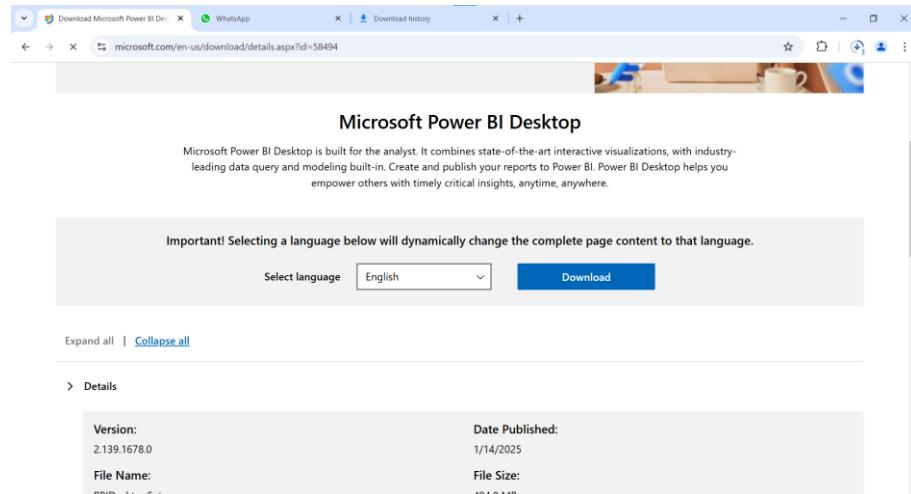


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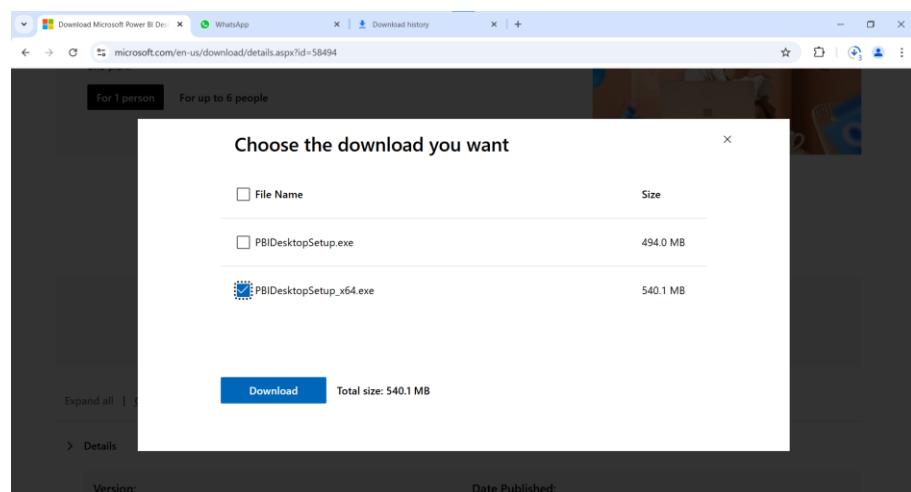
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Practical 1 A – Installation of PowerBi

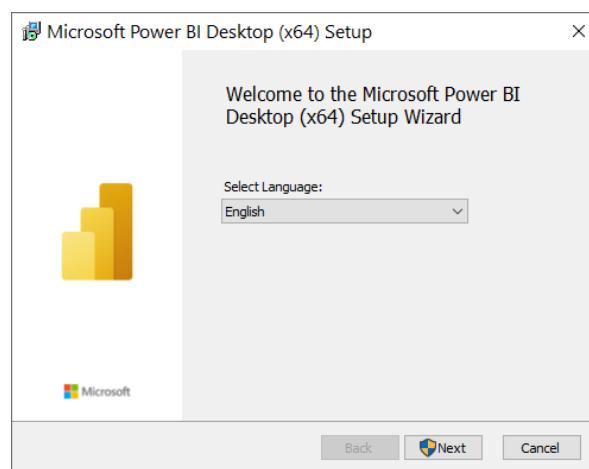
1) Go to - <https://www.microsoft.com/en-us/download/details.aspx?id=58494>



2) Download 64-bit file



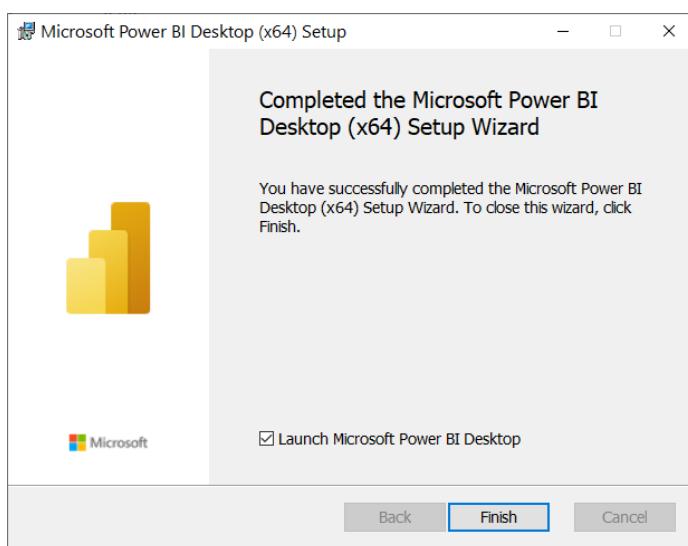
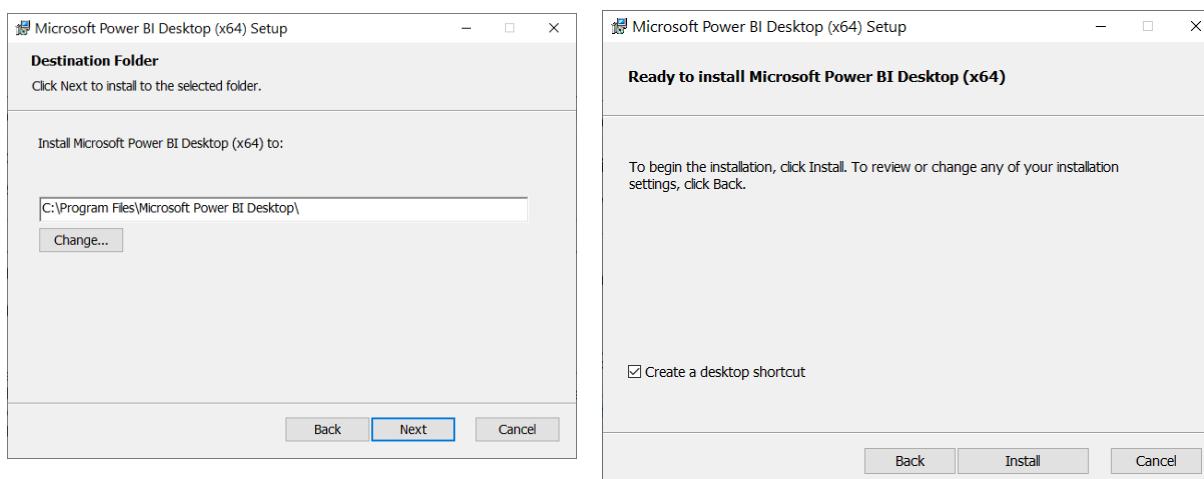
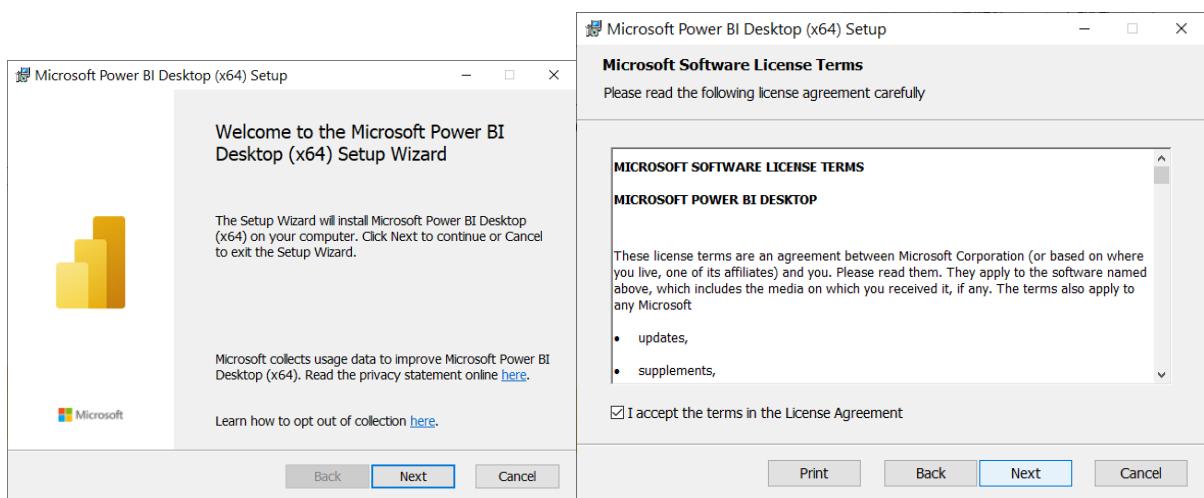
3) Run the installer



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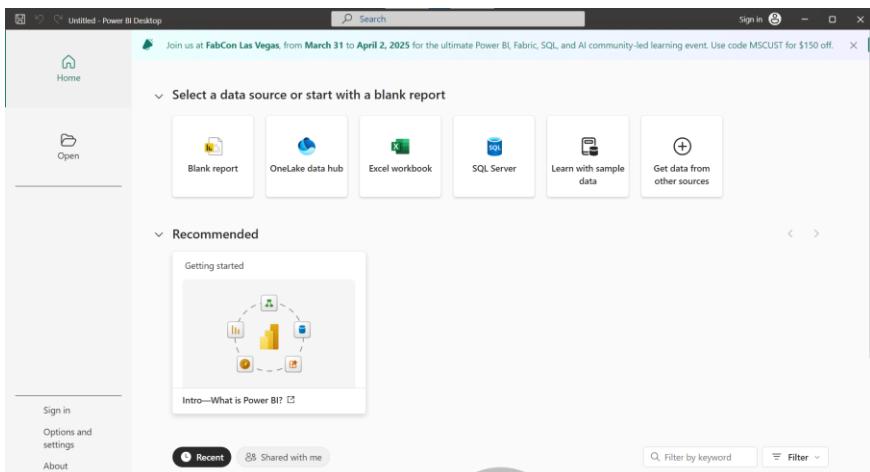
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4) Click next > next > accept > next > install > finish

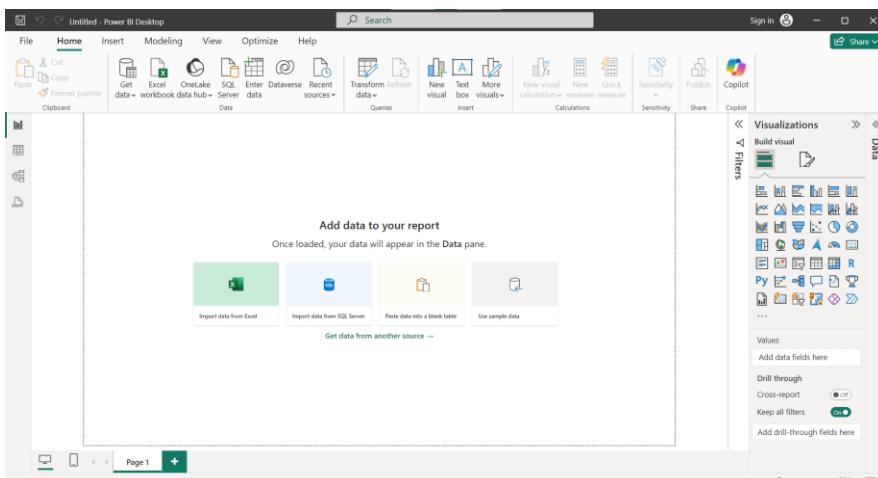


Practical 1B – Import Legacy Data from Different Sources

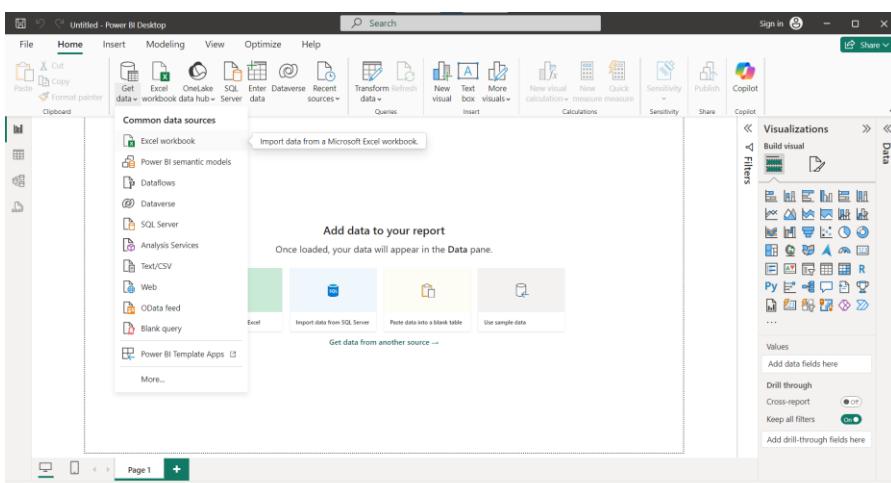
1) Open Power BI



2) Create Blank Report



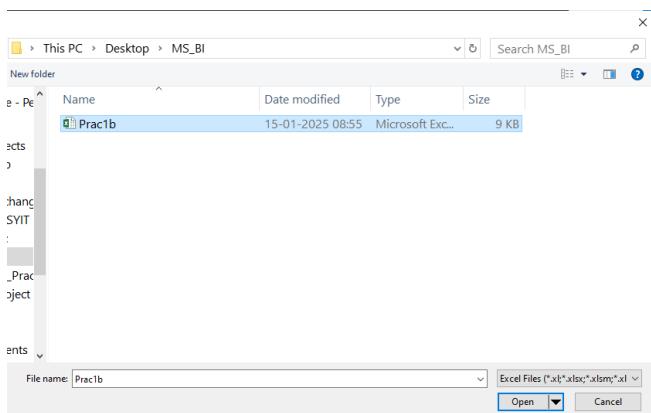
3) Select Excel workbook under get data option. Click on connect



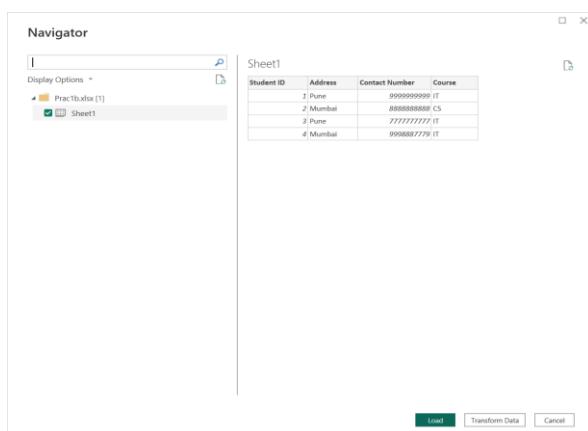
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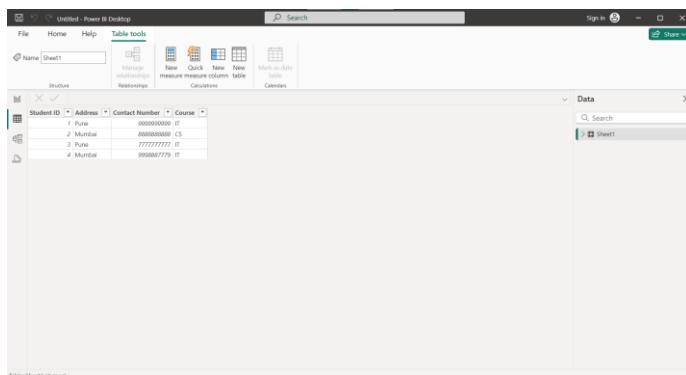
4) Browse your file and select it



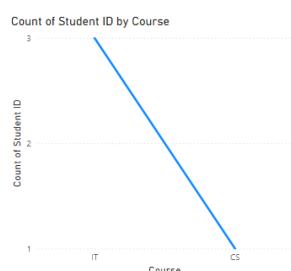
5) Click on Sheet and Load



6) The data will be shown



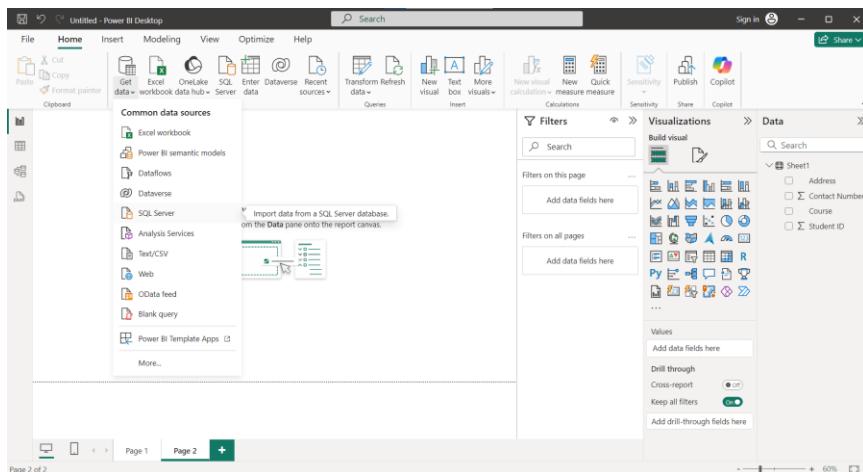
7) Create charts



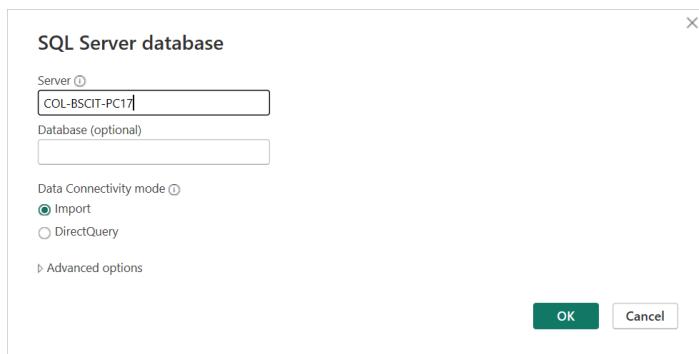
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8) Click on get data and select sql server



