630    0.03205   2.381  0.01728 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 111.888  on 98  degrees of freedom
Residual deviance: 89.127  on 96  degrees of freedom
AIC: 95.127

Number of Fisher Scoring iterations: 4
```

Step5:Run this code

Code:

```
predictTrain=predict(QualityLog,type = "response")
summary(predictTrain)
```

```
> predictTrain=predict(QualityLog,type = "response")
> summary(predictTrain)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
0.06623 0.11912 0.15967 0.25253 0.26765 0.98456
> |
```

Step6:Run this code

Code:

```
tapply(predictTrain,qualityTrain$PoorCare,mean)
```

```
table(qualityTrain$PoorCare,predictTrain>0.5)
```

```
table(qualityTrain$PoorCare,predictTrain>0.7)
```

8/25

73/74

```
table(qualityTrain$PoorCare,predictTrain>0.2)
```

16/25

54/74

```
> tapply(predictTrain,qualityTrain$PoorCare,mean)
      0      1
0.1894512 0.4392246
> table(qualityTrain$PoorCare,predictTrain>0.5)
      FALSE TRUE
0        70    4
1        15   10
> table(qualityTrain$PoorCare,predictTrain>0.7)
      FALSE TRUE
0        73    1
1        17    8
> 8/25
[1] 0.32
> 73/74
[1] 0.9864865
> table(qualityTrain$PoorCare,predictTrain>0.2)
      FALSE TRUE
0         54   20
1          9   16
> 16/25
[1] 0.64
> 54/74
[1] 0.7297297
```

Step7:Run this code

Code:

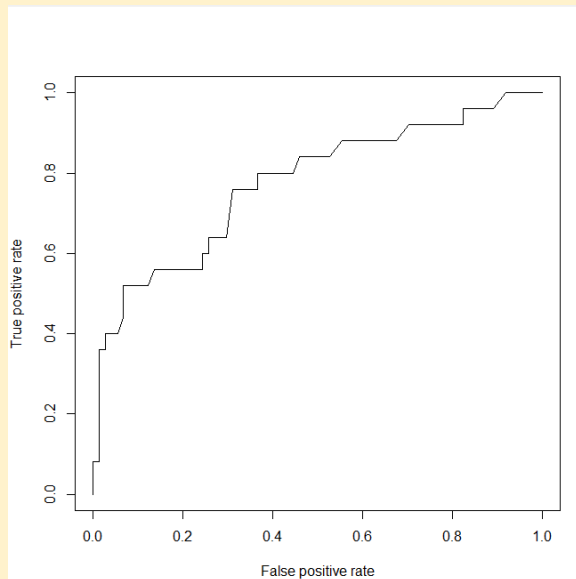
```
install.packages("ROCR")
```

```
library(ROCR)
```

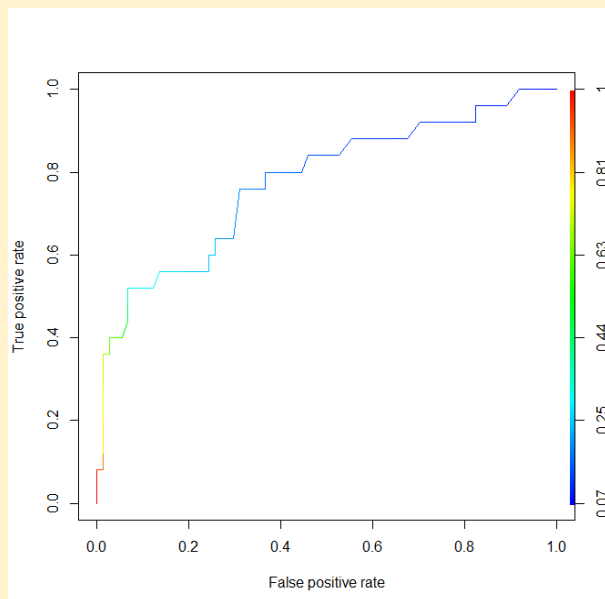
```
ROCRpred=prediction(predictTrain,qualityTrain$PoorCare)
```

```
ROCRperf=performance(ROCRpred,"tpr","fpr")
```

```
plot(ROCRperf)
```

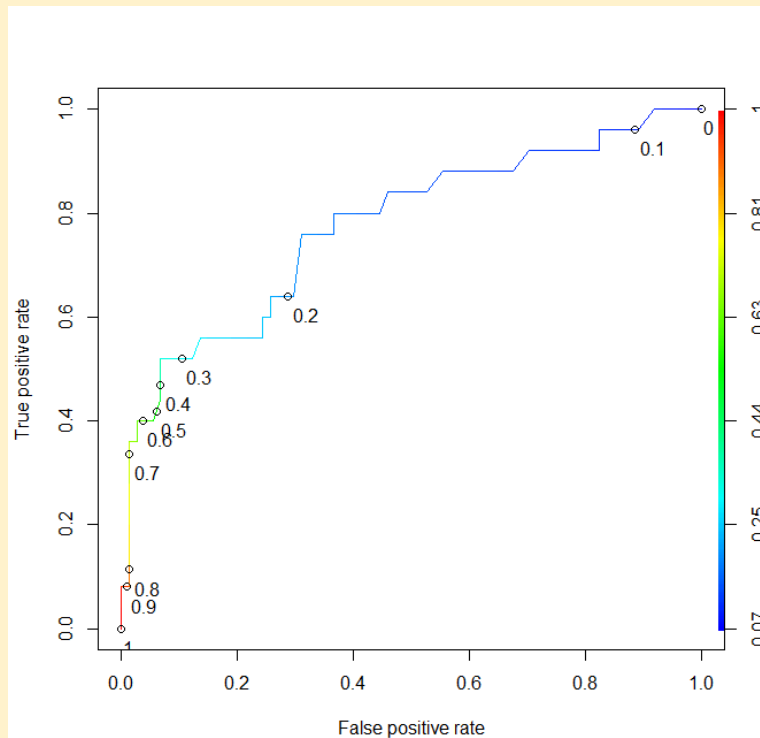


```
plot(ROCRperf,colorize=TRUE)
```





```
plot(ROCRperf,colorize=TRUE,print.cutoffs.at=seq(0,1,by=0.1),text.adj=c(-0.2,1.7))
```



# PRACTICAL 9

AIM: Create a sales dashboard with key metrics like Total Sales, Sales by Region, and Sales over Time.

Step 1: Install Power BI Desktop

Step 2: Load Data into Power BI

