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BUSINESS INTELLIGENCE JOURNAL

Sr No	PRACTICALS
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.

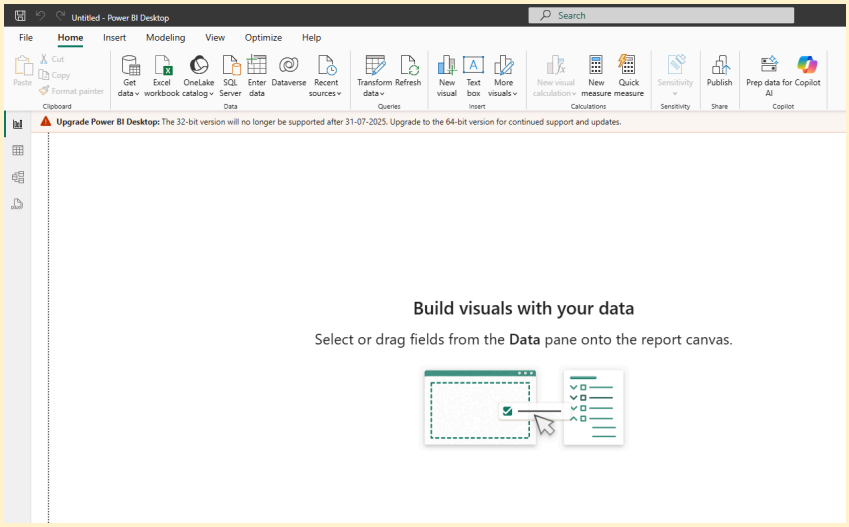
PRACTICAL 1

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

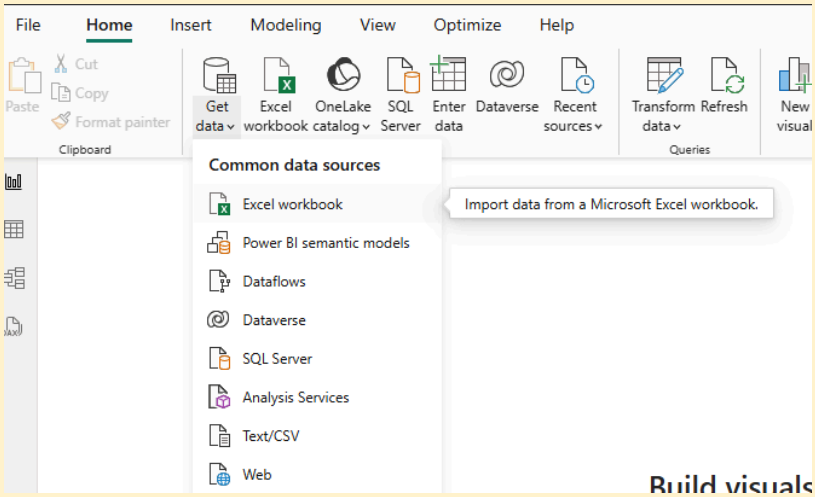
A. IMPORTING EXCEL DATA TO POWER BI

Step 1: Download the Excel.

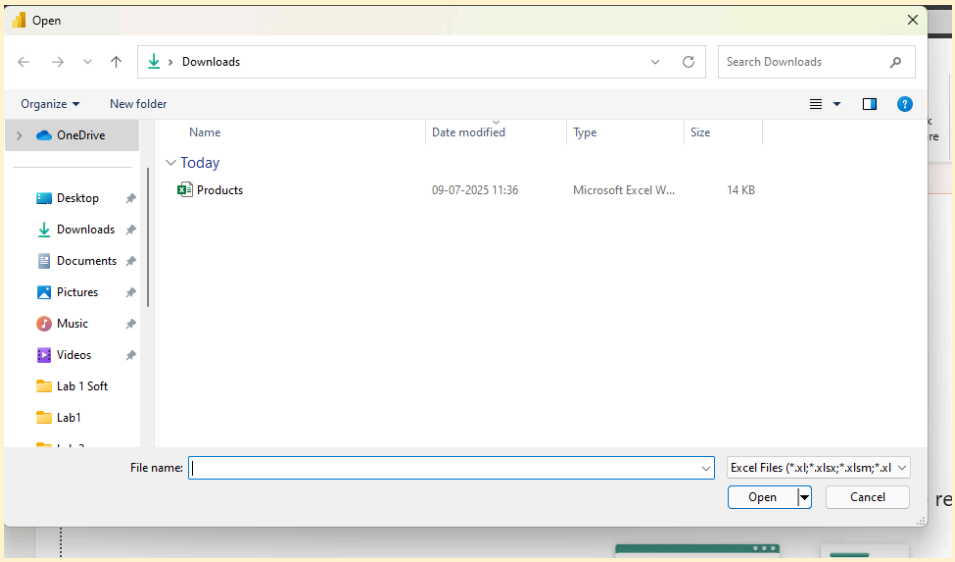
Step 2: Click on Get Data.



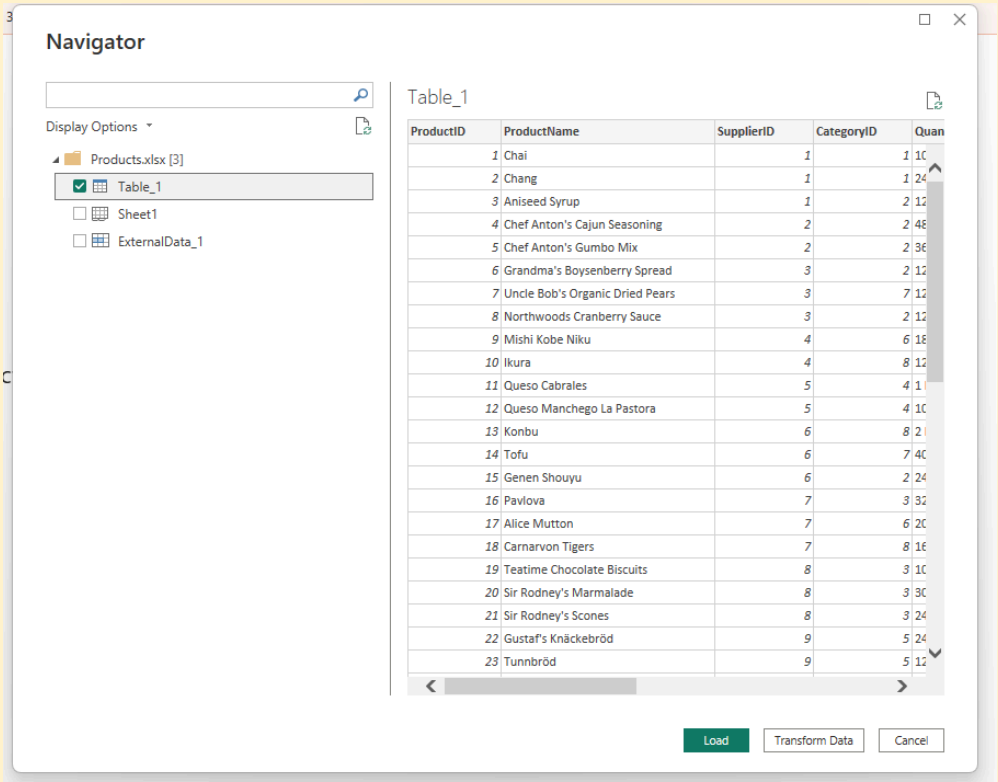
Step 3: Click Excel Workbook.



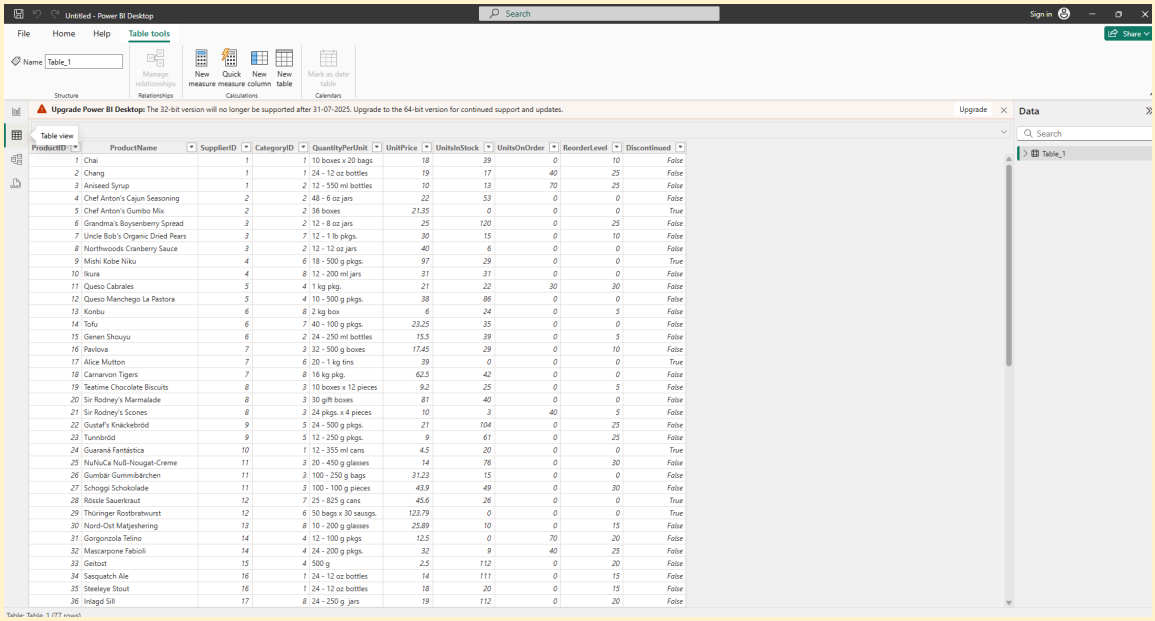
Step 4:Select the downloaded Table.



Step 5:Load the table.

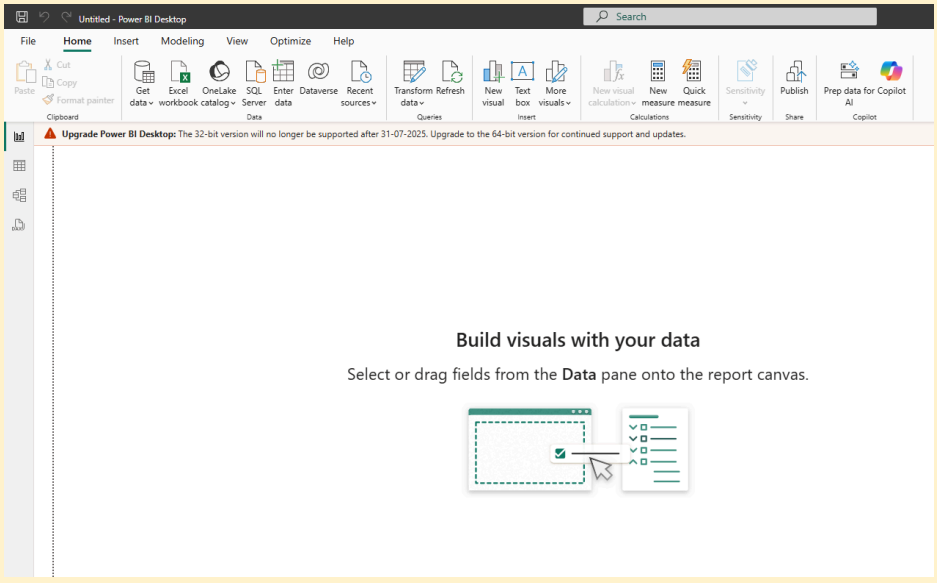


Step 6: Go to Table View on the left side of the page to view the table.

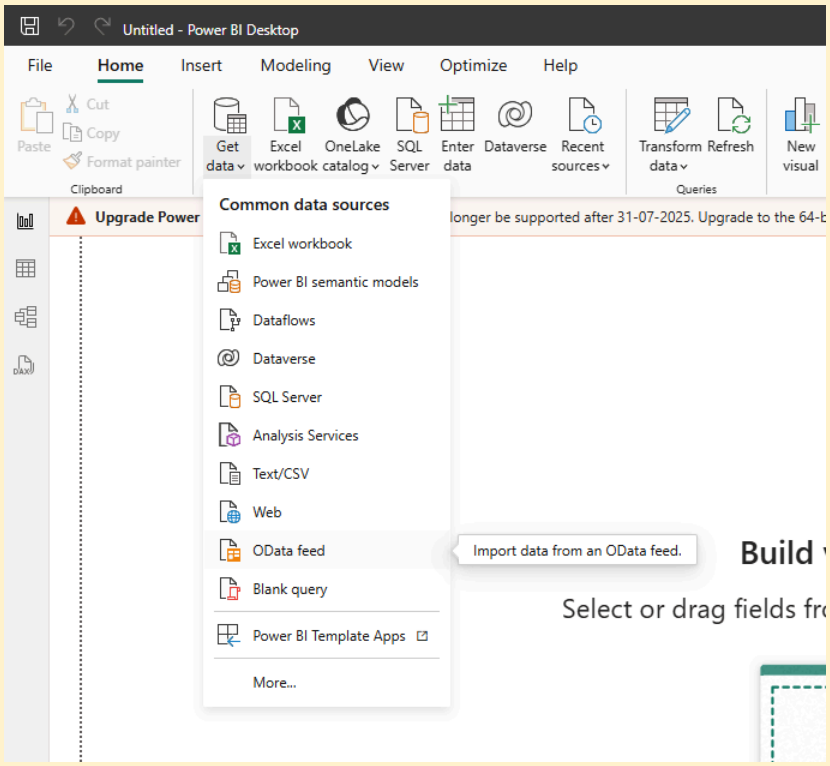


B.IMPORTING ODATA TO POWER BI

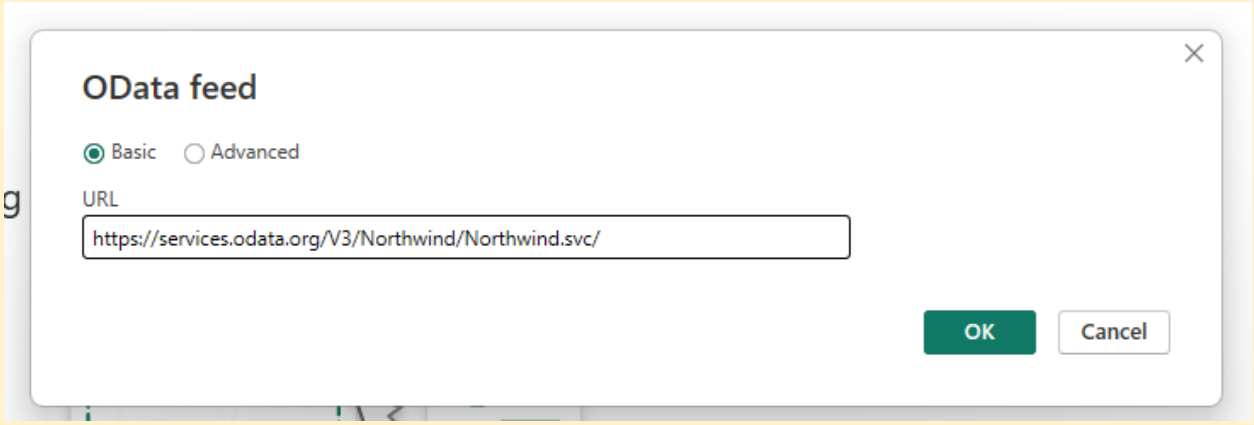
Step 1: Click on Get Data.



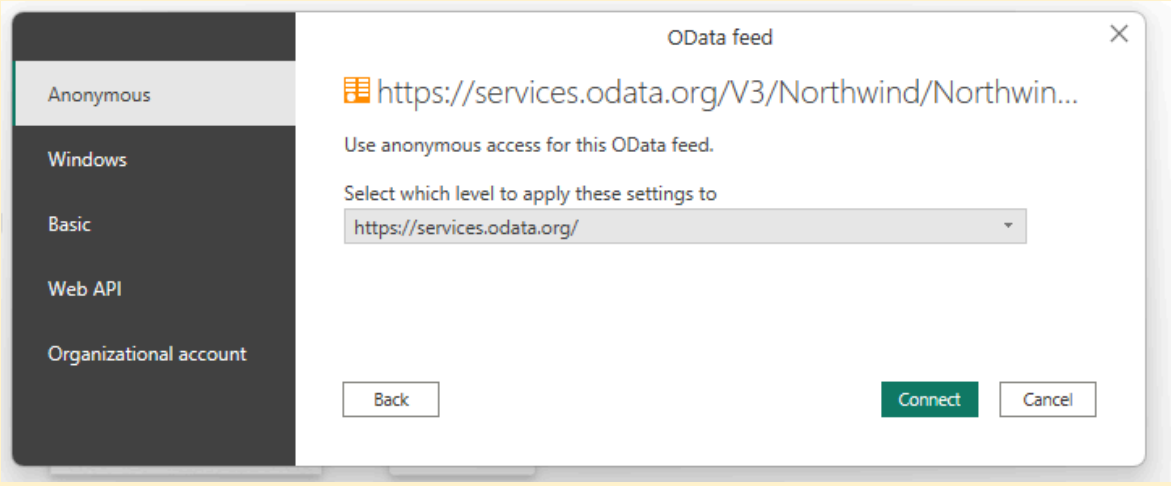
Step 2:Click on Odata.



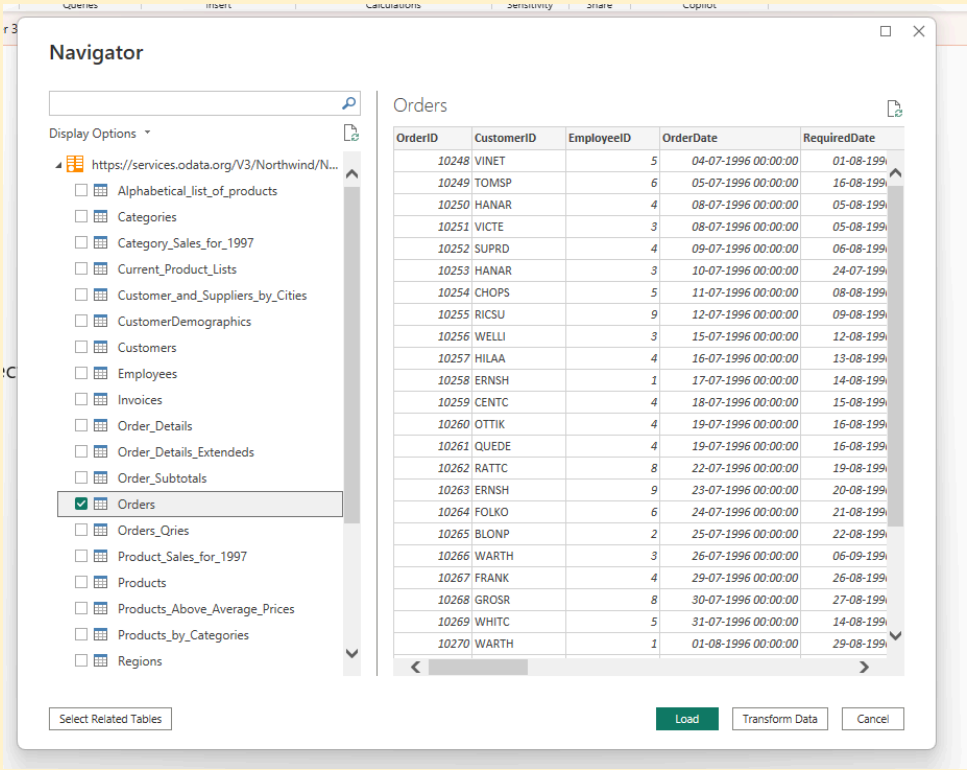
Step 3:Type the Link.



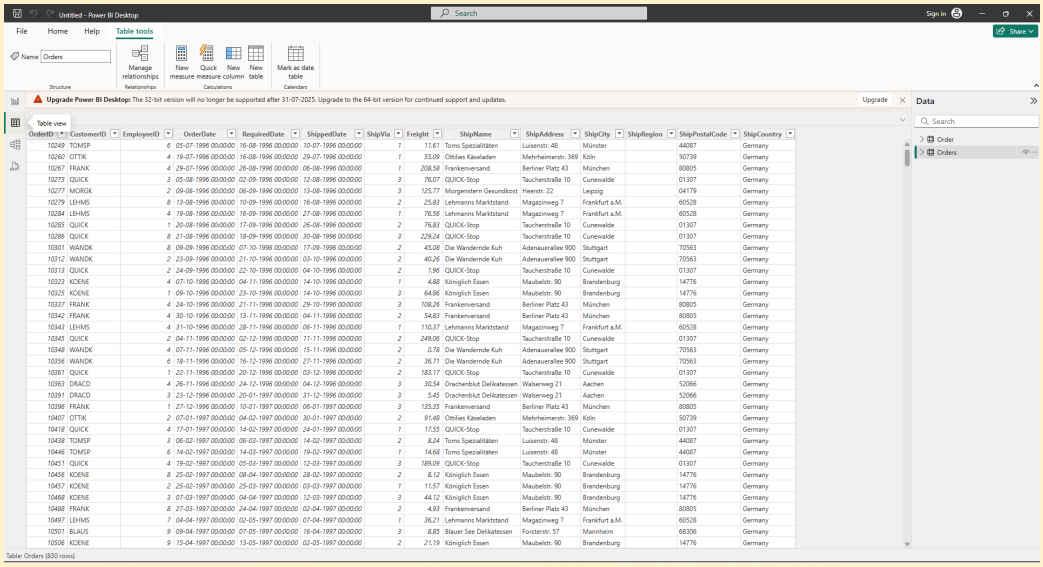
Step 4: Click on Connect.



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.

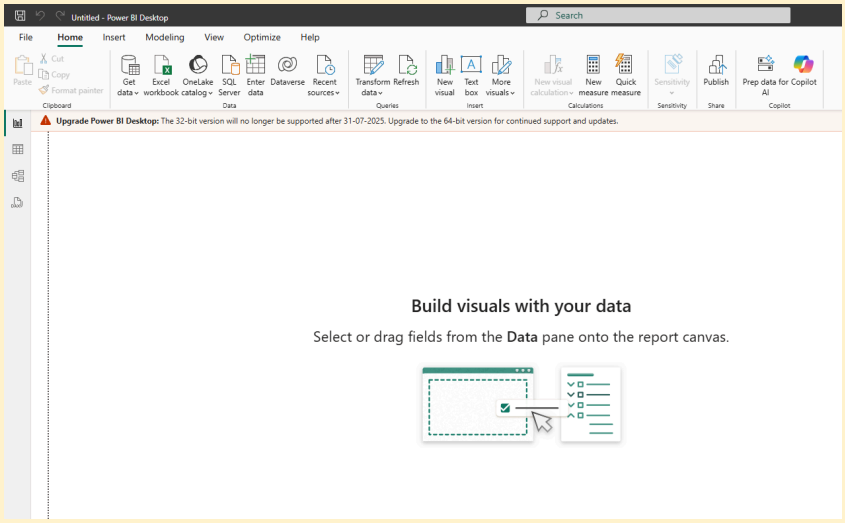


PRACTICAL 2

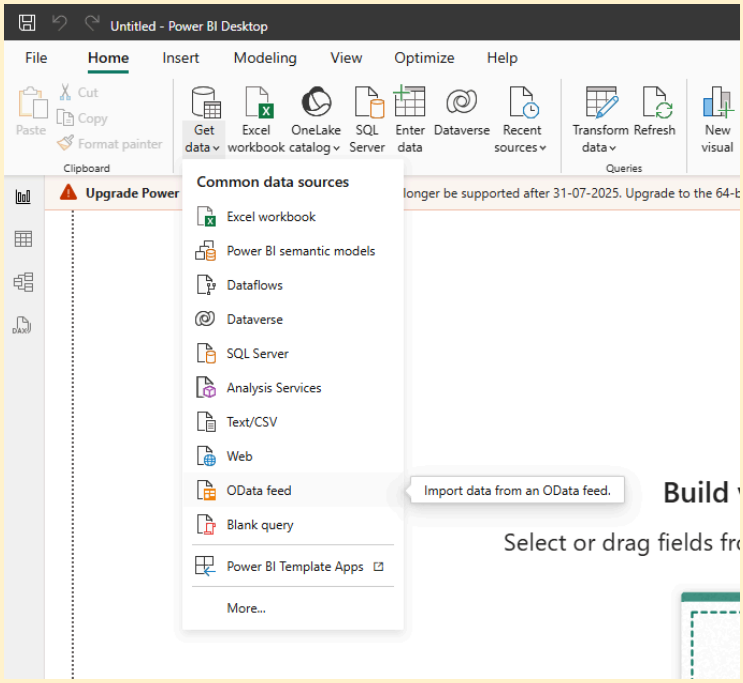
AIM: Perform the Extraction Transformation and Loading (ETL) process to construct the database in the SQL Server/ Power BI.