9) Add sever name > select database > select table



Navigator

Std_ID	Std_Name	Address
1	A	Mumbai
2	B	Mumbai
3	C	Pune

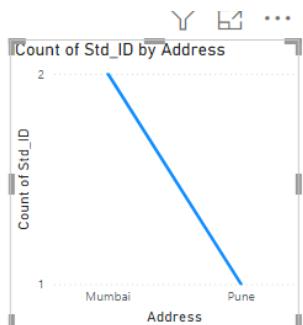
10) Data will be loaded

Std_ID	Std_Name	Address
1	A	Mumbai
2	B	Mumbai
3	C	Pune

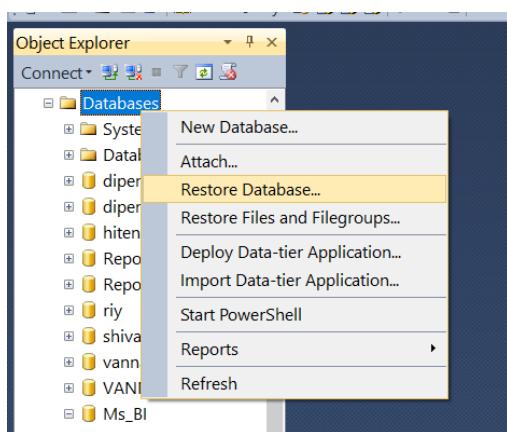
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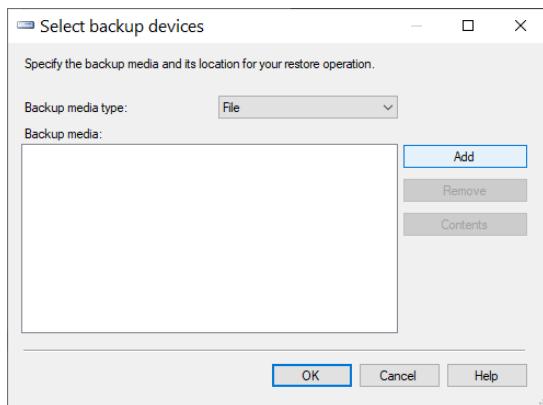
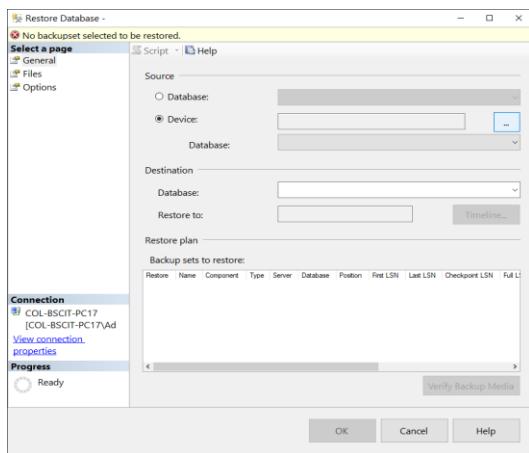
11) Create a chart



12) In SSMS, restore database

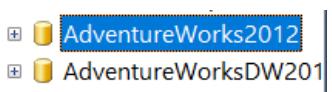
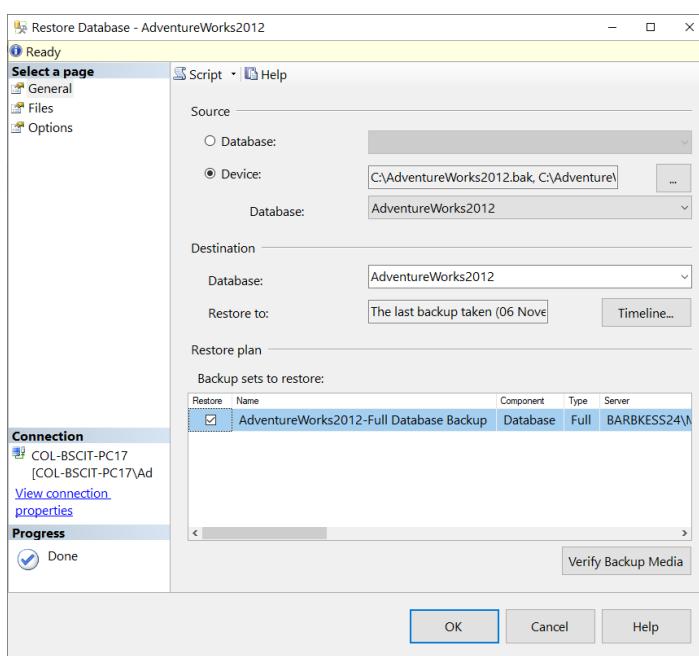
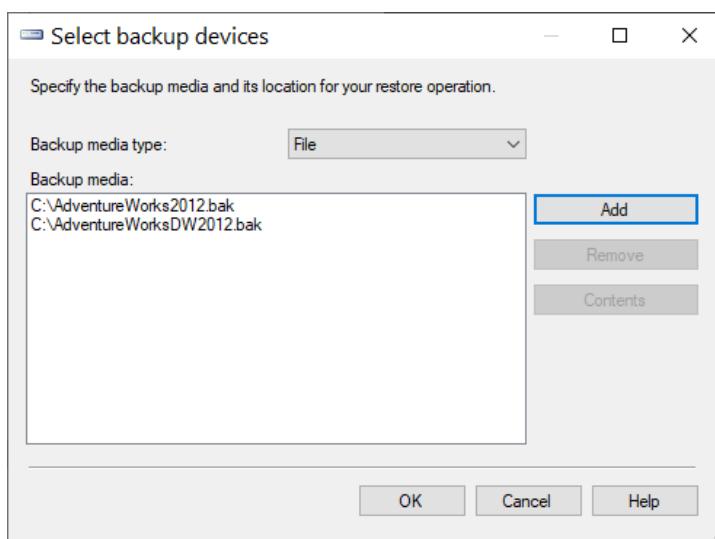
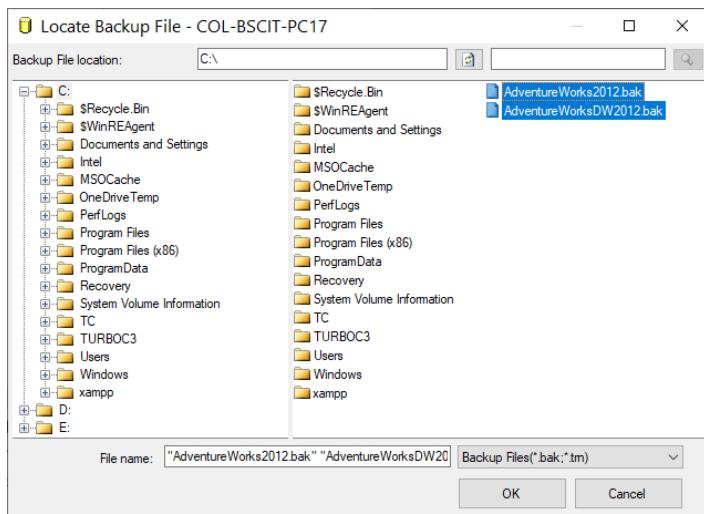


13) Select Device > ... > Add > Select Files > Ok > Ok



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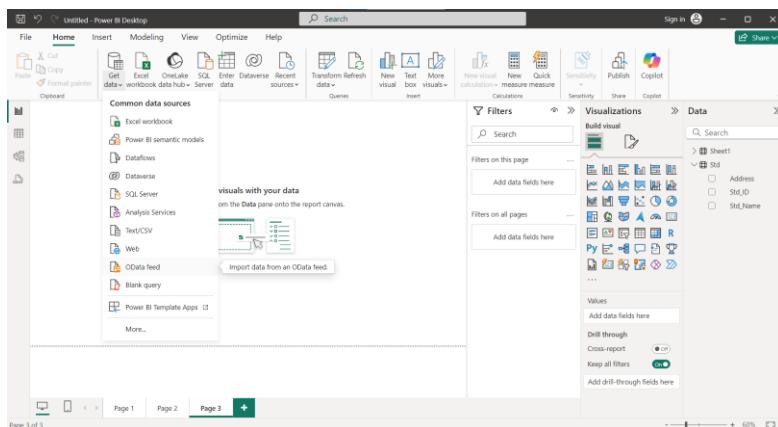
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14) Get – O Data Feed



15) Paste URL



16) Select customer and product table

ProductID	ProductName	SupplierID	CategoryID	Quantity
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	1
12	Queso Manchego La Pastora	5	4	10
13	Konbu	6	8	2
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

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17) Tables are shown

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File Home Help Table tools

Name: Customers

Structure Relationships Calculations Calendars

CustomerID CompanyName ContactName ContactTitle Address City Region PostalCode

CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode
ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berl	Mes	WA1 1DP
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222		Storage mode	S-995 22
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos 2312		Data refreshed	69306
AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London		28023
BERGS	Berglundsnabbbköp	Christina Berglund	Order Administrator	Berguvsvägen 8	Luleå		13008
BLAUS	Blauer See Delikatessen	Hanna Mous	Representative	Forststr. 57	Mannheim		T2F 8M4
BLONP	Blondel's père et fils	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg		EC2 5NT
BOLID	Bólido Comidas preparadas	Martin Sommer	Owner	C/ Aragó, 67	Madrid		1010
BONAP	Bon app'	Laurence Lebihan	Owner	12, rue des Bouchers	Marseille		05022
BOTTN	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	23 Tsawassen Blvd.	Tsawassen	BC	05442-030
BSBEV	B's Beverages	Victoria Ashworth	Sales Representative	Fauntleroy Circus	London		28034
CACTU	Cactus Comidas para llevar	Patricia Simpson	Sales Agent	Cerrito 333	Buenos Aires		8010
CENTC	Centro comercial Moctezuma	Francisco Chang	Marketing Manager	Sierras de Granada 9993	México D.F.		20000-000
CHOPS	Chop-suey Chinese	Yang Wang	Owner	Hauptstr. 29	Bern		3012
COMMI	Comércio Mineiro	Pedro Afonso	Sales Associate	Av. dos Lusíadas, 23	Sao Paulo	SP	05432-043
CONSM	Consolidated Holdings	Elizabeth Brown	Sales Representative	Berkeley Gardens 12	Brewery	VX1 6LT	52066
DRACD	Drachenblut Delikatessen	Sven Ottlieb	Order Administrator	Walterweg 21	Aachen		44000
DUMON	Du monde entier	Jeanne Lubrune	Owner	67, rue des Quinante Otages	Nantes		VX3 6FW
EASTC	Eastern Connection	Ann Devon	Sales Agent	35 King George	London		8010
ERNSH	Ernst Handel	Roland Mendel	Saler Manager	Kirchgasse 6	Graz		05442-030
FAMIA	Familia Arquibaldo	Aria Cruz	Marketing Assistant	Rua Orós, 92	Sao Paulo	SP	28034
FISFA	FIESA Fabrica Inter. Salchichas S.A.	Diego Roel	Accounting Manager	C/ Morálzaral, 86	Madrid		05000
FOLIG	Folies gourmandes	Martine Rancé	Assistant Sales Agent	184, chaussée de Tournai	Lille		05022
FOLIG	Folies gourmandes	Martine Rancé	Assistant Sales Agent	184, chaussée de Tournai	Lille		05022

Table: Customers (91 rows)

Untitled - Power BI Desktop

File Home Help Table tools

Name: Products

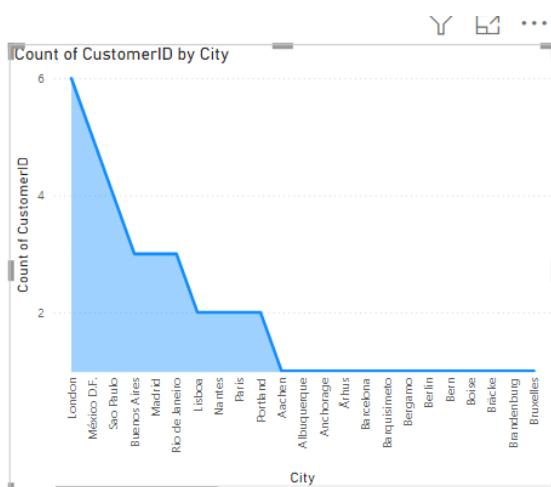
Structure Relationships Calculations Calendars

ProductID ProductName SupplierID CategoryID QuantityPerUnit UnitPrice UnitsInStock UnitsOnOrder ReorderLevel Discontinued

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	24 - 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	2	7 - 1 lb pkgs.	30	15	0	10	False
8	Northwoods Cranberry Sauce	3	2	2 - 12 oz jars	40	6	0	0	False
9	Mishi Kōbe Niku	4	3	6 - 500 g pkgs.	97	29	0	0	True
10	Ikura	4	3	8 - 12 - 200 ml jars	31	31	0	0	False
11	Queso Cabrales	5	4	4 - 1 kg pkgs.	21	22	30	30	False
12	Queso Manchego La Pastor	5	4	10 - 500 g pkgs.	38	86	0	0	False
13	Konbu	6	4	8 - 2 kg box	6	24	0	5	False
14	Tofu	6	4	7 - 40 - 100 g pkgs.	23.25	35	0	0	False
15	Genen Shouyu	6	2	24 - 250 ml bottles	15.5	39	0	5	False
16	Pavlova	7	3	3 - 32 - 500 g boxes	17.45	29	0	10	False
17	Alice Mutton	7	3	6 - 20 - 1 kg tins	39	0	0	0	True
18	Caranarow Tigers	7	3	8 - 16 kg pkgs.	62.5	42	0	0	False
19	Teatime Chocolate Biscuits	8	3	3 - 10 boxes x 12 pieces	9.2	25	0	5	False
20	Sir Rodney's Marmalade	8	3	30 gift boxes	81	40	0	0	False
21	Sir Rodney's Scones	8	3	3 - 24 pkgs x 4 pieces	10	3	40	5	False
22	Gustaf's Knäckebrot	9	5	24 - 500 g pkgs.	21	104	0	25	False
23	Tunnbröd	9	5	5 - 12 - 250 g pkgs.	9	61	0	25	False

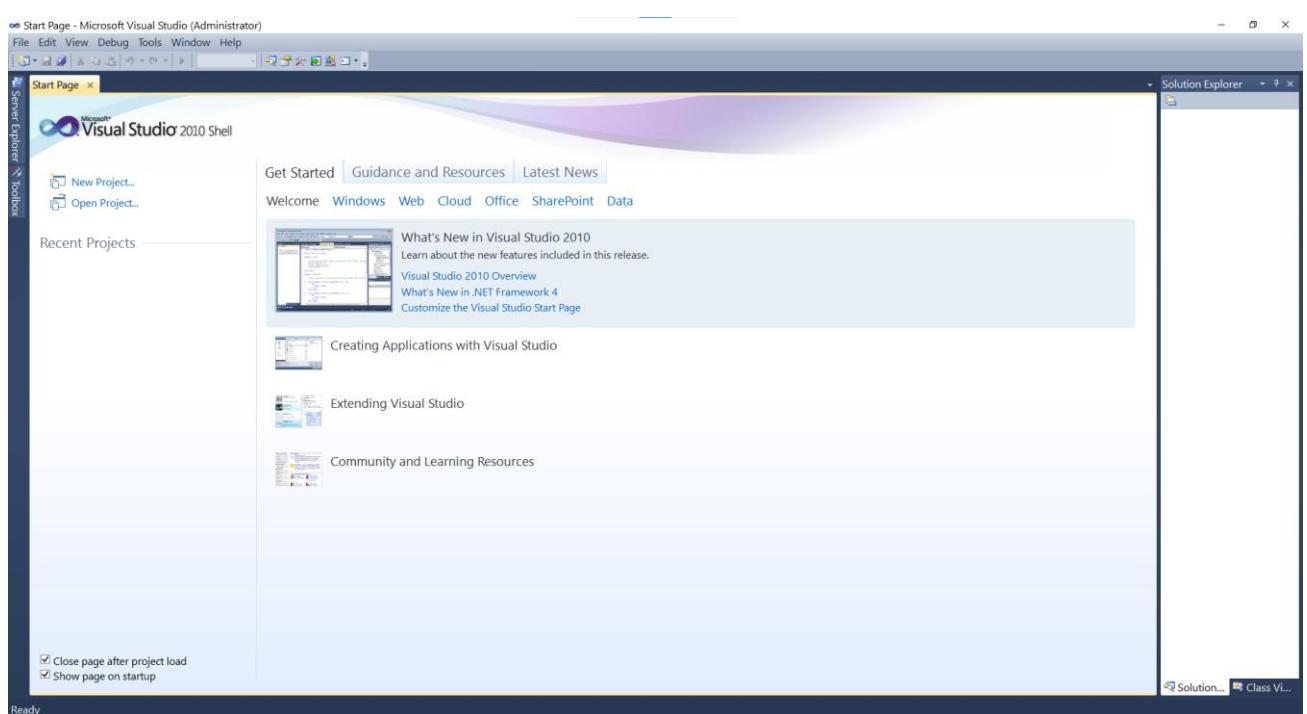
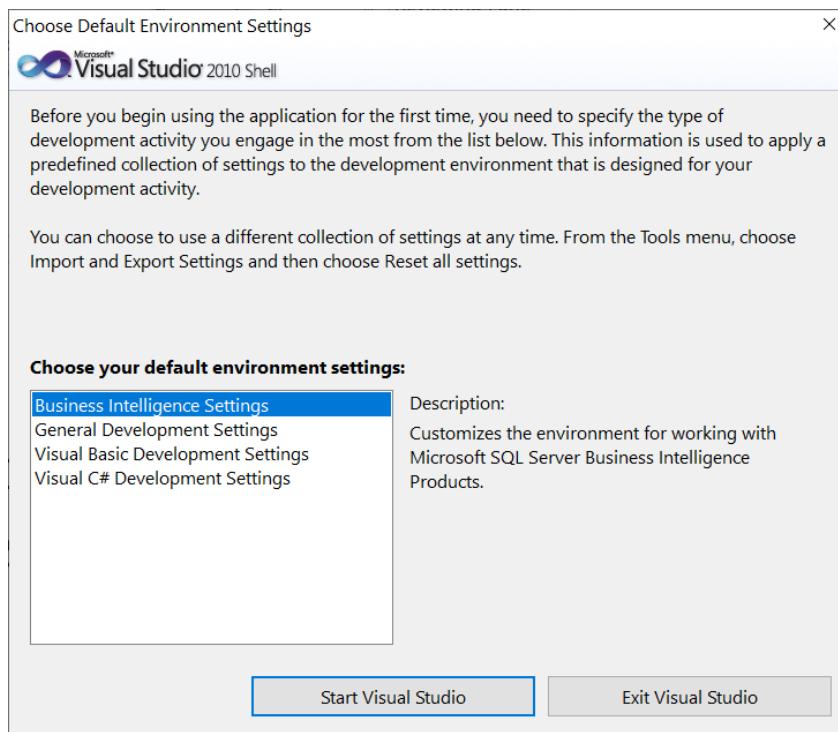
Table: Products (77 rows)

