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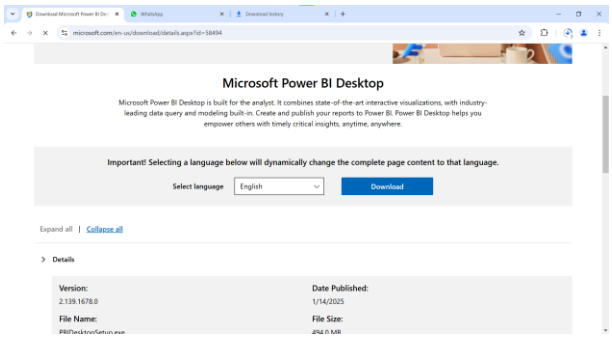
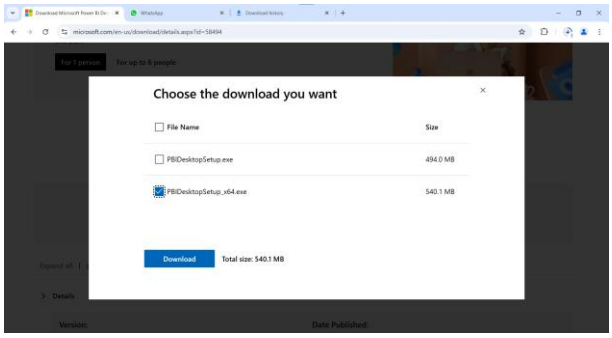
Practical 1 A – Installation of PowerBi

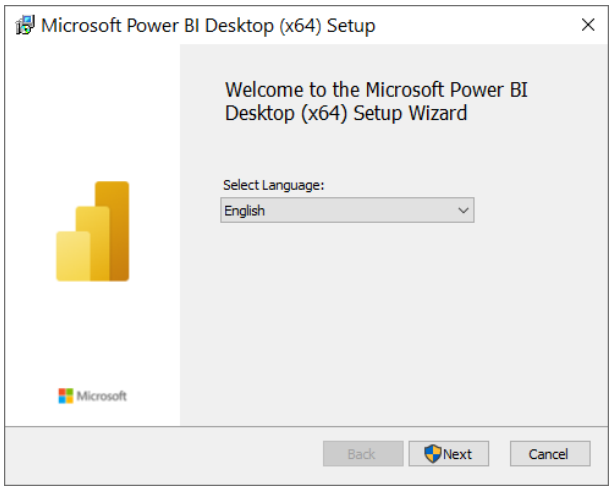
1) Go to - https://www.microsoft.com/en-us/download/details.aspx?id=58494



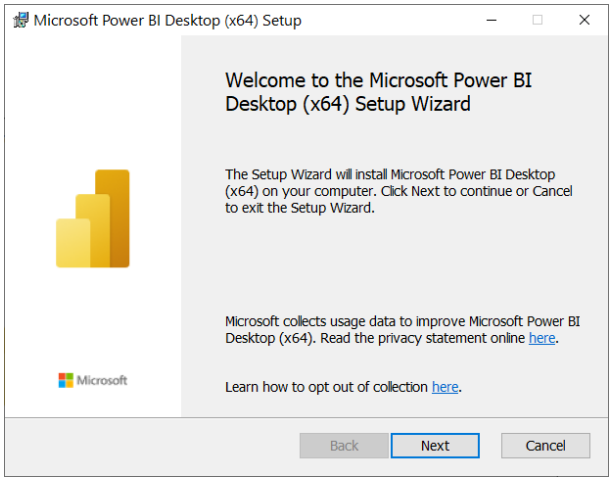
2) Download 64-bit file

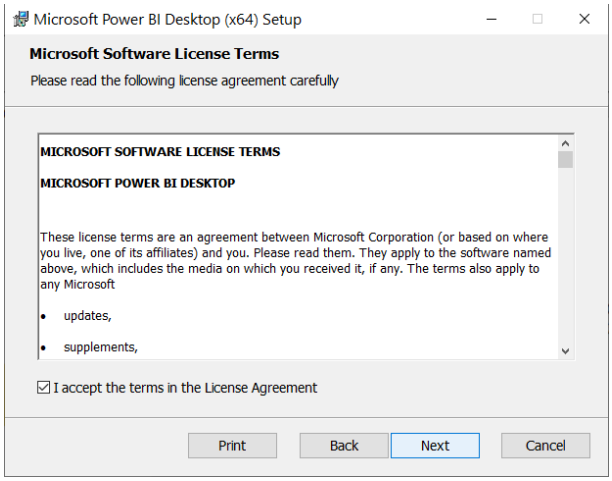


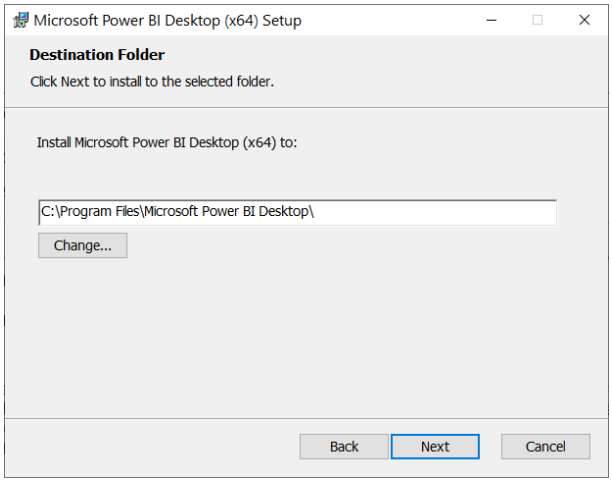
3) Run the installer



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







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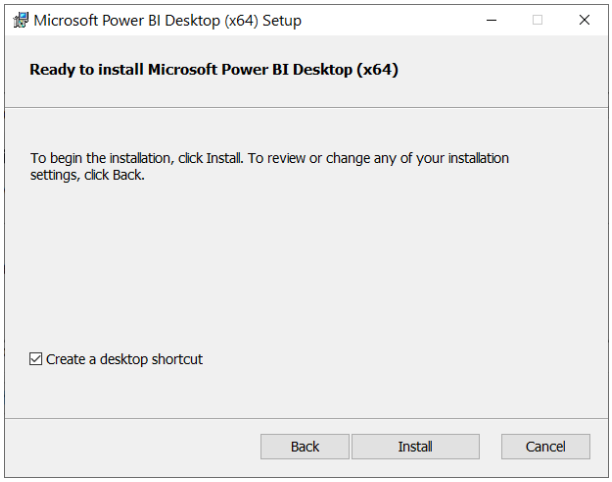
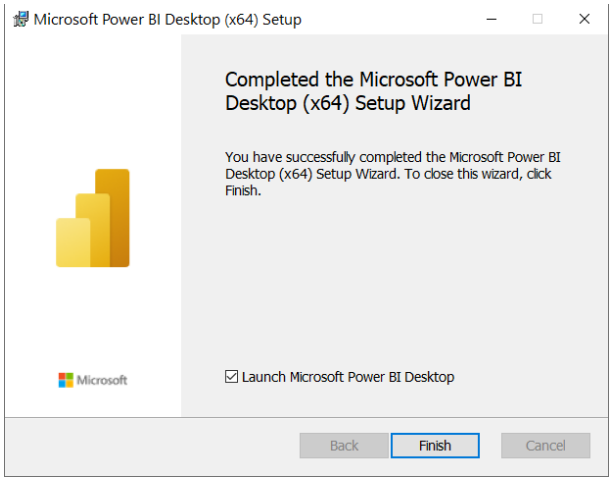
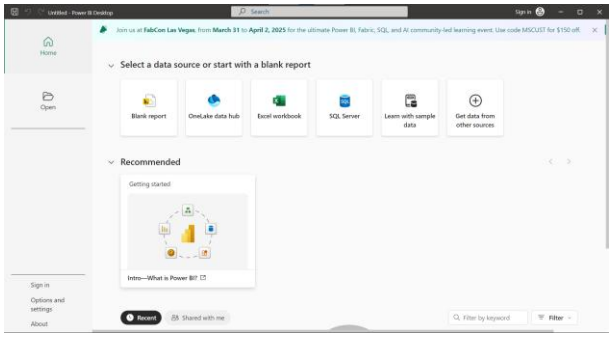


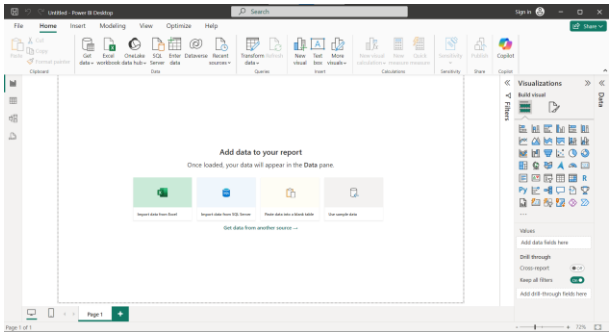


Practical 1B – Import Legacy Data from Different Sources

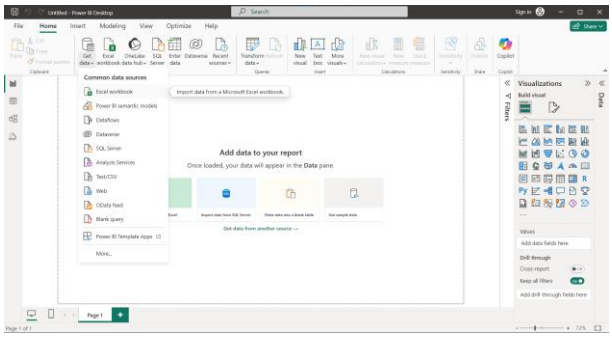
1) Open Power BI



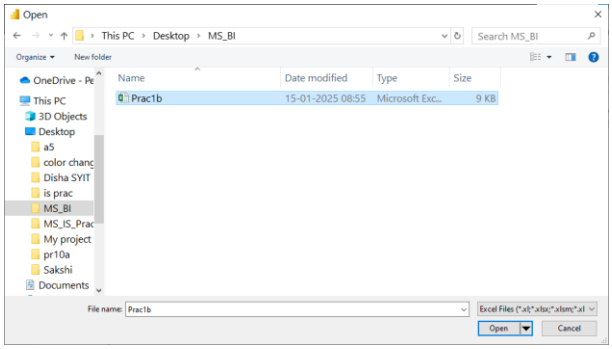
2) Create Blank Report



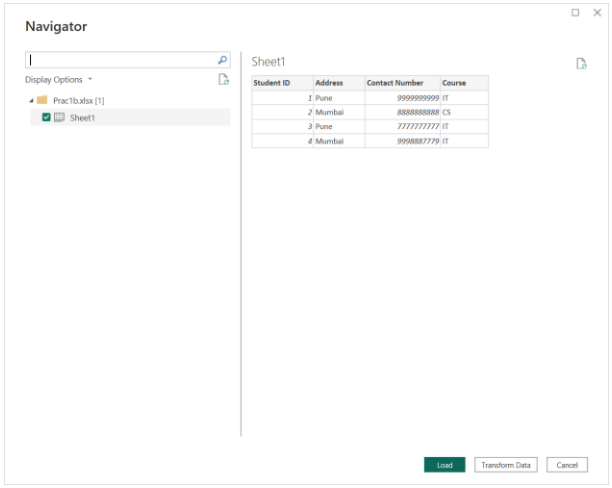
3) Select Excel workbook under get data option. Click on connect