A. ETL process in PowerBI

Step 1: Click on Get Data.

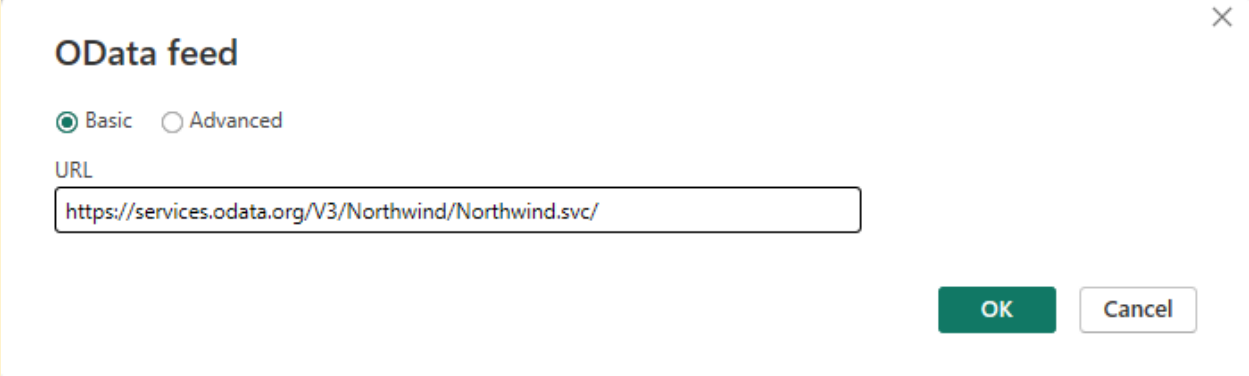


Step 2:Click on Odata.

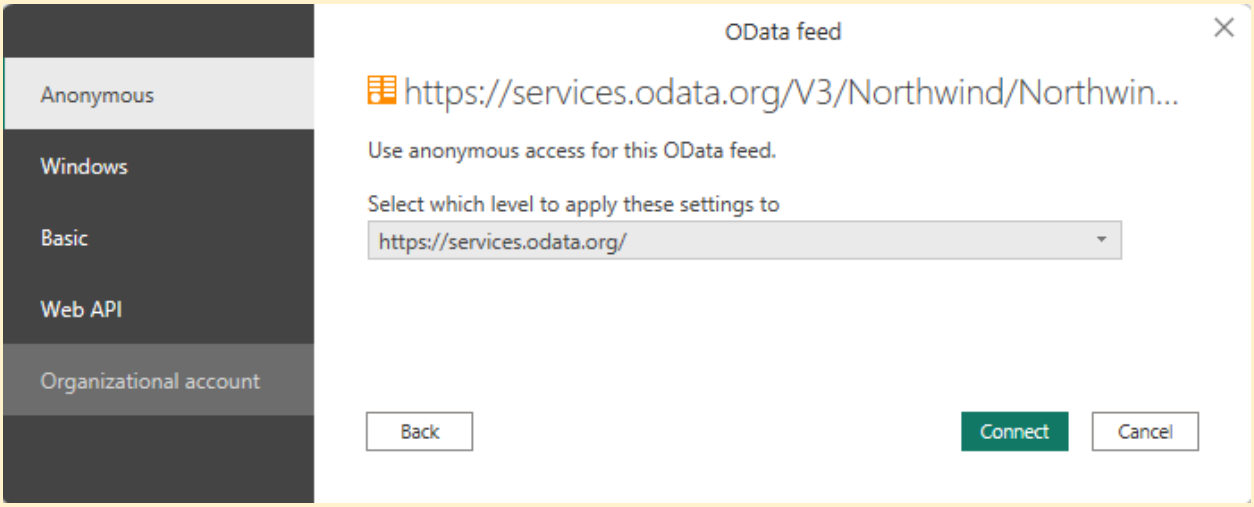


Step 3:Type the Link.

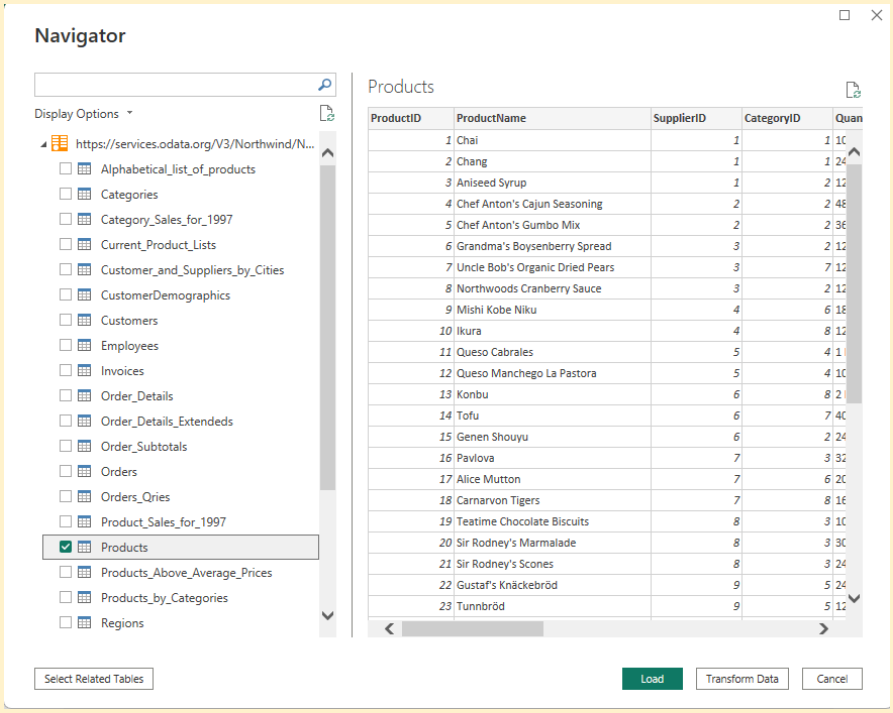
https://services.odata.org/V3/Northwind/Northwind.svc/



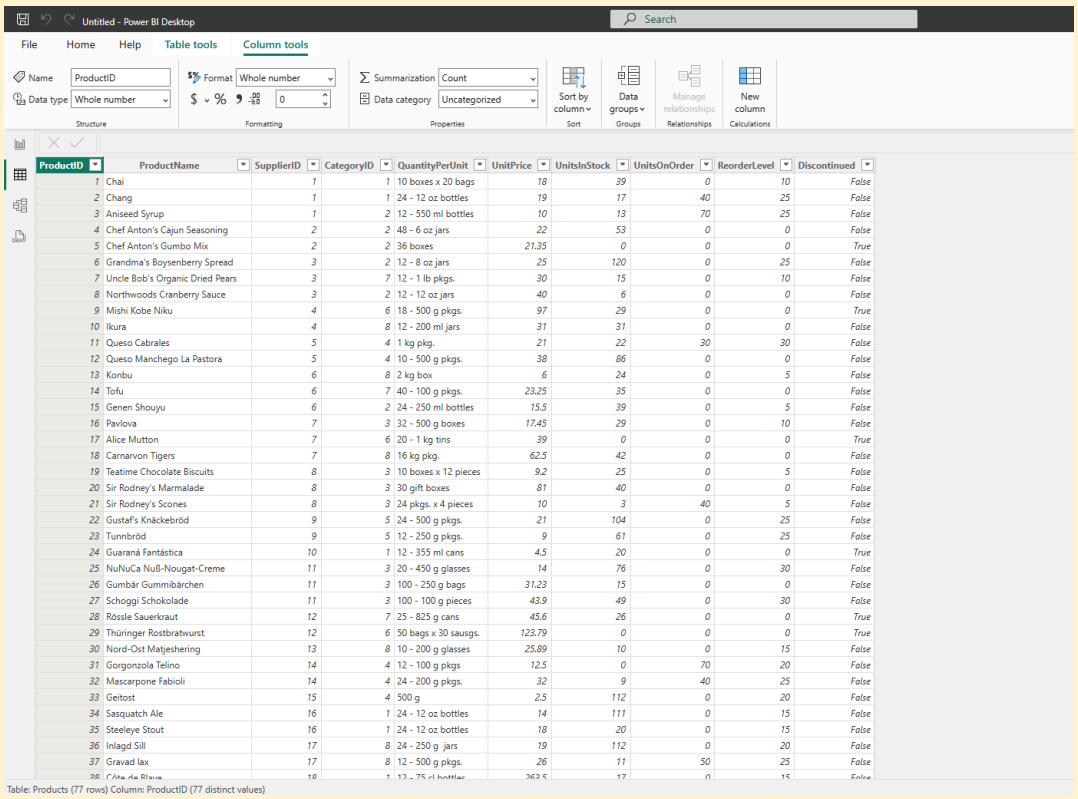
Step 4: Click on Connect.



Step 5:Click On Product Table and Load.



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.

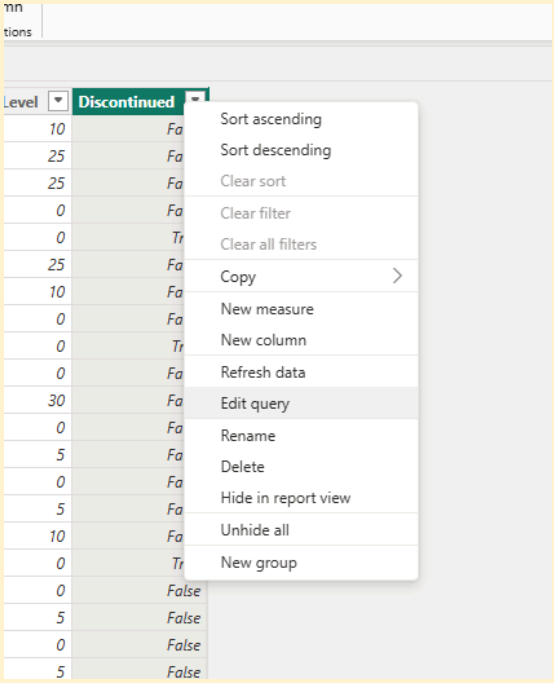


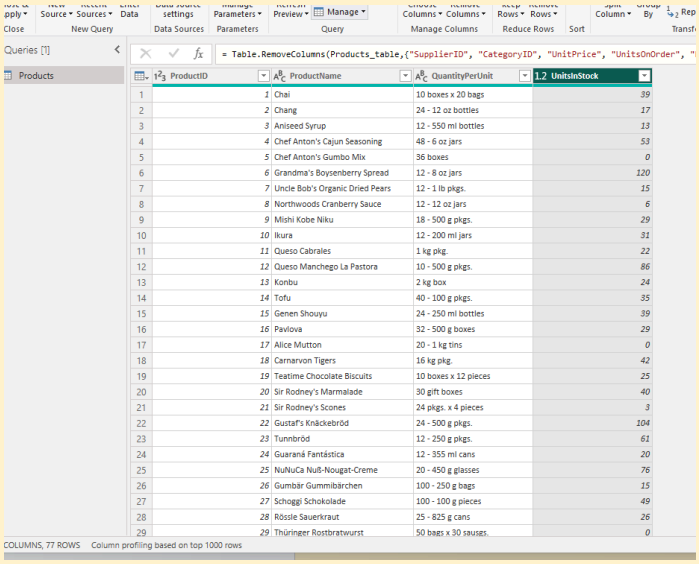
Step6: Remove other column to only display columns of interest in Query Editor, select the ProductID, ProductName, QuantityPerUnit and UnitInsTStocks

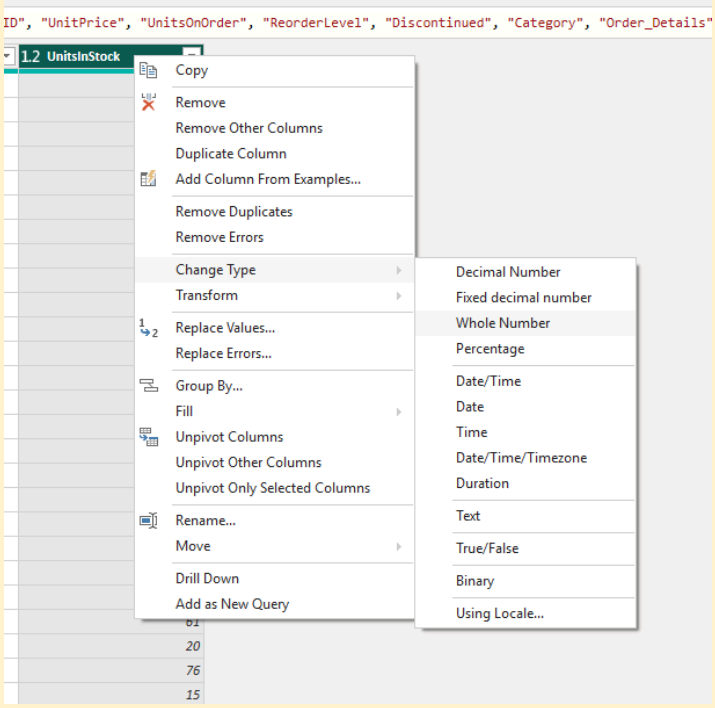
.Click on Edit Query

.Select and Remove column

.Right click and change to Whole Numbers







Step7: Query editor window will appear

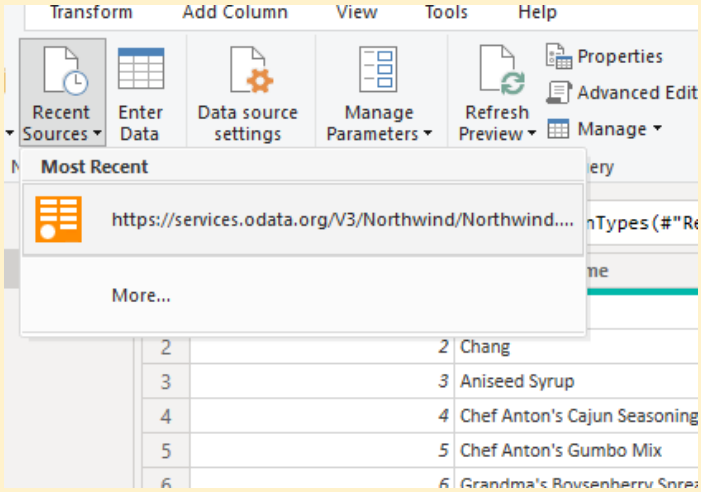
.In the query view, scroll to the order_detail column

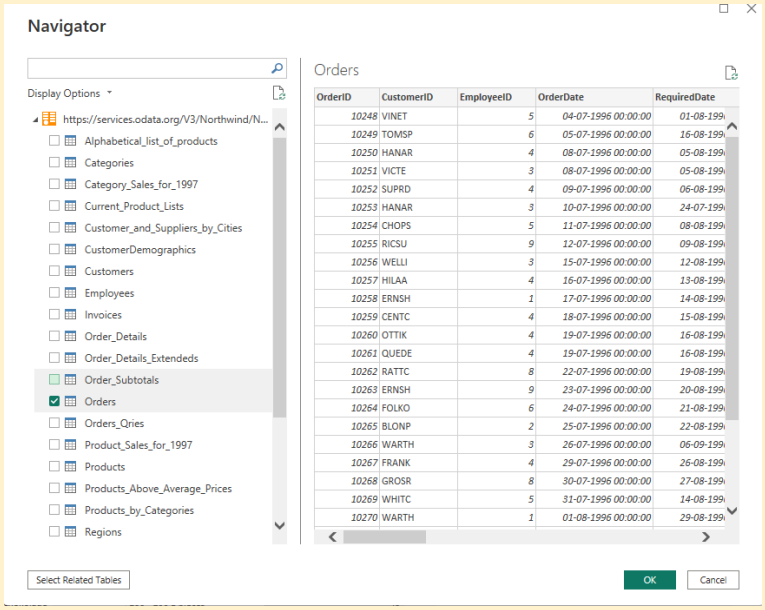
.In the order_detail column, select the expand icon

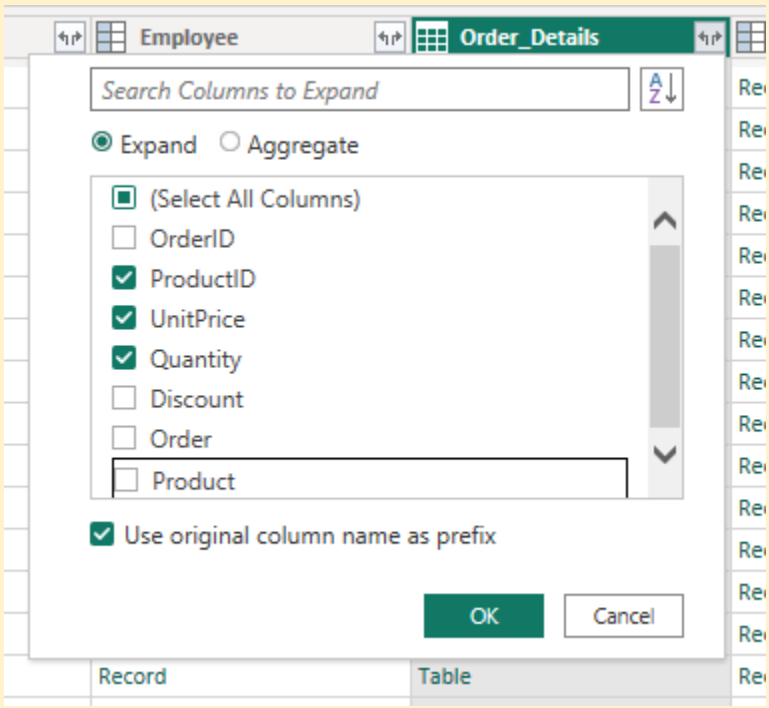
.In the expand drop down:

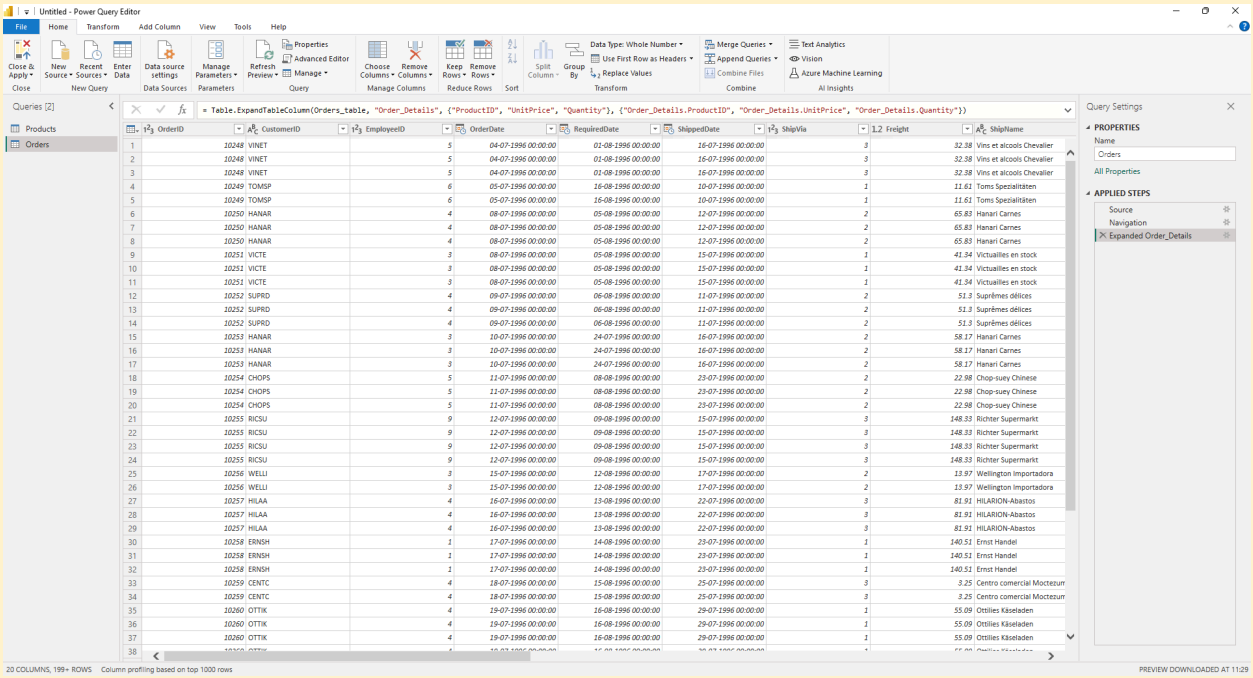
.select (Select all column) to clear the columns

.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_Qries
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 01-08-199
10249 TOMSP 6 05-07-1996 00:00:00 16-08-199
10250 HANAR 4 08-07-1996 00:00:00 05-08-199
10251 VICTE 3 08-07-1996 00:00:00 05-08-199
10252 SUPRD 4 09-07-1996 00:00:00 06-08-199
10253 HANAR 3 10-07-1996 00:00:00 24-07-199
10254 CHOPS 5 11-07-1996 00:00:00 08-08-199
10255 RICSU 9 12-07-1996 00:00:00 09-08-199
10256 WELLI 3 15-07-1996 00:00:00 12-08-199
10257 HILAA 4 16-07-1996 00:00:00 13-08-199
10258 ERNSH 1 17-07-1996 00:00:00 14-08-199
10259 CENTC 4 18-07-1996 00:00:00 15-08-199
10260 OTTIK 4 19-07-1996 00:00:00 16-08-199
10261 QUEDE 4 19-07-1996 00:00:00 16-08-199
10262 RATTC 8 22-07-1996 00:00:00 19-08-199
10263 ERNSH 9 23-07-1996 00:00:00 20-08-199
10264 FOLKO 6 24-07-1996 00:00:00 21-08-199
10265 BLONP 2 25-07-1996 00:00:00 22-08-199
10266 WARTH 3 26-07-1996 00:00:00 06-09-199
10267 FRANK 4 29-07-1996 00:00:00 26-08-199
10268 GROSR 8 30-07-1996 00:00:00 27-08-199
10269 WHITC 5 31-07-1996 00:00:00 14-08-199
10270 WARTH 1 01-08-1996 00:00:00 29-08-199
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
Record
Table



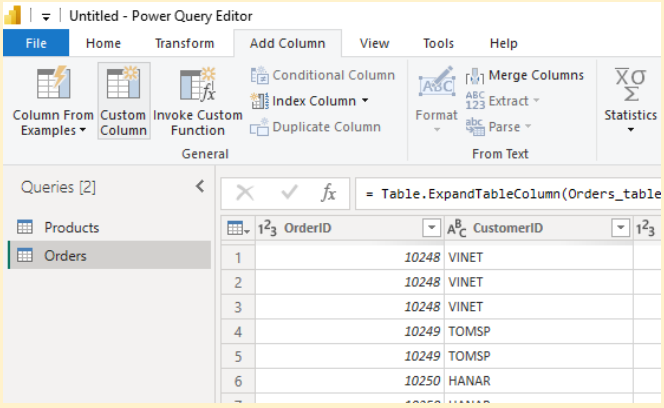
Step8:Calculate the lines total for each order_details row