18) Create Chart



Practical 2A – Perform ETL Process to construct the database in SQL Server

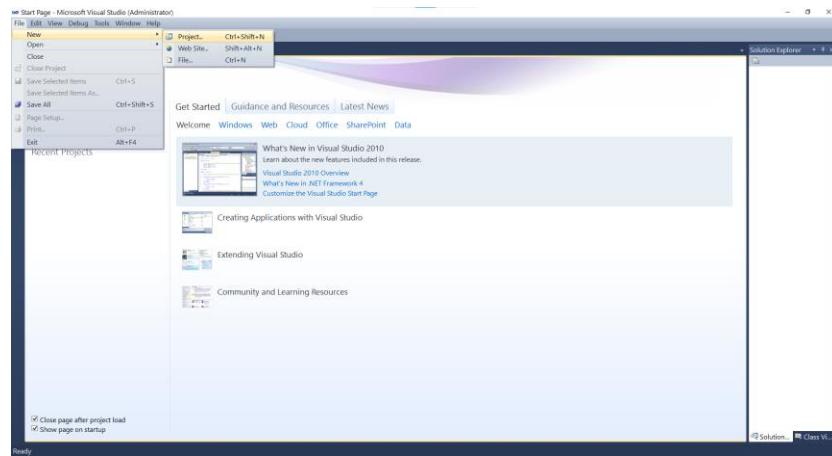
1) Open SQL Server Data Tools



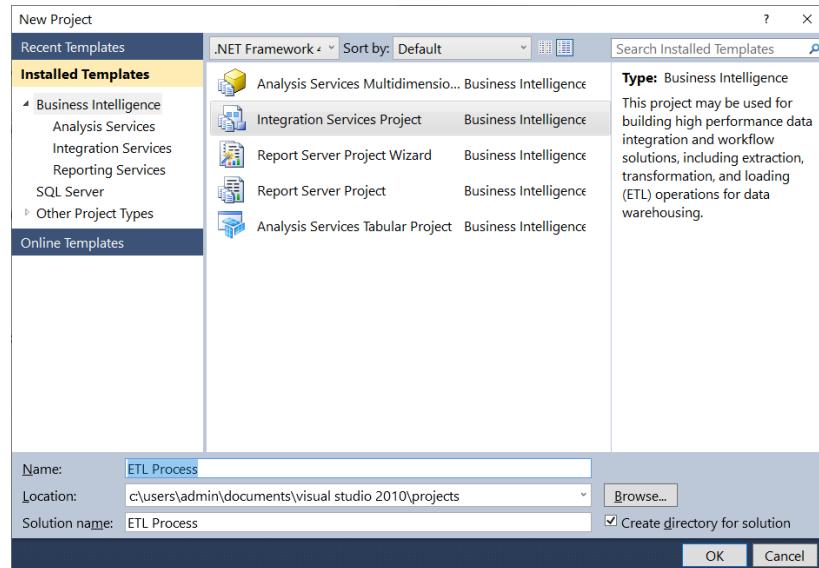
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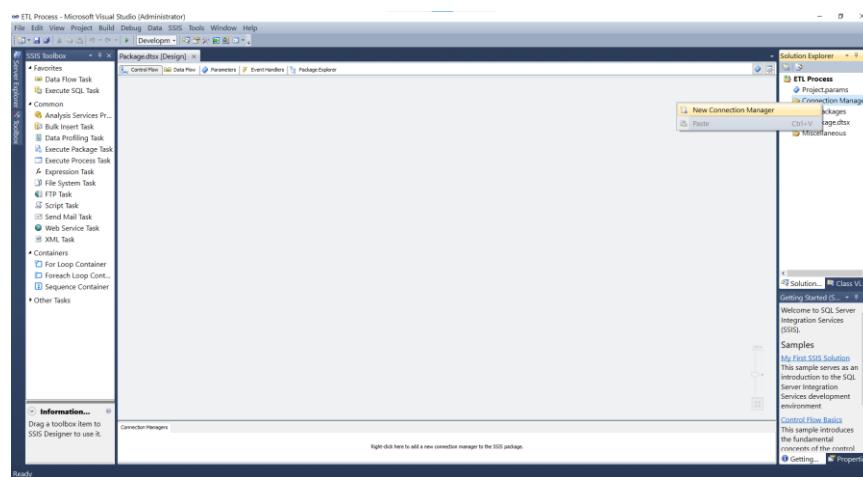
2) Go to File and create new project



3) Select Integration Services Project and name it "ETL Process"



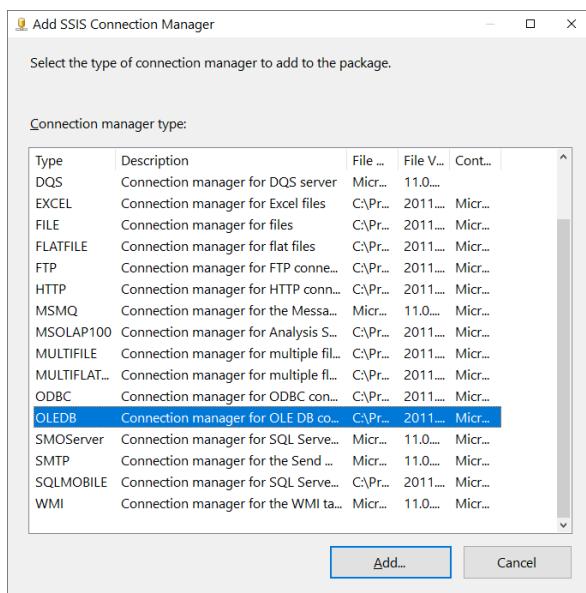
4) Right Click Connection Managers and select new Connection Manager



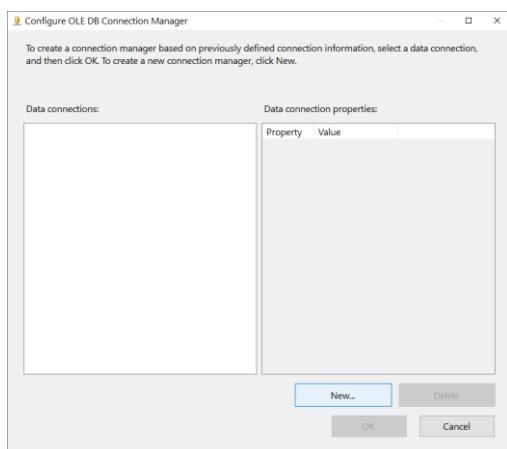
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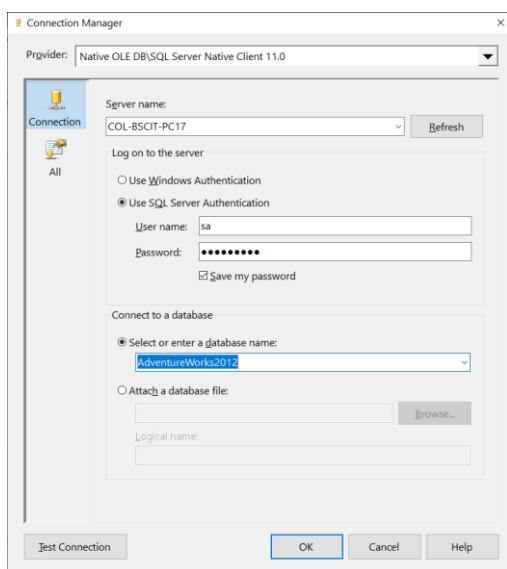
5) Add OLEDB



6) Click New



7) Enter server name and select database AdventureWorks



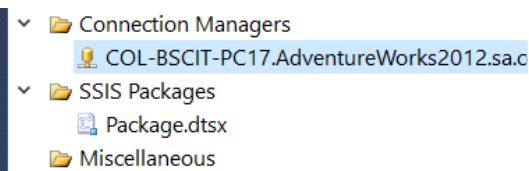
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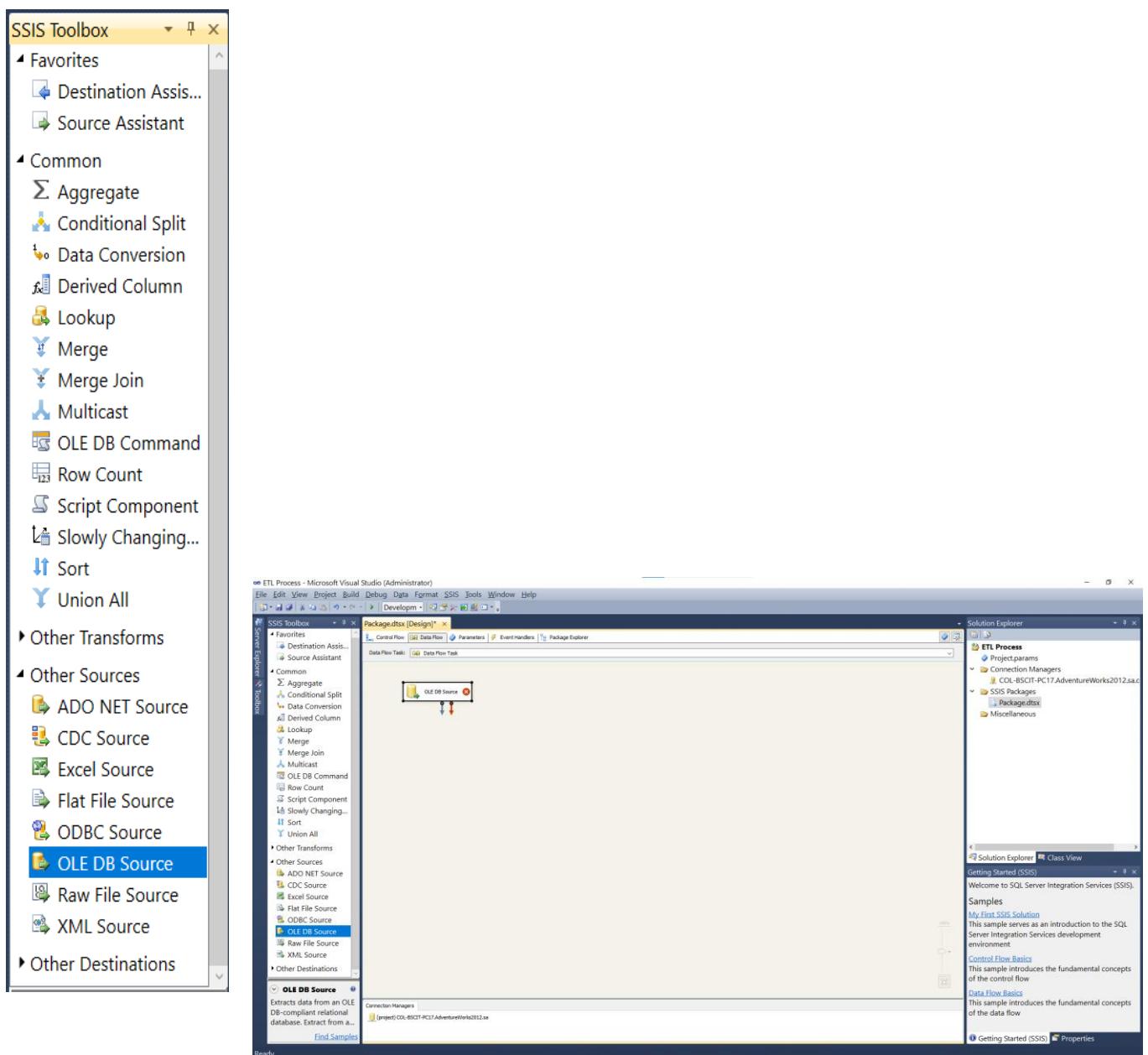
8) Test Connection



9) Click OK



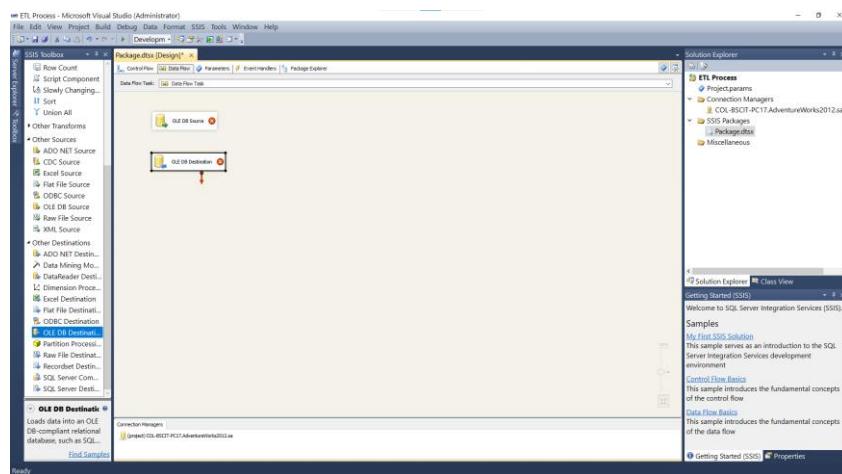
10) In Data Flow Task, In SSIS Tool box, Drag and drop the Data Source



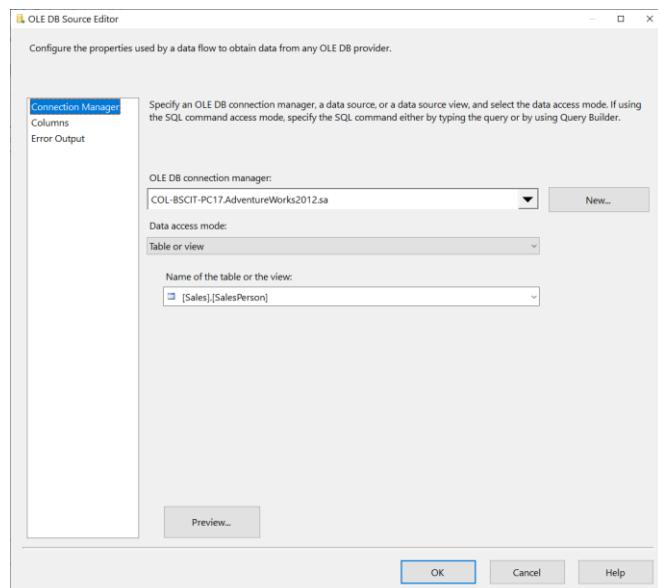
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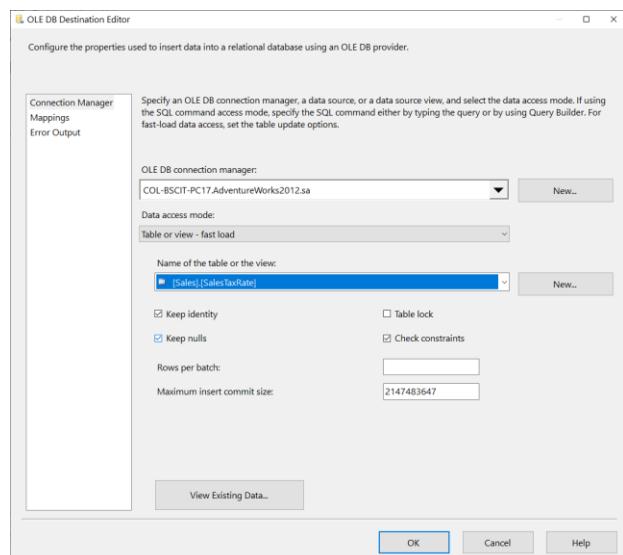
11) Similarly Drag and Drop OLEDB Destination



12) Double Click OLEDB Source, Select SalesPerson



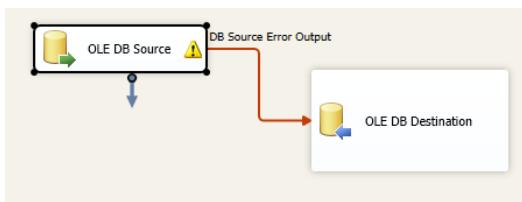
13) Double Click OLEDB Destination, select Sales SalesTaxRate Table



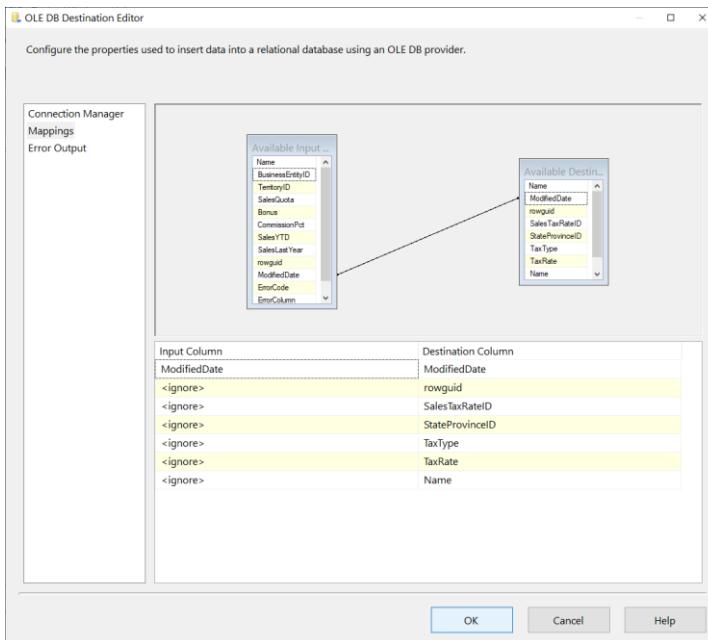
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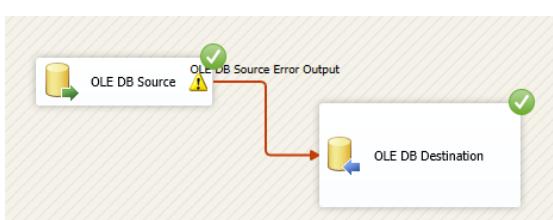
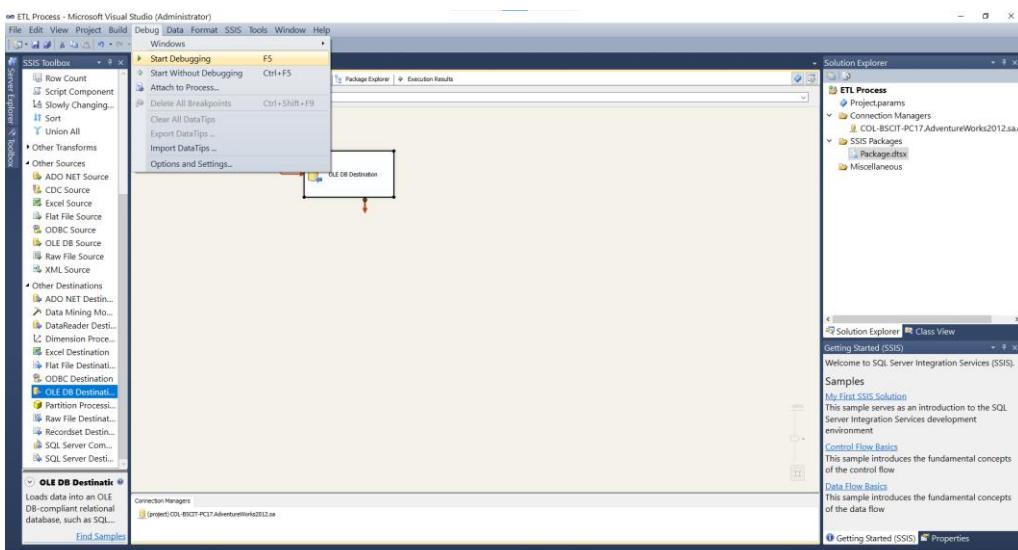
14) Connect Orange Line from Source to Destination



15) In OLE DB Destination check mappings



16) Start Debugging

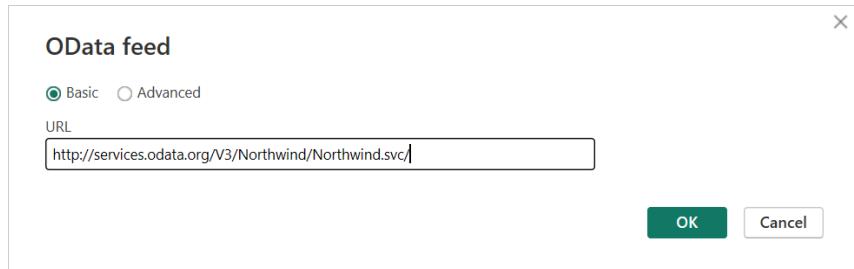


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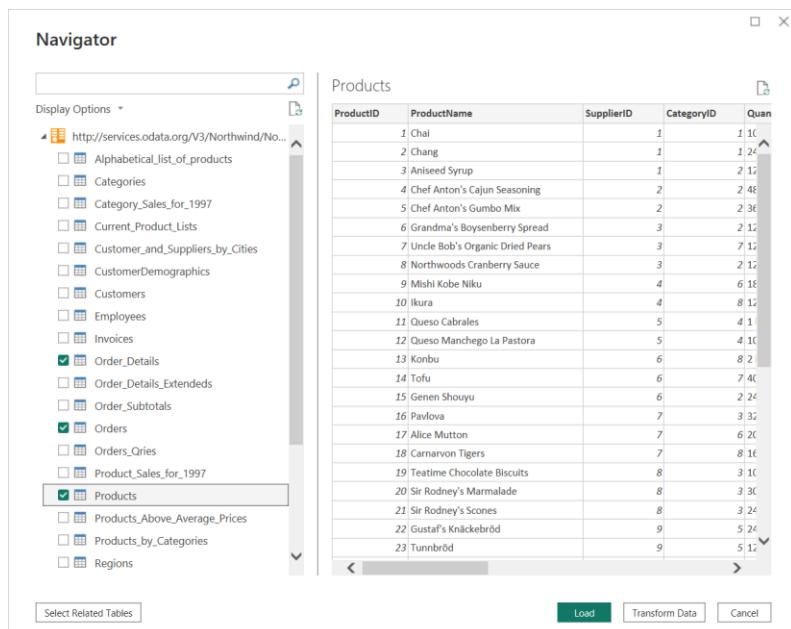
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Practical 2B – Perform ETL Process in Power BI

1) Select ODATA from Get Data and enter URL



2) Select Order_Details, Orders, Products and load



3) Tables will be loaded

The screenshot shows the Power BI Desktop interface. The ribbon at the top has tabs: File, Home, Help, and Table tools. Under Table tools, the 'Structure' tab is selected, showing the 'Order_Details' table. The main area displays the 'Order_Details' table data with columns: OrderID, ProductID, UnitPrice, Quantity, and Discount. The Data pane on the right shows the table structure and relationships.