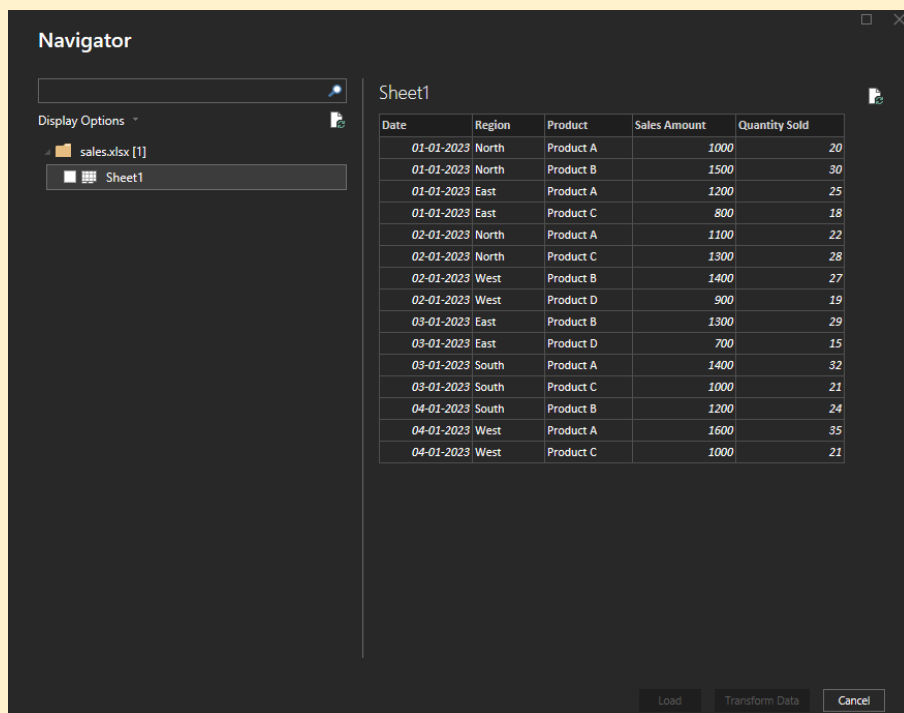
1. Open Power BI Desktop: Launch Power BI Desktop after installation.

2. Get Data:

- For this example, we'll use an Excel file with sales data.
- Browse to the location of the file and select it.

3. Select the Data:

- After loading the file, you'll see the Navigator window with the tables in the Excel file.



- Select the table(s) you need for your dashboard (e.g., Sales Data Table).
- Click Load to bring the data into Power BI.

Date	Region	Product	Sales Amount	Quantity Sold
01 January 2023	North	Product A	1000	20
01 January 2023	North	Product B	1500	30
01 January 2023	East	Product A	1200	25
01 January 2023	East	Product C	800	18
02 January 2023	North	Product A	1100	22
02 January 2023	North	Product C	1300	28
02 January 2023	West	Product B	1400	27
02 January 2023	West	Product D	900	19
03 January 2023	East	Product B	1300	29
03 January 2023	East	Product D	700	15
03 January 2023	South	Product A	1400	32
03 January 2023	South	Product C	1000	21
04 January 2023	South	Product B	1200	24
04 January 2023	West	Product A	1600	35
04 January 2023	West	Product C	1000	21

### Step 3: Prepare Data (Optional)

#### 1. Transform Data (if needed):

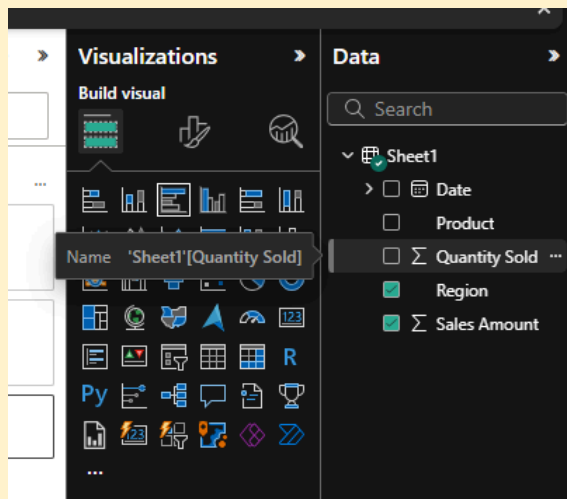
- If you need to clean or modify the data (e.g., remove columns, change data types), click on Transform Data.
- Use the Power Query Editor to clean and transform the data.
- Once done, click Close & Apply to load the cleaned data.