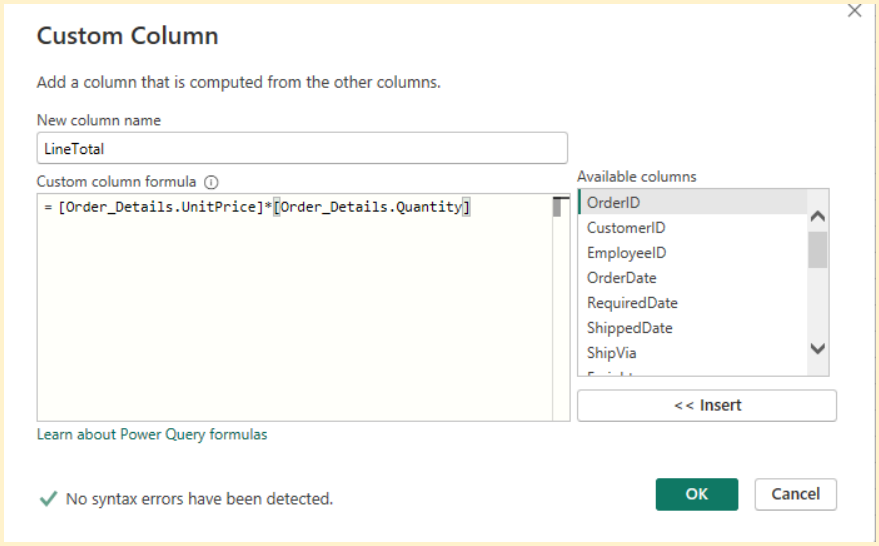
.In the add column ribbon tab, click add custom column

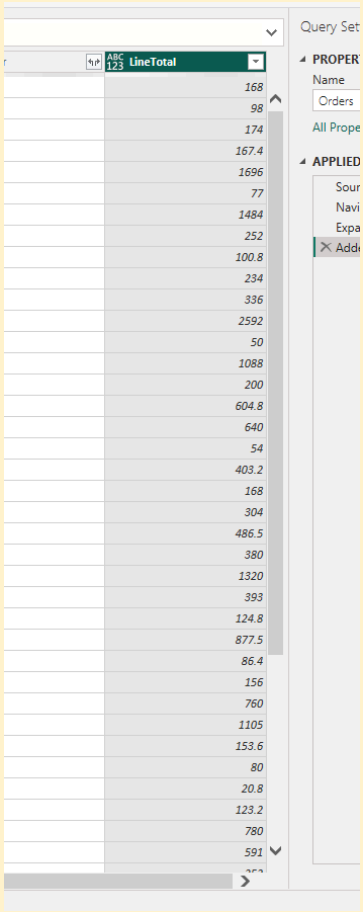
.In the custom column dialog box , in the custom column formula textbox, enter: [order_detail.unitprice]*[order_detail.Quantatiy] by selecting from available columns and click on insert for each column

.In the new column name textbox, enter linetotal

.Click ok

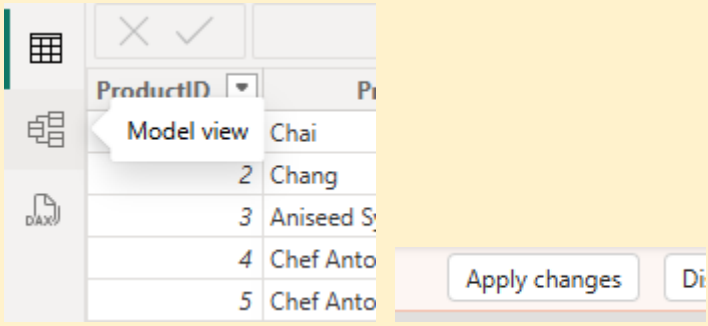


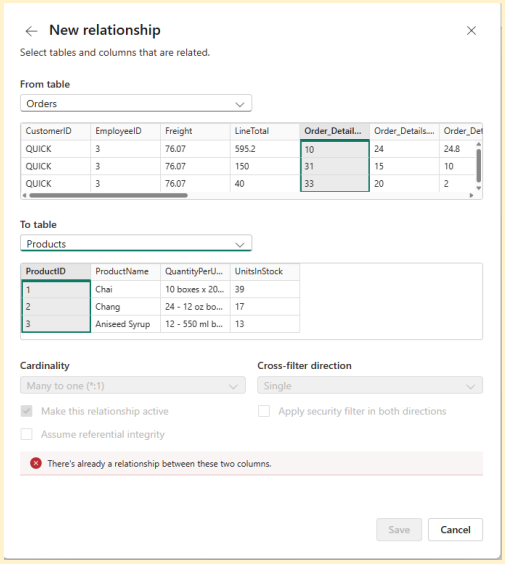

Custom Column
Add a column that is computed from the other columns.
New column name
LineTotal
Custom column formula
= [Order_Details.UnitPrice]*[Order_Details.Quantity]
Available columns
OrderID
CustomerID
EmployeeID
OrderDate
RequiredDate
ShippedDate
ShipVia
<< Insert
Learn about Power Query formulas
No syntax errors have been detected.
OK
Cancel

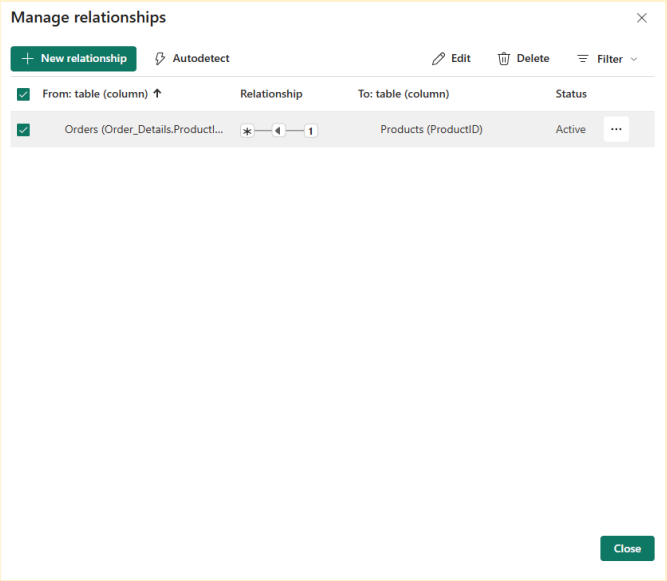

LineTotal
168
98
174
167.4
1696
77
1484
252
100.8
234
336
2592
50
1088
200
604.8
640
54
403.2
168
304
486.5
380
1320
393
124.8
877.5
86.4
156
760
1105
153.6
80
20.8
123.2
780
591
Query Set
PROPER
Name
Orders
All Prope
APPLIED

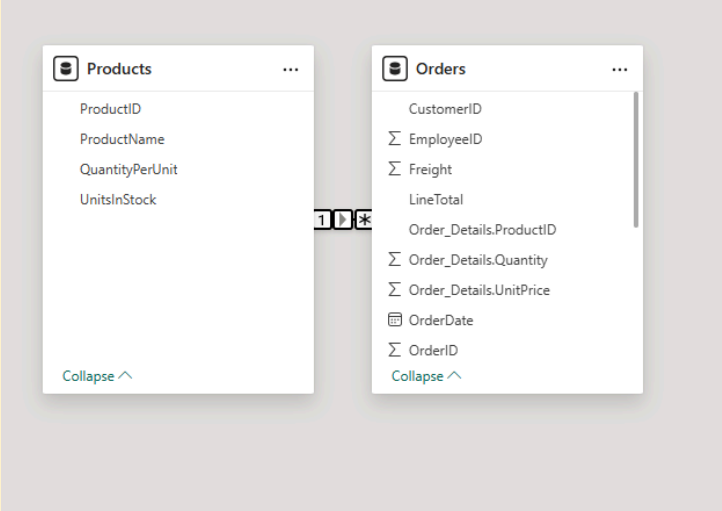
Step9:one the data is loaded, select the mange relationship button home ribbon from untitled powerBI desktop windows

- Click on model-> manage relationship






Manage relationships
New relationship
Autodetect
Edit
Delete
Filter
From: table (column)
Relationship
To: table (column)
Status
Orders (Order_Details.ProductI...
Products (ProductID)
Active
Close


Products
ProductID
ProductName
QuantityPerUnit
UnitsInStock
Collapse
Orders
CustomerID
EmployeeID
Freight
LineTotal
Order_Details.ProductID
Order_Details.Quantity
Order_Details.UnitPrice
OrderDate
OrderID
Collapse

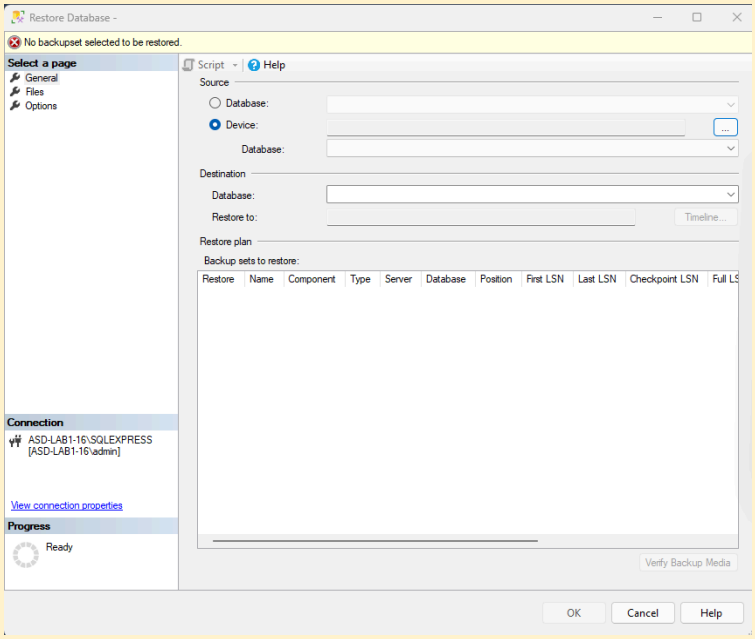
B. ETL Process Using SQL Server

Step1: Open Microsoft SQL

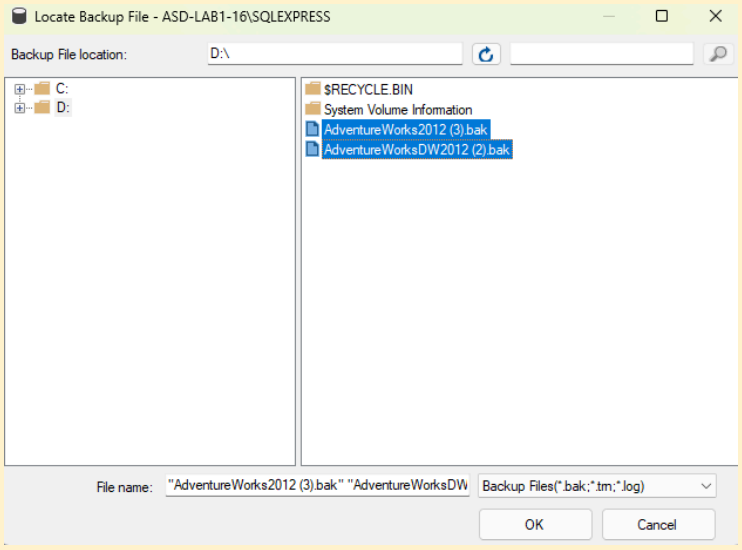
Step2: Download the 2 files and save them in D Drive

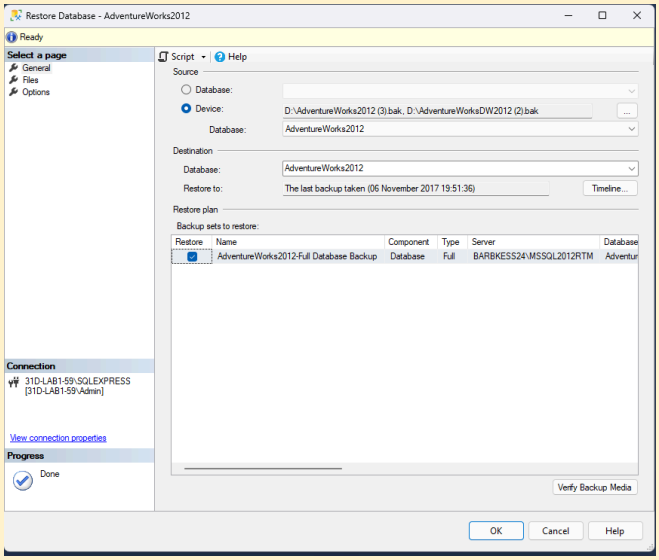
Step3: Right click on Databases and select restore database.

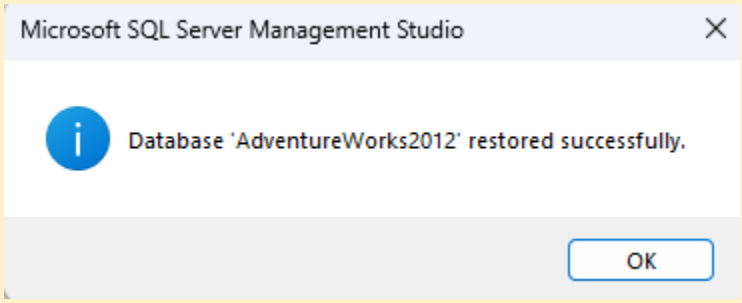
Step4:Select Devices and click on 3 Dots



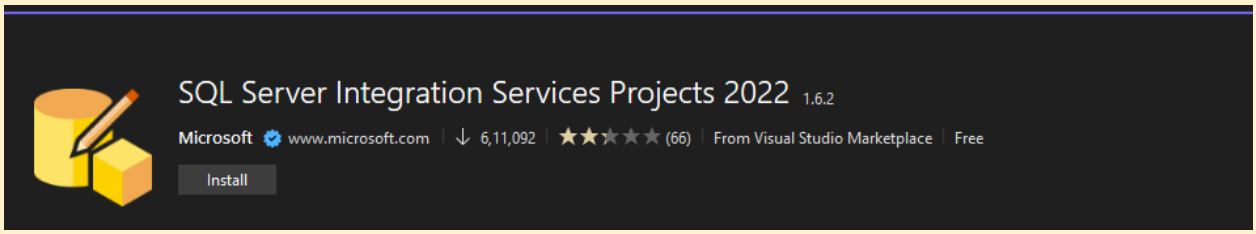
Step 5: Select the files



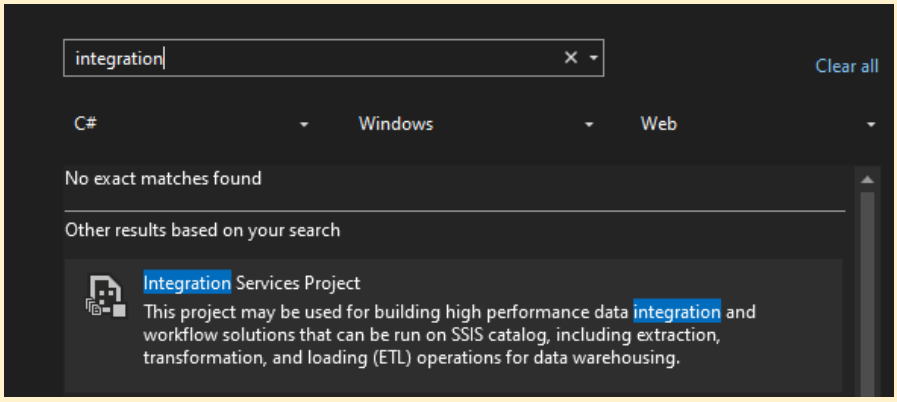




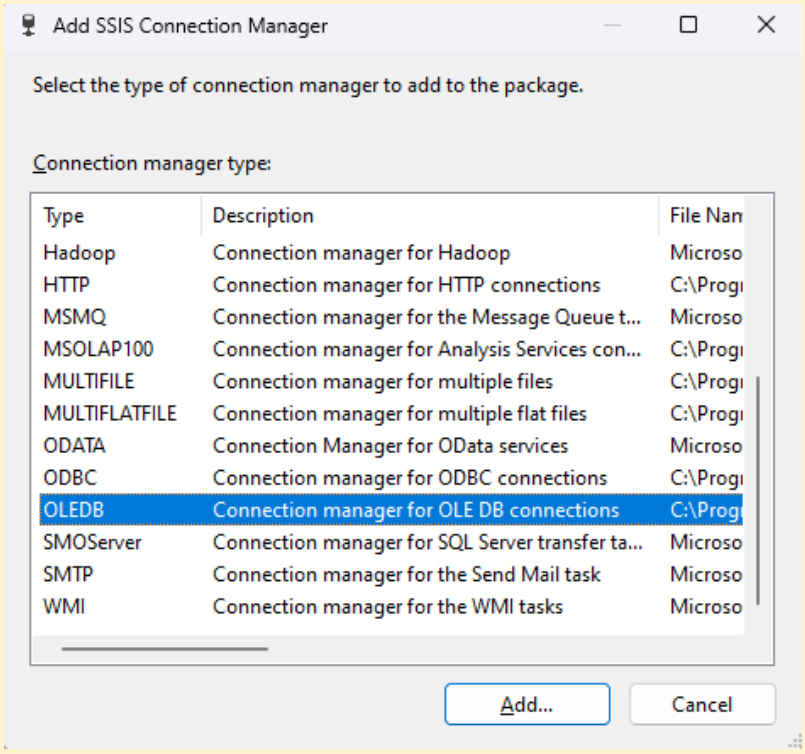
Step6:Open Visual Studio and Open any Project then Click on Extensions and Install SQL Server Integration Services Project 2022. (Make Sure VIsual Studio is CLOSED when installing otherwise it will throw an error)(If some task occurs after installing, Click Ctrl+Alt+Del and then Task Manager and Then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



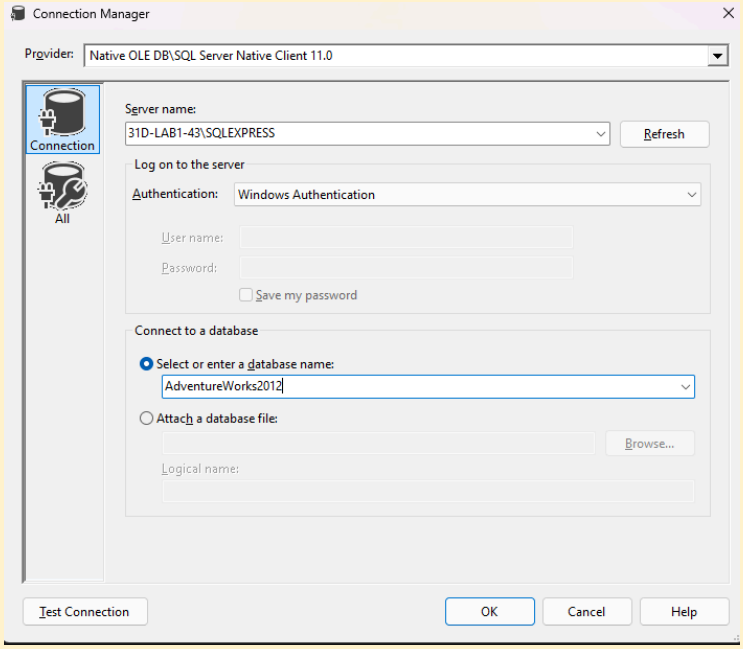
Step7: Create a New Project in Visual Studio and Search Integration Services Project (C#,Windows,Web) and Create a Project.



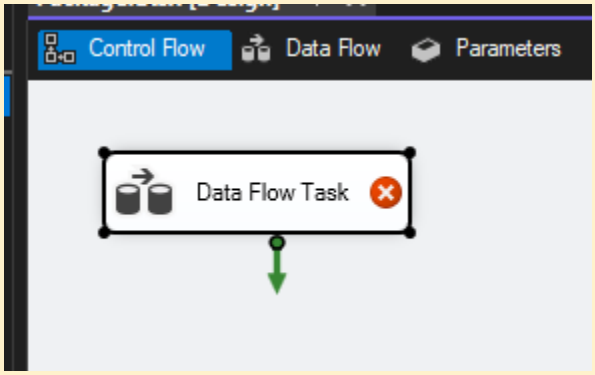
Step8: Right Click on Connection Manager in Solution Explorer and select new connection manager and Select OLEDB(Object Linking and Embedding Database) and click add

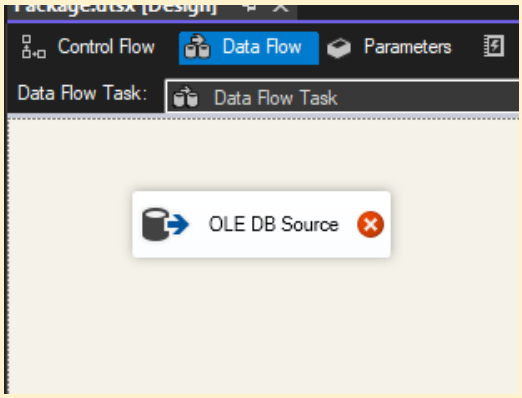


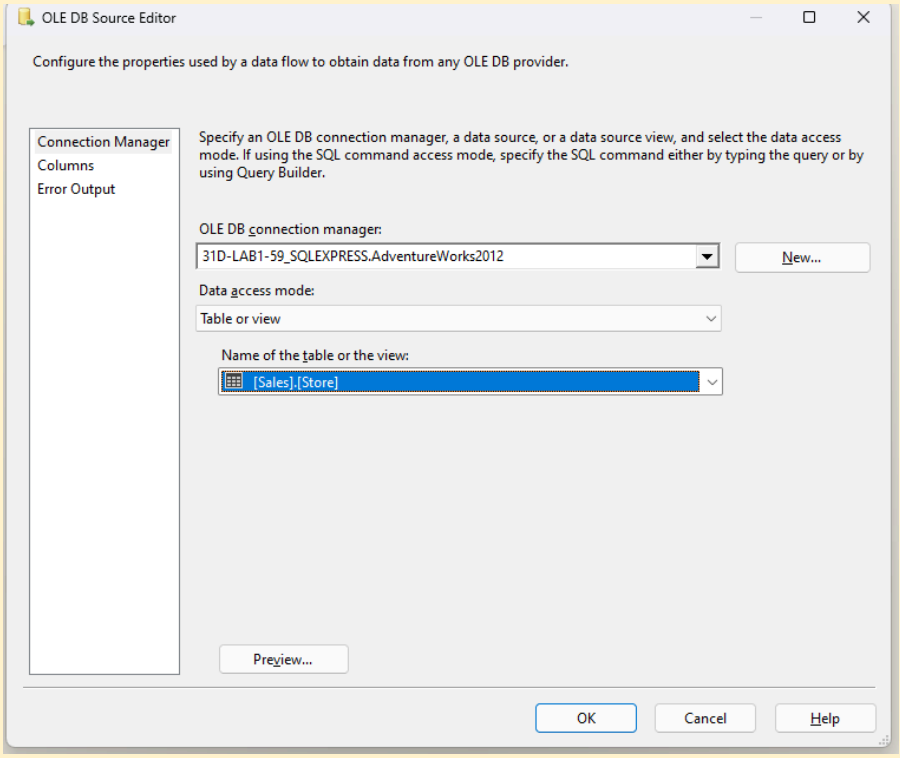
Step9: Click on New-Add Server Name(Right CLick on Database and Properties)-SElect or Enter a Database Name and select AdventureWorks2012- Test Connection- If succeeded, Click Ok