OrderID	ProductID	UnitPrice	Quantity	Discount
10251	65	16.0	20	0
10253	31	10	20	0
10255	2	15.2	20	0
10261	21	8	20	0
10261	35	14.4	20	0
10265	70	12	20	0
10273	33	2	20	0
10274	71	17.2	20	0
10280	20	36.0	20	0
10280	55	19.2	20	0
10283	15	12.4	20	0
10287	34	11.2	20	0
10290	5	17	20	0
10292	20	64.8	20	0
10297	72	27.8	20	0
10299	70	12	20	0
10300	68	10	20	0
10301	56	30.4	20	0
10309	4	17.6	20	0
10309	43	36.8	20	0
10312	53	26.2	20	0
10317	1	14.4	20	0
10318	41	7.7	20	0
10322	52	5.6	20	0

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4) Right Click any column and select edit query

The screenshot shows the Power BI Desktop interface with the 'Order_Details' table selected in the Data view. A context menu is open over the 'OrderID' column, with 'Edit query' selected. The 'Applied Steps' pane shows a single step named 'Navigation'. The preview pane shows the first 10 rows of the table.

5) Click on Add > Custom Column

The screenshot shows the Power Query Editor interface with the 'Order_Details' table selected. A new column 'LineTotal' is being added using the formula $[UnitPrice]*[Quantity]$. The 'Applied Steps' pane shows a step named 'Added Custom'.

6) Name it LineTotal, add formula $[UnitPrice]*[Quantity]$

The screenshot shows the 'Custom Column' dialog box in Power Query Editor. It shows the formula $= [UnitPrice]*[Quantity]$ and the 'Available columns' list with 'Quantity' selected.

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7) Line Total Column is added

The screenshot shows the Power Query Editor interface with the 'Applied Steps' pane open. A new step named 'Added Custom' is visible, which contains the formula: `= Table.AddColumn(Order_Details_table, "LineTotal", each [UnitPrice]*[Quantity])`. The preview pane shows the updated table with a new column 'LineTotal' containing calculated values.

8) In Power BI Select Order Tables and in Table tools select Manage Relationships

The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. The 'Manage relationships' tab is active. A context menu is open over the 'Order_Details' relationship, showing options like 'Manage relationships', 'New measure', 'New column', 'New quick measure', 'Measure table', 'Calculated', 'Mark as date table', and 'Incremental refresh'.

9) Select the columns

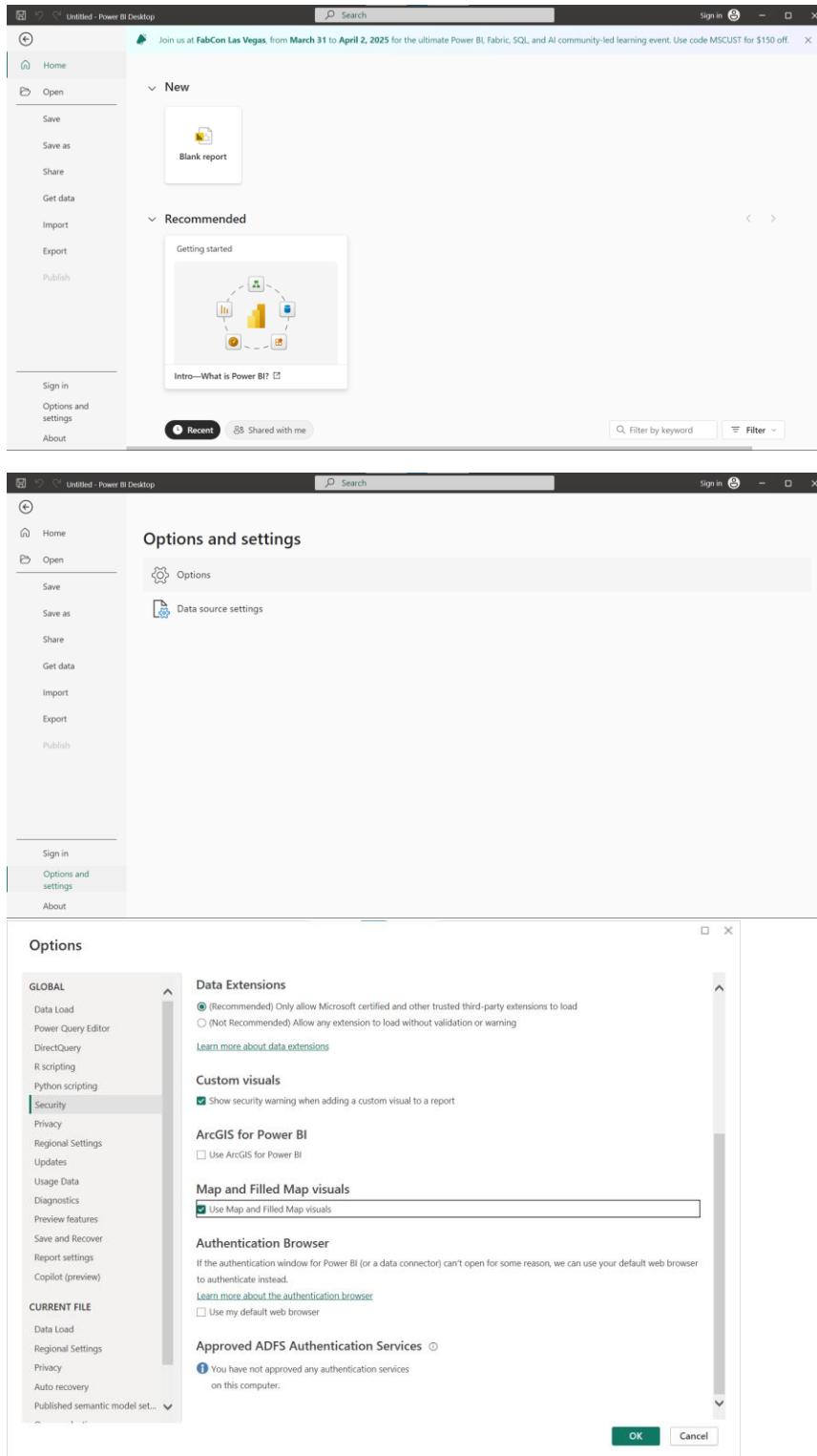
The screenshot shows the 'Manage relationships' dialog. Two relationships are selected: 'Order_Details (OrderID)' to 'Orders (OrderID)' and 'Order_Details (ProductID)' to 'Products (ProductID)'. Both relationships have a status of 'Active'.

10) Click on Model View

The screenshot shows the Power BI Desktop interface with the 'Model view' selected. It displays a diagram of three tables: Products, Order_Details, and Orders, showing their relationships. The Order_Details table is highlighted with a yellow border, indicating it is the current table being viewed.

Practical 3A – Perform Data Visualization and Create the Data Staging Area

1) Go to File > Options and Settings > Options > Security > Use Map and Filled Maps



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2) Open Customers Table

Table: Customers (91 rows)

3) Right click CustomerId > Edit Query

Table: Customers (91 rows) Column: CustomerID (91 distinct values)

Queries [1]

Customers

Source{[Name="Customers",Signature="table"]}[Data]

Properties

Name: Customers

Applied Steps

Navigation

13 COLUMNS, 91 ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 09:42

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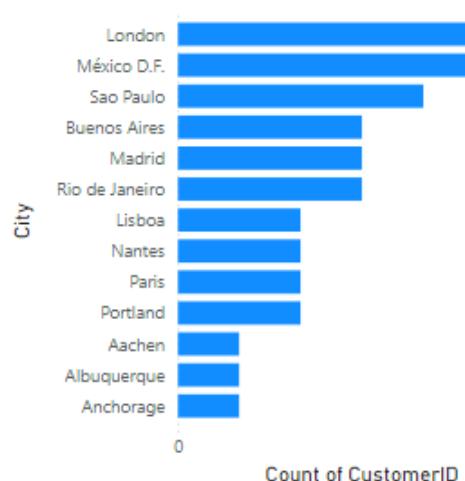
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4) Remove Duplicate Entries and save

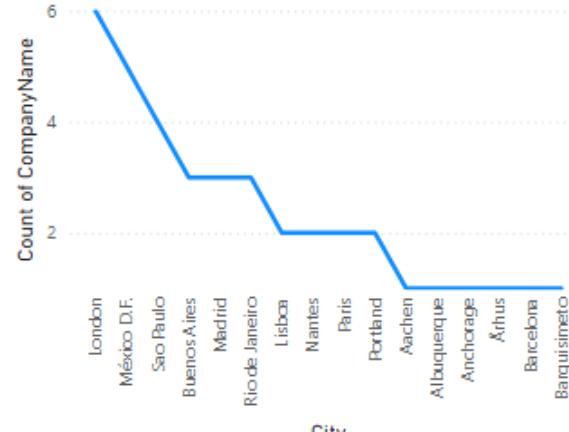
The screenshot shows the Microsoft Power Query Editor interface. A context menu is open over the first row of the 'Customers' query, with the 'Remove Duplicates' option highlighted. The 'Applied Steps' pane on the right shows a single step named 'Source'. The preview pane displays the data with 13 columns and 91 rows.

5) Create charts

Count of CustomerID by City

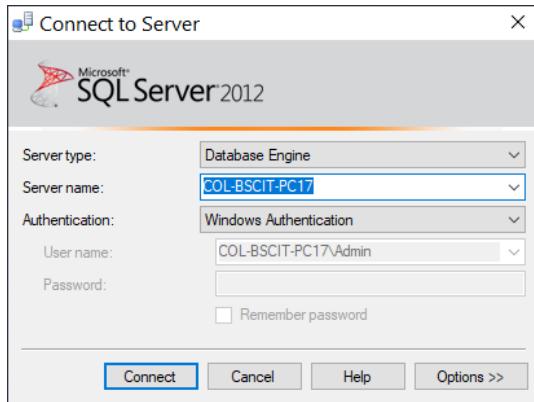


Count of CompanyName by City

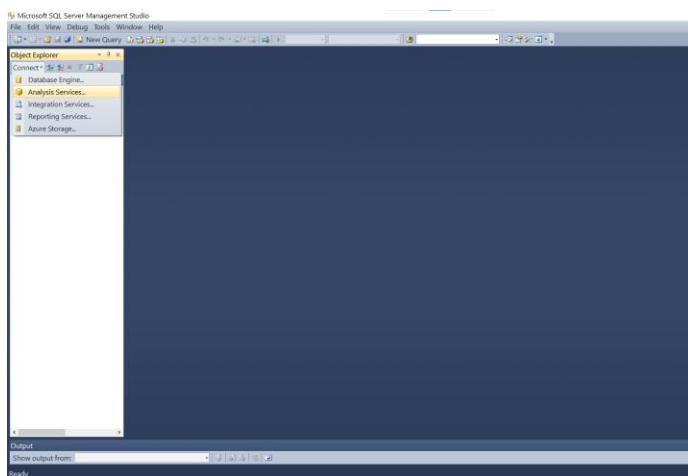


Practical 3B – Create Staging Area for Selected Database using Star Schema

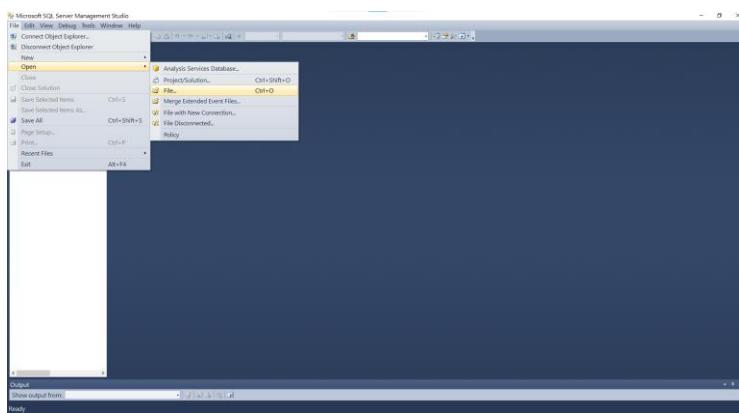
1) Open SSMS and Connect



2) Click Connect > Analysis Server

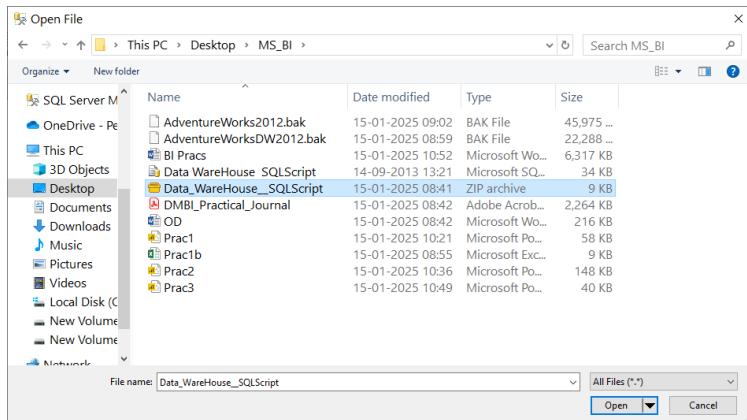


2) Click on File > Open > File> Select Data_Warehouse_SQLScript.zip



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3) Click Execute

Microsoft SQL Server Management Studio - COL-BSCIT-PC17.master (COL-BSCIT-PC17\Admin (52))

```
--DROP DATABASE Sales_DM
GO
Create database Sales_DM
GO

--Create Customer dimension table in Data Warehouse which will hold customer personal details.
Create Table DimCustomer
(
CustomerID int primary key identity,
CustomerAltID varchar(10) not null,
CustomerName varchar(50),
Gender varchar(20)
)
GO

--Fill the Customer dimension with sample Values
Insert into DimCustomer(CustomerAltID,CustomerName,Gender)values
('100-001','John Smith','M'),
('100-002','Bill Gates','M'),
('100-003','Muken Shahn','F'),
('100-004','Richard Thrushin','M'),
('100-005','Emma Watson','F')
GO

--Create basic level of Product Dimension table without considering any Category or Subcategory.
Create Table DimProduct
(
ProductKey int primary key identity,
ProductAltKey varchar(10) not null,
ProductName varchar(100),
ProductActualCost money,
ProductSalesCost money
)
GO

--Fill the Product dimension with sample Values
Insert into DimProduct(ProductAltKey,ProductName,ProductActualCost,ProductSalesCost)values
('100-001','wheat flour kg',5.50,6.50),
('100-002','Rice Grains kg',22.50,24),
('100-003','Sugar kg',10.00,12.00),
('100-004','Salt kg',1.00,1.20),
('100-005','Oil kg',15.00,18.00)
GO
```

Properties pane shows connection details for 'COL-BSCIT-PC17'.

Microsoft SQL Server Management Studio - COL-BSCIT-PC17.Sales_DM (COL-BSCIT-PC17\Admin (52))

```
DECLARE @size INT
--IF @size>32 THEN This will Fill values Upto 32:59 hr in Time Dimension
Set @size=32

DECLARE @Hour INT
DECLARE @Minute INT
DECLARE @Second INT
DECLARE @TimeKey INT
DECLARE @TimeAltKey INT
DECLARE @HourBucket INT
DECLARE @HourBucket0ToKey INT
DECLARE @HourBucket0ToKey1 INT
SET @Hour = 0
SET @Minute = 0
SET @Second = 0
SET @TimeKey = 0
```

Results pane shows a table of time dimension data from 2013-01-01 to 2013-01-16.

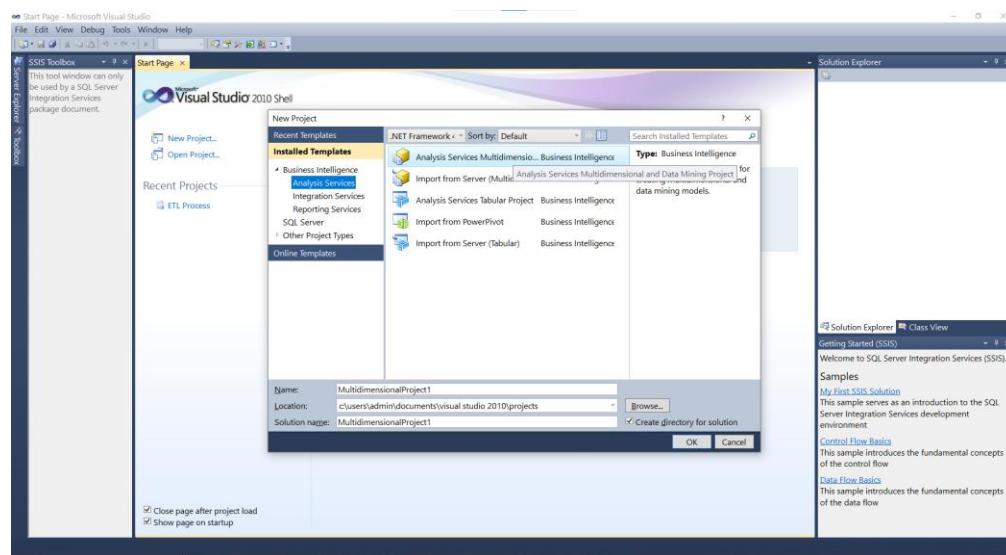
DateKey	Day	FullDateUK	FullDateUSA	DayOfMonth	DaySuffix	DayName	DayOfWeekUSA	DayOfWeekUK	DayOfWeekInMonth	DayOfWeekInYear	DayOfQuarter	DayOfYear	WeekOfMonth	WeekOfQuarter	Week
1	20130101	2013-01-01 00:00:00.000	01/01/2013	1	1st	Tuesday	3	2	1	1	1	1	1	1	1
2	20130102	2013-01-02 00:00:00.000	02/01/2013	2	2nd	Wednesday	4	3	1	1	1	2	1	1	1
3	20130103	2013-01-03 00:00:00.000	03/01/2013	3	3rd	Thursday	5	4	1	1	1	3	1	1	1
4	20130104	2013-01-04 00:00:00.000	04/01/2013	4	4th	Friday	6	5	1	1	1	4	1	1	1
5	20130105	2013-01-05 00:00:00.000	05/01/2013	5	5th	Saturday	7	6	1	1	1	5	1	1	1
6	20130106	2013-01-06 00:00:00.000	06/01/2013	6	6th	Sunday	1	7	1	1	1	6	2	1	2
7	20130107	2013-01-07 00:00:00.000	07/01/2013	7	7th	Monday	2	1	1	1	1	7	2	1	2
8	20130108	2013-01-08 00:00:00.000	08/01/2013	8	8th	Tuesday	3	2	2	2	2	8	2	2	2
9	20130109	2013-01-09 00:00:00.000	09/01/2013	9	9th	Wednesday	4	3	2	2	2	9	2	2	2
10	20130110	2013-01-10 00:00:00.000	10/01/2013	10	10th	Thursday	5	4	2	2	2	10	2	2	2
11	20130111	2013-01-11 00:00:00.000	11/01/2013	11	11th	Friday	6	5	2	2	2	11	2	2	2
12	20130112	2013-01-12 00:00:00.000	12/01/2013	12	12th	Saturday	7	6	2	2	2	12	2	2	2
13	20130113	2013-01-13 00:00:00.000	13/01/2013	13	13th	Sunday	1	7	2	2	2	13	3	2	3
14	20130114	2013-01-14 00:00:00.000	14/01/2013	14	14th	Monday	2	1	2	2	2	14	3	2	3
15	20130115	2013-01-15 00:00:00.000	15/01/2013	15	15th	Tuesday	3	2	3	3	3	15	3	3	3
16	20130116	2013-01-16 00:00:00.000	16/01/2013	16	16th	Wednesday	4	3	3	3	3	16	3	3	3

Properties pane shows connection details for 'COL-BSCIT-PC17'.