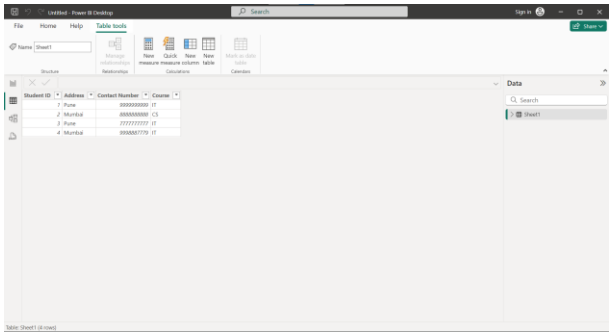
4) Browse your file and select it



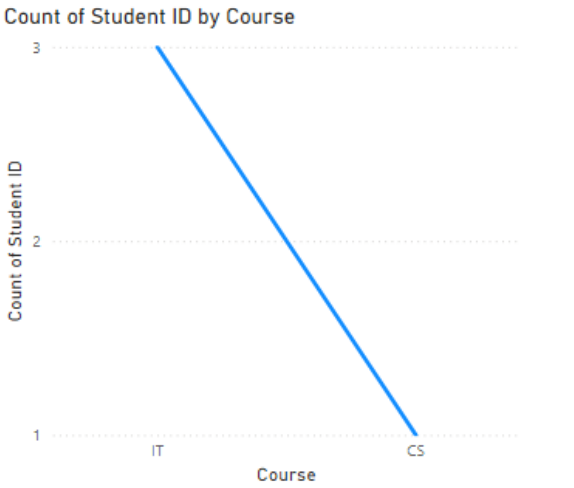
5) Click on Sheet and Load



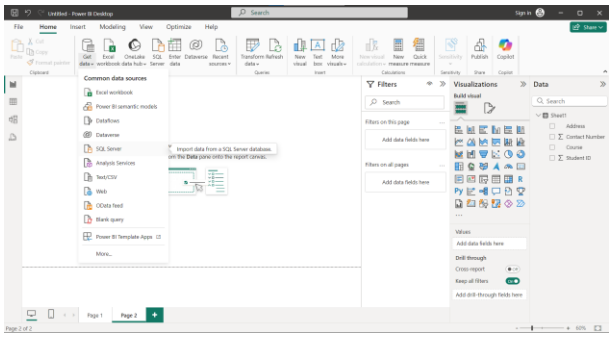
6) The data will be shown



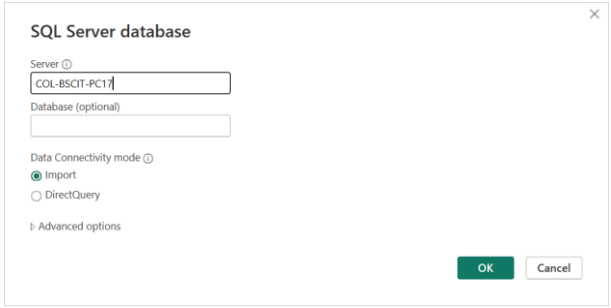
7) Create charts

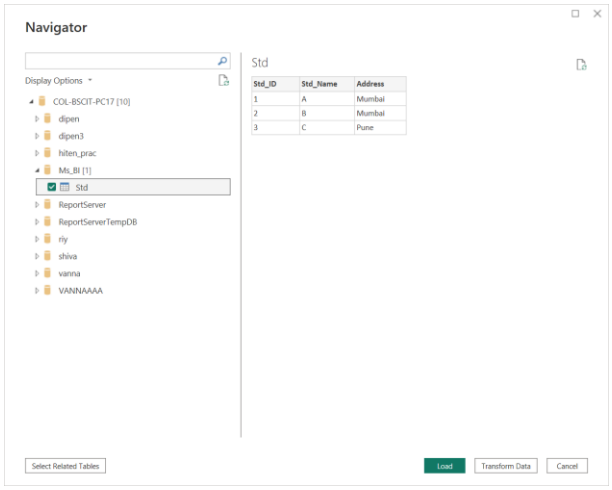


8) Click on get data and select sql server

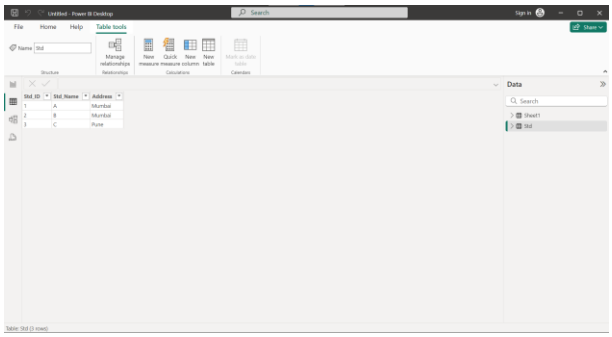


9) Add sever name > select database > select table

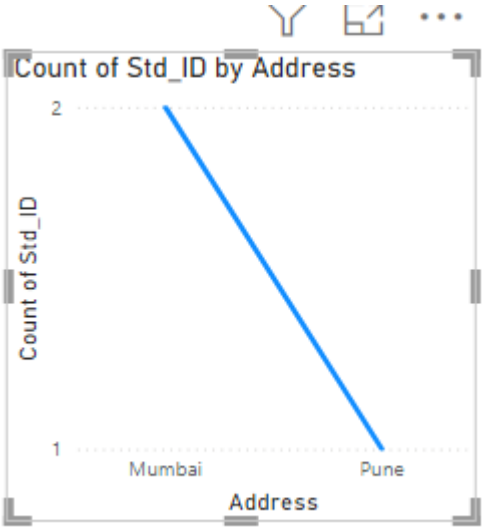




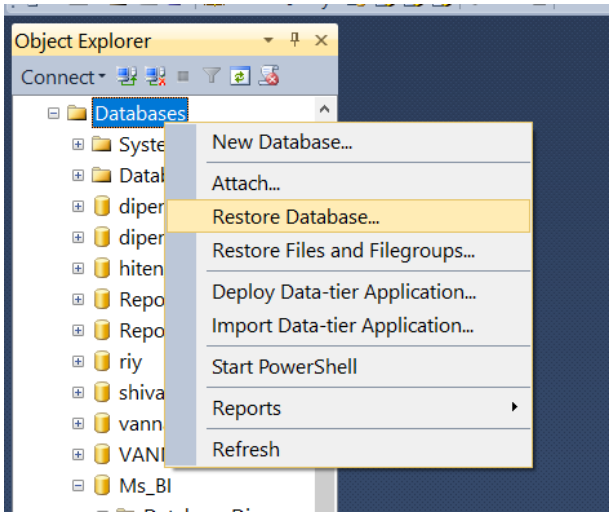
10) Data will be loaded



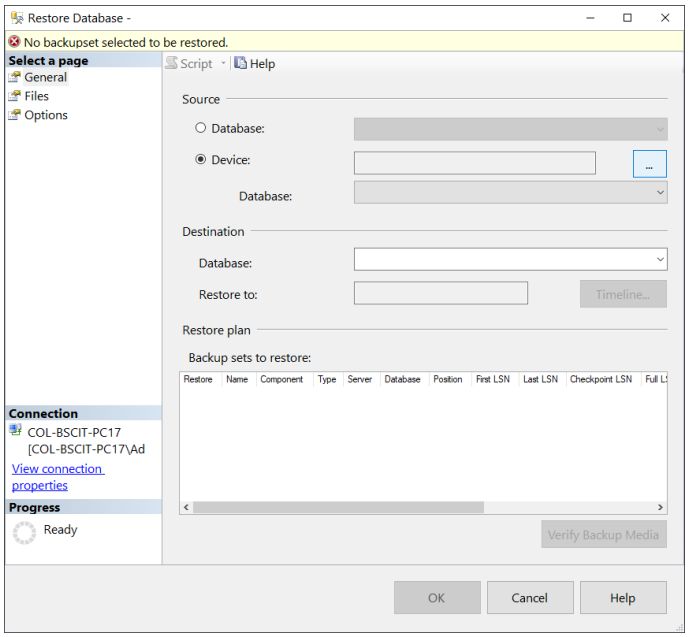
11) Create a chart



12) In SSMS, restore database



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



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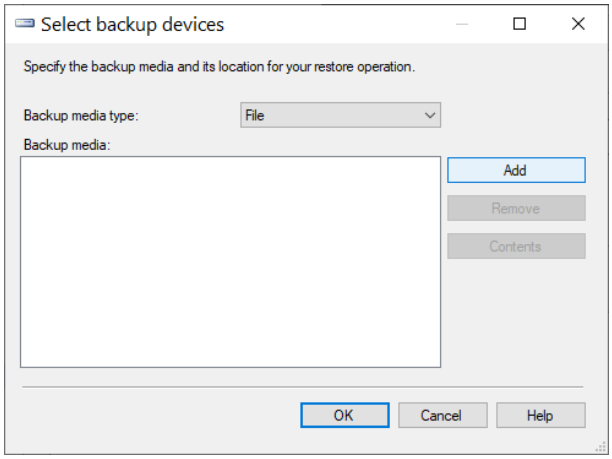
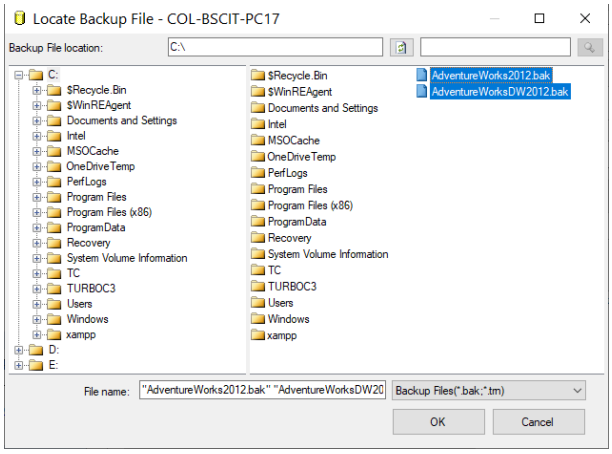
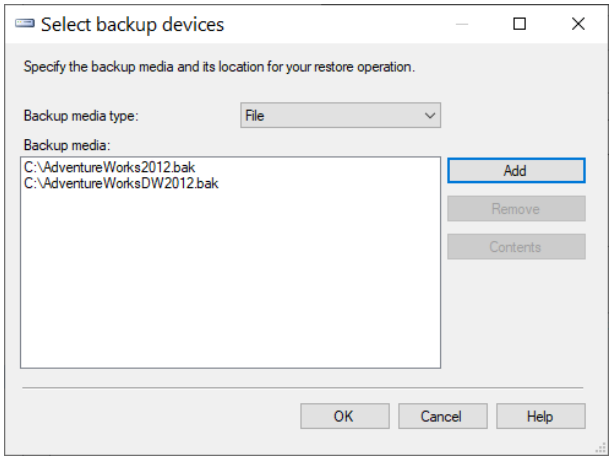
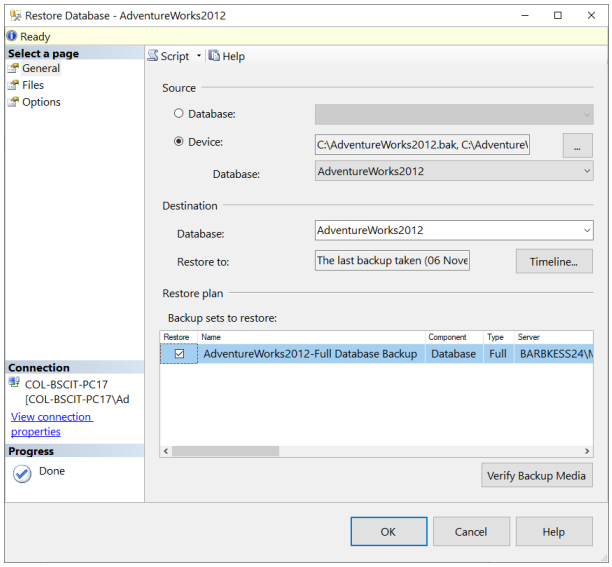
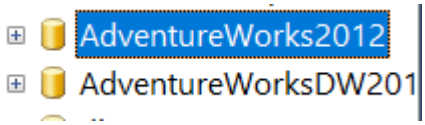