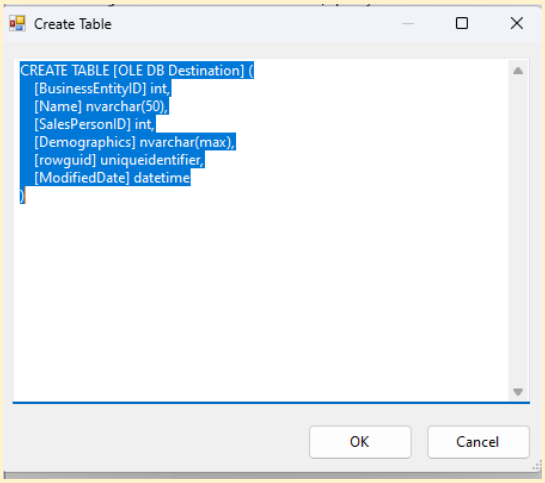
Step10: Drag and Drop Data Flow Task in Control Flow, Go to Data Flow and Drag and Drop OLE DB Source(Other Sources)-OK

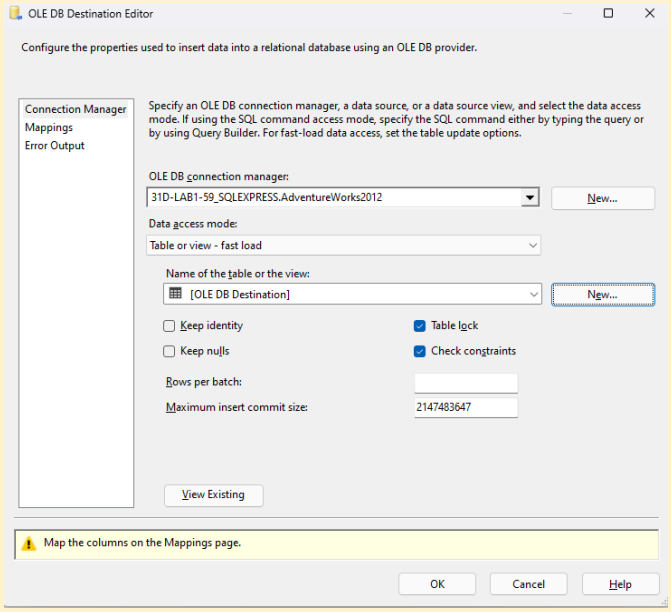


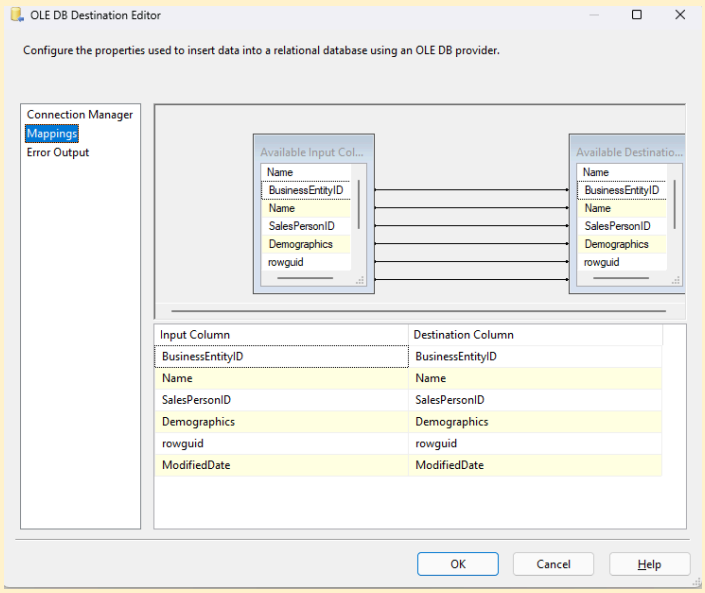




Step11: Drag and Drop OLEDB Destination- Double Click OLEDB Destination - Select New(2nd Row) -Ok-Click on Mapping-Check the mapping-Check

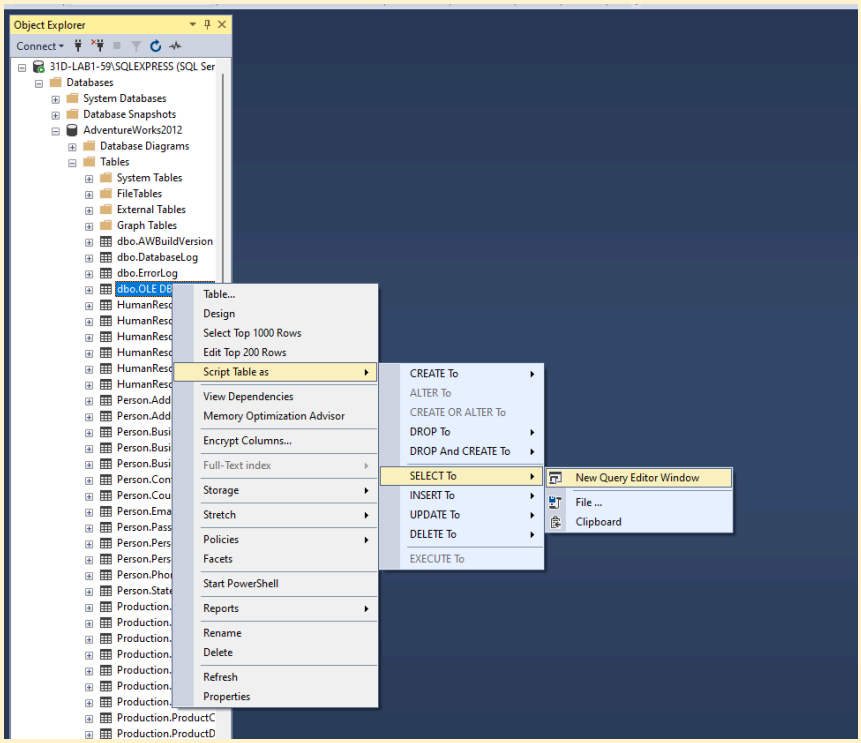


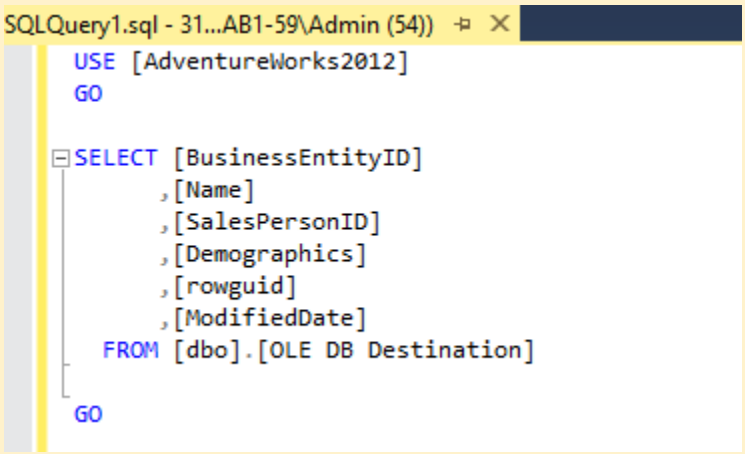


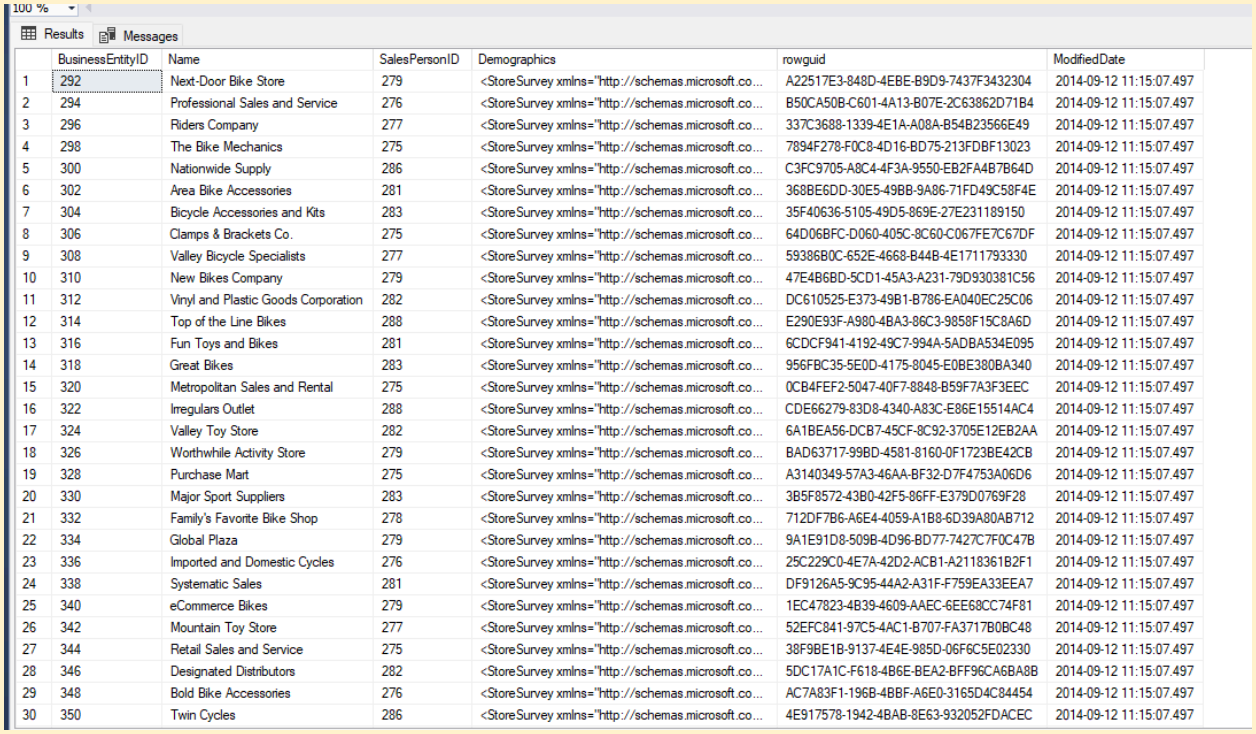


Step12: Click on Start and Get the output for Front End

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







100 %

Results | Messages

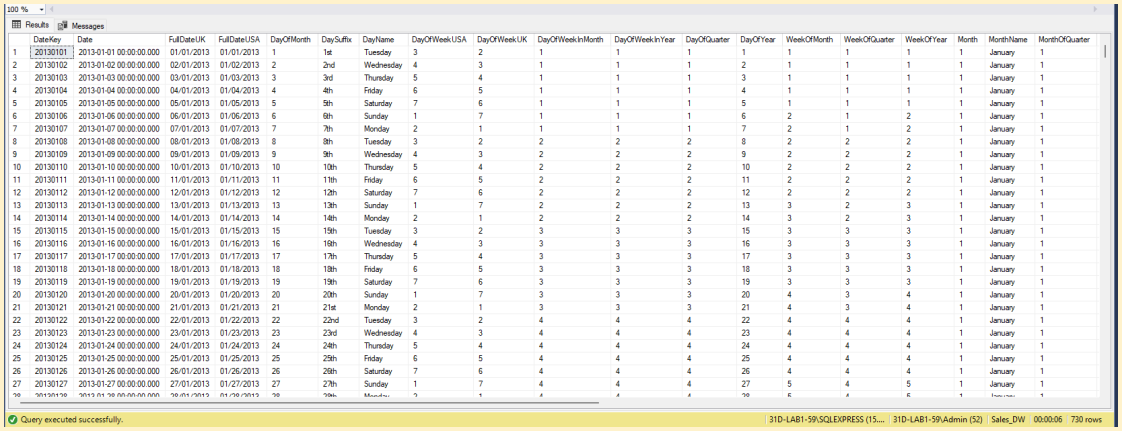
	BusinessEntityID	Name	SalesPersonID	Demographics	rowguid	ModifiedDate
1	292	Next-Door Bike Store	279	<StoreSurvey xmlns="http://schemas.microsoft.co...	A22517E3-848D-4EBE-B9D9-7437F3432304	2014-09-12 11:15:07.497
2	294	Professional Sales and Service	276	<StoreSurvey xmlns="http://schemas.microsoft.co...	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-30E5-49BB-9A86-71FD49C58F4E	2014-09-12 11:15:07.497
7	304	Bicycle Accessories and Kits	283	<StoreSurvey xmlns="http://schemas.microsoft.co...	35F40636-5105-49D5-869E-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

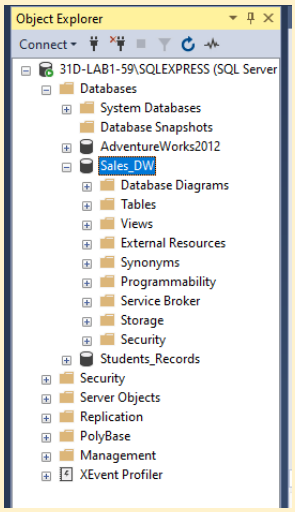
AIM: Create a cube with subtitle dimension and fact tables based on OLAP.

Step1: Creating a Data Warehouse.

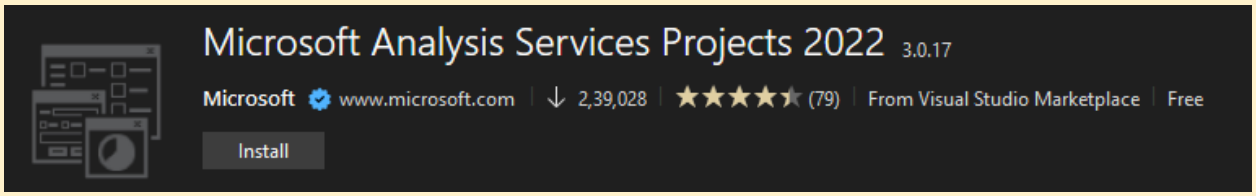
New Query-write the code

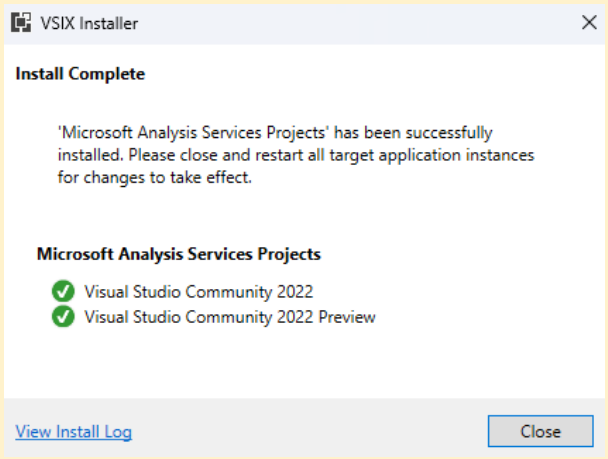


	DateKey	Date	FullDateUK	FullDateUSA	DayOfMonth	DaySuffix	DayName	DayOfWeekUSA	DayOfWeekUK	DayOfWeekInMonth	DayOfWeekInYear	DayOfQuarter	DayOfYear	WeekOfMonth	WeekOfQuarter	WeekOfYear	Month	MonthName	MonthOfQuarter
1	20130101	2013-01-01 00:00:00.000	01/01/2013	01/01/2013	1	1st	Tuesday	3	2	1	1	1	1	1	1	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	1	2	1	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	1	3	1	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	1	4	1	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	1	5	1	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	1	6	2	1	2	1	January	1
7	20130107	2013-01-07 00:00:00.000	07/01/2013	01/07/2013	7	7th	Monday	2	1	1	1	1	7	2	1	2	1	January	1
8	20130108	2013-01-08 00:00:00.000	08/01/2013	01/08/2013	8	8th	Tuesday	3	2	2	2	2	8	2	2	2	1	January	1
9	20130109	2013-01-09 00:00:00.000	09/01/2013	01/09/2013	9	9th	Wednesday	4	3	2	2	2	9	2	2	2	1	January	1
10	20130110	2013-01-10 00:00:00.000	10/01/2013	01/10/2013	10	10th	Thursday	5	4	2	2	2	10	2	2	2	1	January	1
11	20130111	2013-01-11 00:00:00.000	11/01/2013	01/11/2013	11	11th	Friday	6	5	2	2	2	11	2	2	2	1	January	1
12	20130112	2013-01-12 00:00:00.000	12/01/2013	01/12/2013	12	12th	Saturday	7	6	2	2	2	12	2	2	2	1	January	1
13	20130113	2013-01-13 00:00:00.000	13/01/2013	01/13/2013	13	13th	Sunday	1	7	2	2	2	13	3	2	3	1	January	1
14	20130114	2013-01-14 00:00:00.000	14/01/2013	01/14/2013	14	14th	Monday	2	1	2	2	2	14	3	2	3	1	January	1
15	20130115	2013-01-15 00:00:00.000	15/01/2013	01/15/2013	15	15th	Tuesday	3	2	3	3	3	15	3	3	3	1	January	1
16	20130116	2013-01-16 00:00:00.000	16/01/2013	01/16/2013	16	16th	Wednesday	4	3	3	3	3	16	3	3	3	1	January	1
17	20130117	2013-01-17 00:00:00.000	17/01/2013	01/17/2013	17	17th	Thursday	5	4	3	3	3	17	3	3	3	1	January	1
18	20130118	2013-01-18 00:00:00.000	18/01/2013	01/18/2013	18	18th	Friday	6	5	3	3	3	18	3	3	3	1	January	1
19	20130119	2013-01-19 00:00:00.000	19/01/2013	01/19/2013	19	19th	Saturday	7	6	3	3	3	19	3	3	3	1	January	1
20	20130120	2013-01-20 00:00:00.000	20/01/2013	01/20/2013	20	20th	Sunday	1	7	3	3	3	20	4	3	4	1	January	1
21	20130121	2013-01-21 00:00:00.000	21/01/2013	01/21/2013	21	21st	Monday	2	1	3	3	3	21	4	3	4	1	January	1
22	20130122	2013-01-22 00:00:00.000	22/01/2013	01/22/2013	22	22nd	Tuesday	3	2	4	4	4	22	4	4	4	1	January	1
23	20130123	2013-01-23 00:00:00.000	23/01/2013	01/23/2013	23	23rd	Wednesday	4	3	4	4	4	23	4	4	4	1	January	1
24	20130124	2013-01-24 00:00:00.000	24/01/2013	01/24/2013	24	24th	Thursday	5	4	4	4	4	24	4	4	4	1	January	1
25	20130125	2013-01-25 00:00:00.000	25/01/2013	01/25/2013	25	25th	Friday	6	5	4	4	4	25	4	4	4	1	January	1
26	20130126	2013-01-26 00:00:00.000	26/01/2013	01/26/2013	26	26th	Saturday	7	6	4	4	4	26	4	4	4	1	January	1
27	20130127	2013-01-27 00:00:00.000	27/01/2013	01/27/2013	27	27th	Sunday	1	7	4	4	4	27	5	4	5	1	January	1

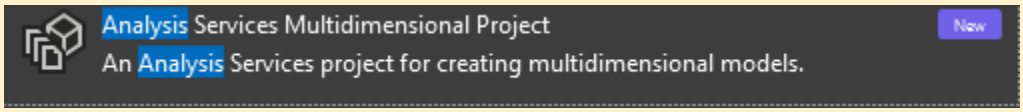


Step2: Install Analysis services download in Visual Studio 2022

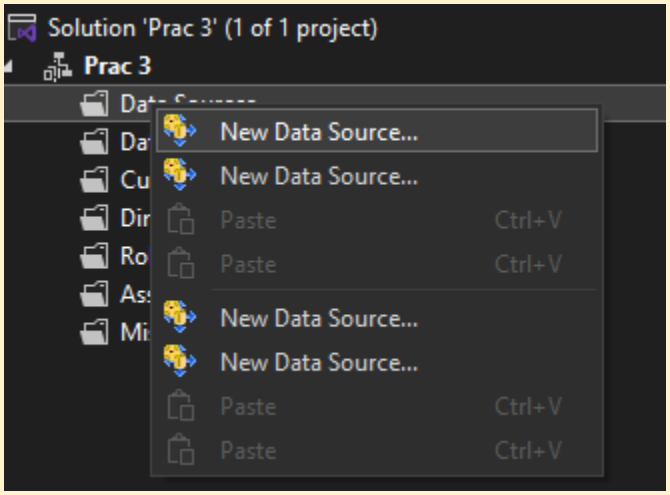


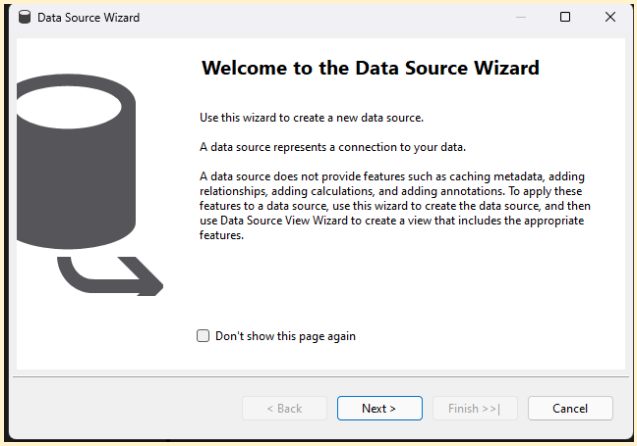


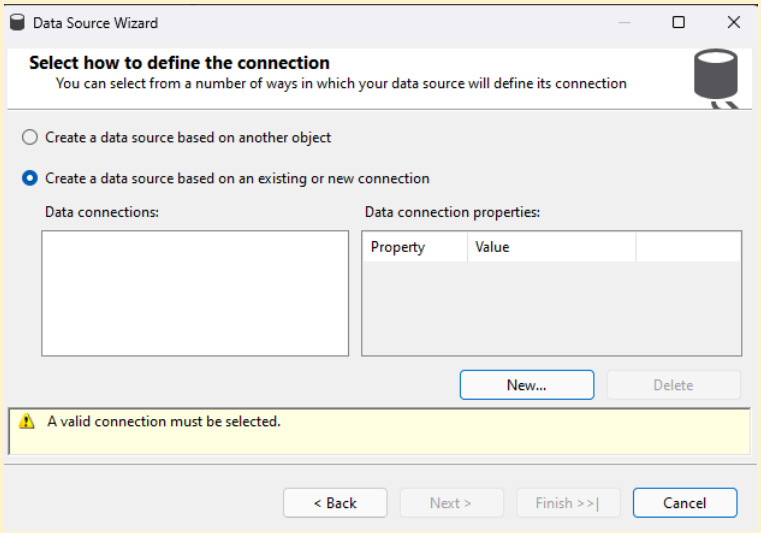
While creating a new project select

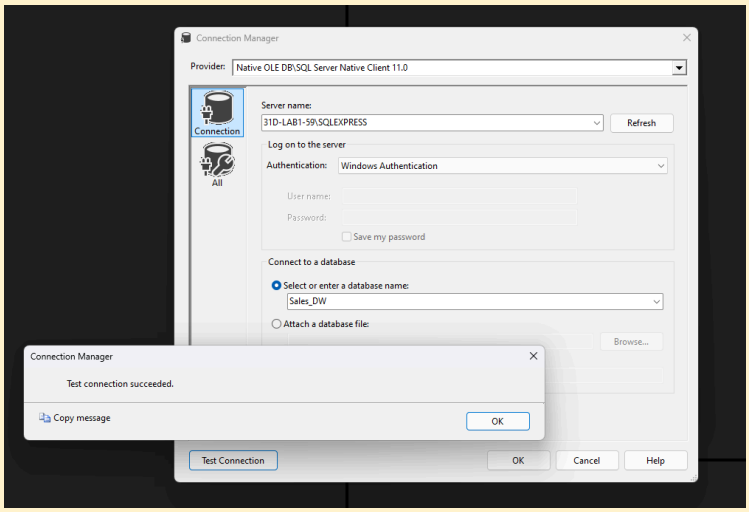


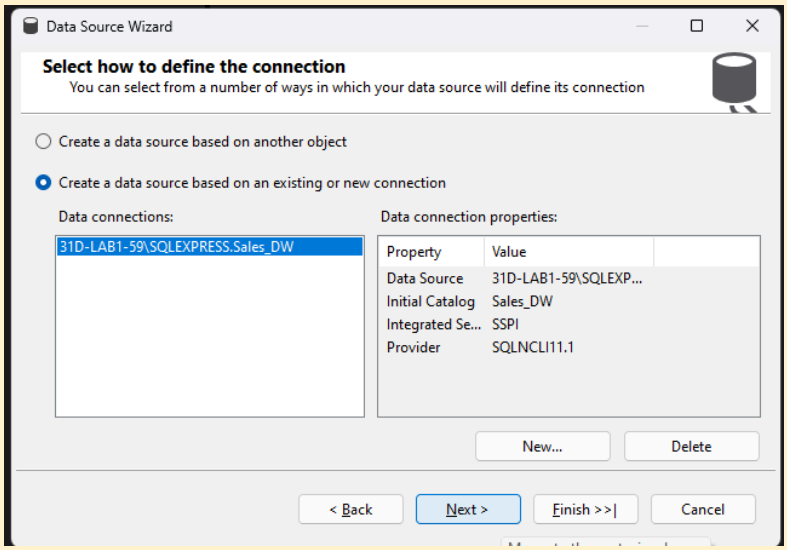
Step 3:Right Click on Data Source-New Data Source-Next-New-Add Server name-Select Sales_DW as database name- Test Connection- Ok-Next-Inherit-Next-Finish