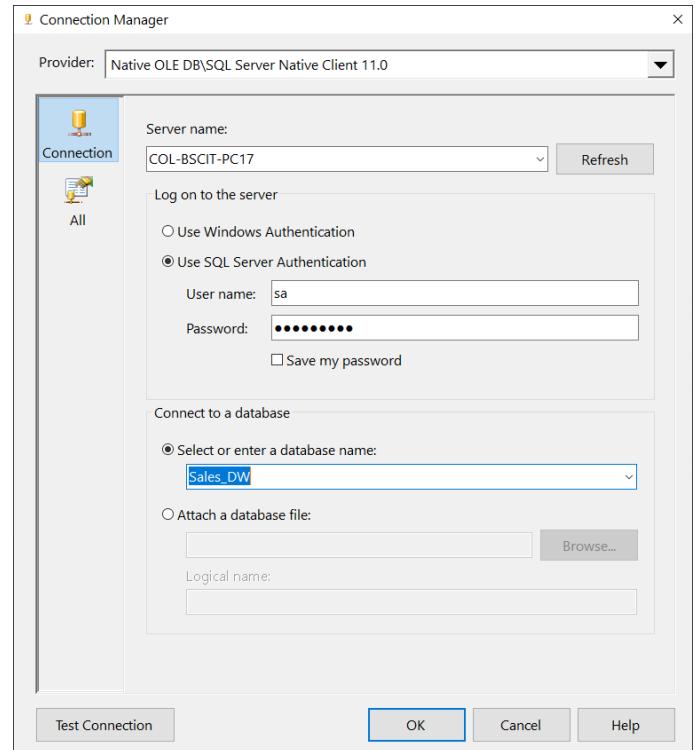
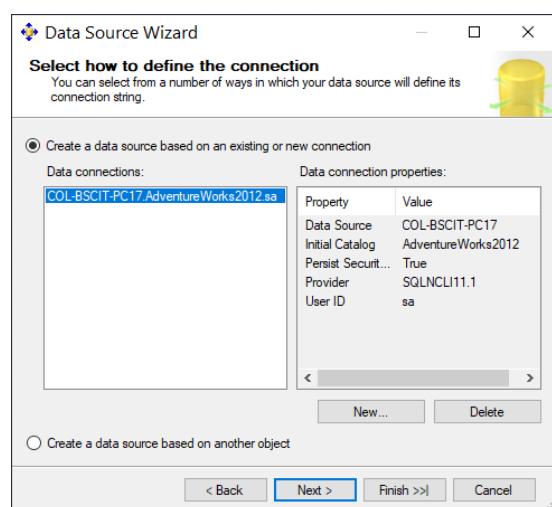
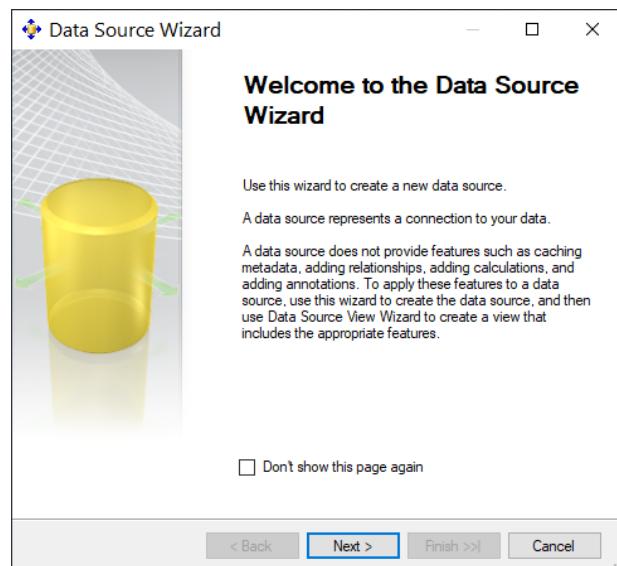
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4) Open Server Data Tools > NewProject > Select Analysis Multidimensional

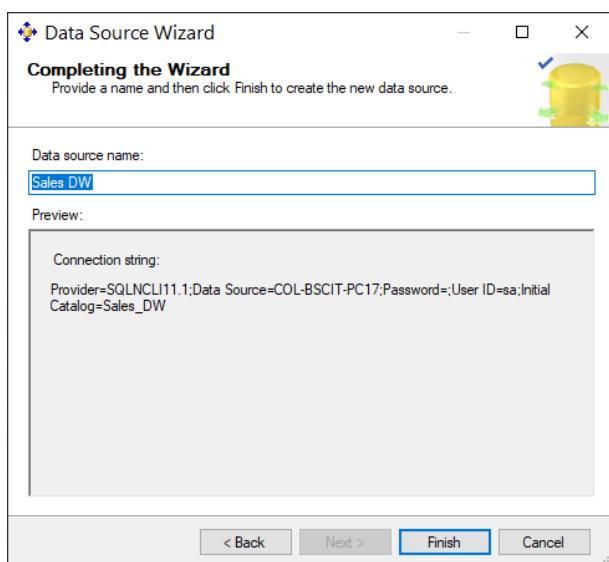
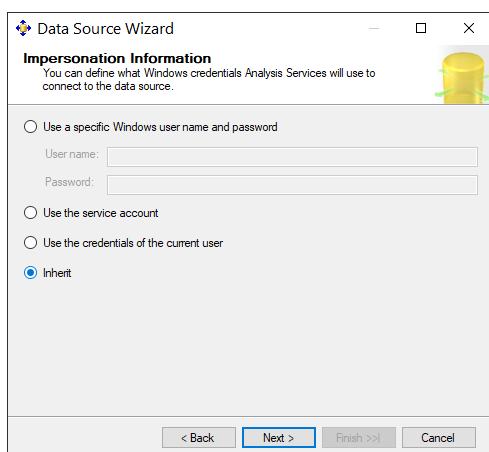
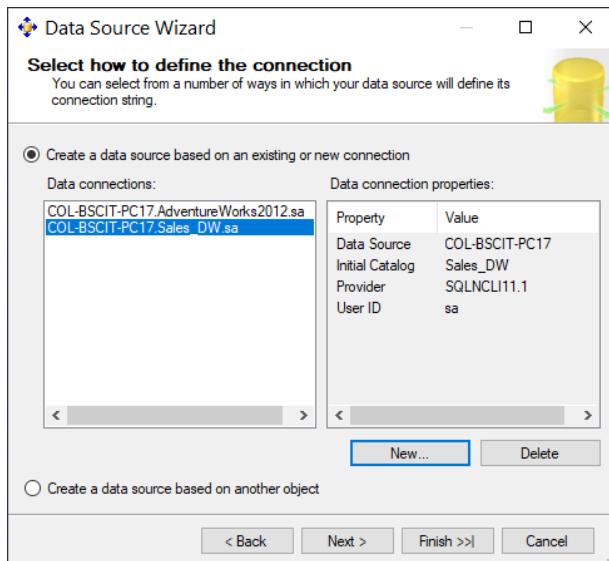


5) Right click Data sources > Data Source Wizard > Next > New > Enter Login and Database > Test Connection > Ok > Next > Inherit > Finish



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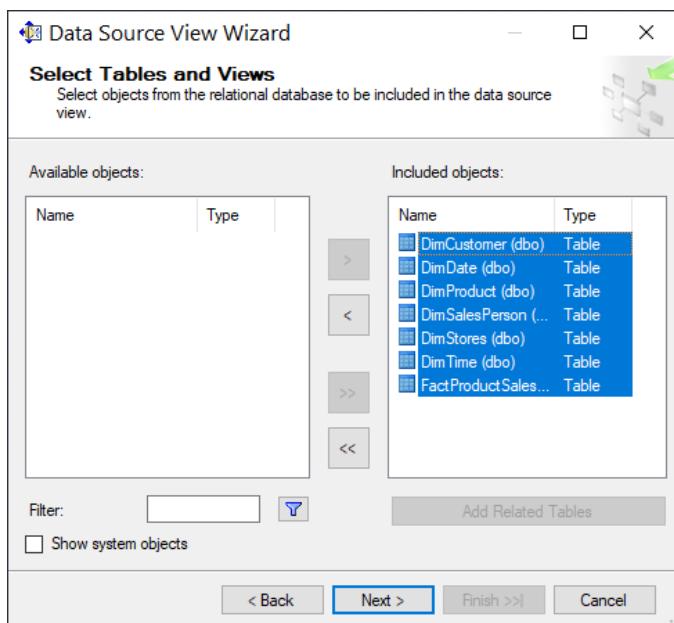
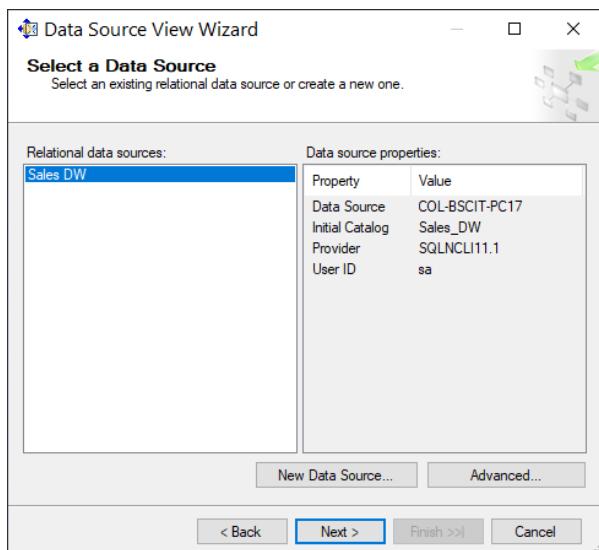
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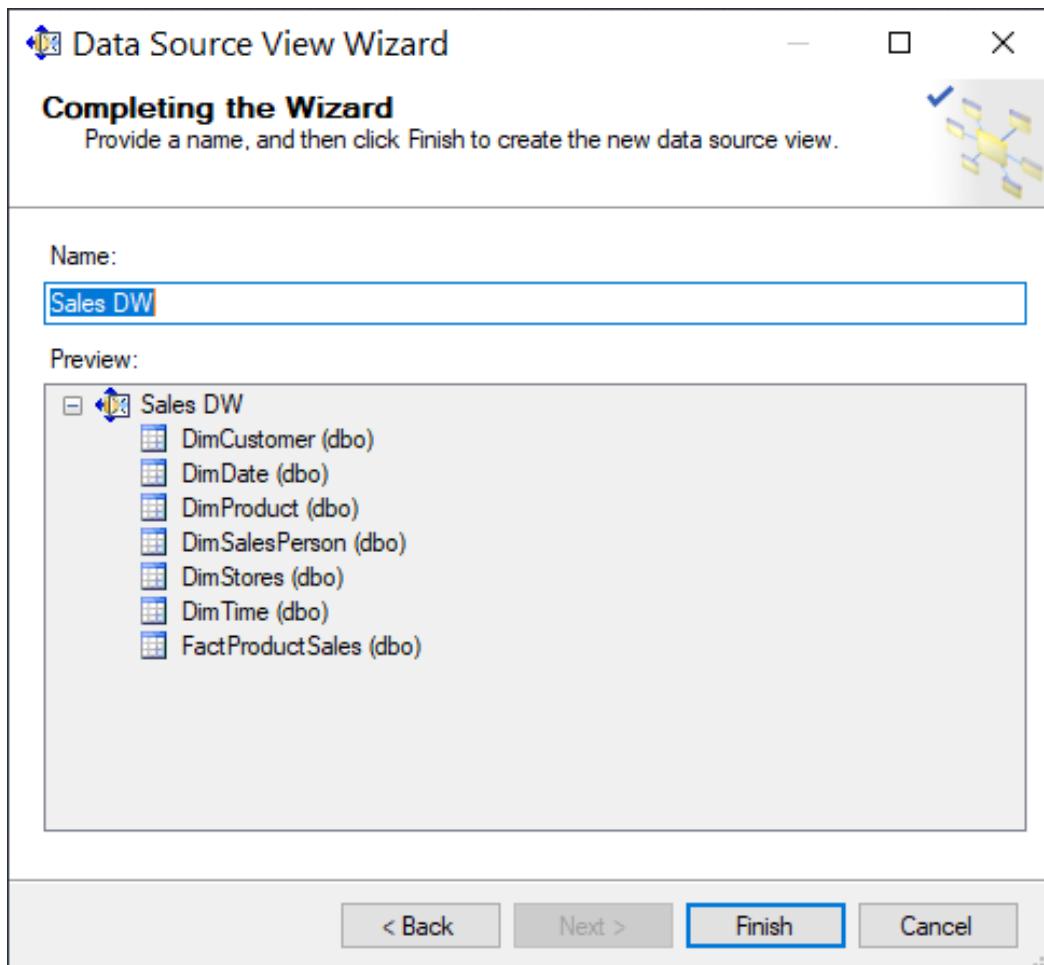
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6) Right Click Data Source View > New Data Source View > Next > Select SalesDW > Add all tables > Finish

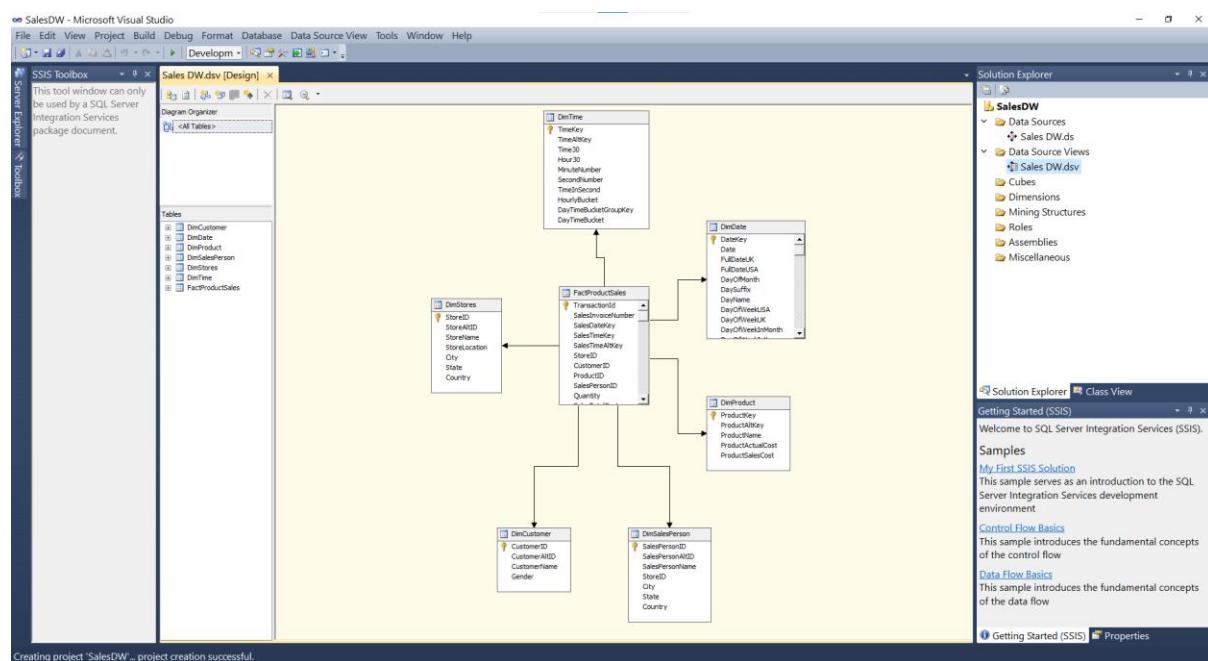


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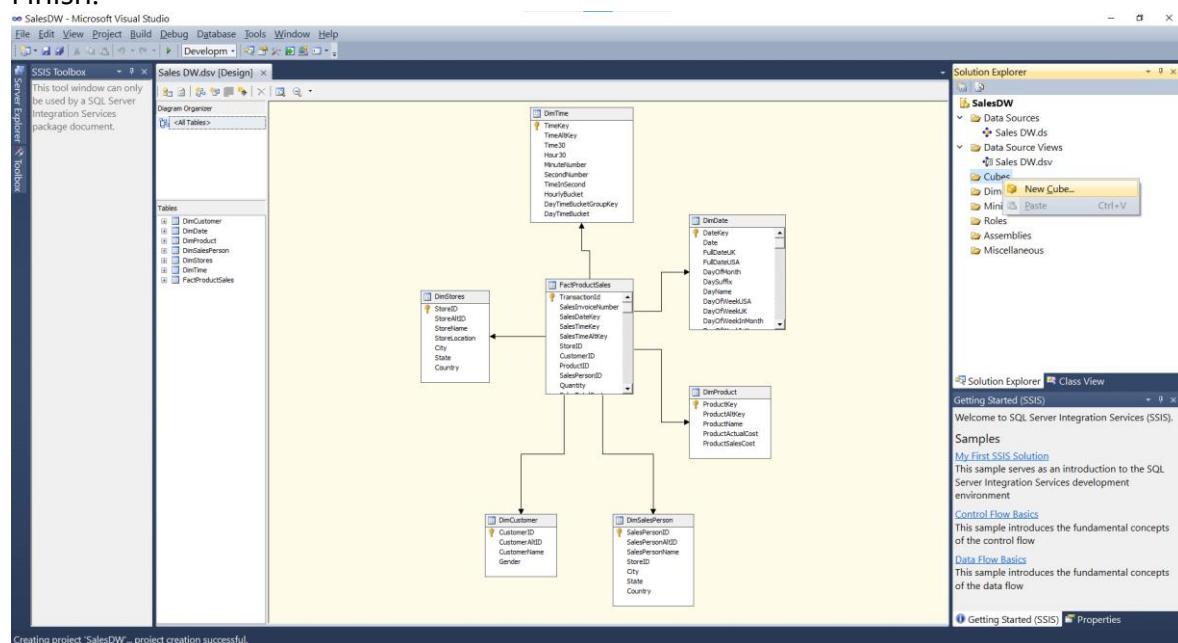


7) Relationship Chart is shown



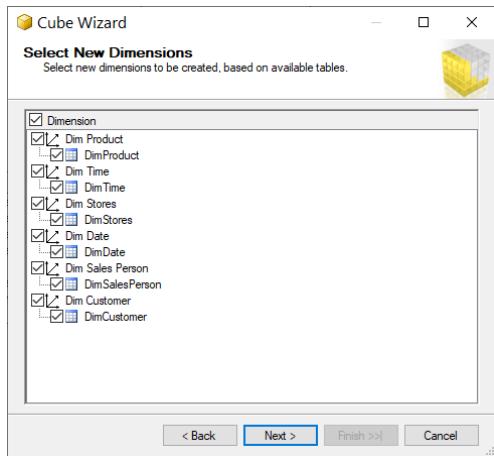
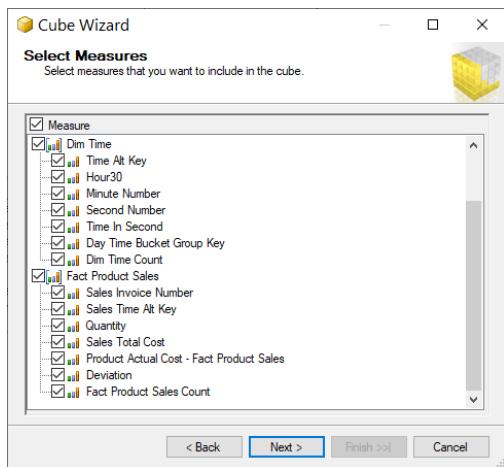
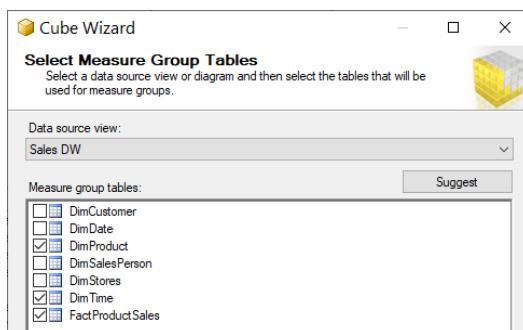
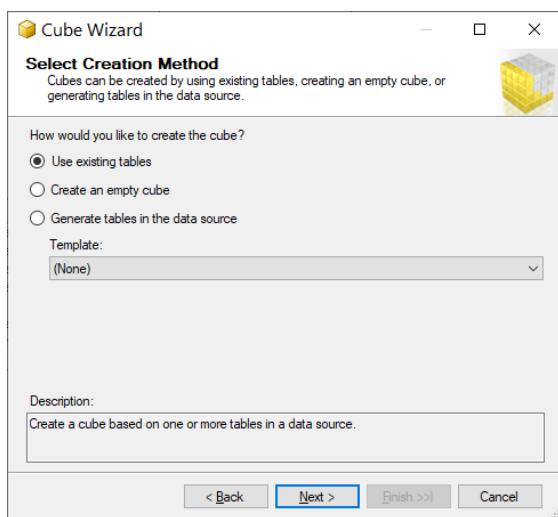
Practical 4A - Create the cube with corresponding dimension and fact table based on OLAP

- 1) Continue from the above practical. In Solution Explorer select Cube which opens a dialogue box. Select the tables – FactProductSales, DimProduct, DimTime and click on Next. Select all the measures to include in the cube and click on Next. Select all the new dimensions and click on Next. Name the cube as Sales DW and click on Finish.