## Step 4: Create Visualizations

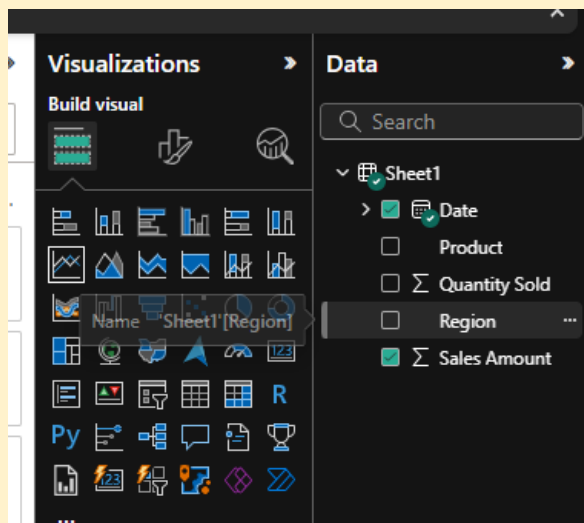
### 1. Select a Visualization Type:

- On the Visualizations pane, you can choose different types of charts and tables, like:

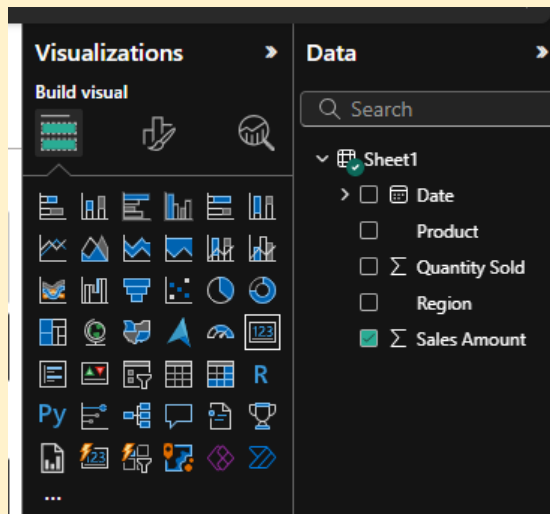
#### Bar Chart for Sales by Region.



#### Line Chart for Sales over Time.

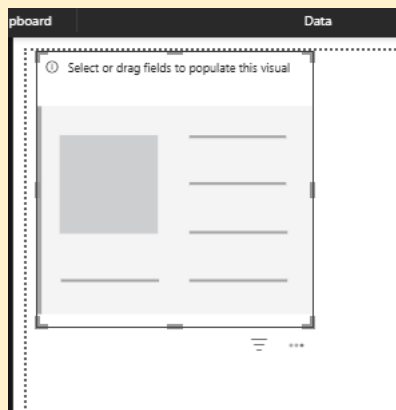


## Card for Total Sales.



### 2. Create a Total Sales Card:

- In the Visualizations pane, click the Card visualization.



- Drag the Sales Amount field into the "Values" section of the card.
- This will show the total sales on the dashboard.

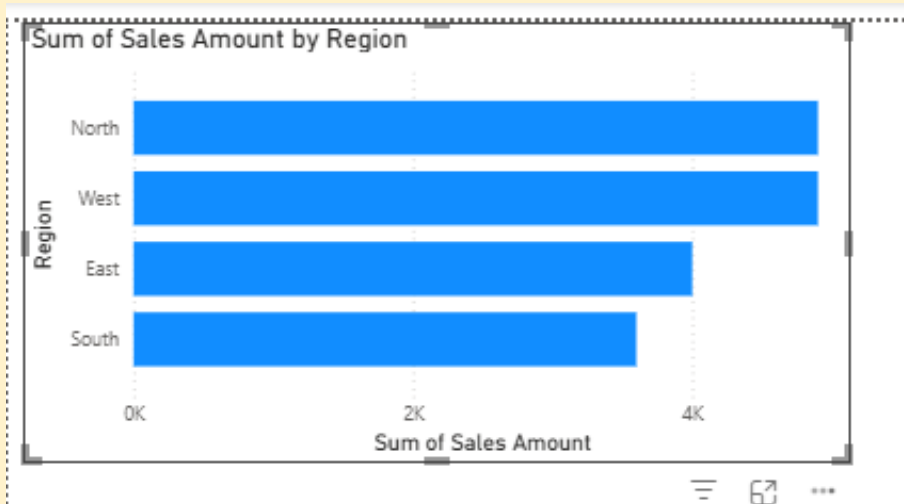


### 3. Create a Sales by Region Bar Chart:

- Click the Clustered Bar Chart from the Visualizations pane.