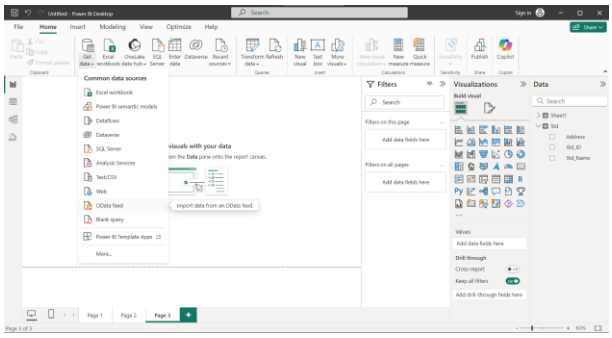






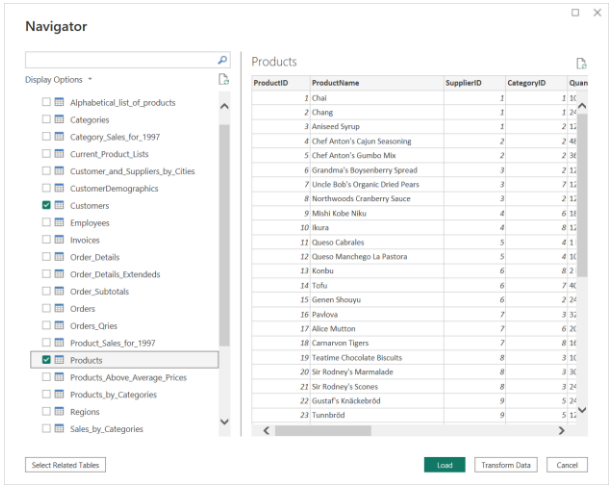


14) Get – O Data Feed

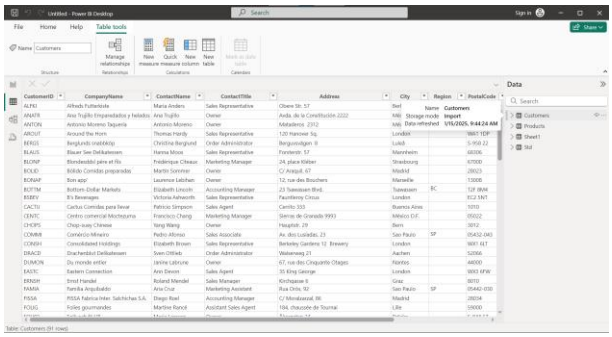


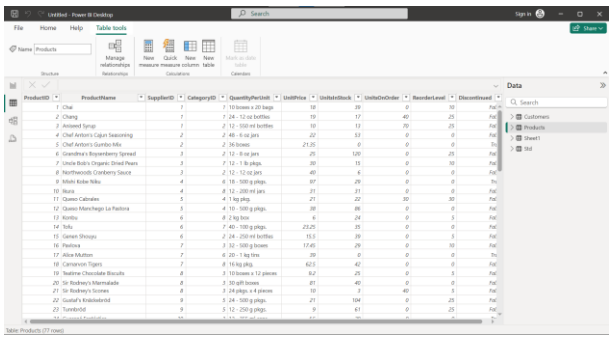
15) Paste URL

16) Select customer and product table

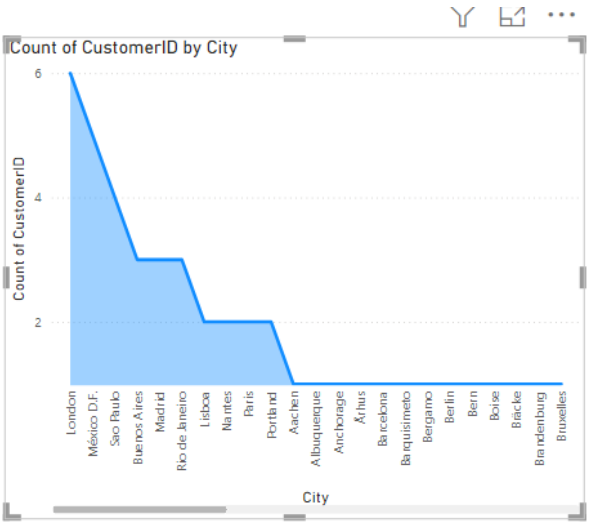


17) Tables are shown



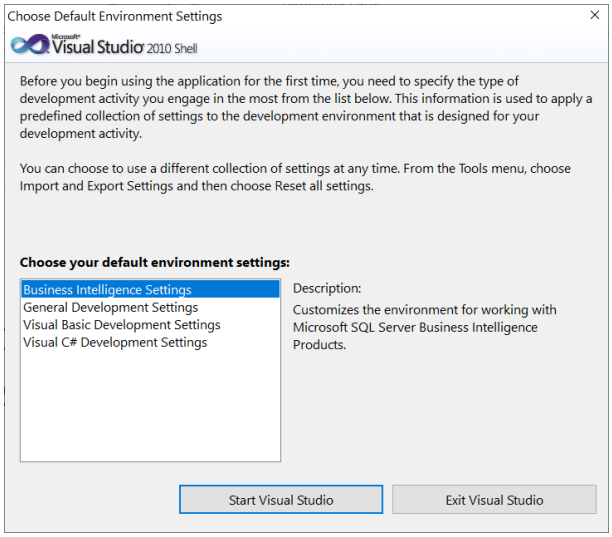


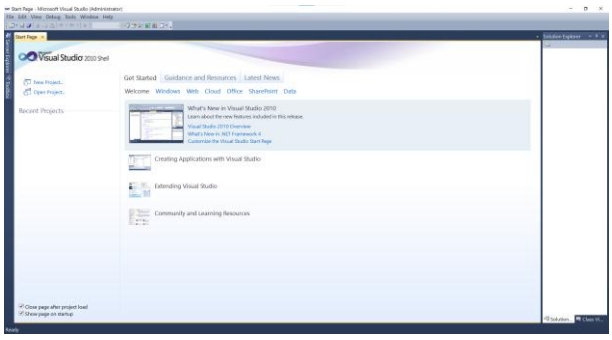
18) Create Chart



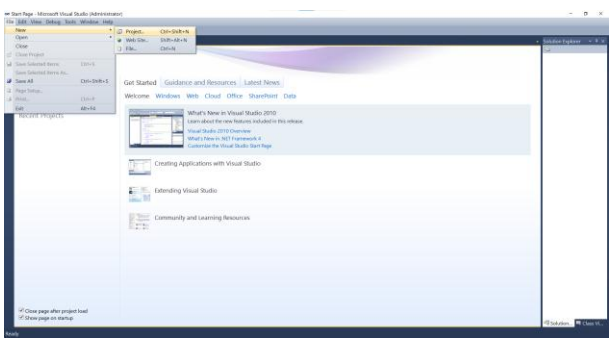
Practical 2A – Perform ETL Process to construct the database in SQL Server

1) Open SQL Server Data Tools

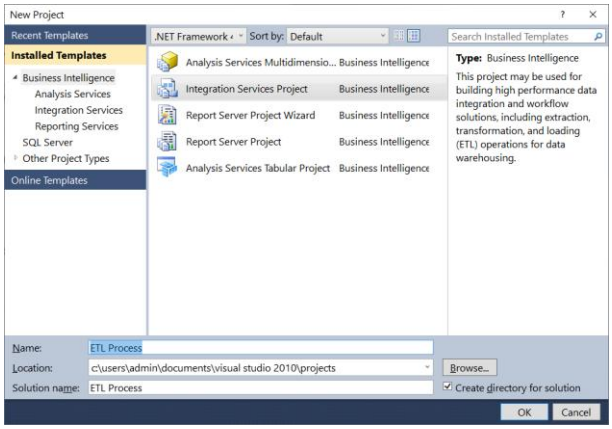




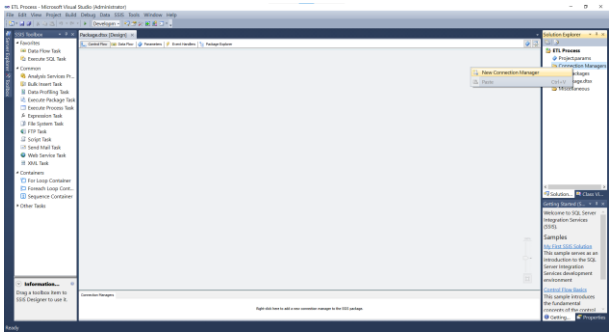
2) Go to File and create new project



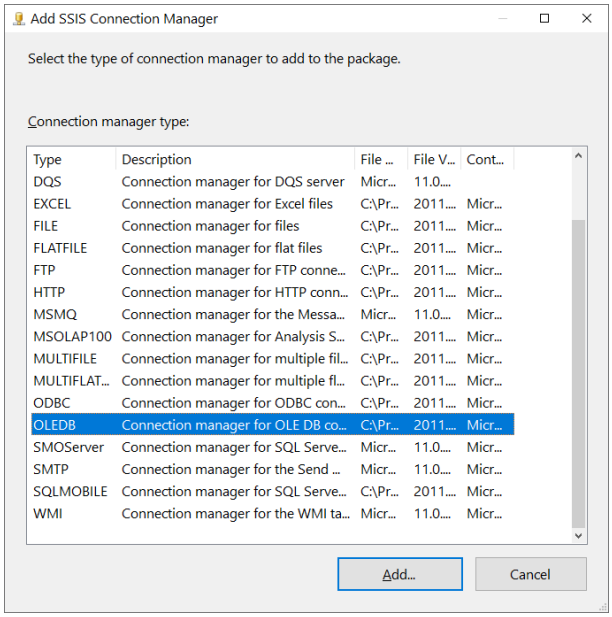
3) Select Integration Services Project and name it “ETL Process”



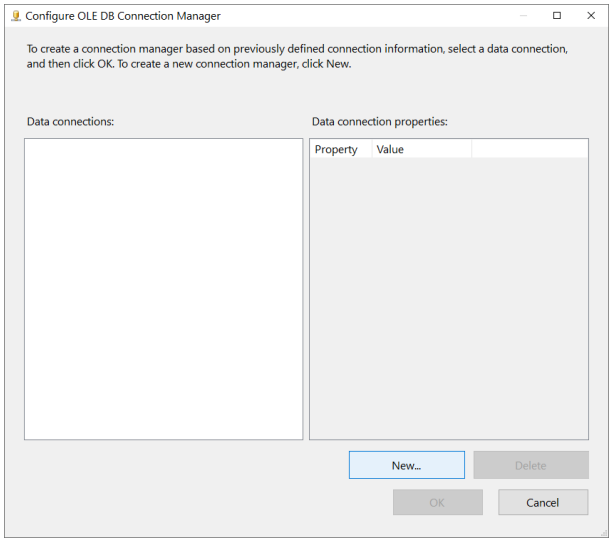
4) Right Click Connection Managers and select new Connection Manager