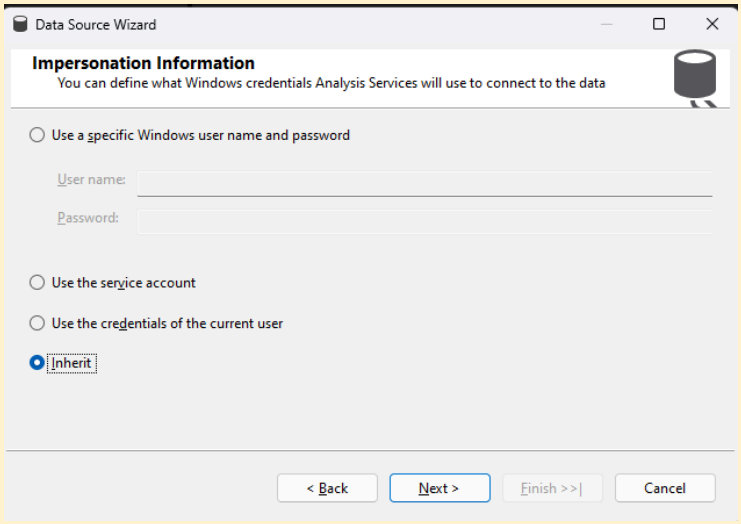


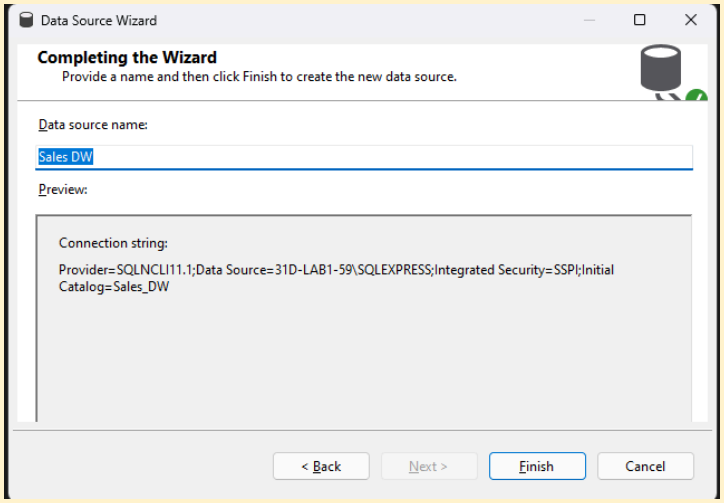

Data Source Wizard
Welcome to the Data Source Wizard
Use this wizard to create a new data source.
A data source represents a connection to your data.
A data source does not provide features such as caching metadata, adding relationships, adding calculations, and adding annotations. To apply these features to a data source, use this wizard to create the data source, and then use Data Source View Wizard to create a view that includes the appropriate features.
Don't show this page again
< Back
Next >
Finish >>|
Cancel


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:
Data connection properties:
Property
Value
New...
Delete
A valid connection must be selected.
< Back
Next >
Finish >>|
Cancel

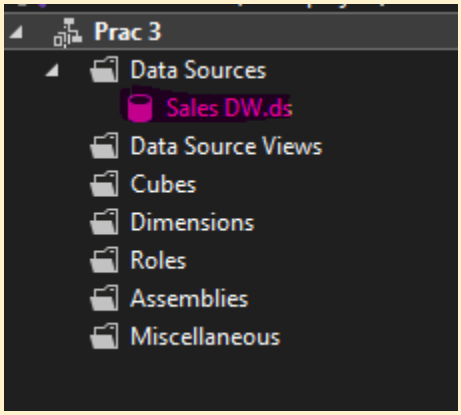

Connection Manager
Provider:
Native OLE DB\SQL Server Native Client 11.0
Connection
All
Server name:
31D-LAB1-59\SQLEXPRESS
Refresh
Log on to the server
Authentication:
Windows Authentication
User name:
Password:
Save my password
Connect to a database
Select or enter a database name:
Sales_DW
Attach a database file:
Browse...
Test Connection
OK
Cancel
Help
Connection Manager
Test connection succeeded.
Copy message
OK

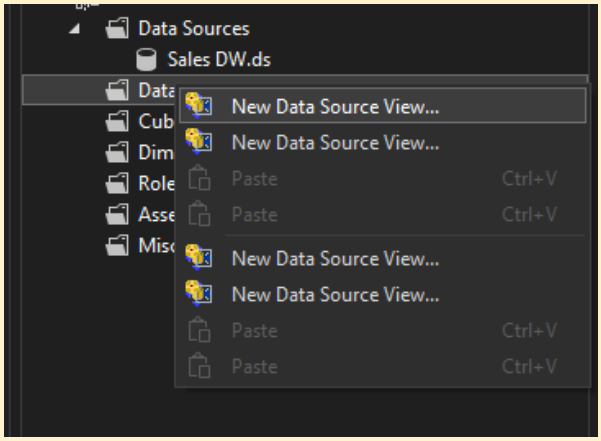

Data Source Wizard
Select how to define the connection
You can select from a number of ways in which your data source will define its connection
Create a data source based on another object
Create a data source based on an existing or new connection
Data connections:
31D-LAB1-59\SQLEXPRESS.Sales_DW
Data 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

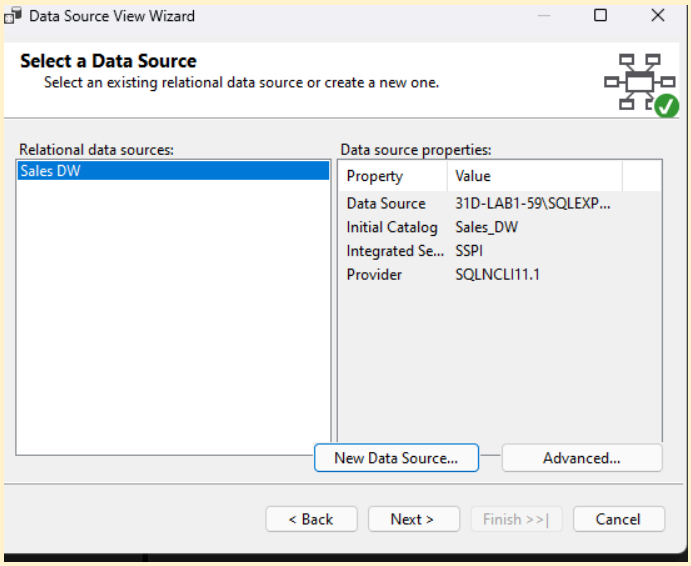

Data Source Wizard
Impersonation Information
You can define what Windows credentials Analysis Services will use to connect to the data
Use a specific Windows user name and password
User name:
Password:
Use the service account
Use the credentials of the current user
Inherit
< Back
Next >
Finish >>|
Cancel

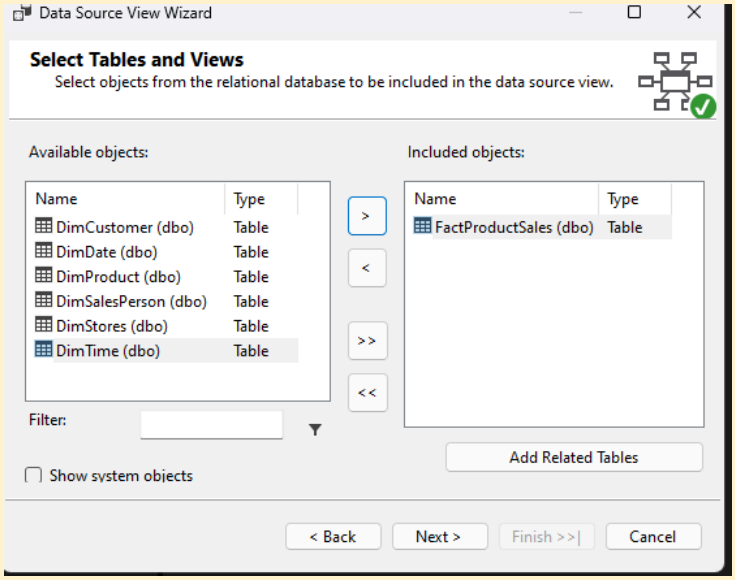

Data Source Wizard
Completing the Wizard
Provide a name and then click Finish to create the new data source.
Data source name:
Sales DW
Preview:
Connection string:
Provider=SQLNCLI11.1;Data Source=31D-LAB1-59\SQLEXPRESS;Integrated Security=SSPI;Initial Catalog=Sales_DW
< Back
Next >
Finish
Cancel

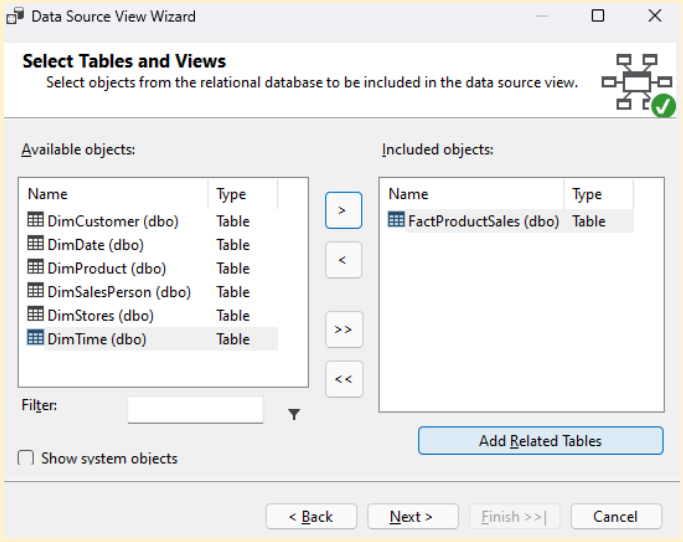
Step4: SalesDW.ds is created-Right Click on Data Source View-New Data Source View-Next-Selecty factProductSales(dbo)->-to included objects-Add Related Tables-Next

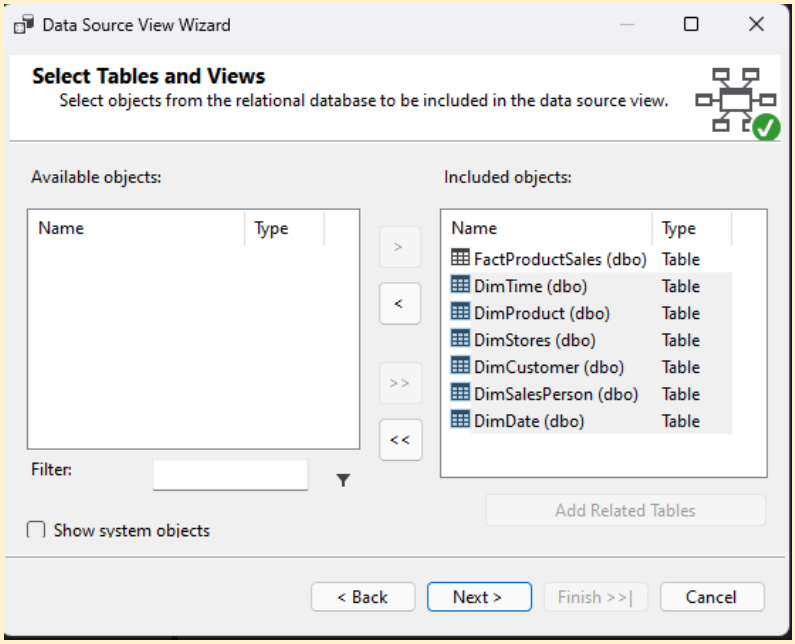




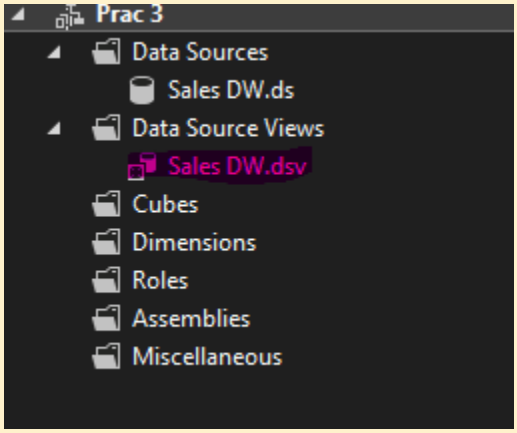



Data Source View Wizard
Select Tables and Views
Select objects from the relational database to be included in the data source view.
Available objects:
Name
Type
DimCustomer (dbo)
Table
DimDate (dbo)
Table
DimProduct (dbo)
Table
DimSalesPerson (dbo)
Table
DimStores (dbo)
Table
DimTime (dbo)
Table
>
<
>>
<<
Included objects:
Name
Type
FactProductSales (dbo)
Table
Filter:
Add Related Tables
Show system objects
< 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
>
<
>>
<<
Included objects:
Name
Type
FactProductSales (dbo)
Table
Filter:
Add Related Tables
Show system objects
< 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



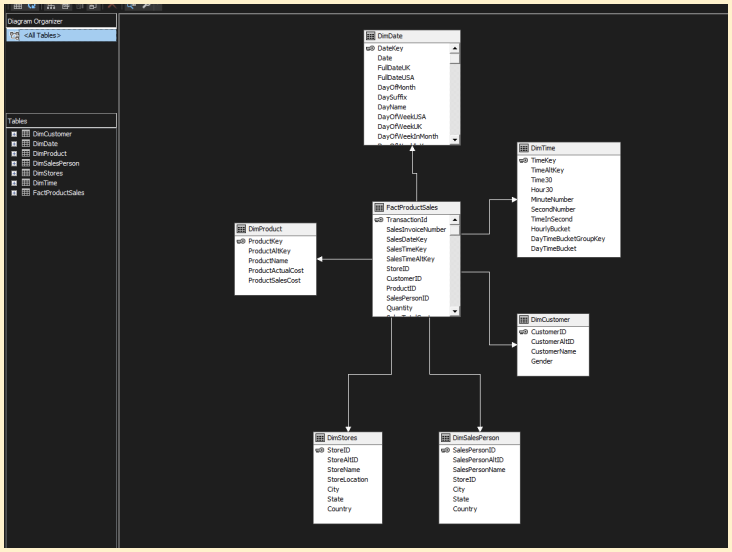
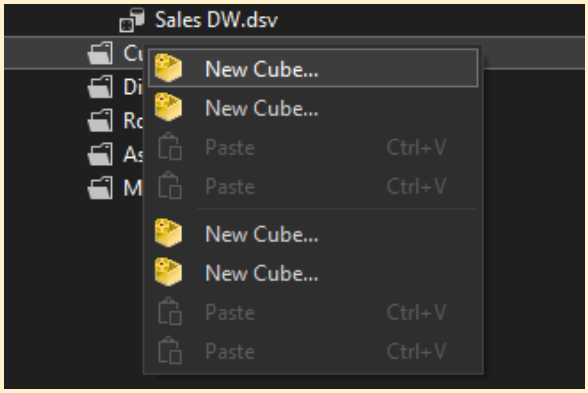
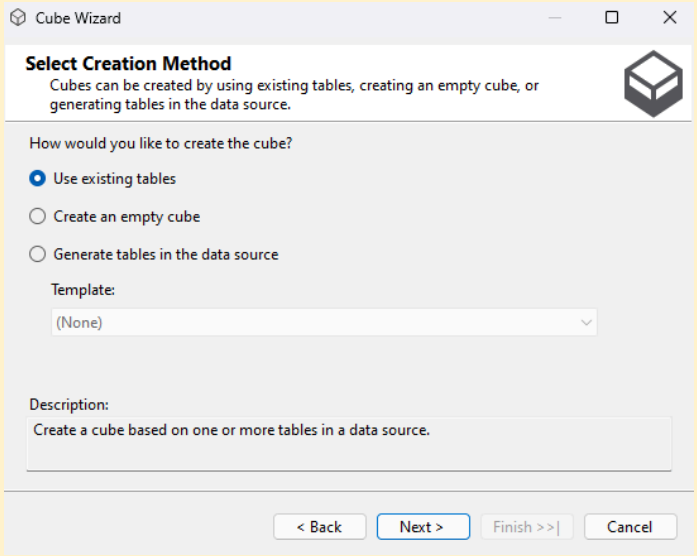
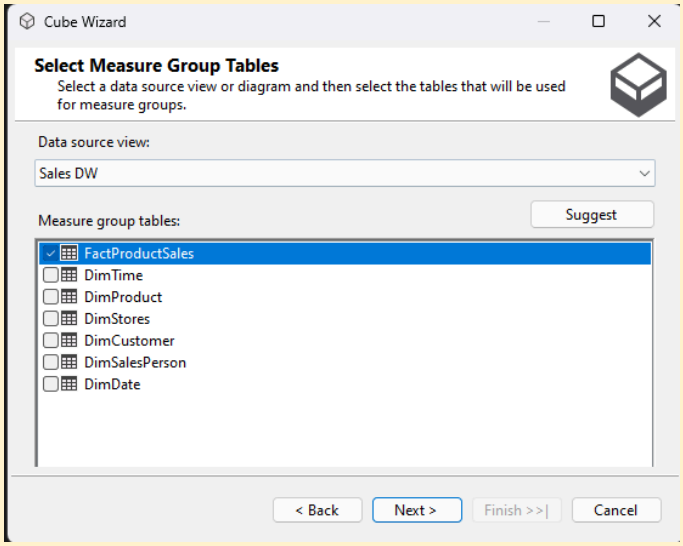
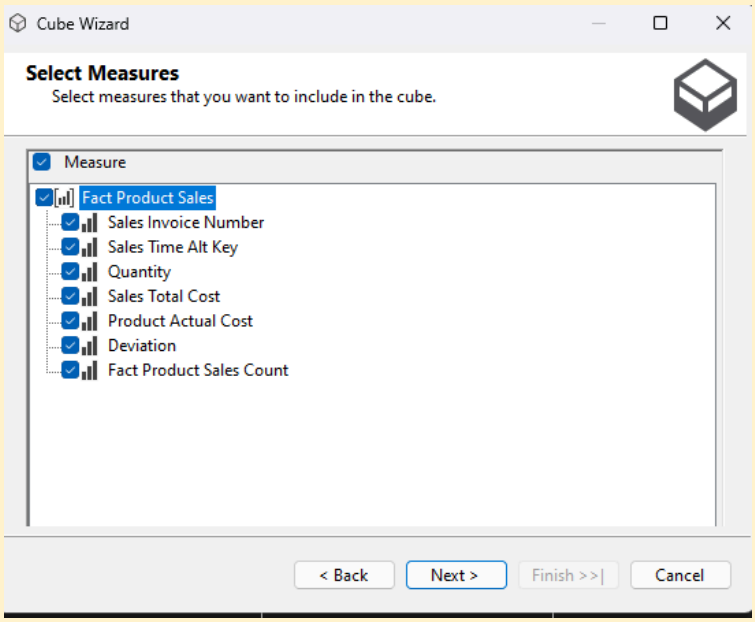


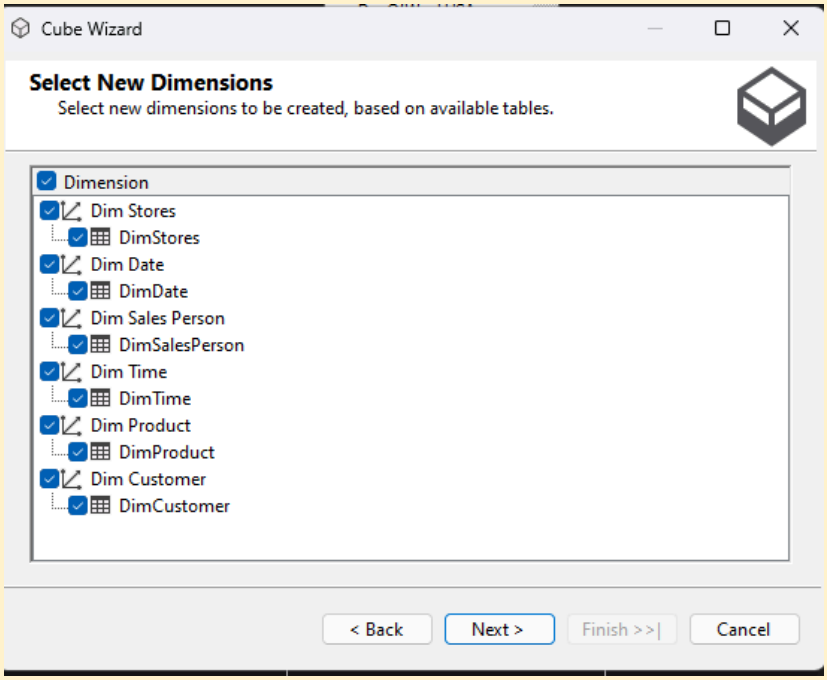
Diagram Organizer
<All Tables>
Tables
DimCustomer
DimDate
DimProduct
DimSalesPerson
DimStores
DimTime
FactProductSales
DimDate
DateKey
Date
FullDateUK
FullDateUSA
DayOfMonth
DaySuffix
DayName
DayOfWeekUSA
DayOfWeekUK
DayOfWeekInMonth
DimTime
TimeKey
TimeAltKey
Time30
Hour30
MinuteNumber
SecondNumber
TimeInSecond
HourlyBucket
DayTimeBucketGroupKey
DayTimeBucket
FactProductSales
Transaction Id
SalesInvoiceNumber
SalesDateKey
SalesTimeKey
SalesTimeAltKey
StoreID
CustomerID
ProductID
SalesPersonID
Quantity
DimProduct
ProductKey
ProductAltKey
ProductName
ProductActualCost
ProductSalesCost
DimCustomer
CustomerID
CustomerAltID
CustomerName
Gender
DimStores
StoreID
StoreAltID
StoreName
StoreLocation
City
State
Country
DimSalesPerson
SalesPersonID
SalesPersonAltID
SalesPersonName
StoreID
City
State
Country