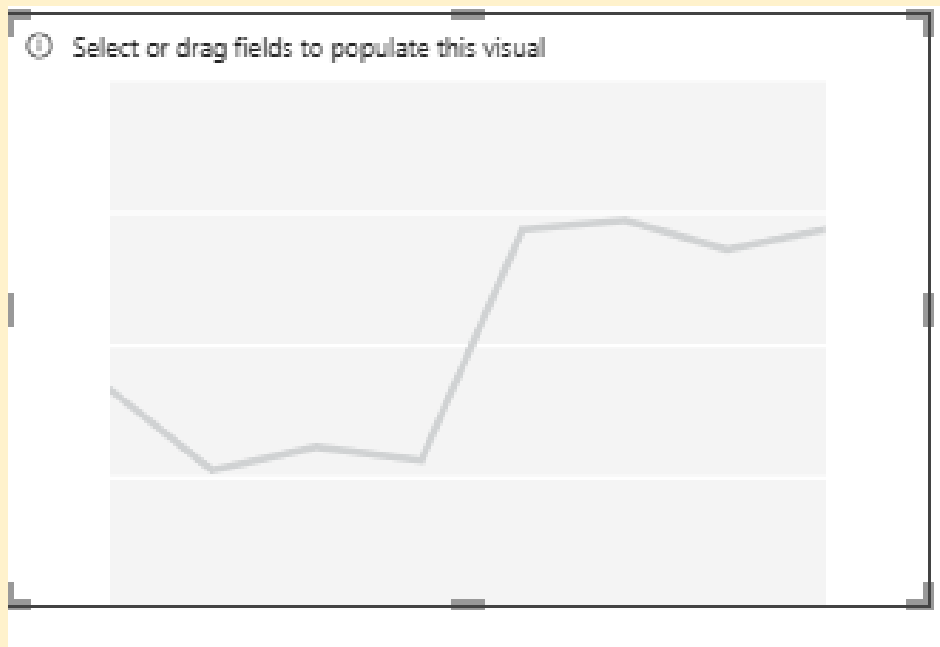


- Drag the Region field to the "Axis" section.
- Drag the Sales Amount field to the "Values" section.
- This will create a bar chart showing sales by region.

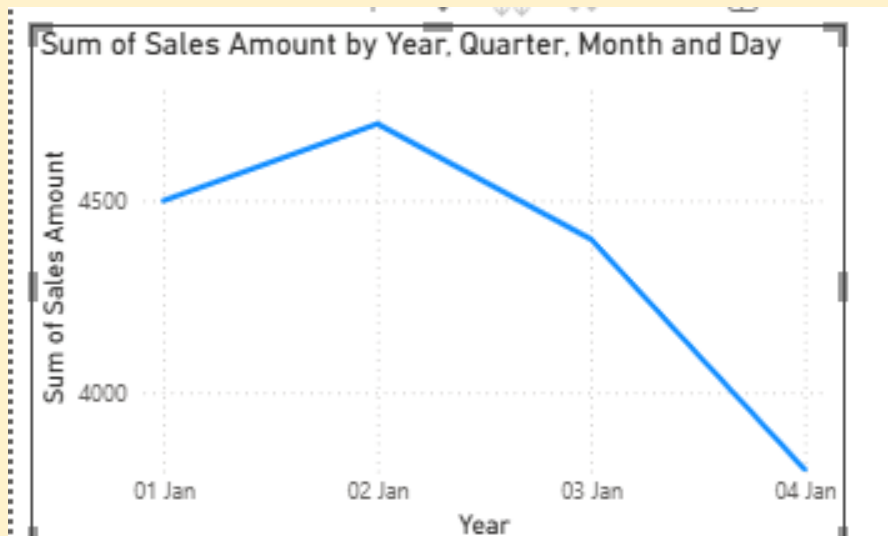


#### 4. Create Sales Over Time Line Chart:

- Click the Line Chart from the Visualizations pane.



- Drag the Date field to the "Axis" section.
- Drag the Sales Amount field to the "Values" section.
- This will show how sales have changed over time.