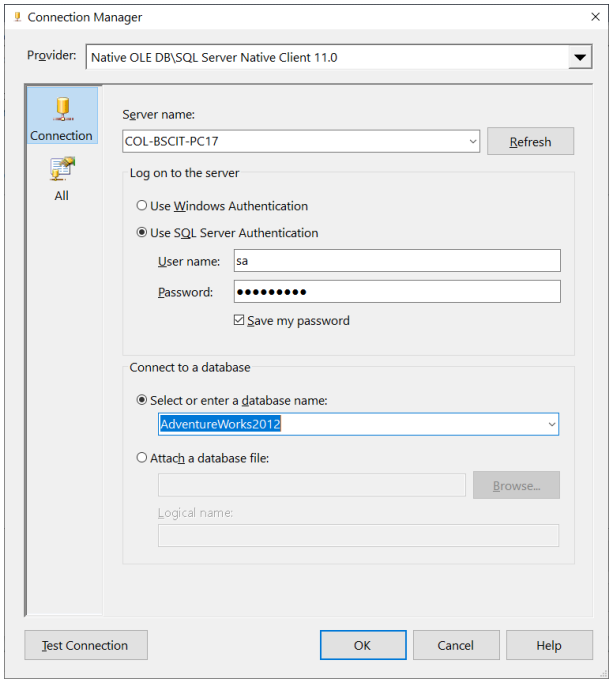
5) Add OLEDB



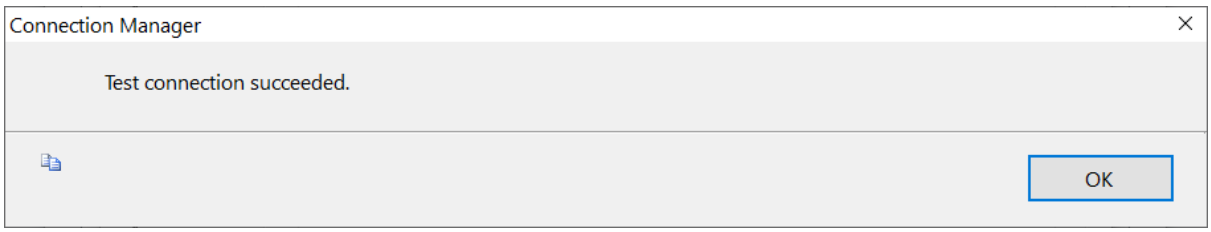
6) Click New



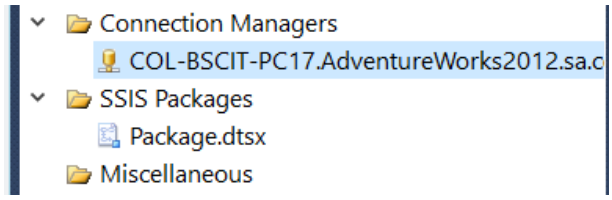
7) Enter server name and select database AdventureWorks



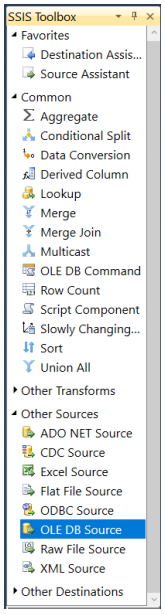
8) Test Connection

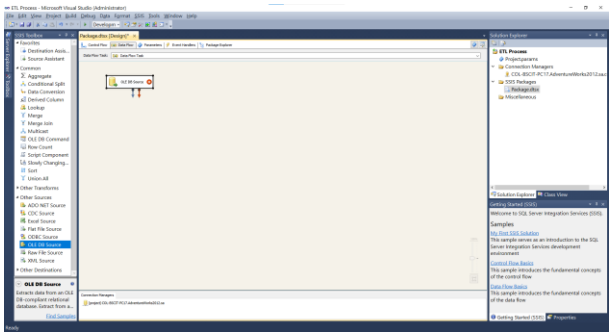


9) Click OK

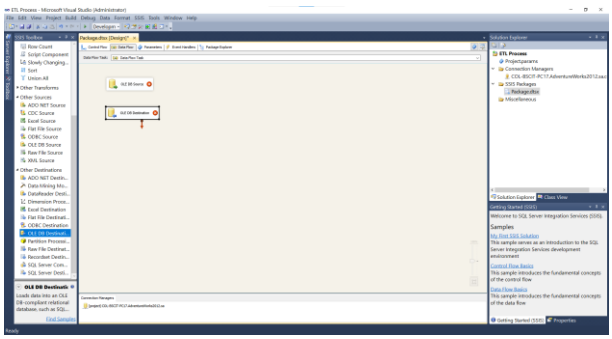


10) In Data Flow Task, In SSIS Tool box, Drag and drop the Data Source

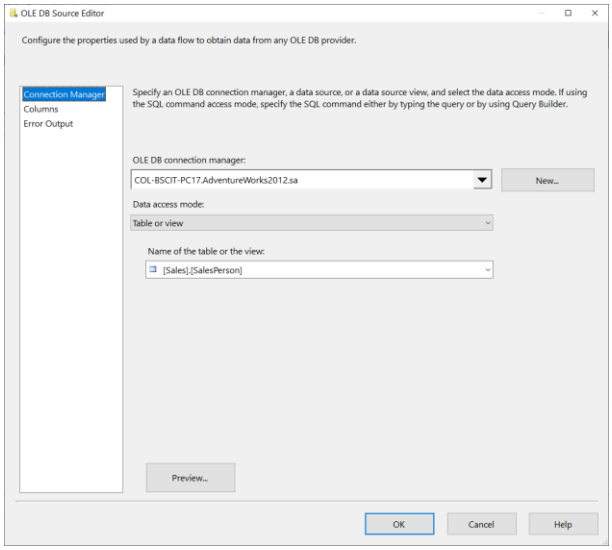




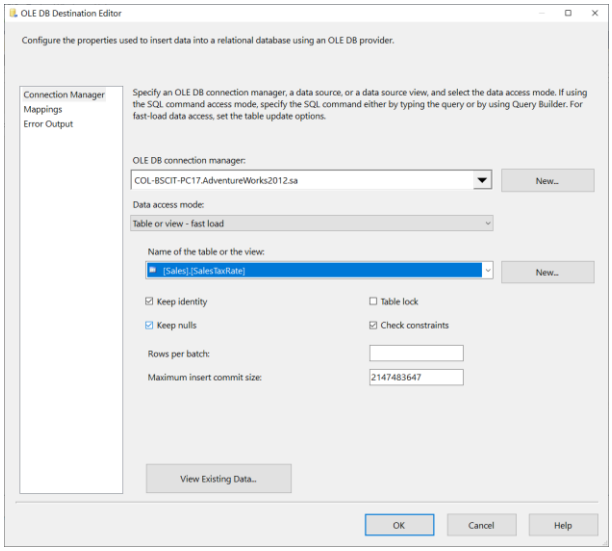
11) Similarly Drag and Drop OLEDB Destination



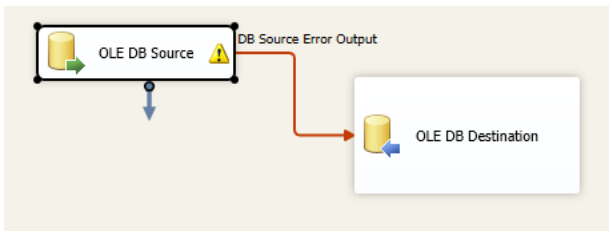
12) Double Click OLEDB Source, Select SalesPerson



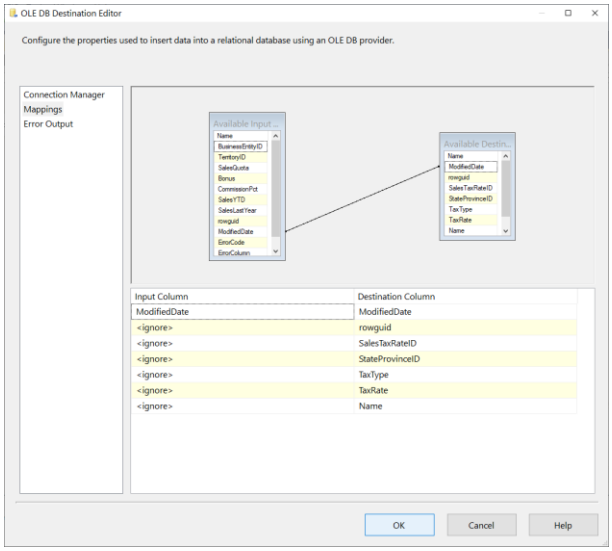
13) Double Click OLEDB Destination, select Sales SalesTaxRate Table



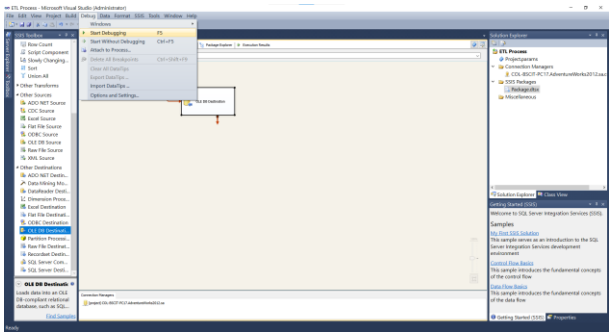
14) Connect Orange Line from Source to Destination

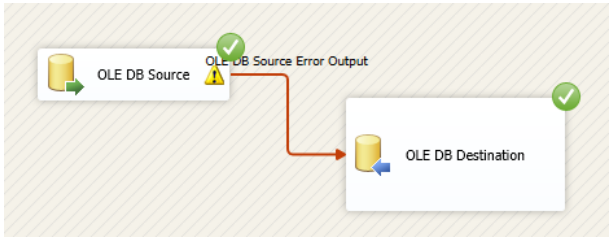


15) In OLE DB Destination check mappings



16) Start Debugging

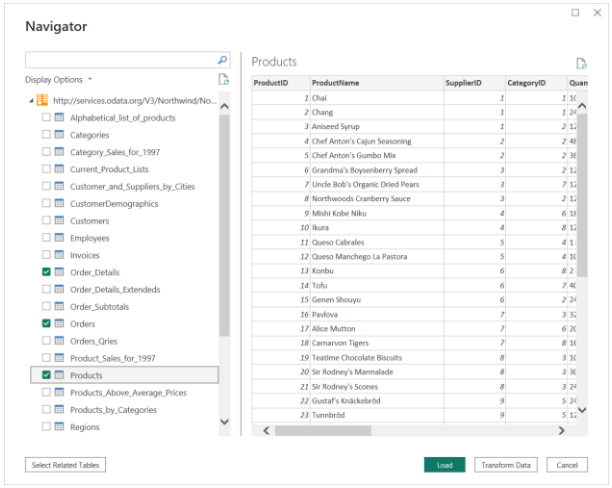




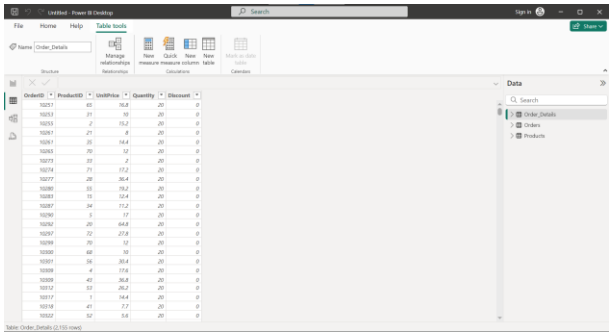
Practical 2B – Perform ETL Process in Power BI