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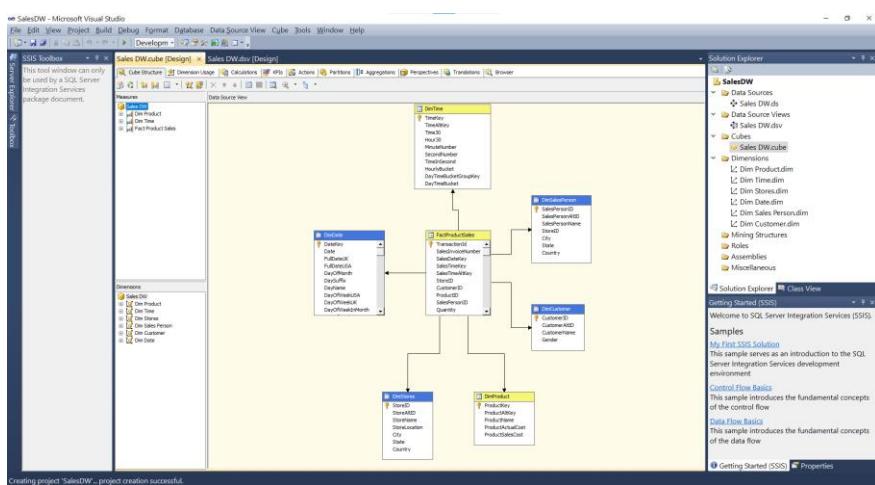


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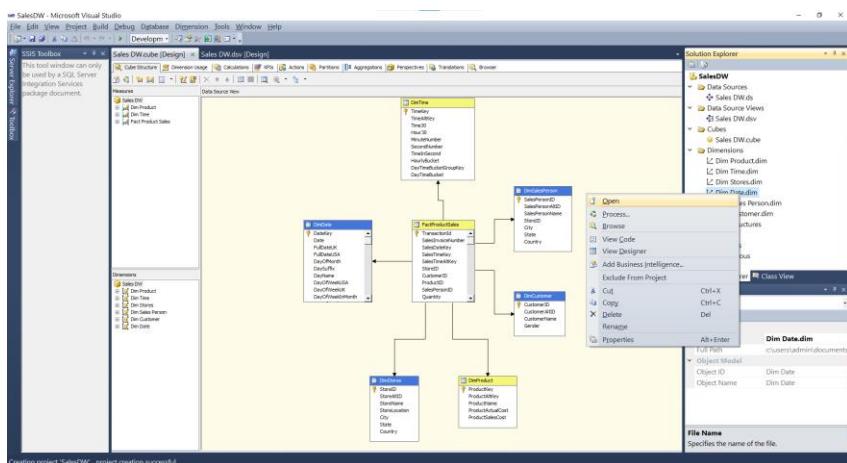
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2) The relationship will be displayed on the screen.

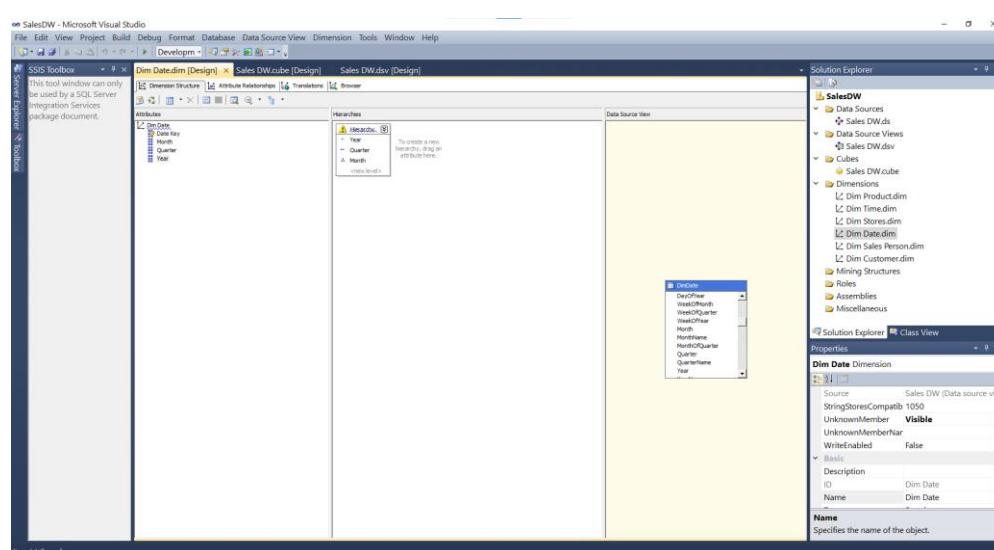
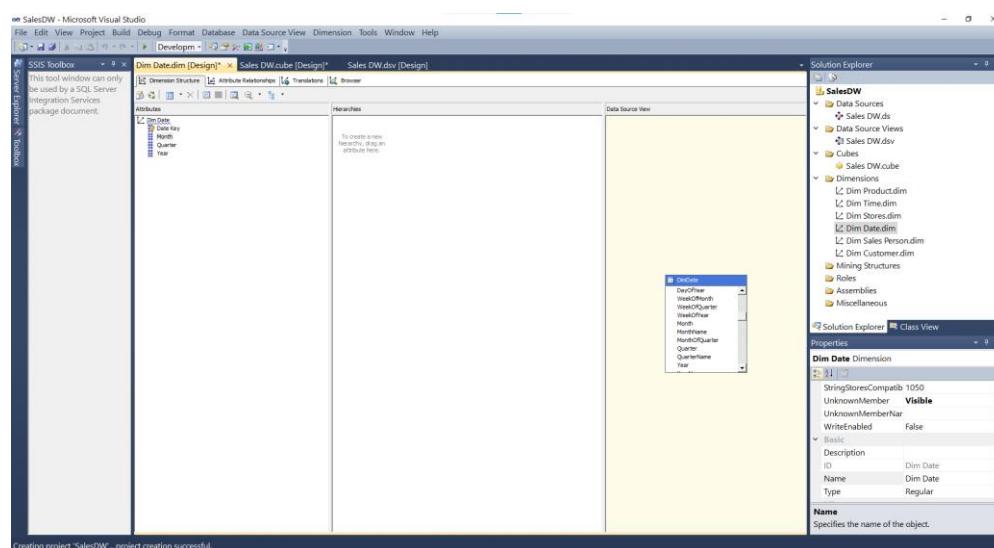
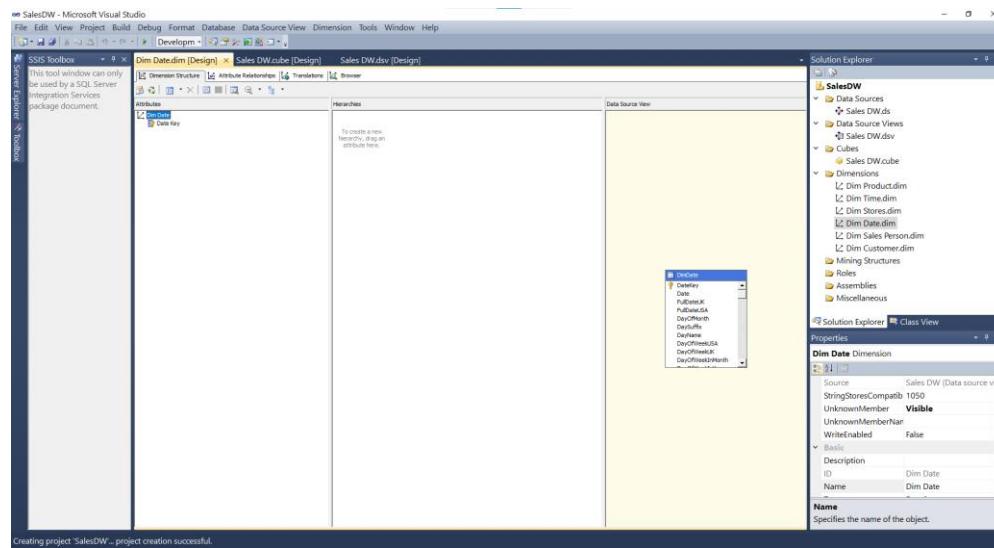


3) In Dimensions > Right Click Dim Date and Open. Drag and drop Year, Quarter and Month to the Attributes. Drag and drop the attributes into the same Hierarchy. Save the progress and click on OK.



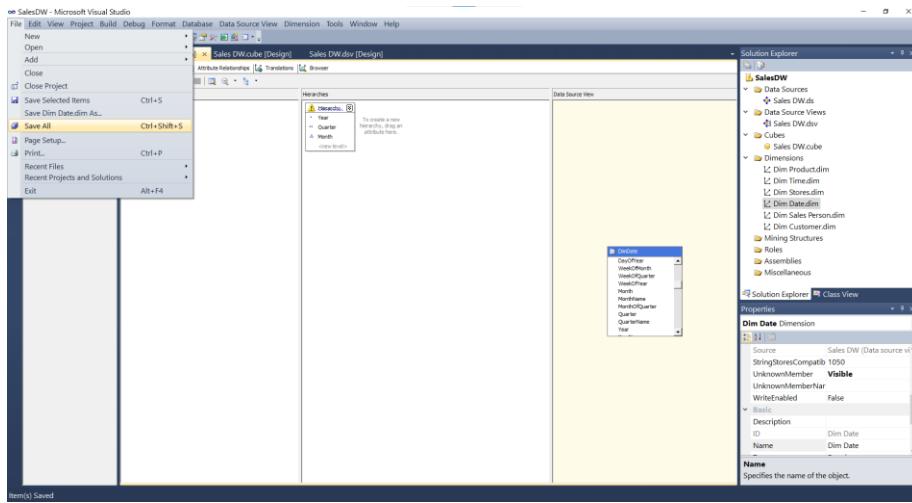
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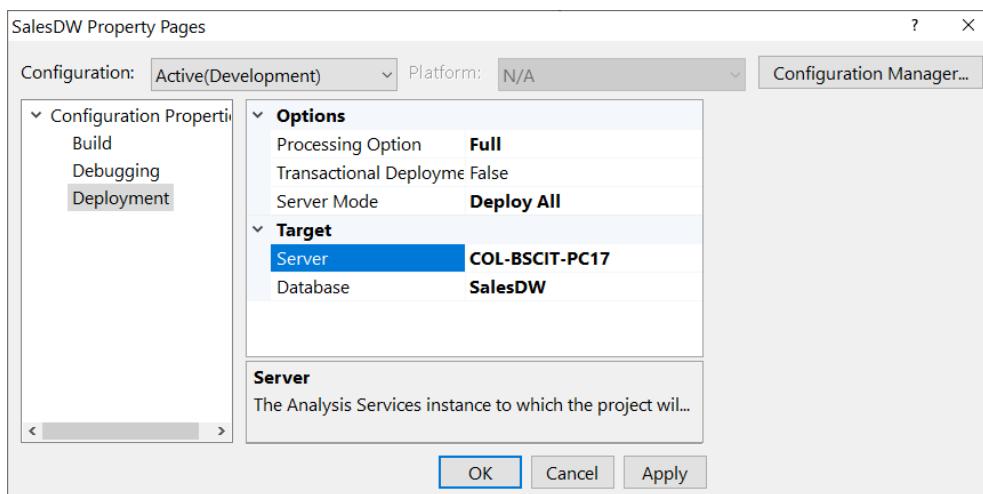
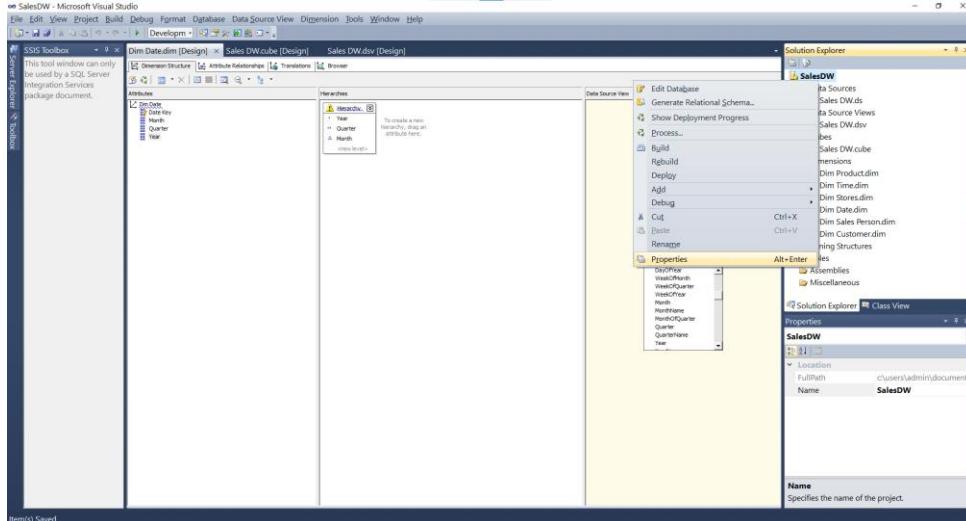


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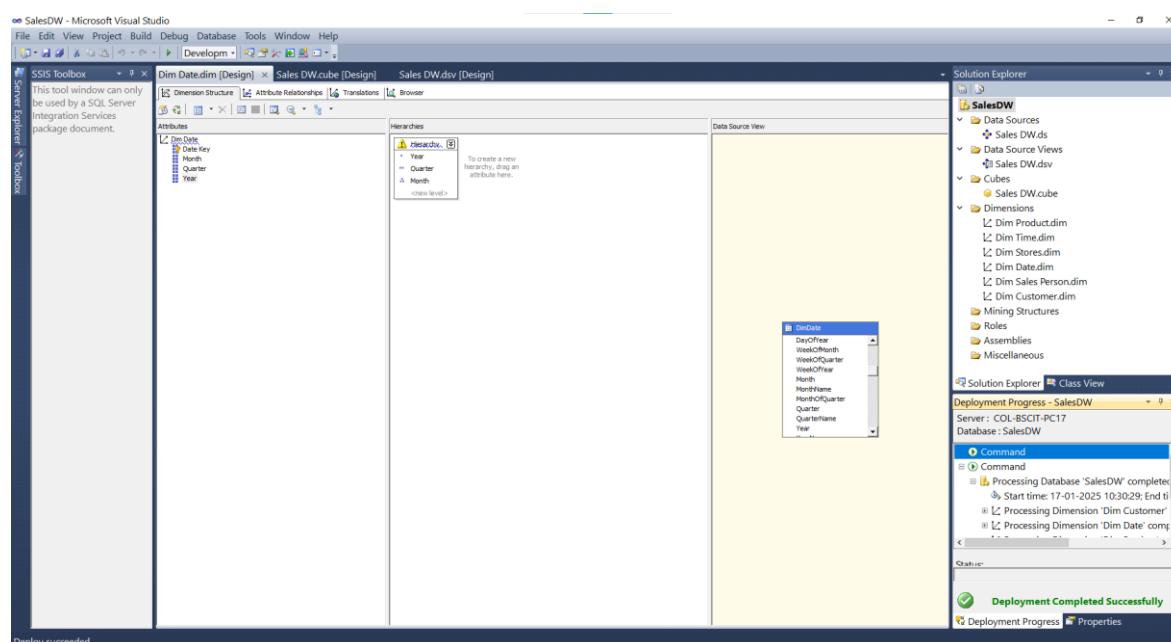
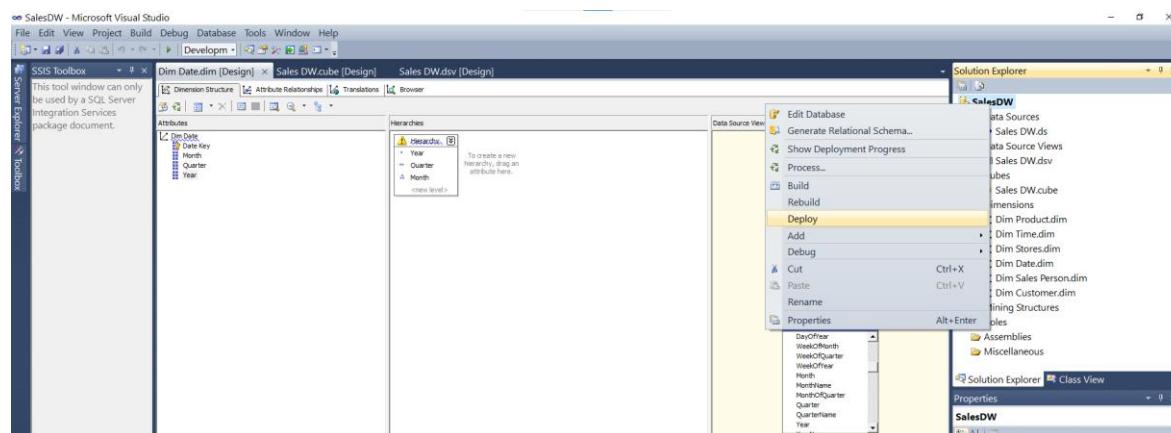
4) Right click on the file name and select Properties. In Build make sure everything is correct. In Deployment, make Processing Option as Full instead of Default. Server Mode as Deploy All instead of Deploy Changes Only. Server as the server name used till now instead of localhost. Apply these changes.