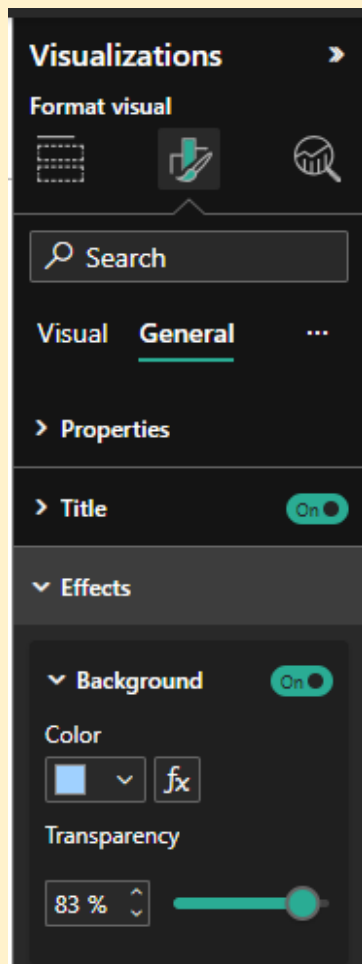
## Step 5: Format Your Dashboard

### 1. Resize and Arrange:

- Click and drag the visualizations to arrange them on the canvas.
- Resize each visualization by dragging the corners.

### 2. Change Colors:

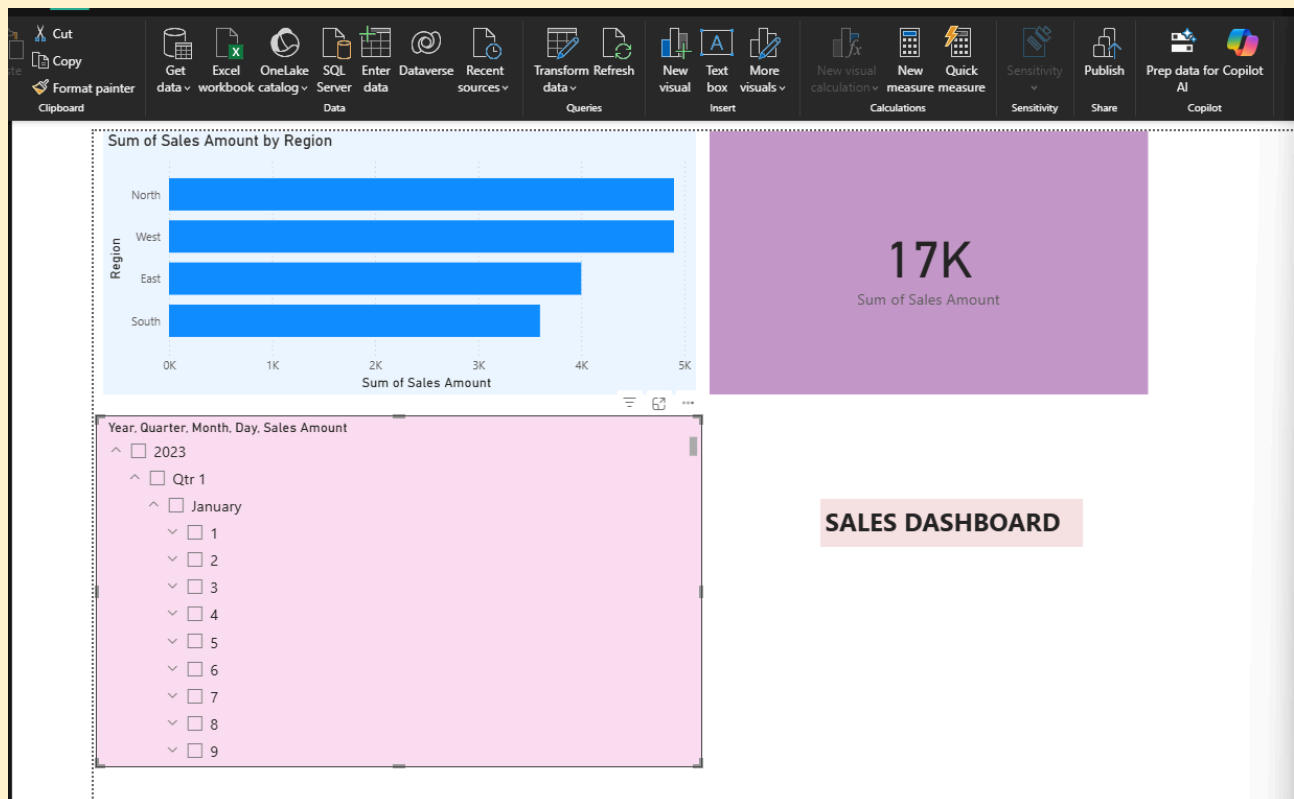
- Select a visualization, then go to the Format pane (paint roller icon).