1) Select ODATA from Get Data and enter URL

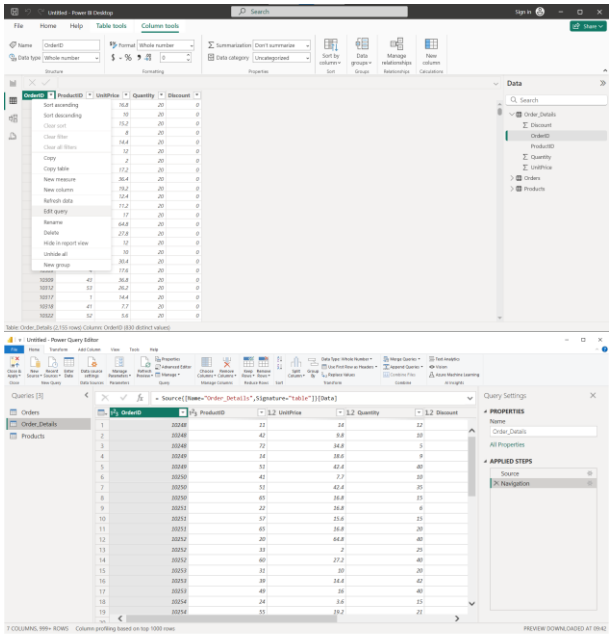
2) Select Order_Details, Orders, Products and load



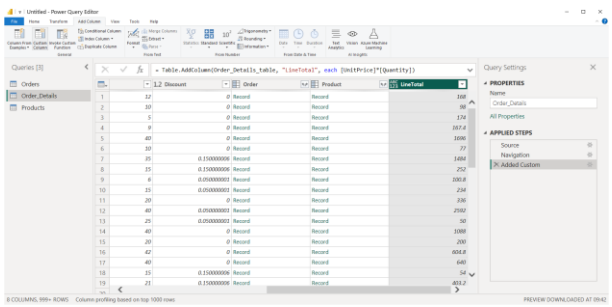
3) Tables will be loaded



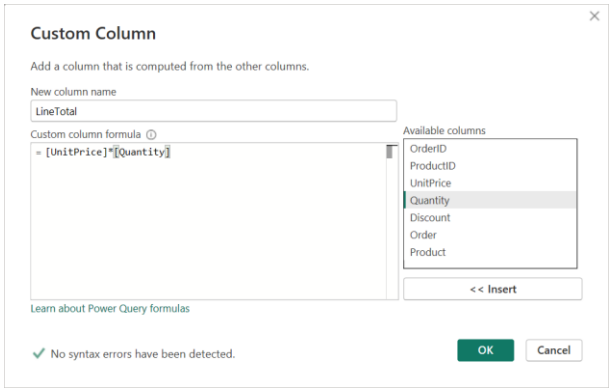
4) Right Click any column and select edit query



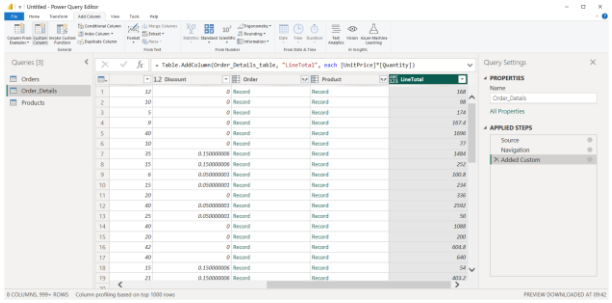
5) Click on Add > Custom Column



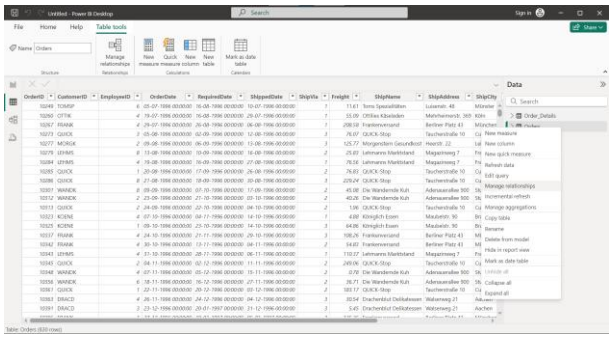
6) Name it LineTotal, add formula [UnitPrice]*[Quantity]



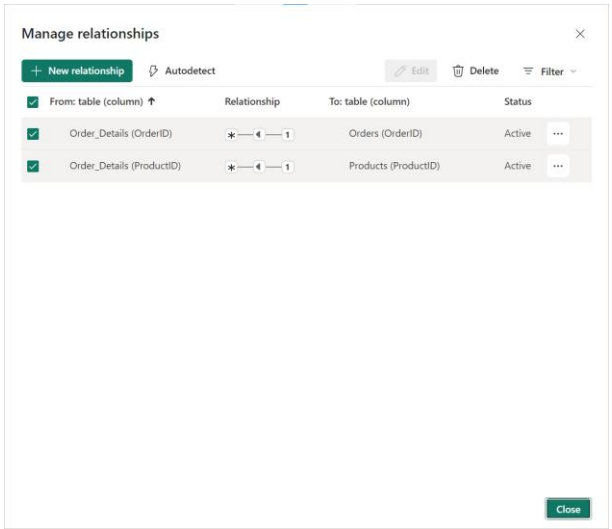
7) Line Total Column is added



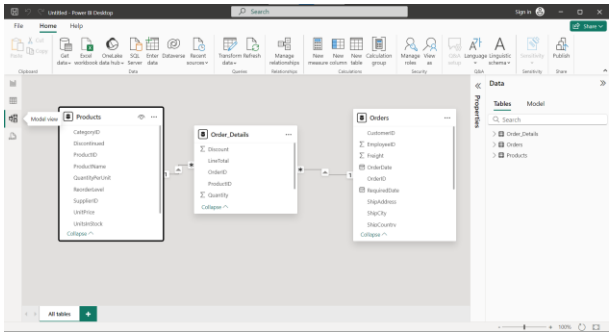
8) In Power BI Select Order Tables and in Table tools select Manage Relationhips



9) Select the columns

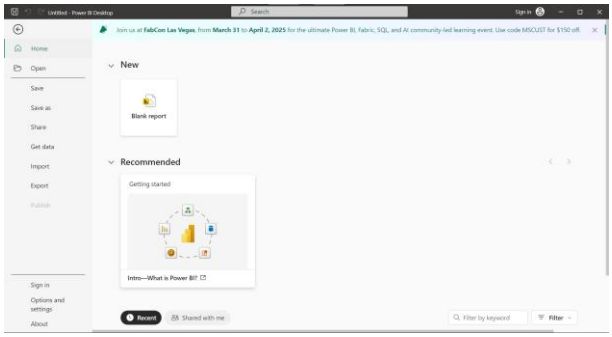


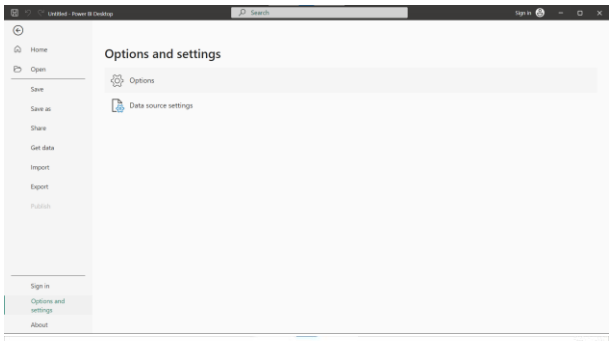
10) Click on Model View

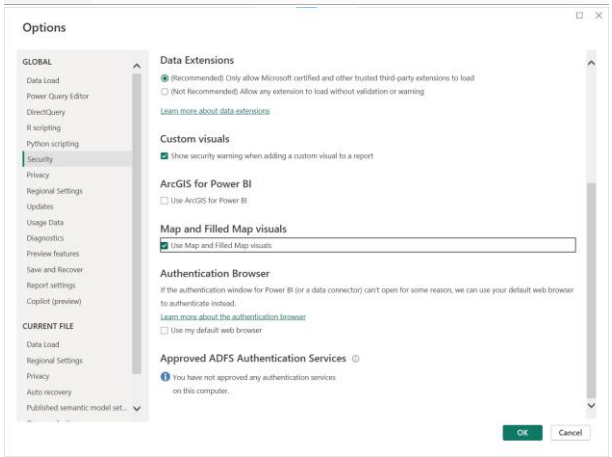


Practical 3A – Perform Data Visualization and Create the Data Staging Area

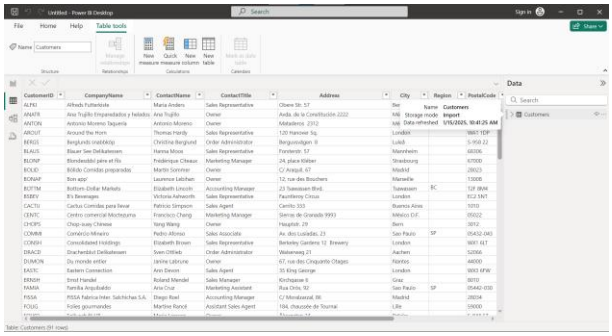
1) Go to File > Options and Settings > Options > Security > Use Map and Filled Maps