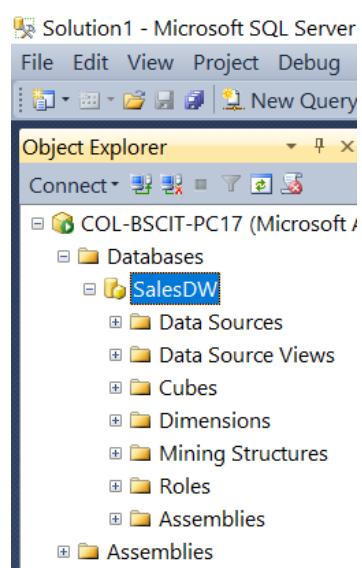
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5) Right click on the file name and click on Deploy to deploy the project.

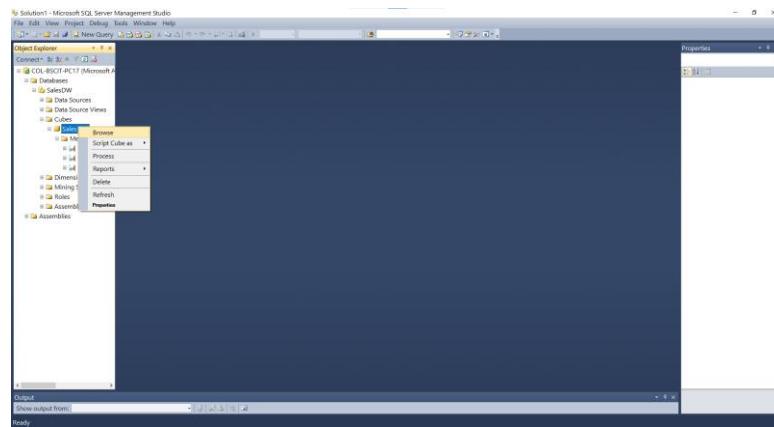
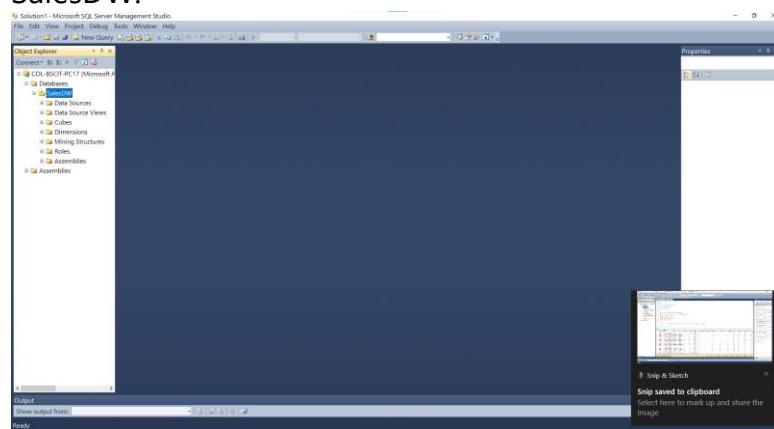


6) SalesDW is Shown in Analysis Server in SSMS.

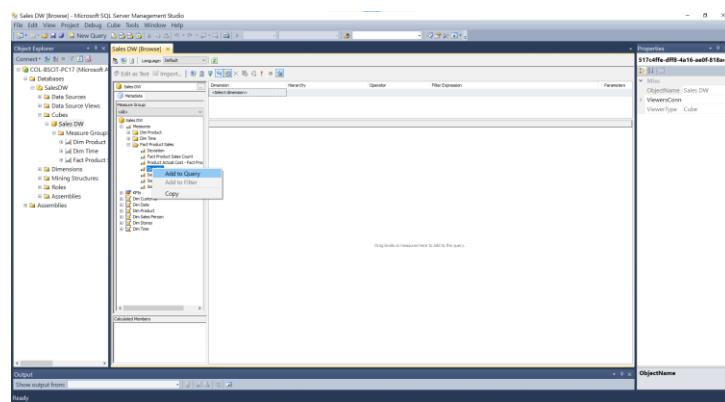


Practical 4B – Perform Multi-Dimensional Expressions (MDX) queries for OLAP database

- 1) Continue from the above practical. To verify, in SQL Server Management right click on the file name in Object Explorer and click on Browse. Enlarge the Measures of SalesDW.

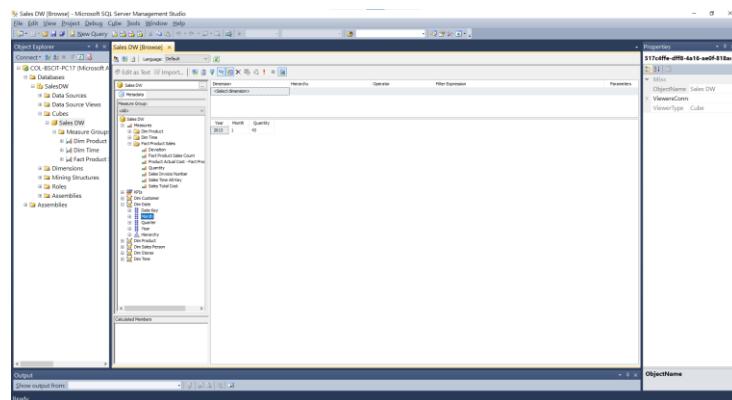
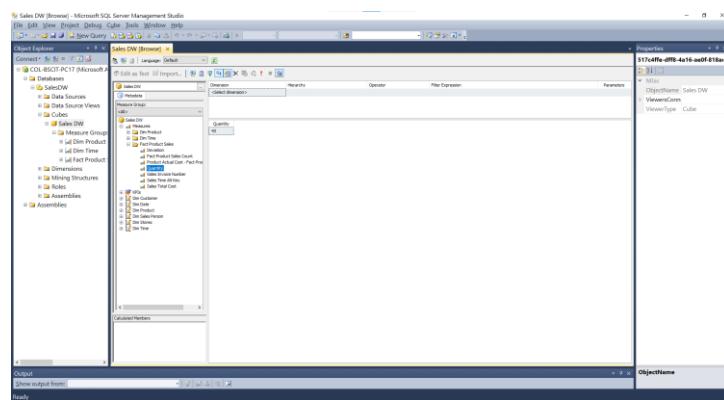


- 2) On selecting Quantity under Fact Product Sales the value shown will be 43. Select Month and Year as well from Dim Date.

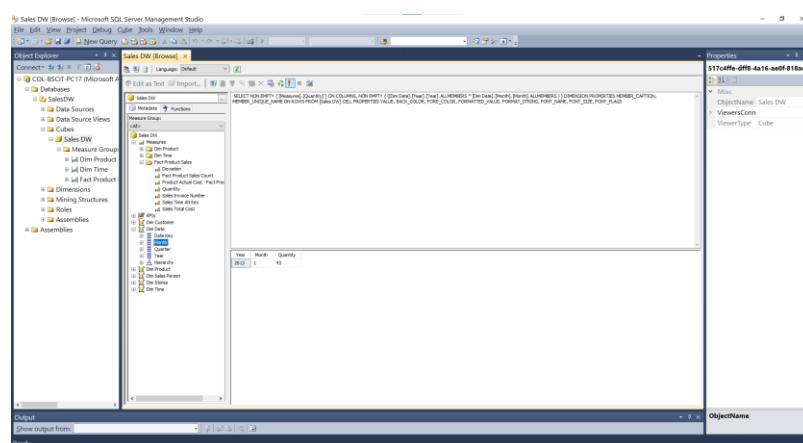
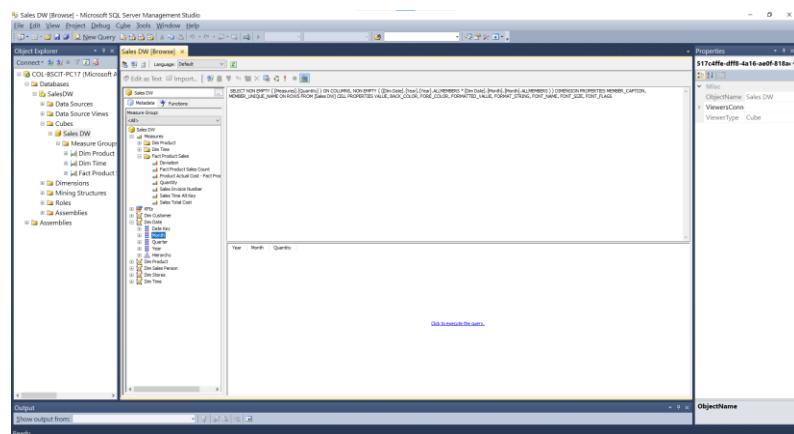


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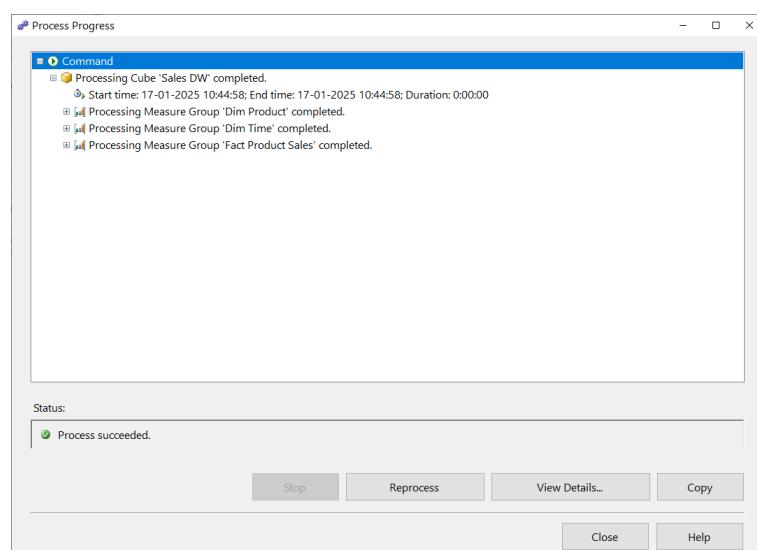
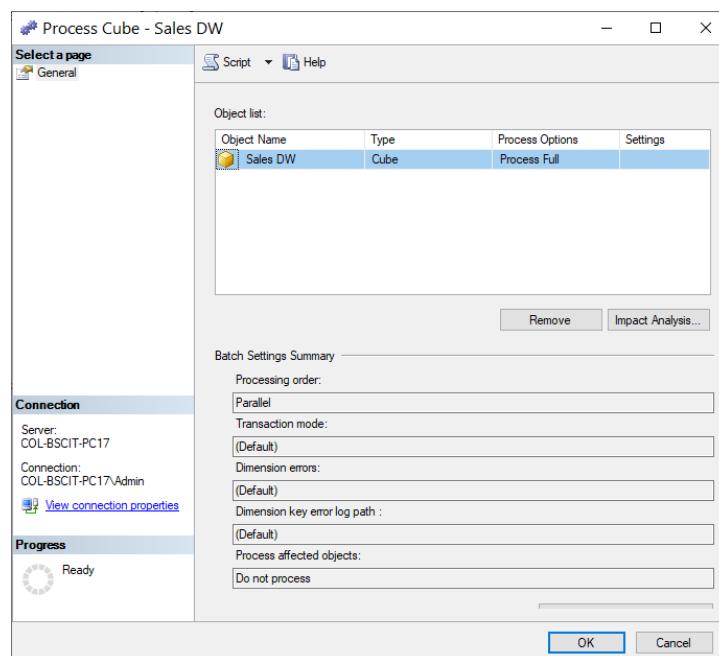
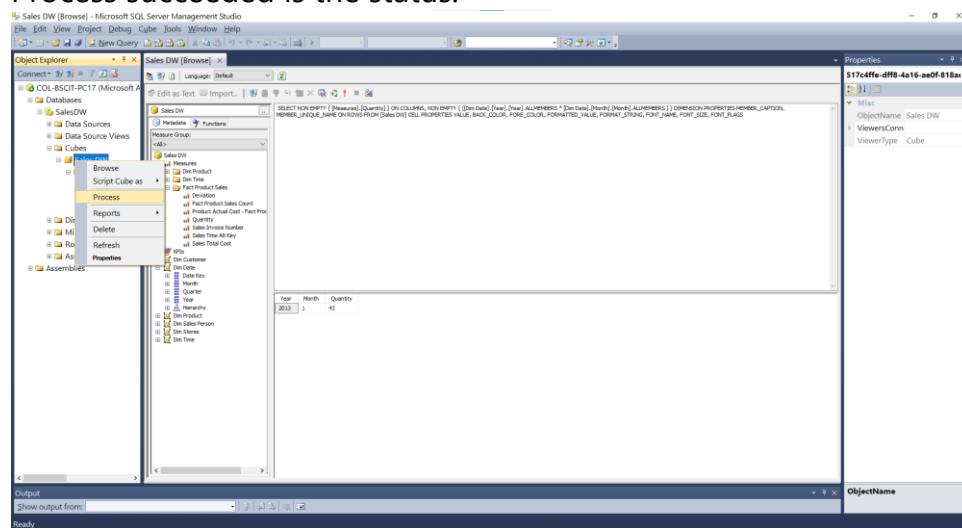
3) Go in Design Mode and click on the line that says 'Click to execute the query.' The entries will be shown on the screen.



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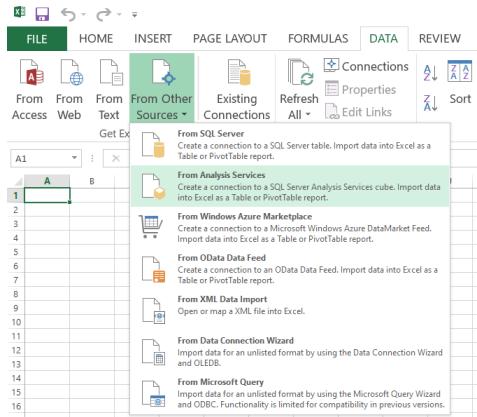
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4) Right click on the file name and select Process. Select the file and click on Run. Process succeeded is the status.

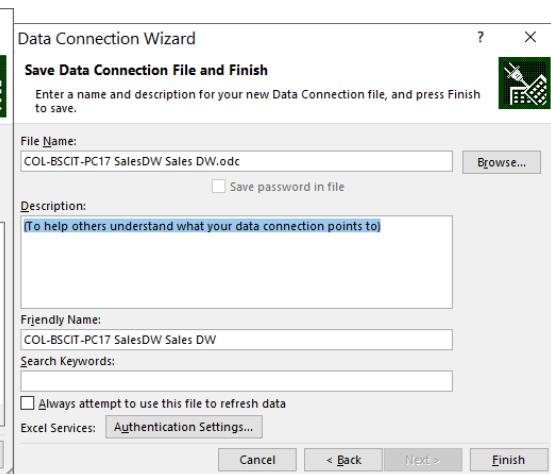
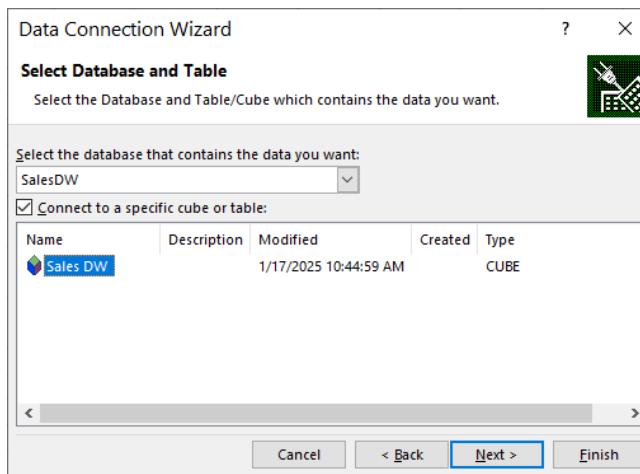
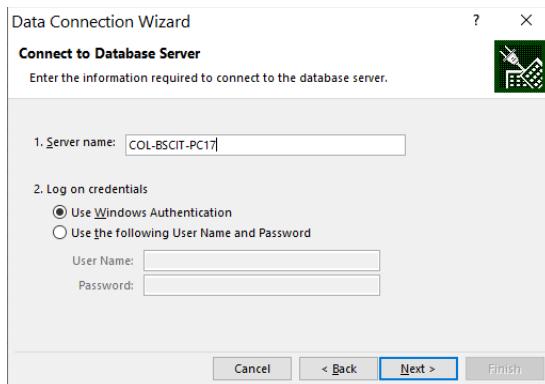


Practical 5A – Import the data warehouse in Microsoft Excel and create Pivot Table to perform Data Analytics

1) Open Excel > Data > From Other Sources > Analysis Services



2) Enter Server Name > Next > Select Database > Next > Finish > Pivot Table Report > Ok



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3) Select Fields to show

PivotTable Fields

Show fields: (All) ⚙️

- ▲ **Σ Dim Product**
 - Dim Product Count
 - Product Actual Cost
 - Product Sales Cost
- ▷ **Σ Dim Time**
- ▲ **Σ Fact Product Sales**
 - Deviation
 - Fact Product Sales Count
 - Product Actual Cost - Fact ...
 - Quantity
 - Sales Invoice Number
 - Sales Time Alt Key
 - Sales Total Cost
- ▷ **Dim Customer**
- ▷ **Dim Date**
- ▲ **Dim Product**
 - Product Key
- ▲ **Dim Sales Person**
 - Sales Person ID
- ▲ **Dim Stores**
 - Store ID

4) Pivot Table is shown

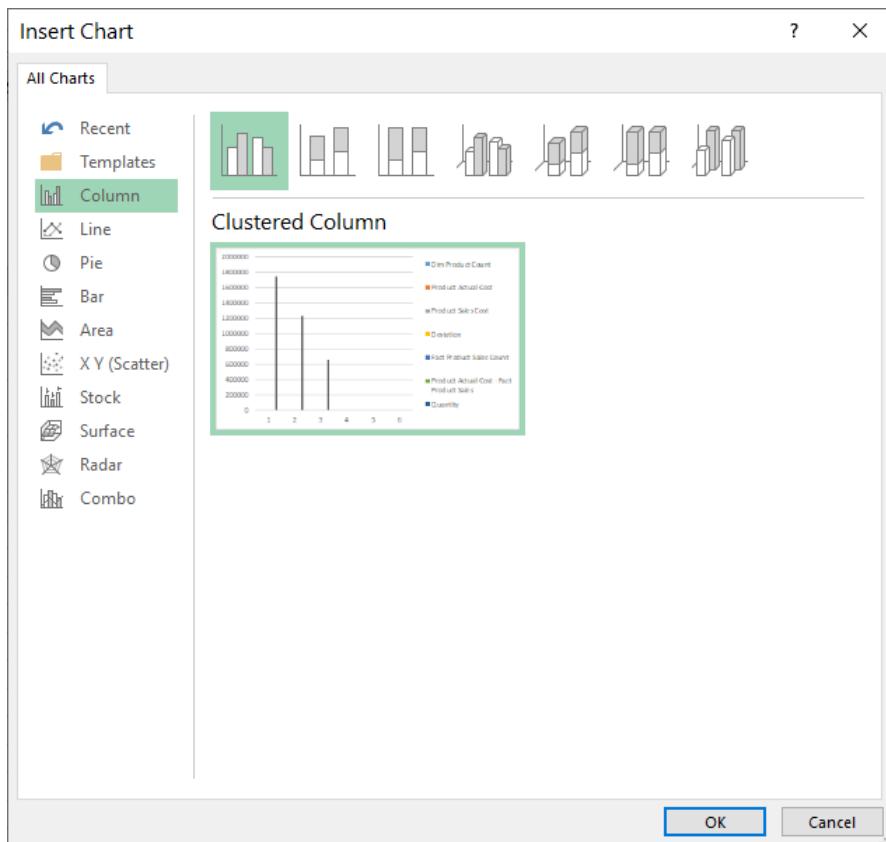
Row Labels	Dim Product Count	Product Actual Cost	Product Sales Cost	Deviation	Fact Product Sales Count	Product Actual Cost - Fact Product Sales	Quantity	Sales Invoice Number	Sales Time Alt Key	Sales Total Cost
1 Row Labels	5	223	233	32	13	467	22	59	1749681	502
2	5	223	233	27.5	8	453	15	44	1228630	480.5
3	5	223	233	12.5	4	236.5	6	36	653328	249
4	5	223	233							
5	5	223	233							
6	5	223	233							
7	5	223	233							
8	5	223	233							
Grand Total	5	223	233	72	25	1156.5	43	139	3631639	1231.5