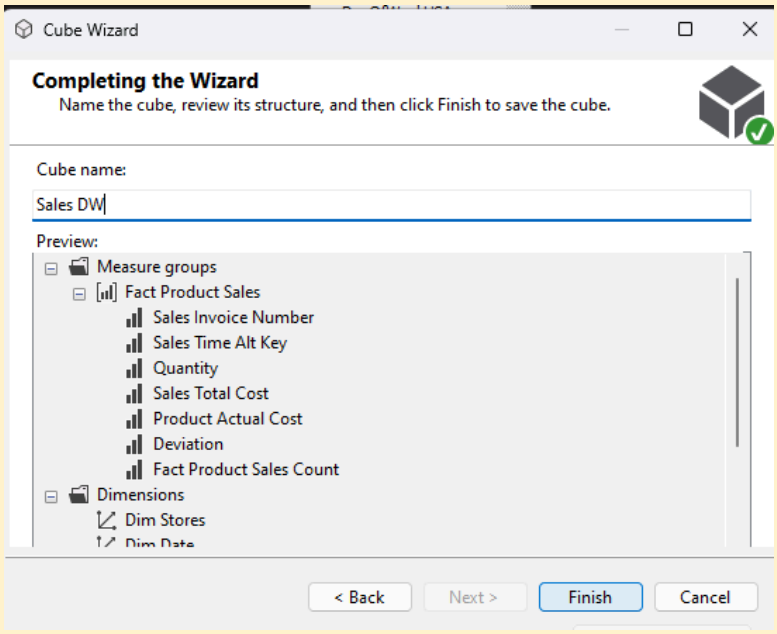

Sales DW.dsv
New Cube...
New Cube...
Paste Ctrl+V
Paste Ctrl+V
New Cube...
New Cube...
Paste Ctrl+V
Paste Ctrl+V


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

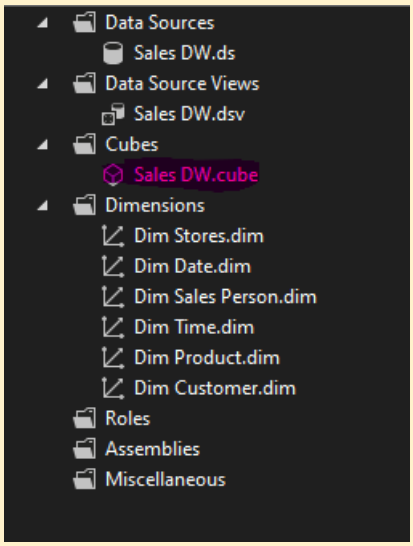

Cube Wizard
Select Measure Group Tables
Select a data source view or diagram and then select the tables that will be used for measure groups.
Data source view:
Sales DW
Measure group tables:
Suggest
FactProductSales
DimTime
DimProduct
DimStores
DimCustomer
DimSalesPerson
DimDate
< Back
Next >
Finish >>|
Cancel

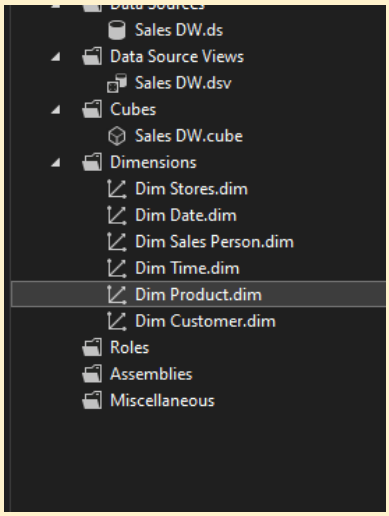

Cube Wizard
Select Measures
Select measures that you want to include in the cube.
Measure
Fact Product Sales
Sales Invoice Number
Sales Time Alt Key
Quantity
Sales Total Cost
Product Actual Cost
Deviation
Fact Product Sales Count
< Back
Next >
Finish >>|
Cancel

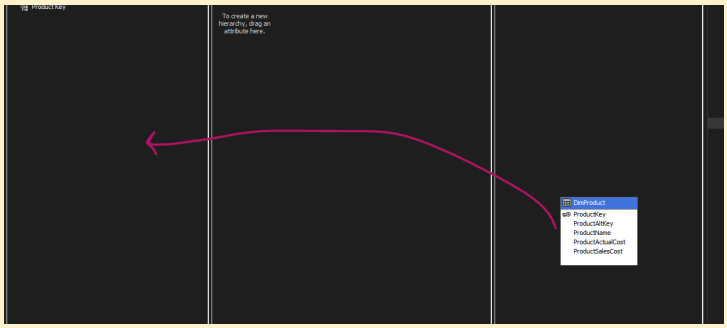

Cube Wizard
Select New Dimensions
Select new dimensions to be created, based on available tables.
Dimension
Dim Stores
DimStores
Dim Date
DimDate
Dim Sales Person
DimSalesPerson
Dim Time
DimTime
Dim Product
DimProduct
Dim Customer
DimCustomer
< Back
Next >
Finish >>|
Cancel

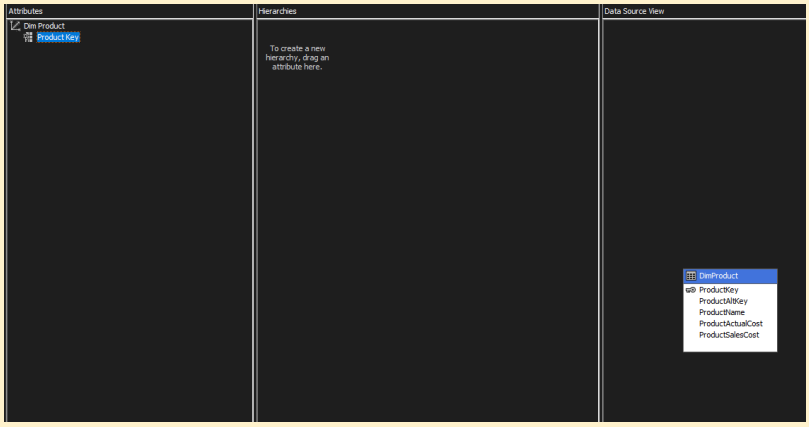

Cube Wizard
Completing the Wizard
Name the cube, review its structure, and then click Finish to save the cube.
Cube name:
Sales DW
Preview:
Measure groups
Fact Product Sales
Sales Invoice Number
Sales Time Alt Key
Quantity
Sales Total Cost
Product Actual Cost
Deviation
Fact Product Sales Count
Dimensions
Dim Stores
< Back
Next >
Finish
Cancel

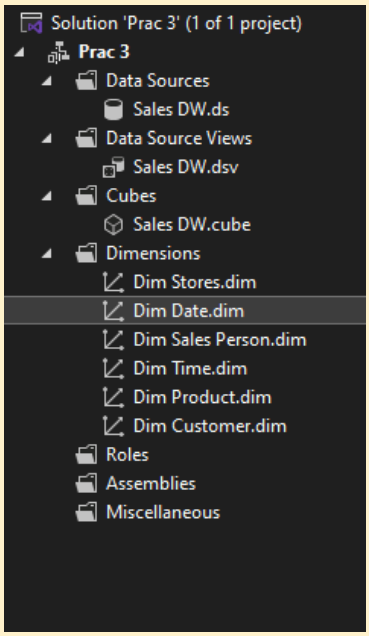
Step6:SalesDW.cube is created-Dim Product.dim-Drag the window to Attributes-Product key is created-Dim.Date.dim-Drag and Drop Full Date UK,Month,Month Name,Quater,Quater Name,Week of Month,Year Individually

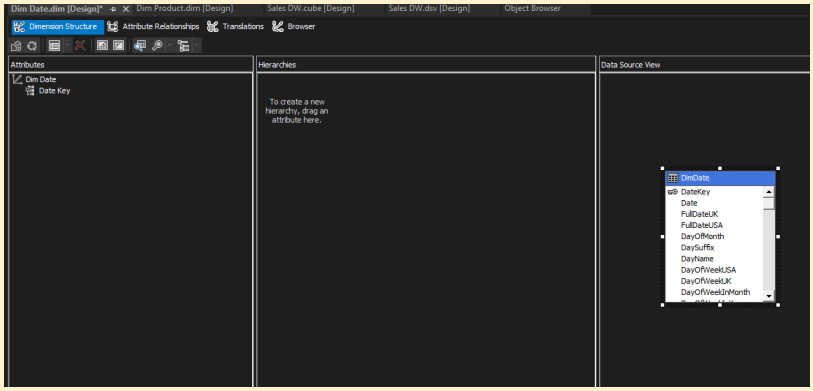


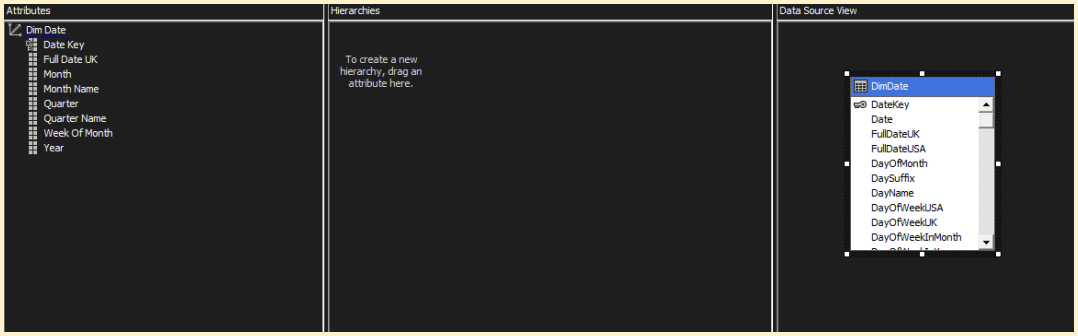


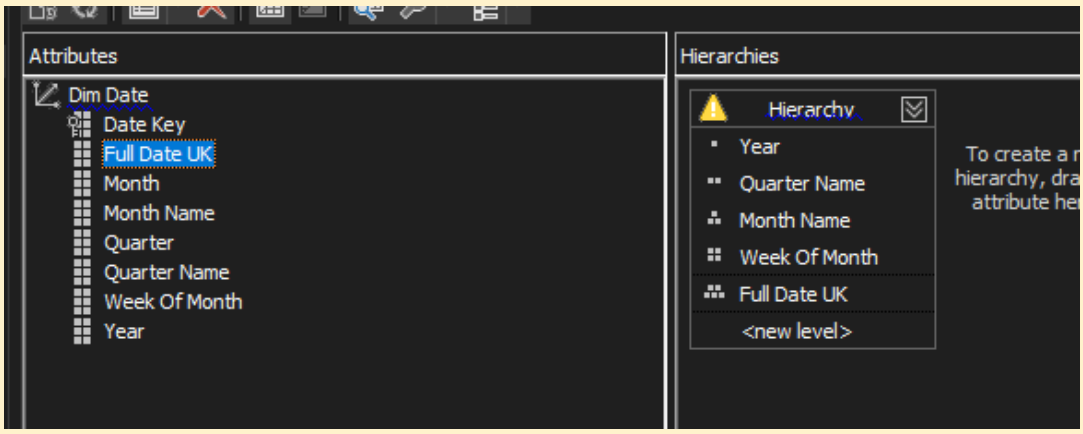



Attributes
Dim Product
Product Key
Hierarchies
To create a new hierarchy, drag an attribute here.
Data Source View
DimProduct
ProductKey
ProductAltKey
ProductName
ProductActualCost
ProductSalesCost

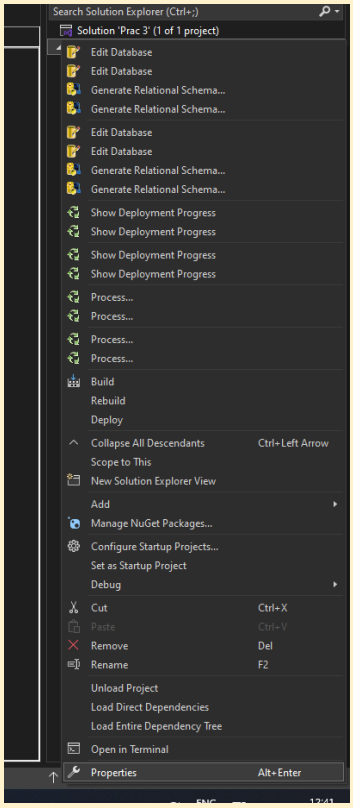

Solution 'Prac 3' (1 of 1 project)
Prac 3
Data Sources
Sales DW.ds
Data Source Views
Sales DW.dsv
Cubes
Sales DW.cube
Dimensions
Dim Stores.dim
Dim Date.dim
Dim Sales Person.dim
Dim Time.dim
Dim Product.dim
Dim Customer.dim
Roles
Assemblies
Miscellaneous

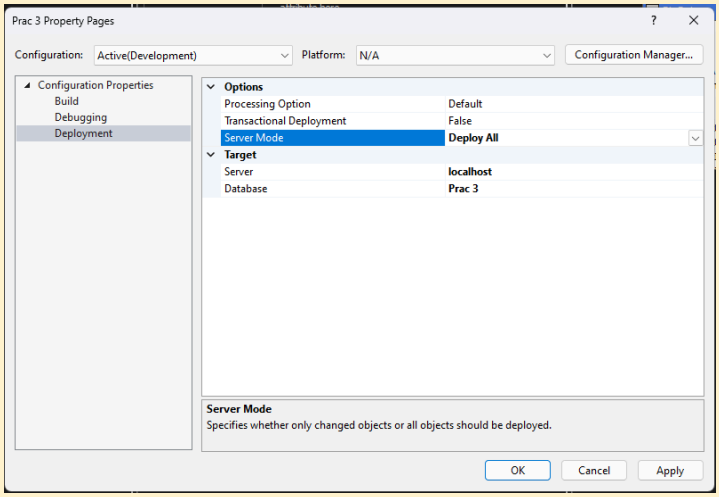

Dim Date.dim [Design]*
Dim Product.dim [Design]
Sales DW.cube [Design]
Sales DW.dsv [Design]
Object Browser
Dimension Structure
Attribute Relationships
Translations
Browser
Attributes
Dim Date
Date Key
Hierarchies
To create a new hierarchy, drag an attribute here.
Data Source View
DimDate
DateKey
Date
FullDateUK
FullDateUSA
DayOfMonth
DaySuffix
DayName
DayOfWeekUSA
DayOfWeekUK
DayOfWeekInMonth


Attributes
Dim Date
Date Key
Full Date UK
Month
Month Name
Quarter
Quarter Name
Week Of Month
Year
Hierarchies
To create a new hierarchy, drag an attribute here.
Data Source View
DimDate
DateKey
Date
FullDateUK
FullDateUSA
DayOfMonth
DaySuffix
DayName
DayOfWeekUSA
DayOfWeekUK
DayOfWeekInMonth

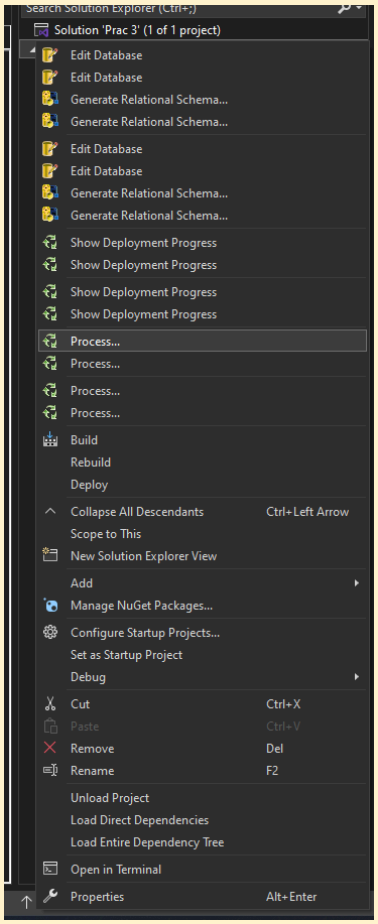

Attributes
Dim Date
Date Key
Full Date UK
Month
Month Name
Quarter
Quarter Name
Week Of Month
Year
Hierarchies
Hierarchy
Year
Quarter Name
Month Name
Week Of Month
Full Date UK
<new level>
To create a
hierarchy, dra
attribute he

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





Step7: Select Project Name-Process-Run

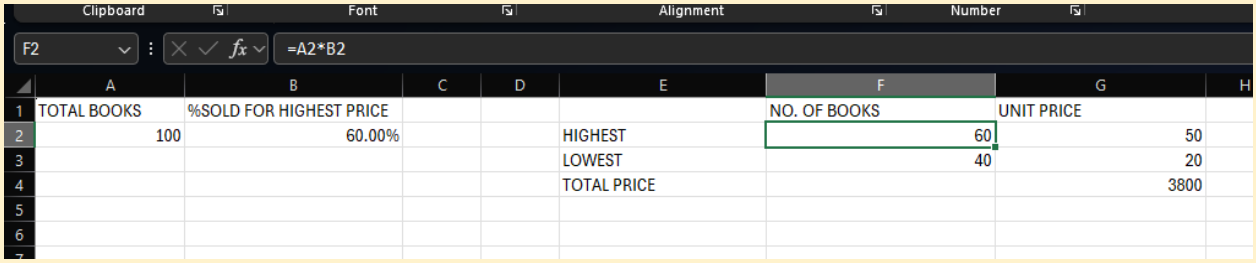


Step8: The code will throw error because of port error

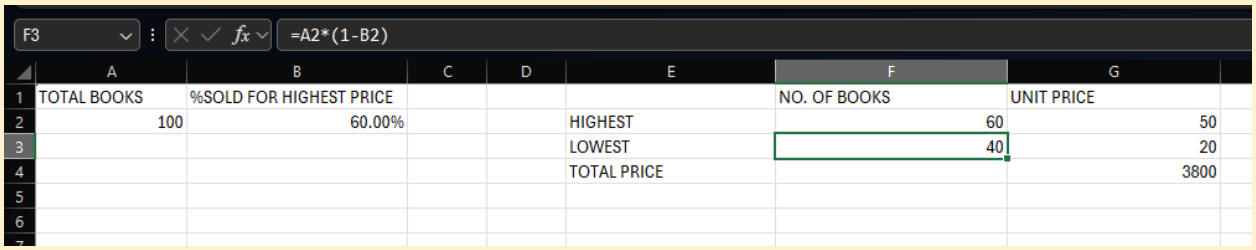
PRACTICAL 4

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

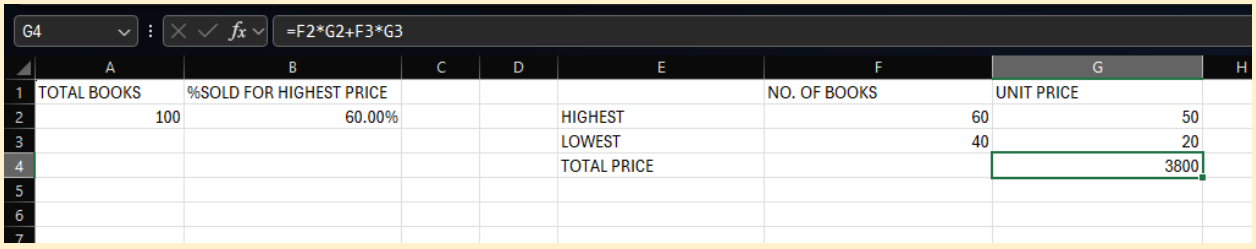
Step1: Total books(100) %Sold for Highest Price(60.00%) Highest [Unit Price(50)] and Lowest [Unit Price(20)]



	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								

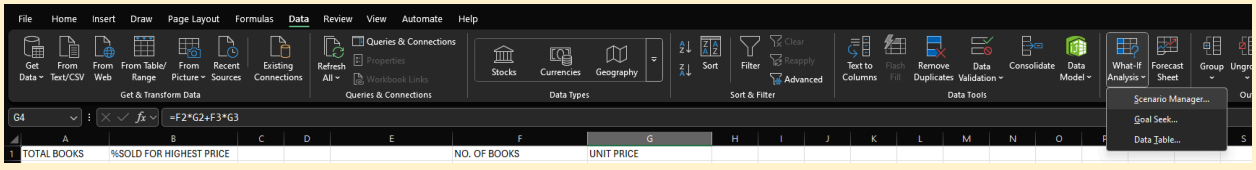


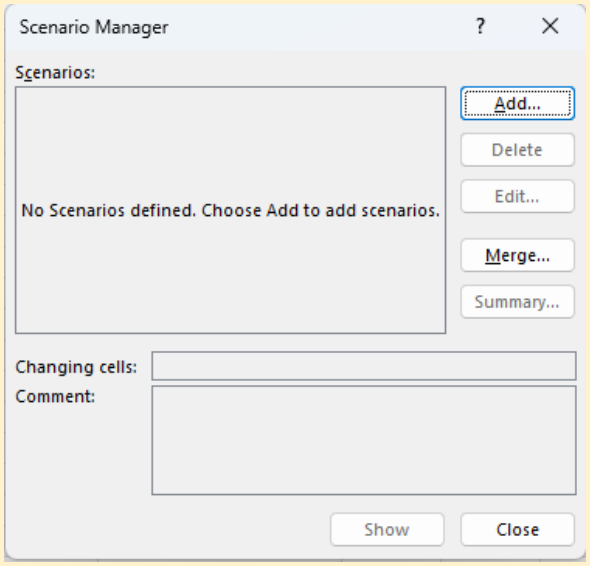
	A	B	C	D	E	F	G
1	TOTAL BOOKS	%SOLD FOR HIGHEST PRICE				NO. OF BOOKS	UNIT PRICE
2	100	60.00%			HIGHEST	60	50
3					LOWEST	40	20
4					TOTAL PRICE		3800
5							
6							



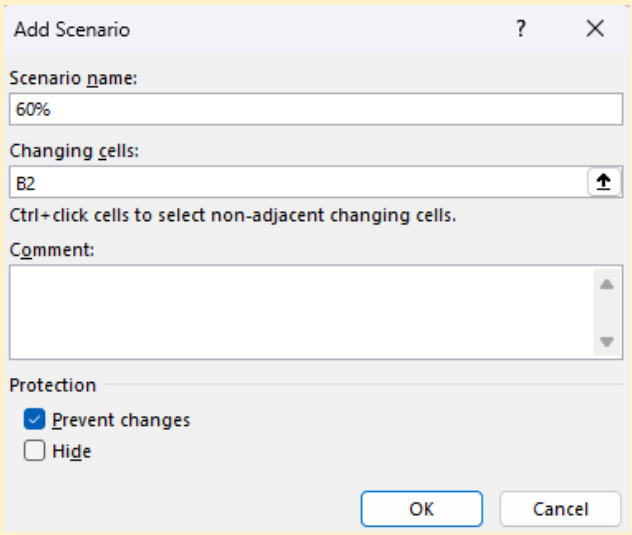
	A	B	C	D	E	F	G	H
1	TOTAL BOOKS	%SOLD FOR HIGHEST PRICE				NO. OF BOOKS	UNIT PRICE	
2	100	60.00%			HIGHEST	60	50	
3					LOWEST	40	20	
4					TOTAL PRICE		3800	
5								
6								

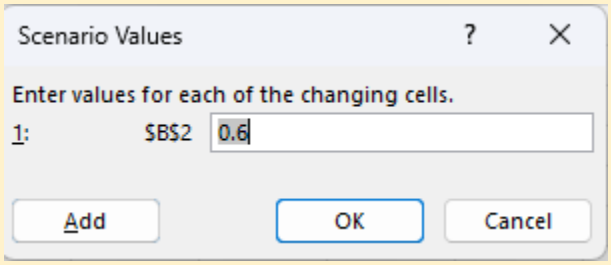
Step2: Data-What-If analysis-Scenario manager