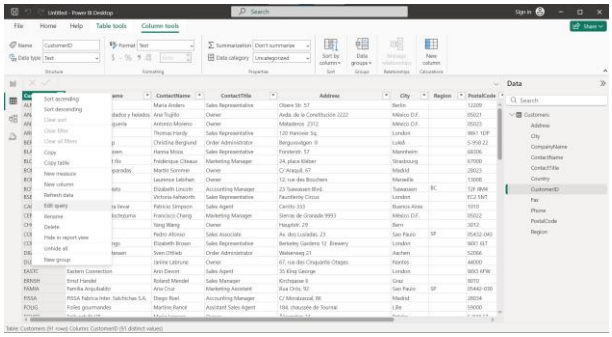


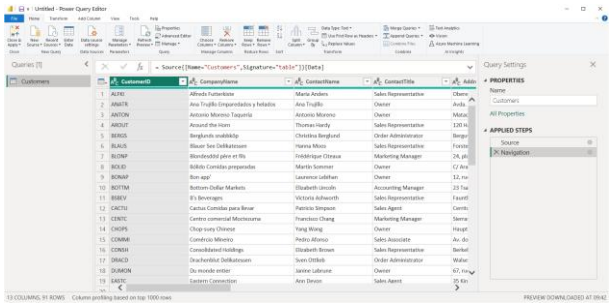


2) Open Customers Table

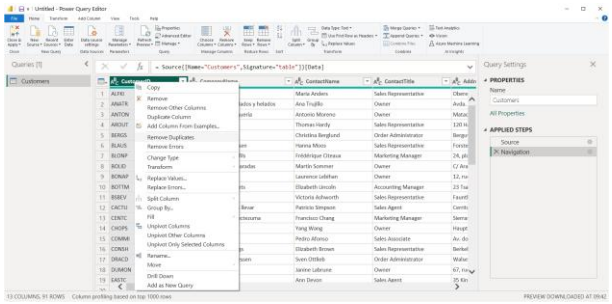


3) Right click CustomerId > Edit Query

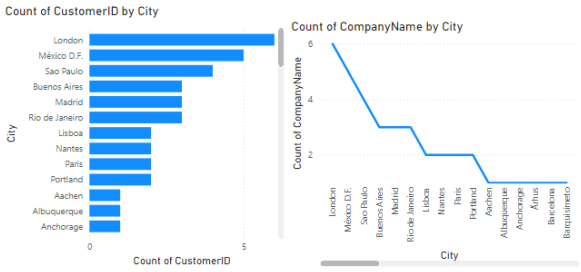




4) Remove Duplicate Entries and save

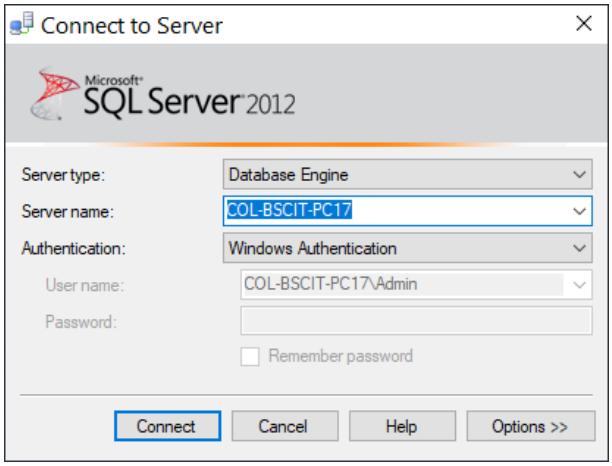


5) Create charts

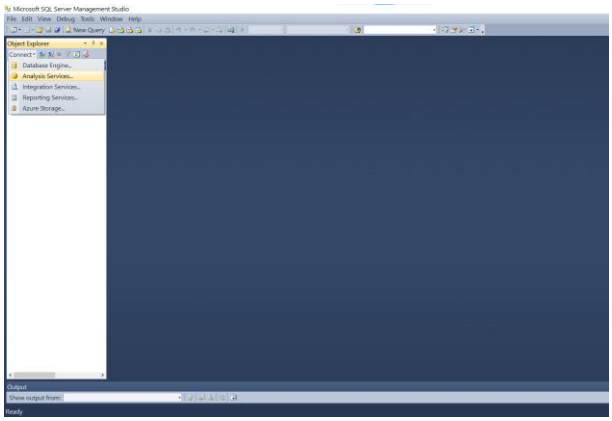


Practical 3B – Create Staging Area for Selected Database using Star Schema

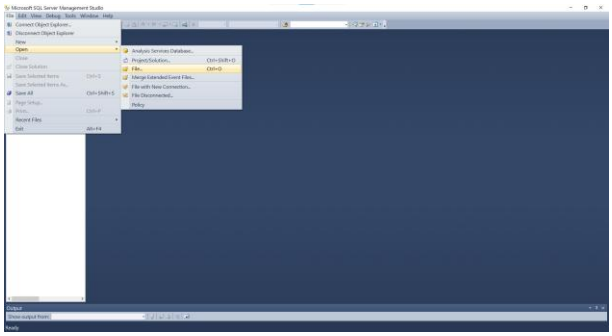
1) Open SSMS and Connect

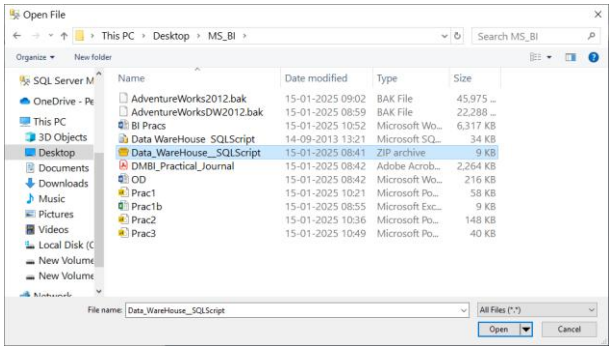


2) Click Connect > Analysis Server

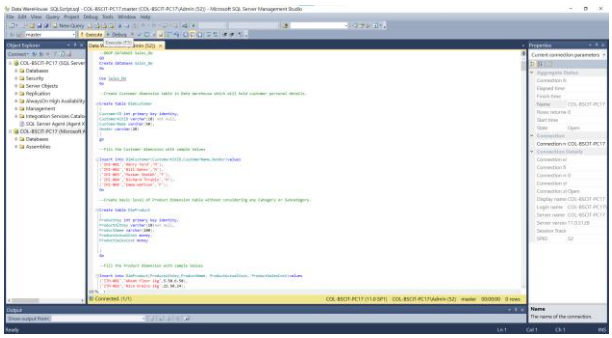


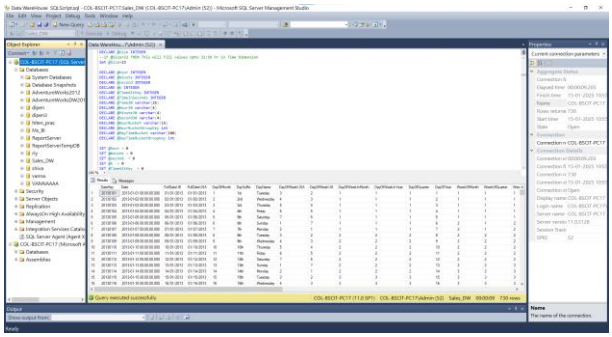
3) Click on File > Open > File> Select Data_Warehouse_SQLScript.zip



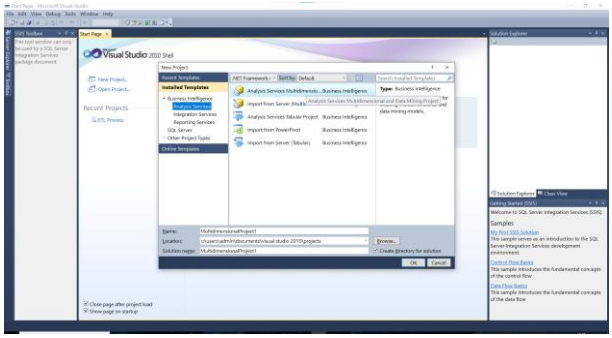


4) Click Execute

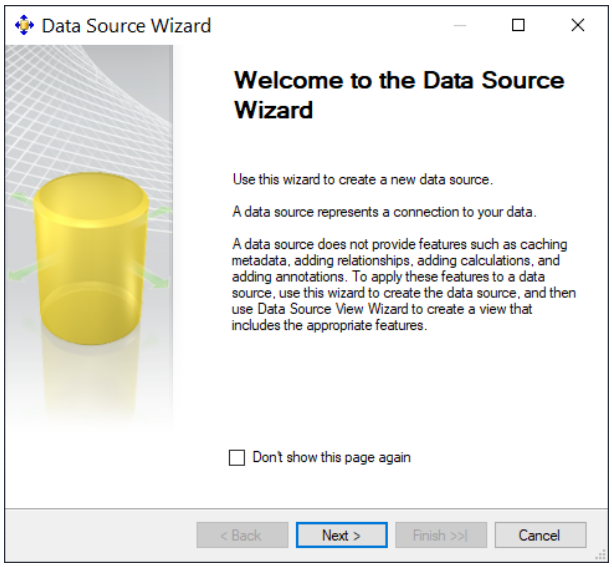




5) Open Server Data Tools > NewProject > Select Analysis Multidimensional



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



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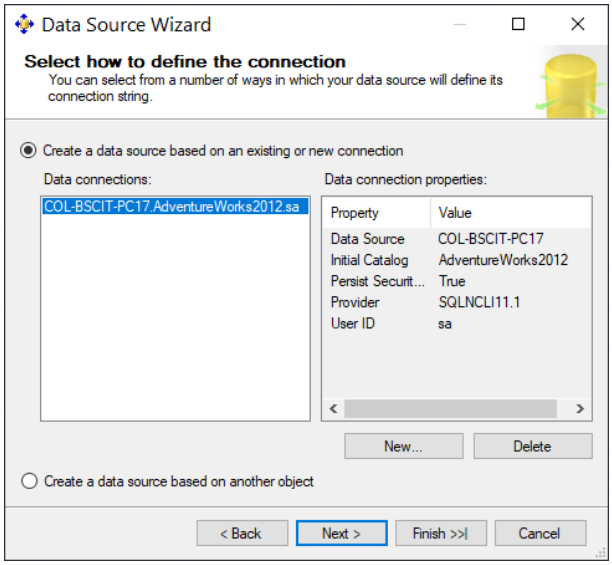