Practical 5B – Import the cube in Microsoft Excel and create the Pivot Chart to perform Data Modelling

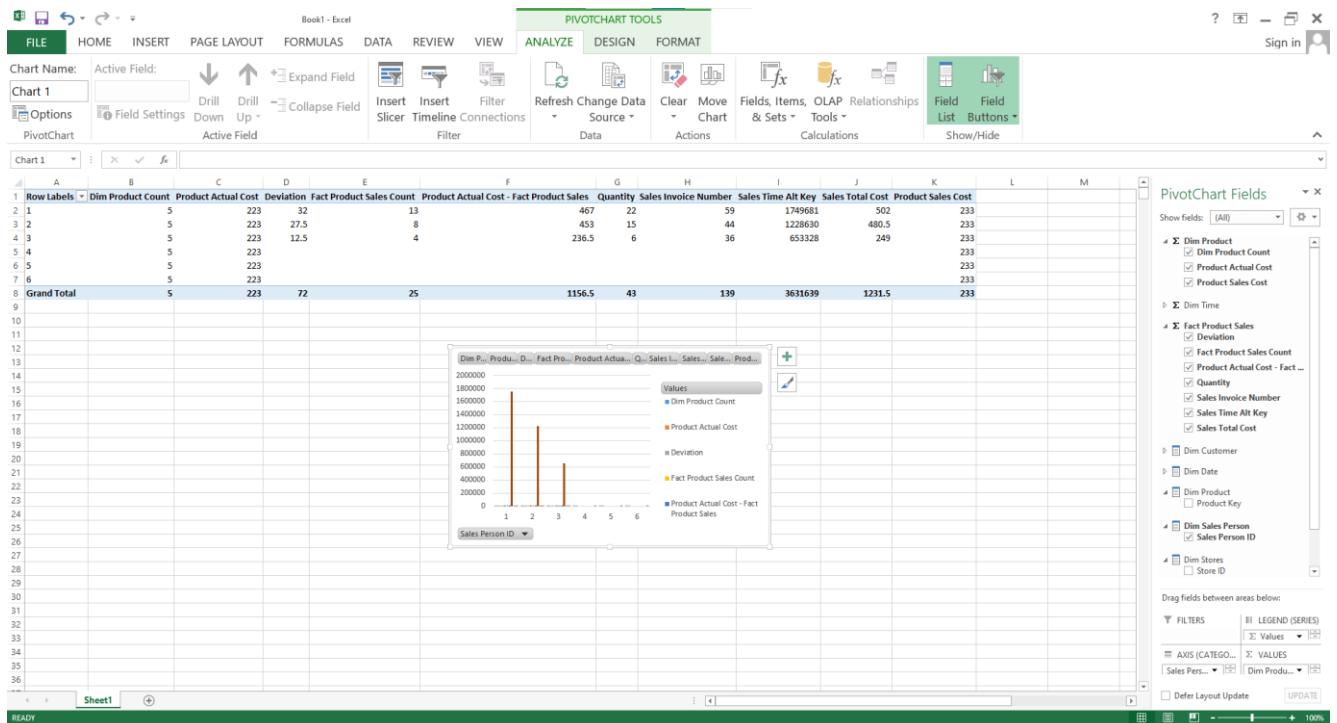
- 1) Open Microsoft Excel containing a Pivot Table > Insert > PivotChart > Clustered Column Chart

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2) Chart is shown



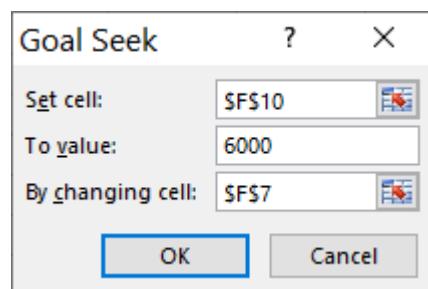
Practical 6 – Perform the What-If Analysis for Data Visualization

1) Create a Excel Sheet > Create a Table

	Product	Rice											
7	QTY/KG	60											
8	Price	70											
10	Total	4200											

2) Go to Data > What-If Analysis > Goal Seek > Select Sells and Target Value. Values Change

	Product	Rice											
7	QTY/KG	60											
8	Price	70											
10	Total	4200											



	Product	Rice											
7	QTY/KG	85.71429											
8	Price	70											
10	Total	6000											

Goal Seek Status

Goal seeking with Cell F10 found a solution.

Target value: 6000

Current value: 6000

OK Cancel

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3) Create another table > Select Table Values > What-If Analysis > Data Table > Column Input > Select Original Quantity (F7) > OK. Values are shown.

	Product	Rice	
QTY/KG	60		QTY
Price	70		4200
	80		
	90		
	100		
	110		
	120		

	Product	Rice	
QTY/KG	85.71429		QTY
Price	70		6000
			Total 6000

	Product	Rice	
QTY/KG	60		QTY
Price	70		4200
	80		
	90		
	100		
	110		
	120		

	Product	Rice	
QTY/KG	60	<th>QTY</th>	QTY
Price	70		4200
	80		5600
	90		6300
	100		7000
	110		7700
	120		8400

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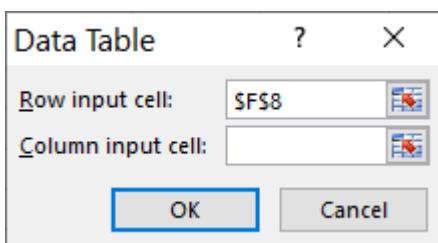
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- 4) Create another table > Select Table Values > What-If Analysis > Data Table > Row Input > Select Original Price (F8) > OK. Values are shown.

The screenshot shows a Microsoft Excel spreadsheet with the following data:

		Product	Rice						
7	8	QTY/KG	60						
	9	Price	70						
	10	Total	4200						
	11			QTY					
	12			80	4200				
	13			90	5600				
	14			100	6300				
	15			110	7000				
	16			120	7700				
	17			130	8400				
	18			140					
	15		Price	150					
	16			4200					

The screenshot shows the Microsoft Excel ribbon with the 'DATA' tab selected. The 'Data Tools' dropdown menu is open, showing options like Scenario Manager, Goal Seek..., and Data Table... The 'Data Table...' option is highlighted.



The screenshot shows the Microsoft Excel spreadsheet with the following data after running the Data Table:

		Product	Rice						
7	8	QTY/KG	60						
	9	Price	70						
	10	Total	4200						
	11			QTY					
	12			80	4200				
	13			90	5600				
	14			100	6300				
	15			110	7000				
	16			120	7700				
	17			130	8400				
	18			140					
	15		Price	150					
	16			4200	7200	7800	8400	9000	

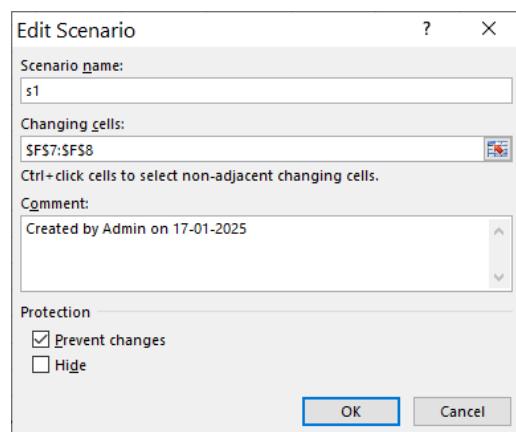
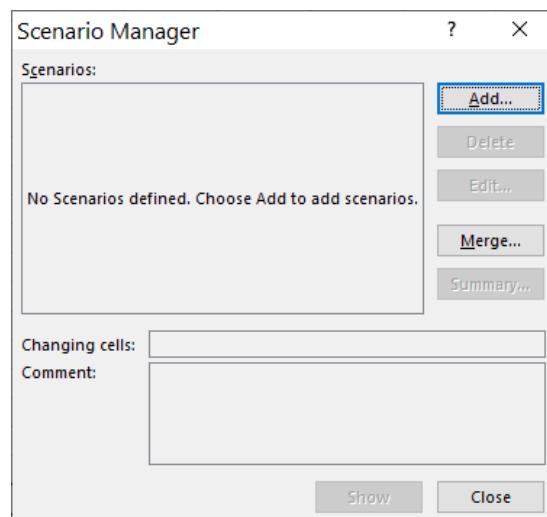
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6) What-If Analysis > Scenario Manager > Add > Name and Cells > Change Value > Ok > Show. Values Change

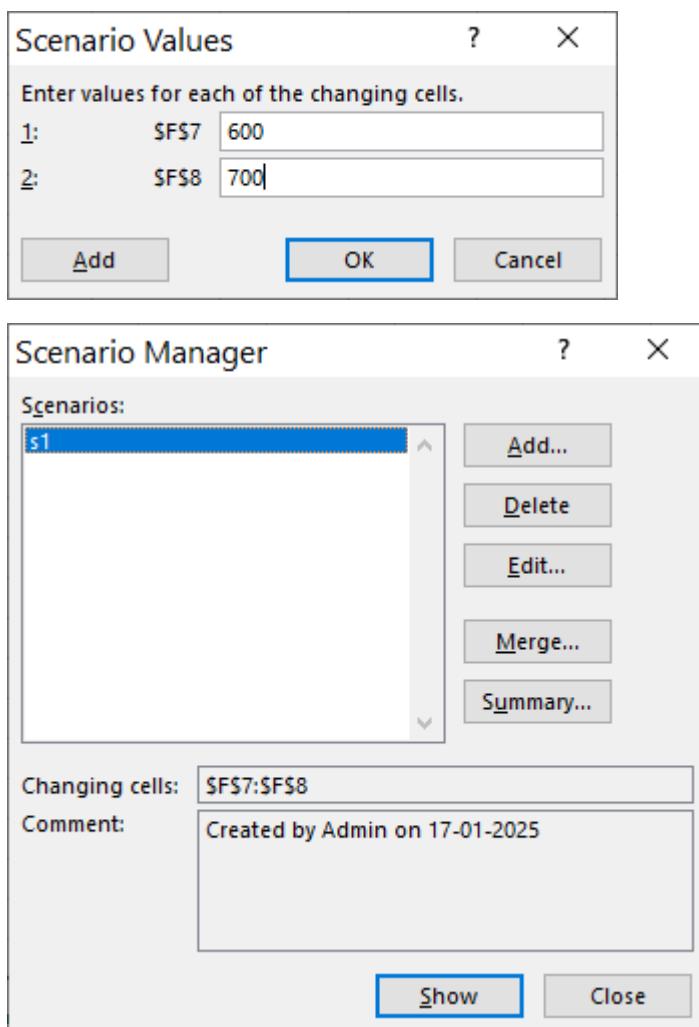
The screenshot shows a Microsoft Excel spreadsheet titled "Prac6 - Excel". The data table consists of several rows and columns of numbers. The "What-If Analysis" ribbon tab is selected, and a dropdown menu is open, showing options like "Scenario Manager...", "Goal Seek...", and "Data Table...".

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
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Practical-7 Perform the data classification using classification algorithm

#Consider the annual rainfall details at a place starting from January 2012. #We create an R time series object for a period of 12 months and plot it.

```
rainfall <- c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)
```

Convert it to a time series object.

```
rainfall.timeseries <- ts(rainfall,start = c(2012,1),frequency
```

```
= 12) # Print the timeseries data.
```

```
print(rainfall.timeseries)
```

Give the chart file a name.

```
png(file = "rainfall.png")
```

Plot a graph of the time series.

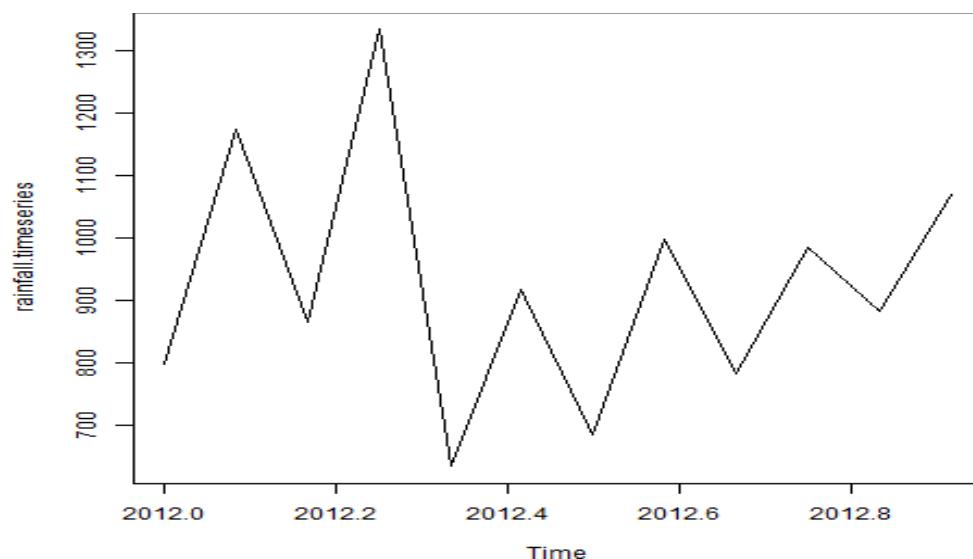
```
plot(rainfall.timeseries)
```

```
# Save the file. dev.off()
```

Output:

When we execute the above code, it produces the following result and

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	799.0	1174.8	865.1	1334.6	635.4	918.5	685.5	998.6	784.2			2012
										985.0	882.8	1071.0

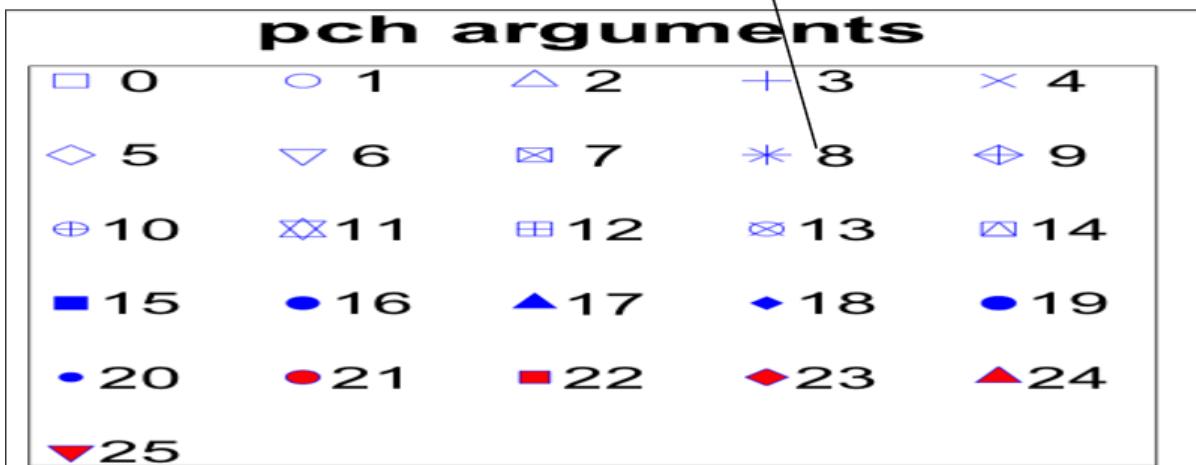


Practical-8 Perform the Data Clustering using Clustering Algorithm(Clustering : k-means Algorithm)

Iris is a genus of 260–300 species of flowering plants with showy flowers.



```
newiris <- iris  
newiris$Species <- NULL  
(kc <- kmeans(newiris,3))  
print(kc)  
# Compare the Species label with the clustering result.  
table (iris$Species,kc$cluster)  
plot(newiris[c("Sepal.Length","Sepal.Width")],col=kc$cluster)  
  
points(kc$centers[,c("Sepal.Length","Sepal.Width")],col=1:3,pch=8,cex=2)
```



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```
R Console
> # Apply K mean to iris and store result
> newiris <- iris
> newiris$Species <- NULL
> (kc <- kmeans(newiris, 3))
K-means clustering with 3 clusters of sizes 62, 38, 50

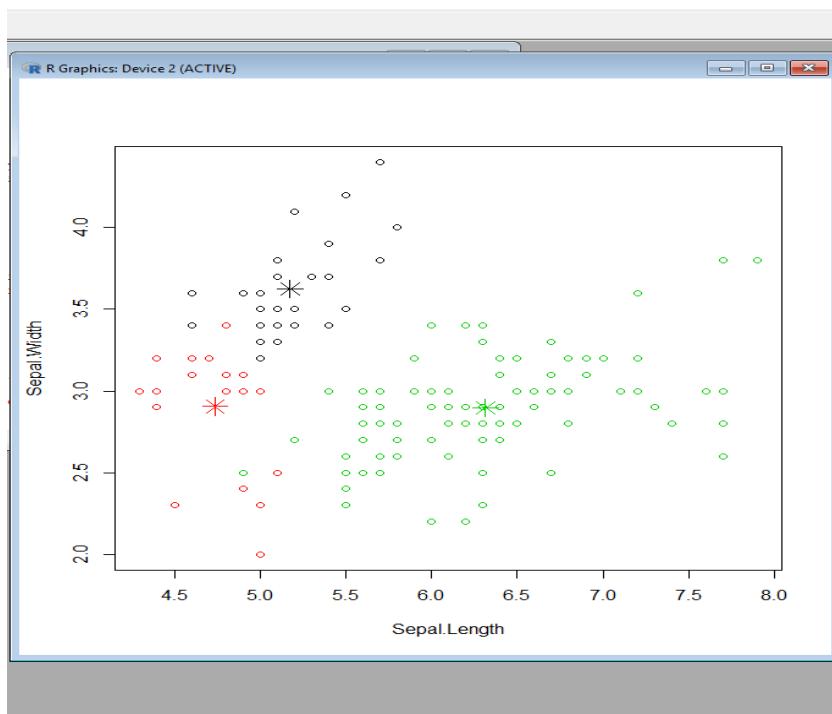
Cluster means:
  Sepal.Length Sepal.Width Petal.Length Petal.Width
1      5.901613     2.748387     4.393548     1.433871
2      6.850000     3.073684     5.742105     2.071053
3      5.006000     3.428000     1.462000     0.246000

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 3 3 3 3 3 3 3 3
[47] 3 3 3 3 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
[93] 1 1 1 1 1 1 1 2 1 2 2 2 2 1 2 2 2 2 2 1 1 2 2 2 2 1 2 1 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2
[139] 1 2 2 2 1 2 2 2 1 2 2 1

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

Available components:

[1] "cluster"      "centers"       "totss"          "withinss"        "tot.withinss"
[7] "size"          "iter"          "ifault"
```



Practical -9 Perform the Linear regression on the given data warehouse data.

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

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

```
# Apply the lm() function. relation <- lm(y~x)
```

```
# Find weight of a person with height 170. a <- data.frame(x = 170)
```

```
result <- predict(relation,a) print(result)
```

```
# Give the chart file a name. png(file = "linearregression.png")
```

```
# Plot the chart.
```

```
plot(y,x,col = "blue",main = "Height & Weight Regression", abline(lm(x~y)),cex = 1.3,pch = 16,xlab = "Weight in Kg",ylab = "Height in cm")
```

```
# Save the file. dev.off()
```