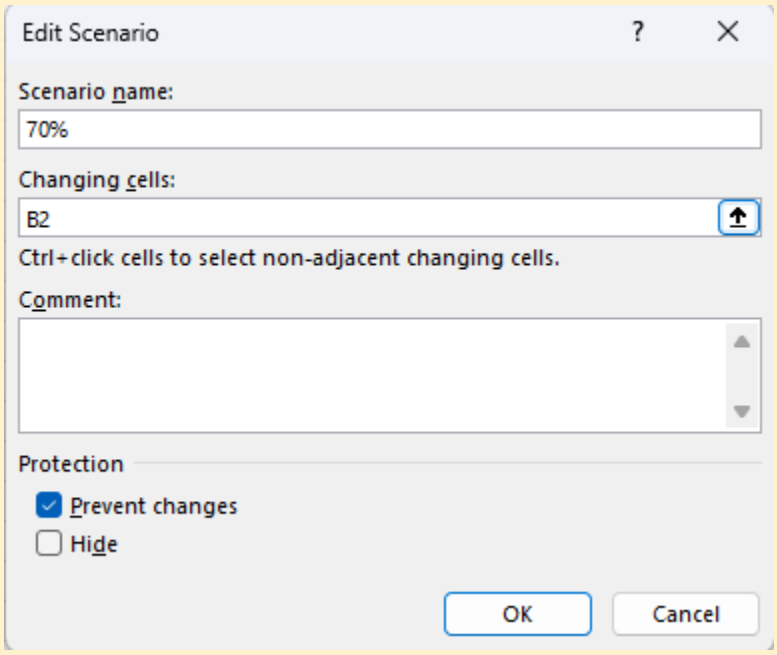


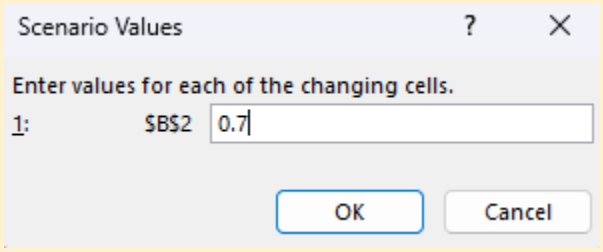
Step3: Add a scenario

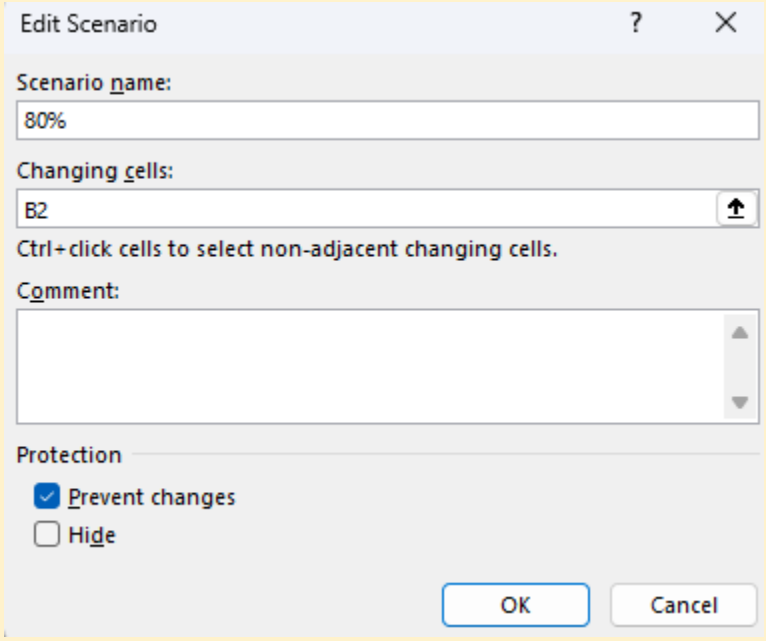


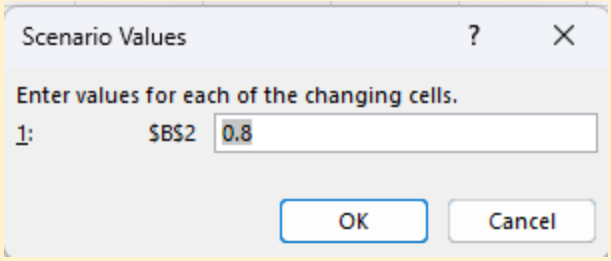


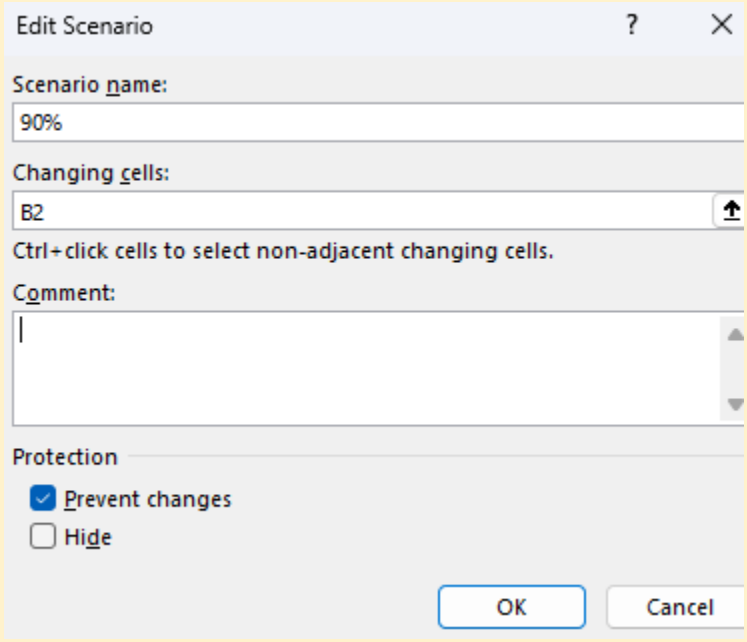
Step4: Add 4 more(70%,80%,90%,100%)

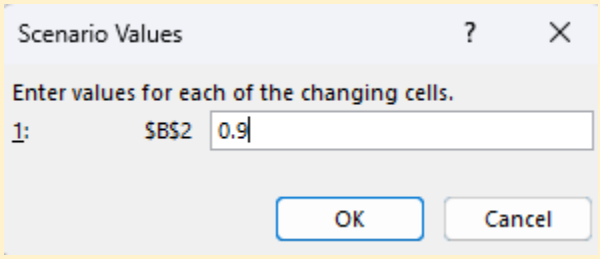


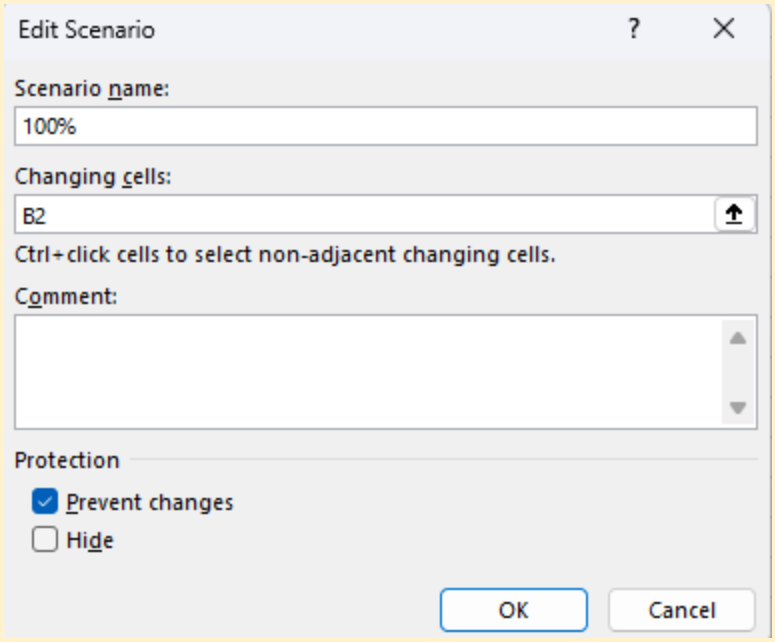


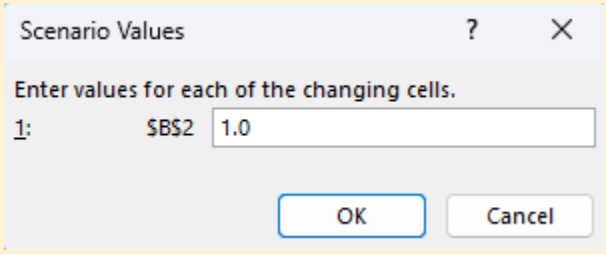


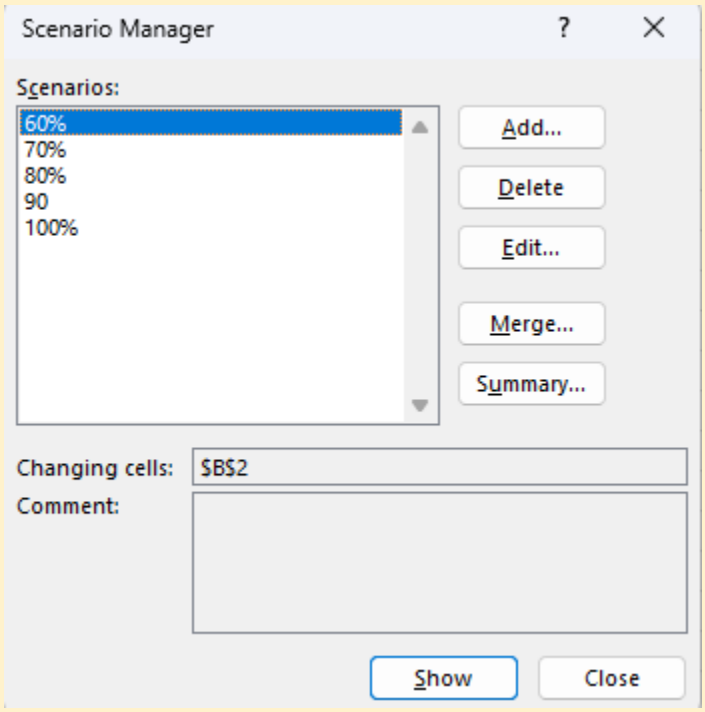

Scenario Values
Enter values for each of the changing cells.
1:
B2
0.8
OK
Cancel


Edit Scenario
Scenario name:
90%
Changing cells:
B2
Ctrl+click cells to select non-adjacent changing cells.
Comment:
Protection
Prevent changes
Hide
OK
Cancel

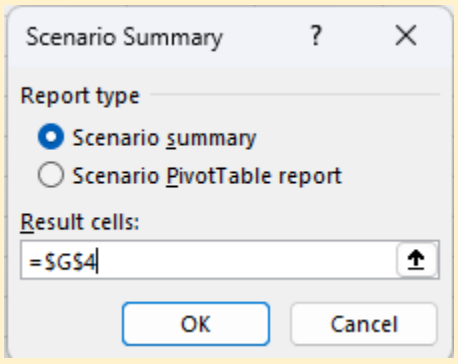

Scenario Values
Enter values for each of the changing cells.
1:
B2
0.9
OK
Cancel


Edit Scenario
Scenario name:
100%
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:
B2
1.0
OK
Cancel


Scenario Manager
Scenarios:
60%
70%
80%
90
100%
Add...
Delete
Edit...
Merge...
Summary...
Changing cells:
B2
Comment:
Show
Close

Step5:Summary



Step6:Output

Scenario Summary

	Current Values:	60%	70%	80%	90%	100%
Changing Cells:						
B2	60.00%	60.00%	70.00%	80.00%	90.00%	100.00%
Result Cells:						
G4	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)

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)
```

```
> 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

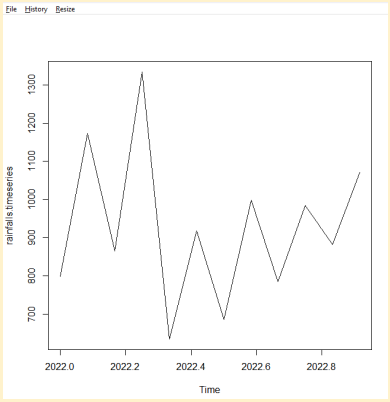
png(file="rainfall")

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
```

```
> newiris<-iris
> newiris$Species<-NULL
> kc<-kmeans(newiris,3)
> kc
K-means clustering with 3 clusters of sizes 38, 62, 50

Cluster means:
  Sepal.Length Sepal.Width Petal.Length Petal.Width
1     6.850000    3.073684     5.742105    2.071053
2     5.901613    2.748387     4.393548    1.433871
3     5.006000    3.428000     1.462000    0.246000

Clustering vector:
  [1] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 1 2 2 2 2 2
 [59] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 2 1 1 1 1 2 1 1 1 1 1 2 2 1
[117] 1 1 1 2 1 2 1 2 1 1 2 2 1 1 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 2

Within cluster sum of squares by cluster:
[1] 23.87947 39.82097 15.15100
 (between_SS / total_SS =  88.4 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss" "betweenss"    "size"
[8] "iter"         "ifault"
> |
```

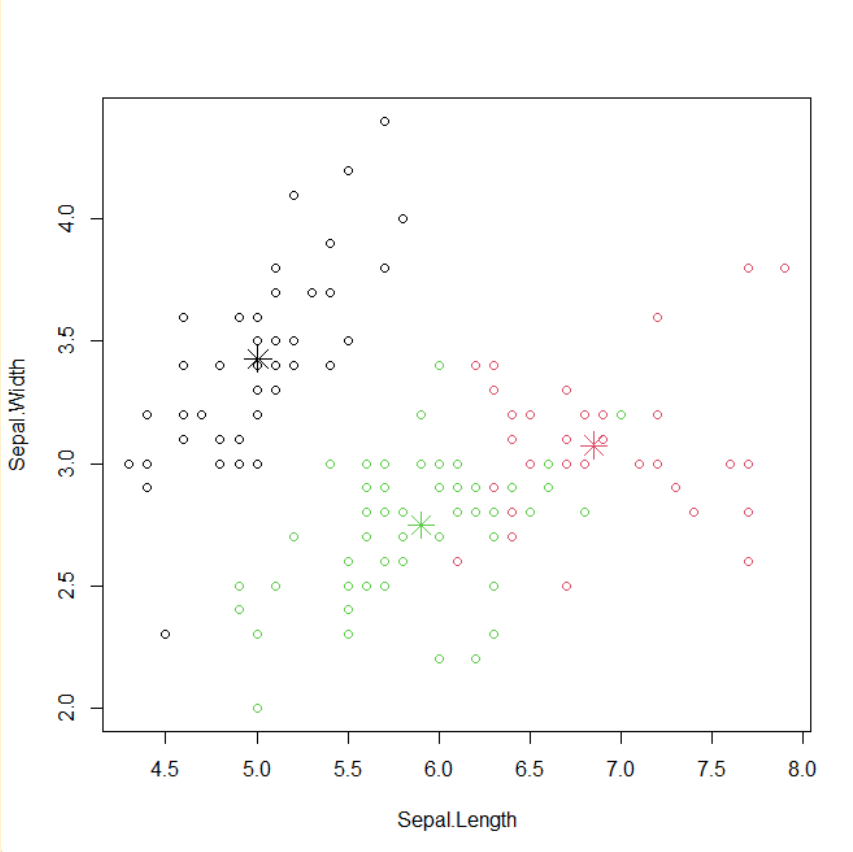
Step2: Code2

```
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
> |
```

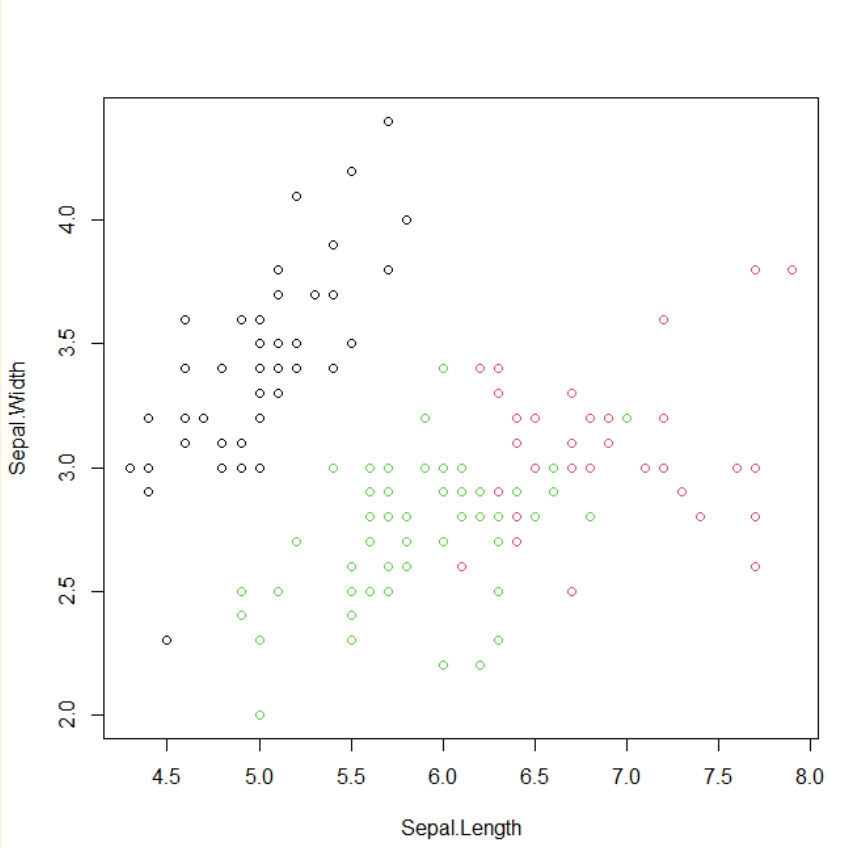
Step3: Code3

```
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)
```

```
> 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 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\RtmpmES1yl\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 FALSE  TRUE  TRUE  TRUE  TRUE FALSE FALSE FALSE FALSE  TRUE
 [35]  TRUE  TRUE FALSE  TRUE  TRUE  TRUE FALSE FALSE  TRUE  TRUE FALSE  TRUE FALSE  TRUE FALSE  TRUE  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 FALSE  TRUE
 [86]  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

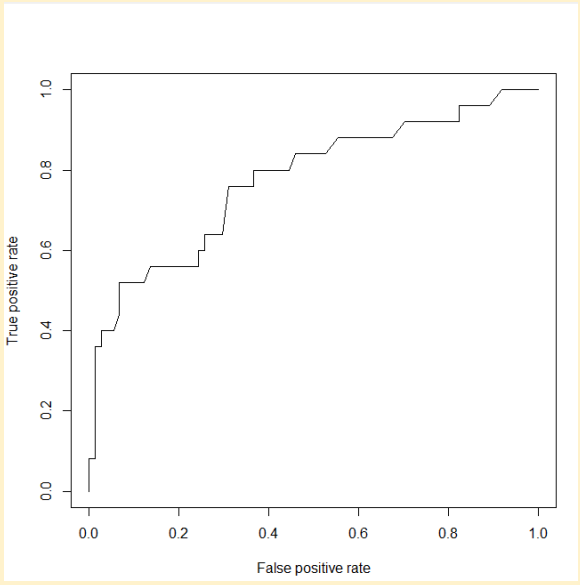
54/74

```
> 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
```

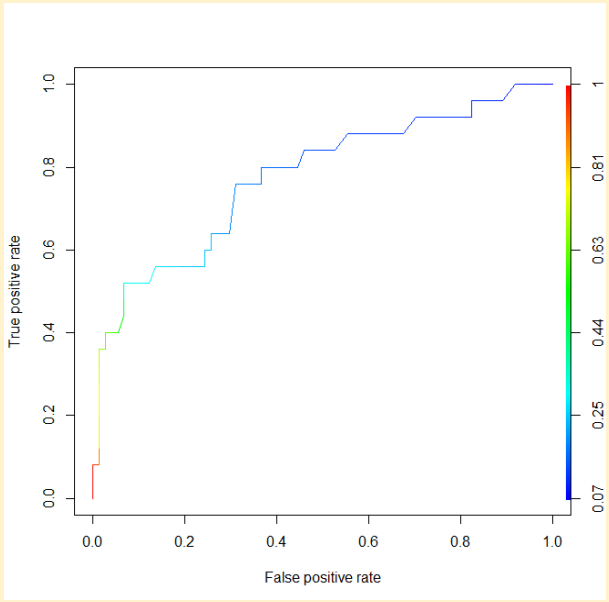
Step7:Run this code

Code:

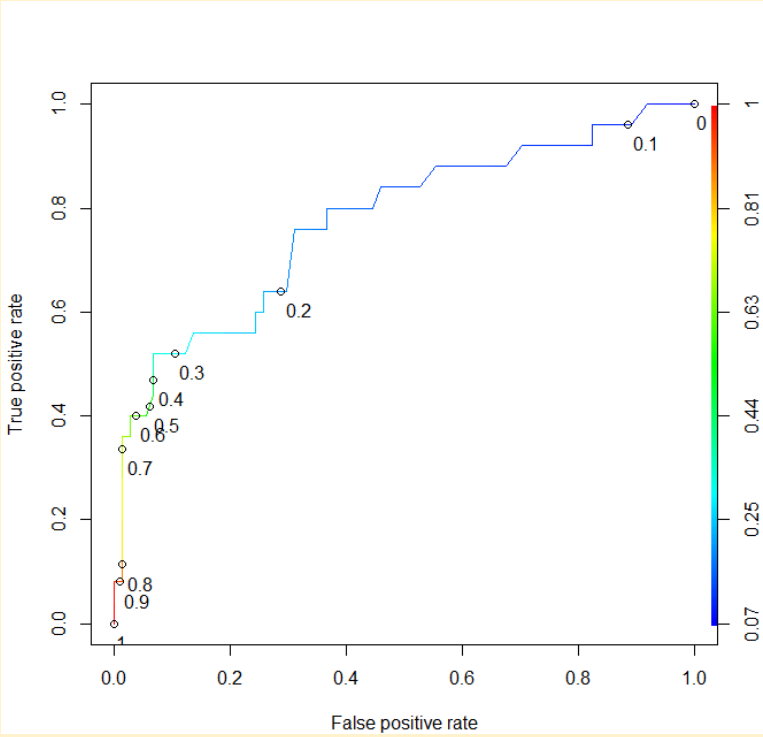
```
install.packages("ROCR")
library(ROCR)
ROCRRpred=prediction(predictTrain,qualityTrain$PoorCare)
ROCRperf=performance(ROCRpred,"tpr","fpr")
plot(ROCRperf)
```