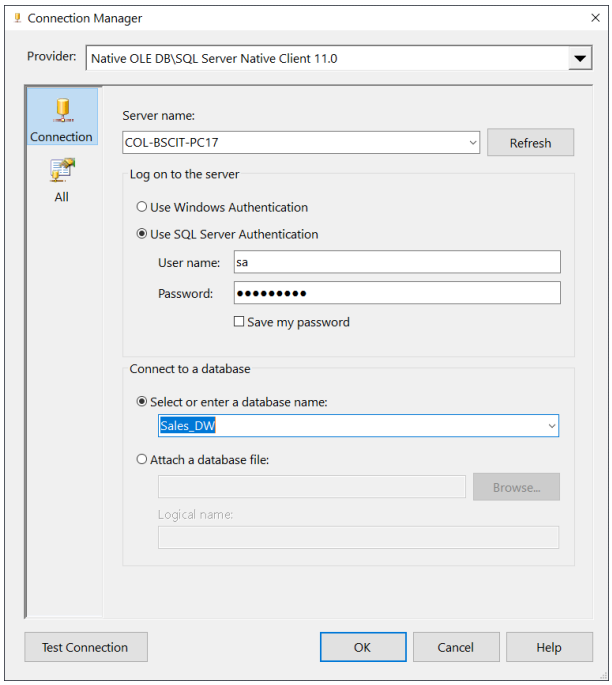

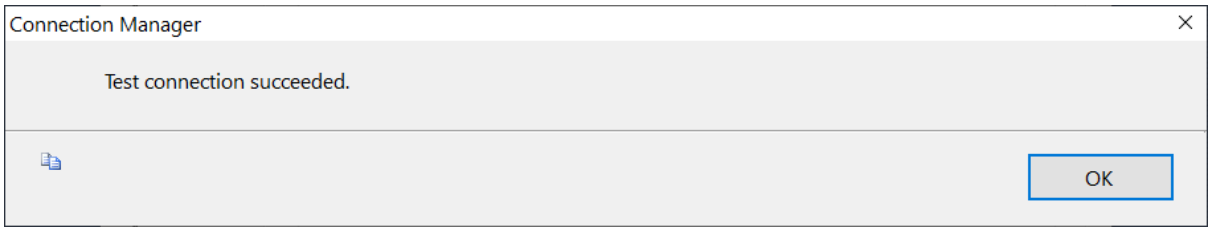

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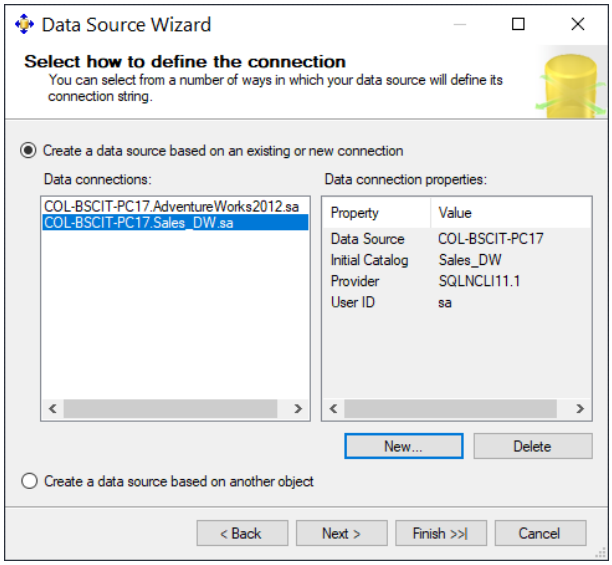
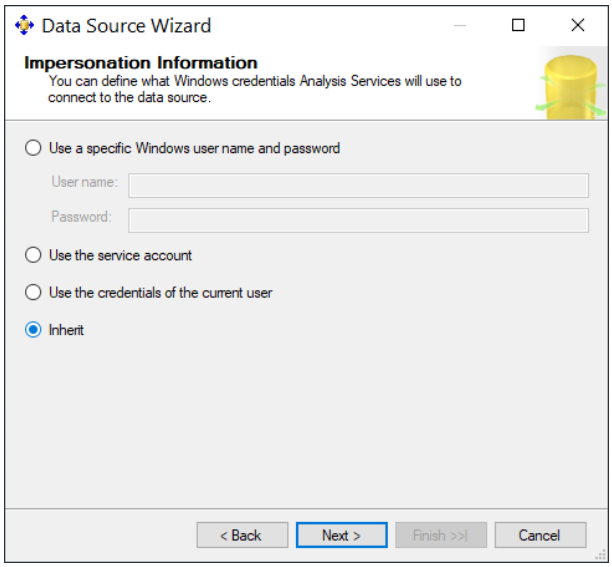
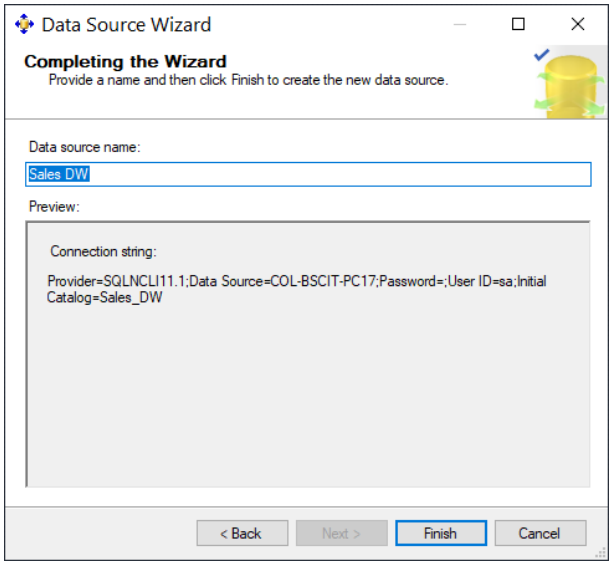
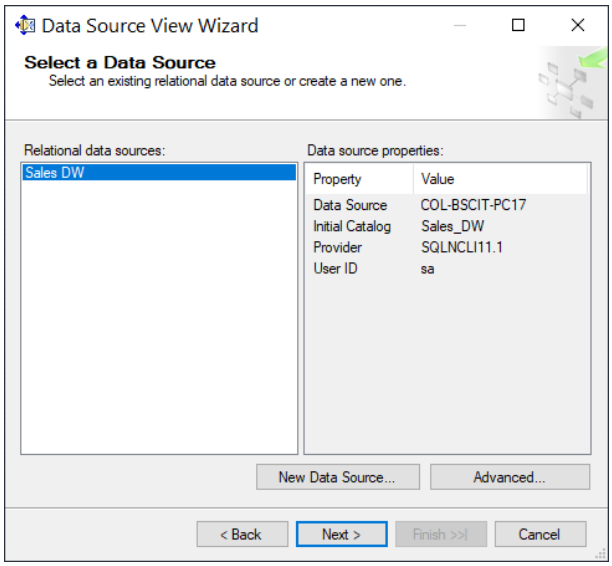
FY / SY / TY B. Sc. (I. T.) Semester_____

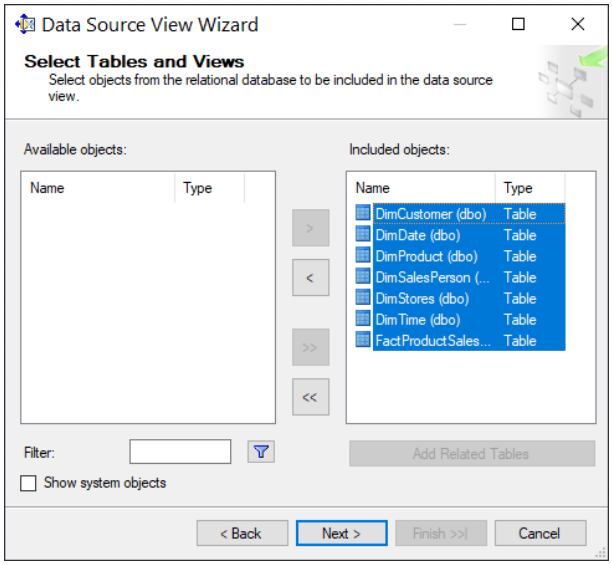


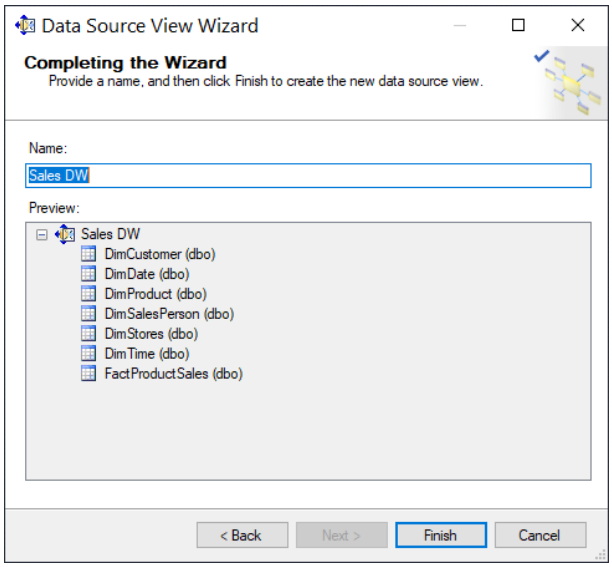




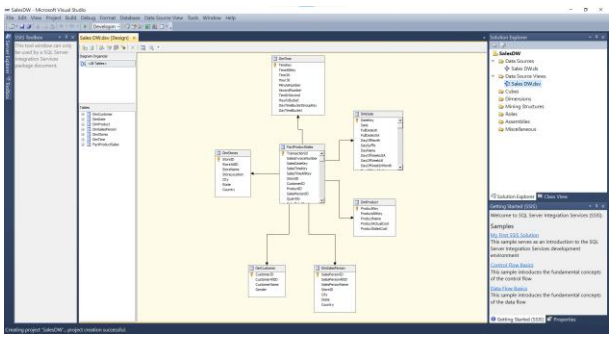
7) Right Click Data Source View > New Data Source View > Next > Select SalesDW > Add all tables > Finish





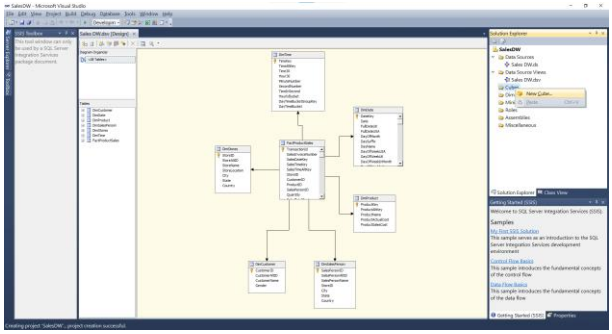


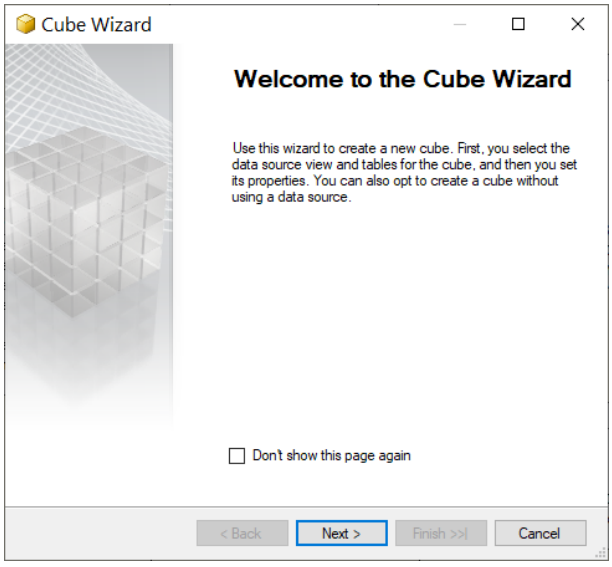
8) Relationship Chart is shown



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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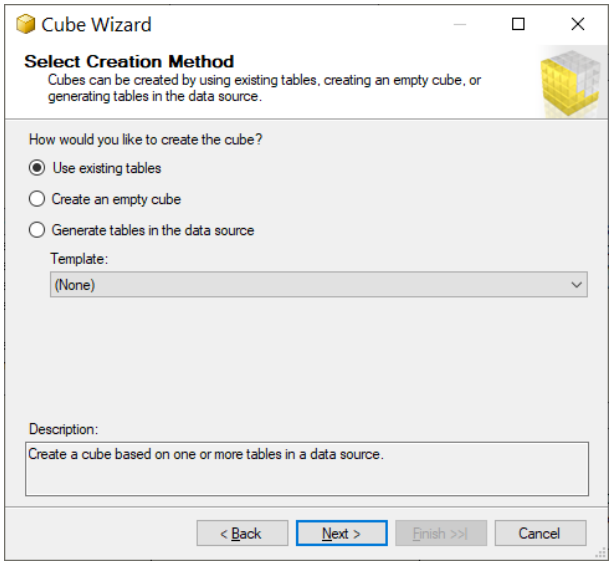
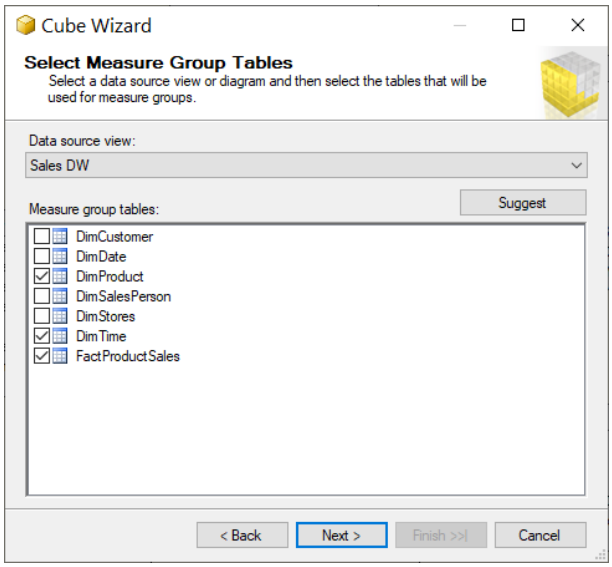
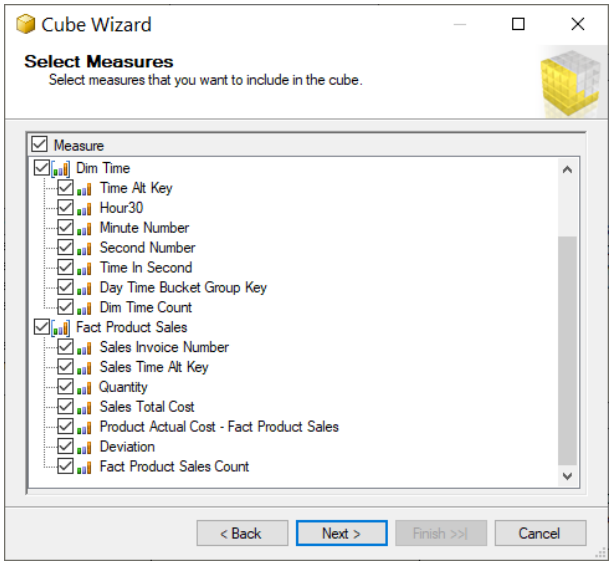
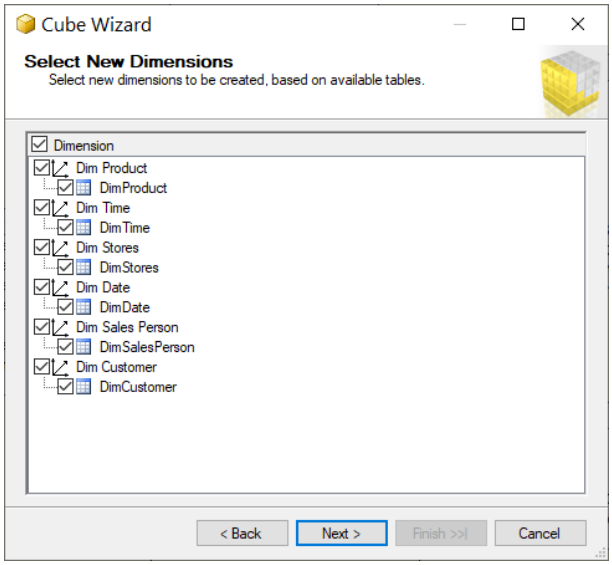
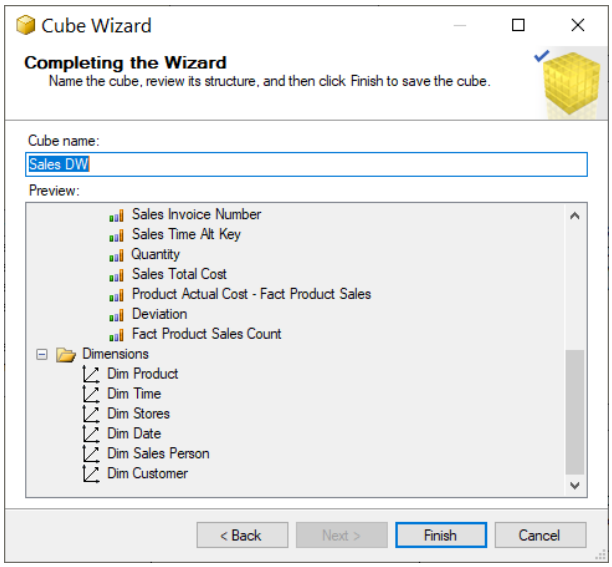