- Customize the colors, titles, and labels to match your desired style.





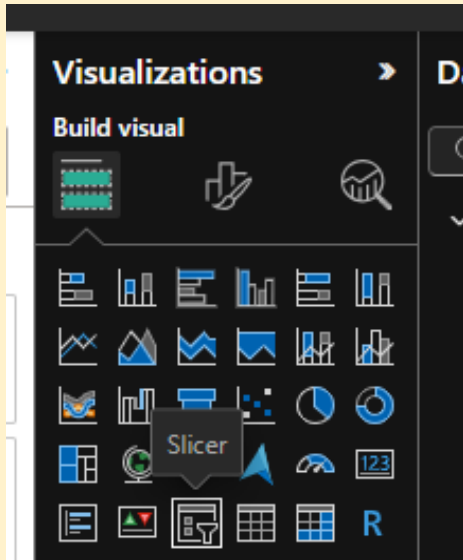
### 3. Add Titles:

- To add a title to your dashboard, click on the Text box icon from the Home tab.
- Type your title, e.g., &quot;Sales Dashboard&quot;.

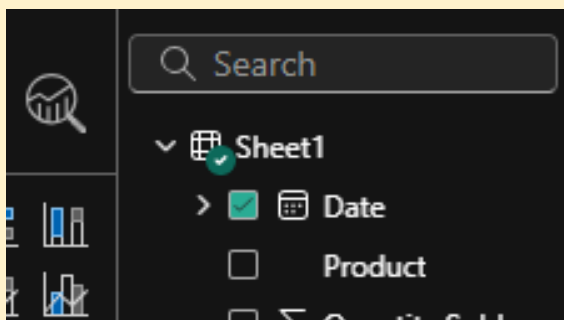


#### 4. Add Filters (Optional):

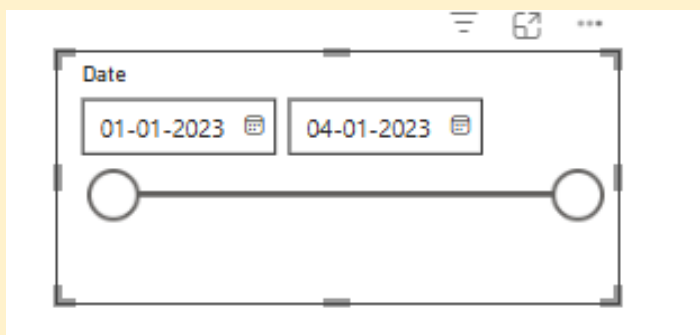
- To filter data by Region or Date, you can add slicers.
- Click on Slicer from the Visualizations pane.



- Drag the Region or Date field to the slicer.