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



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



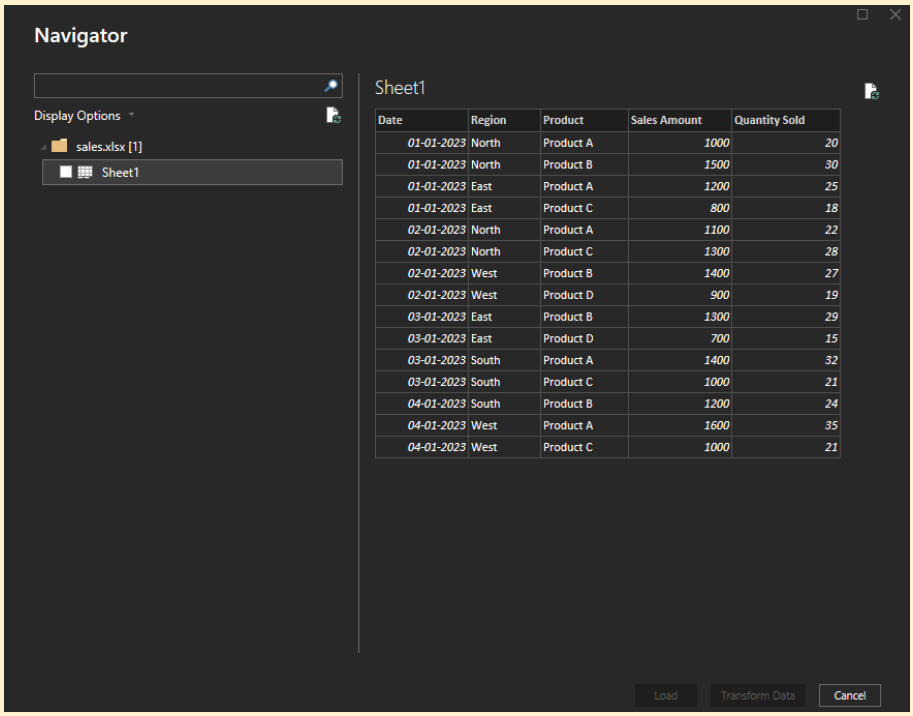
PRACTICAL 9

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

Step 1: Install Power BI Desktop

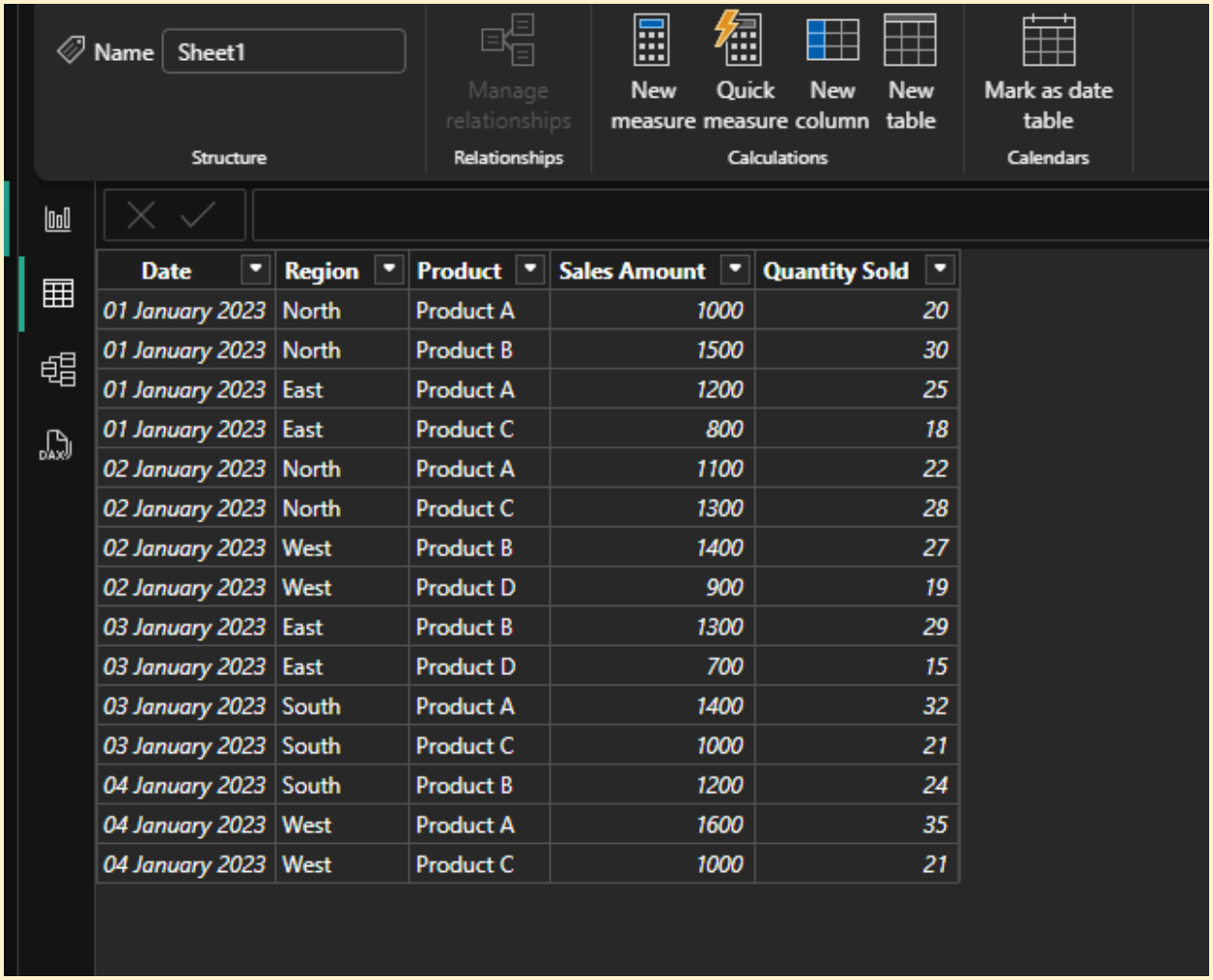
Step 2: Load Data into Power BI

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.



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

- 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

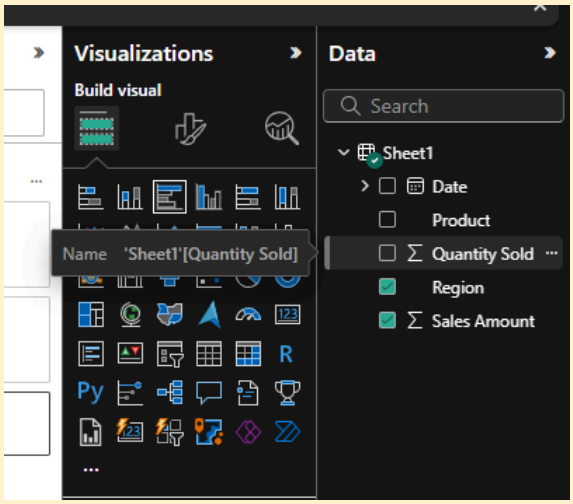
Step 3: Prepare Data (Optional)

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.

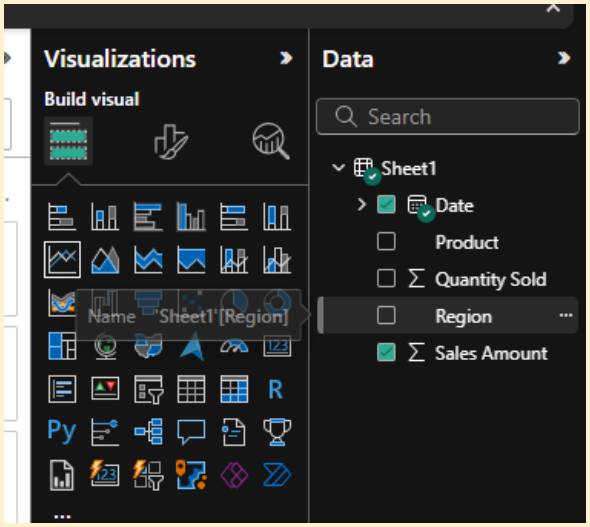
Step 4: Create Visualizations

1. Select a Visualization Type:
    - On the Visualizations pane, you can choose different types of charts and tables, like:

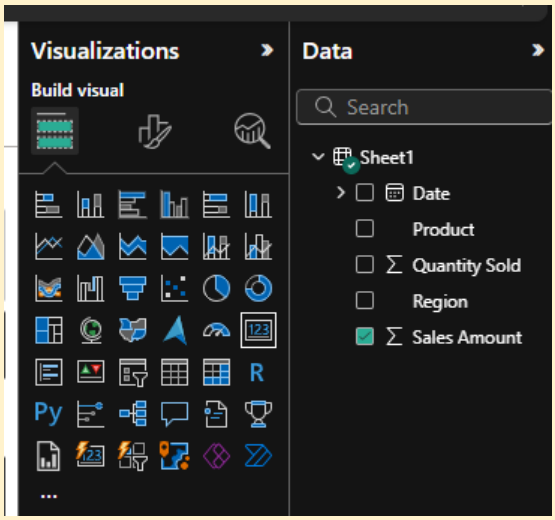
Bar Chart for Sales by Region.



Line Chart for Sales over Time.



Card for Total Sales.



2. Create a Total Sales Card:

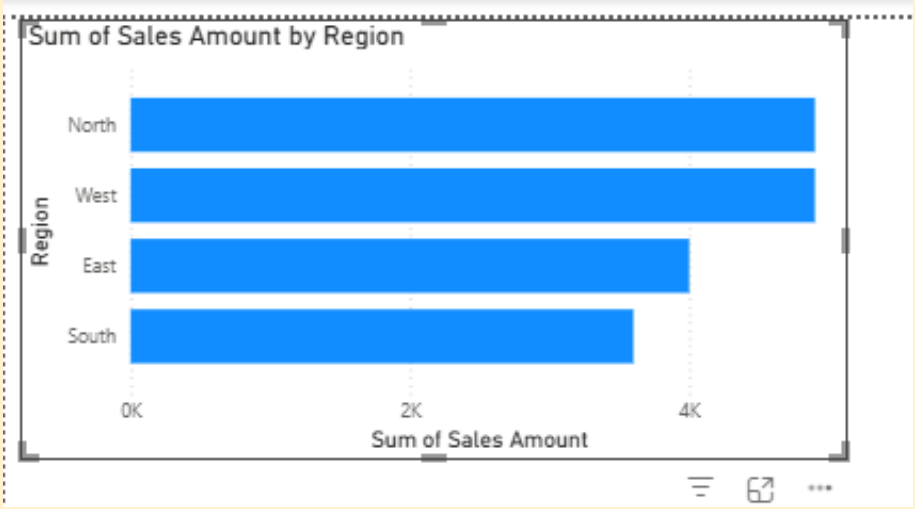
- In the Visualizations pane, click the Card visualization.

- 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:

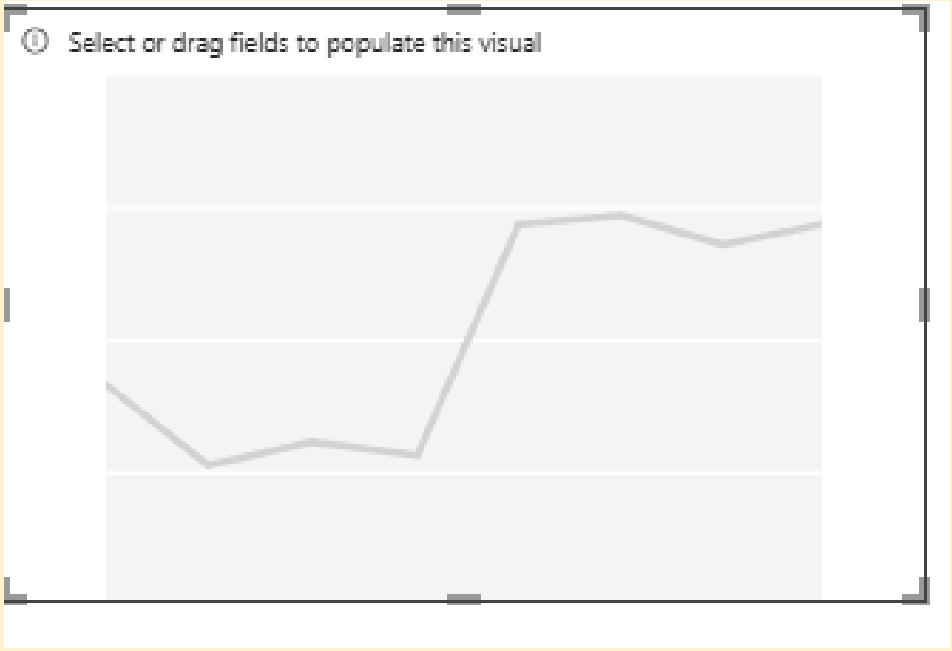
- Click the Clustered Bar Chart from the Visualizations pane.

- 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.

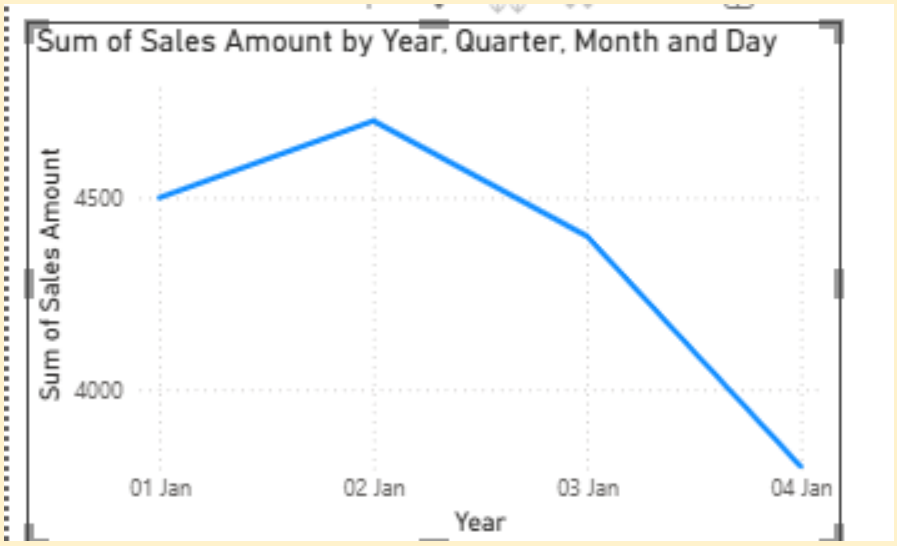


4. Create Sales Over Time Line Chart:

- Click the Line Chart from the Visualizations pane.

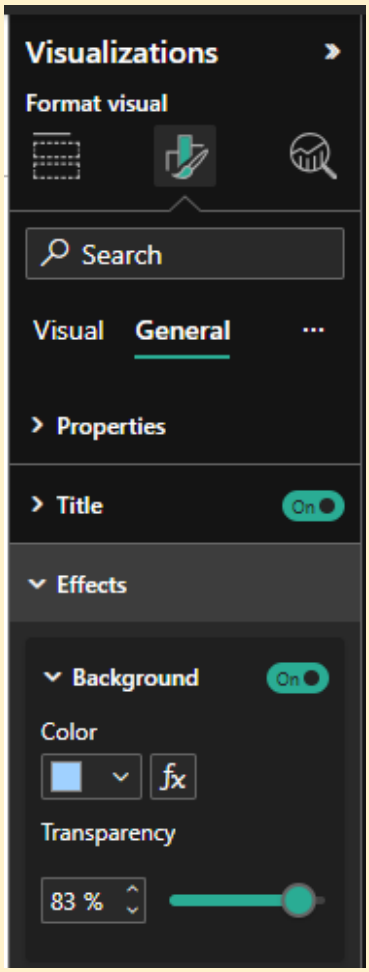


- Drag the Date field to the "Axis" section.
- Drag the Sales Amount field to the "Values" section.
- This will show how sales have changed over time.



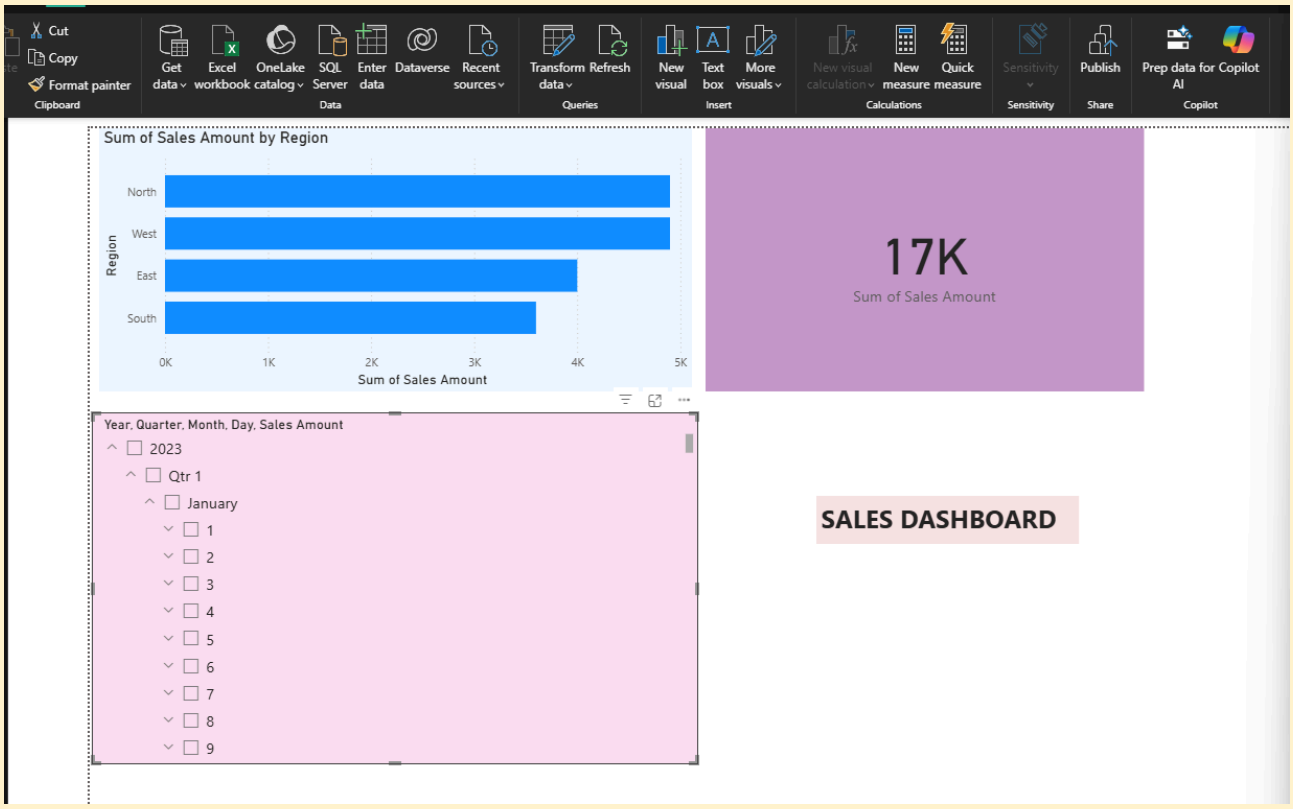
Step 5: Format Your Dashboard

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.

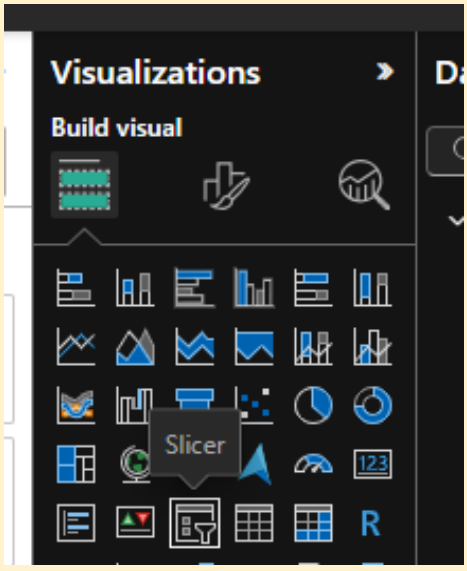


3. Add Titles:

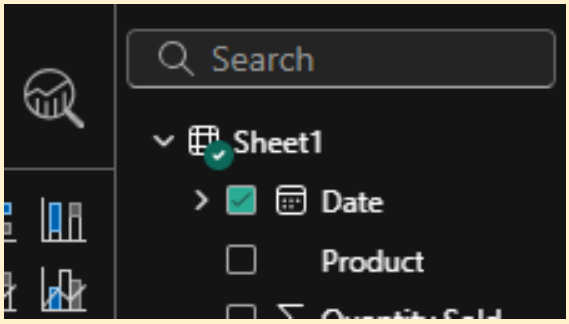
- To add a title to your dashboard, click on the Text box icon from the Home tab.
- Type your title, e.g., "Sales Dashboard".



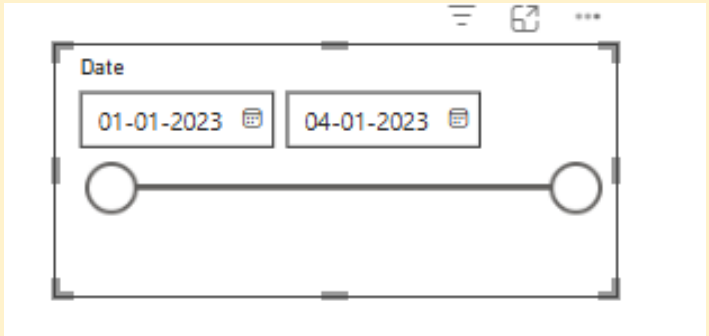
4. Add Filters (Optional):
   - To filter data by Region or Date, you can add slicers.
   - Click on Slicer from the Visualizations pane.



   - Drag the Region or Date field to the slicer.

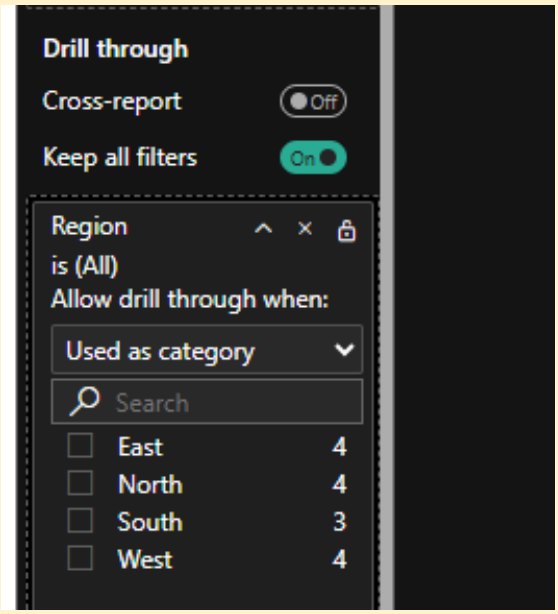


   - Now, users can interact with the dashboard and filter data by region or Time.

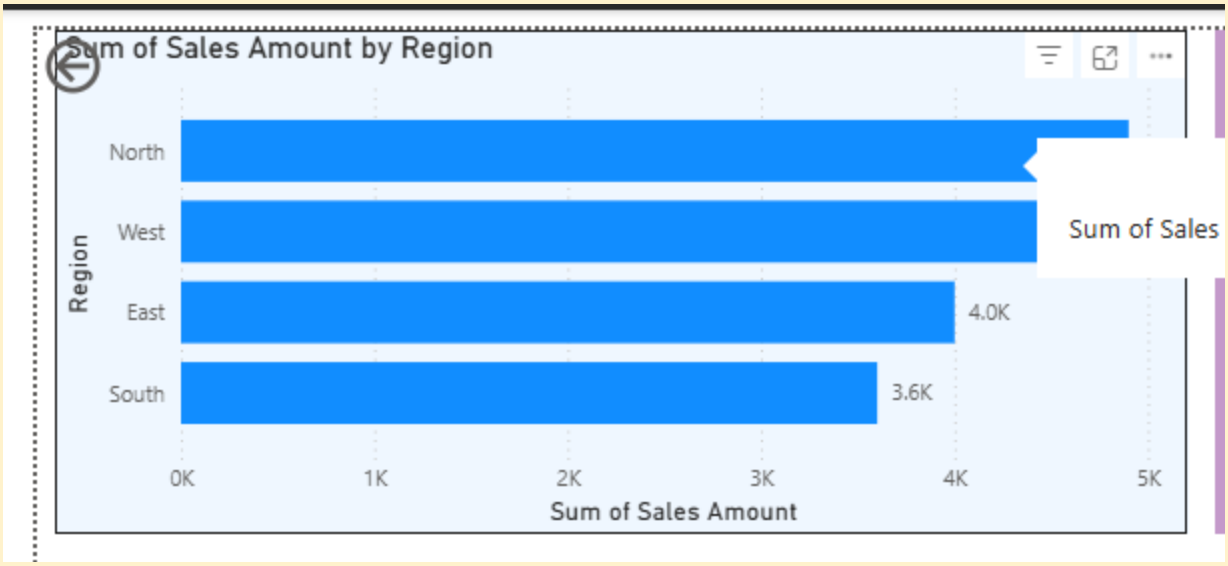


Step 6: Interactivity and Drilldowns

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