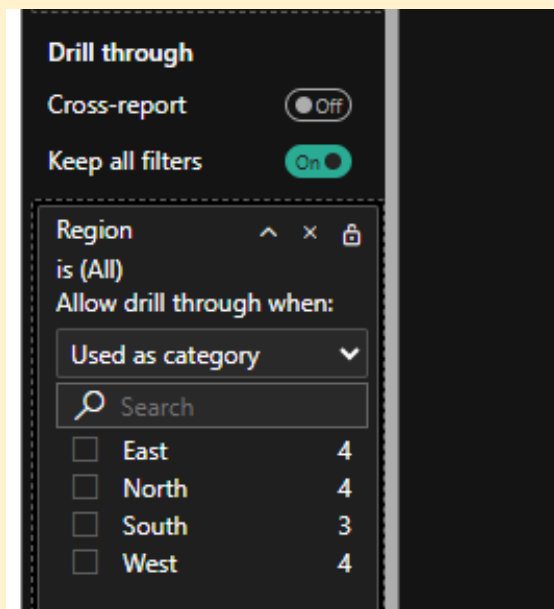
- Now, users can interact with the dashboard and filter data by region or Time.



## Step 6: Interactivity and Drilldowns

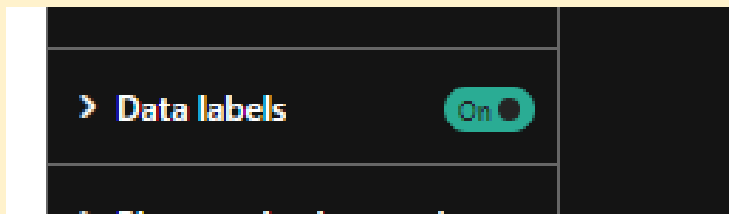
### 1. Enable Drillthrough (Optional):

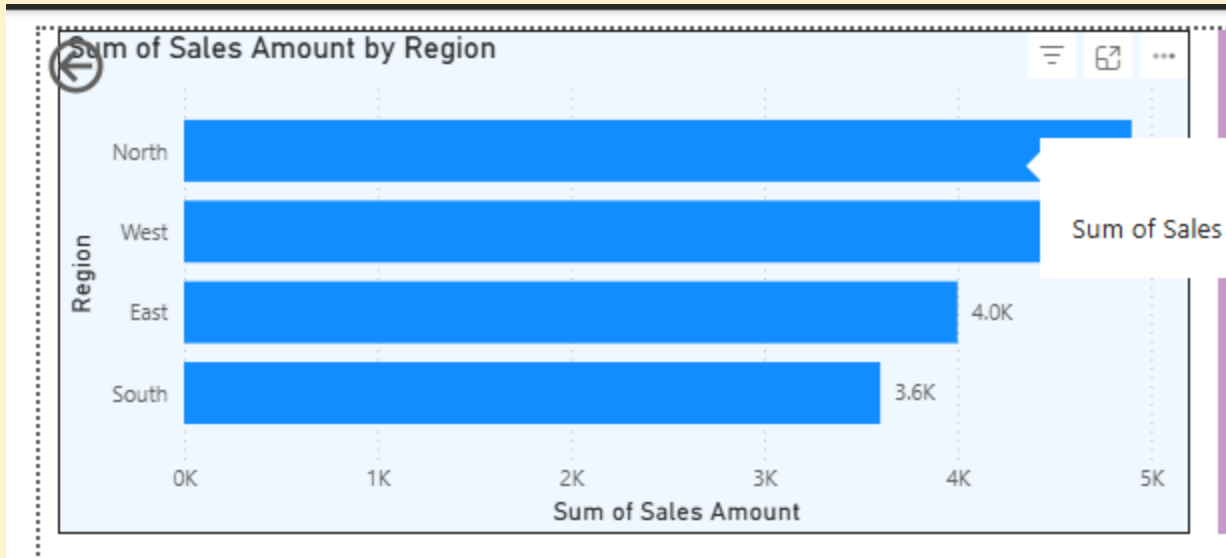
- Right-click a chart (e.g., the bar chart by Region) and select Drillthrough.
- Choose a field (e.g., Region) to create a drillthrough page.  
This allows users to right-click and “drill into” a specific region for more detailed data.



### 2. Add Data Labels:

- For better clarity, you can enable Data Labels in your visualizations to show values directly on the chart.
- Select a chart, go to the Format pane, and turn on Data Labels.





## Step 7: Save and Publish Your Dashboard