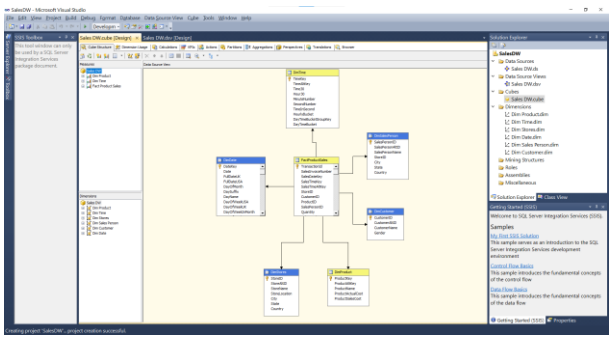




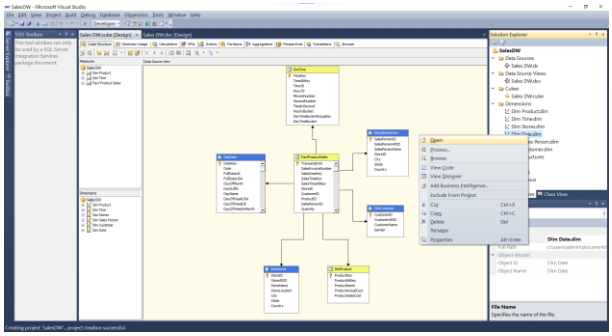


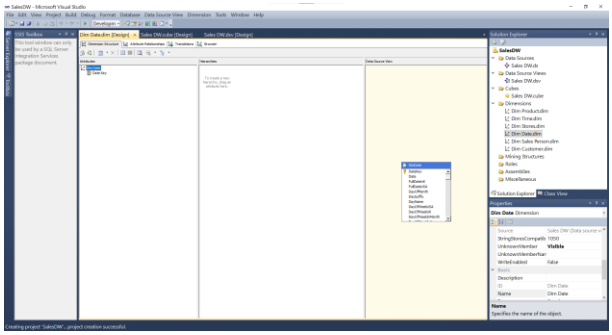


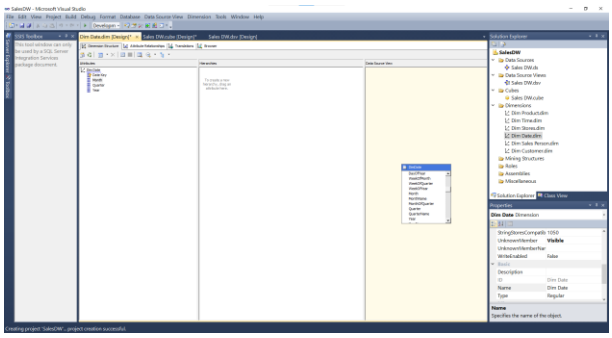
2) The relationship will be displayed on the screen.

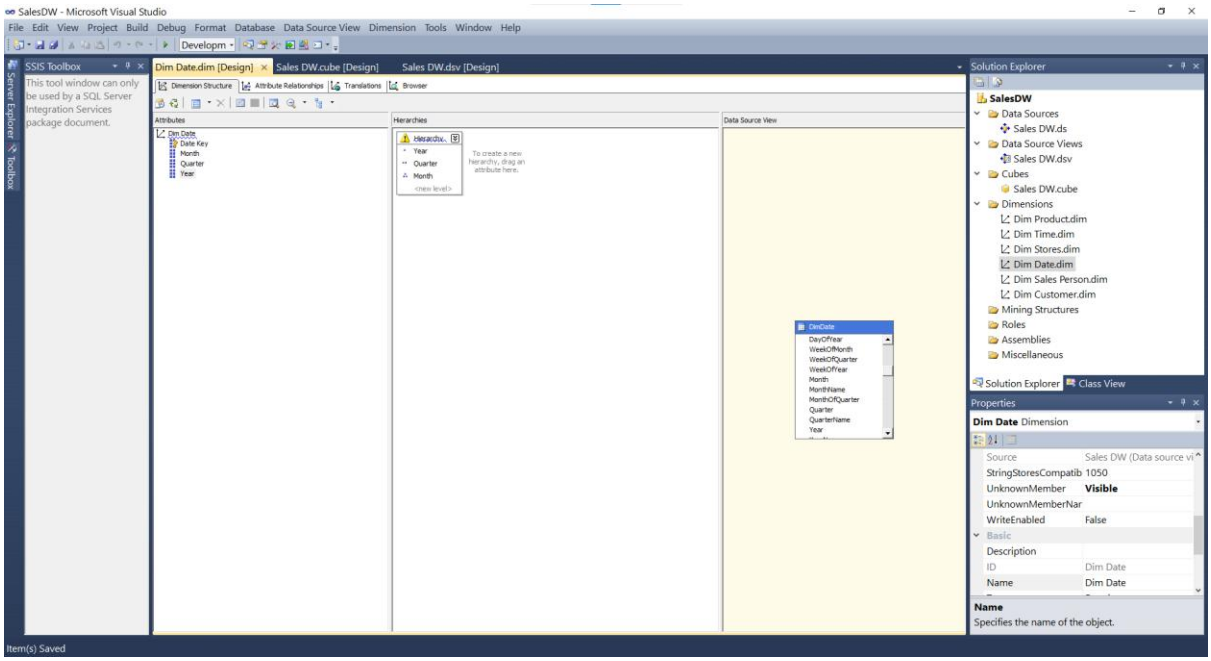


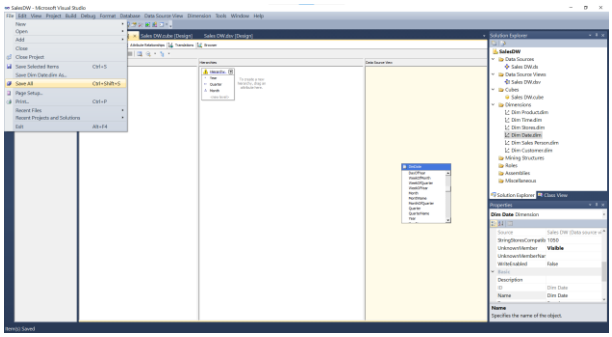
3) In Dimensions > Right Click Dim Date and Open. Drag and drop Year, Quarter and Month to the Attributes. Drag and drop the attributes into the same Hierarchy. Save the progress and click on OK.



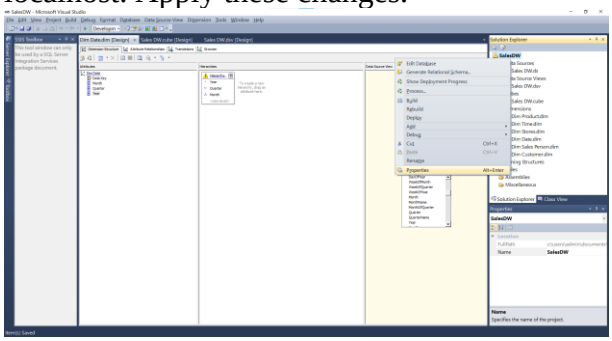


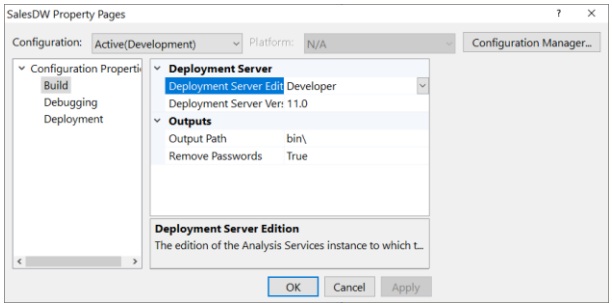


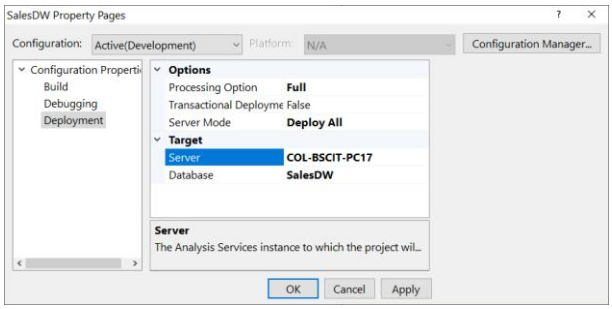




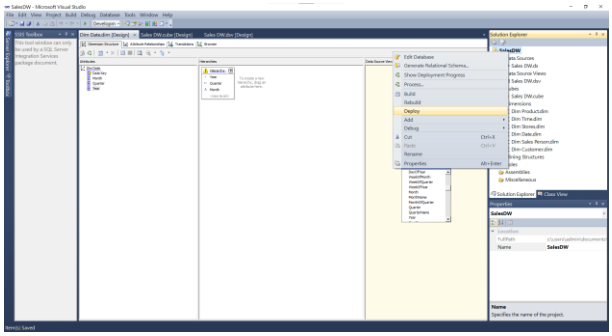
4) Right click on the file name and select Properties. In Build make sure everything is correct. In Deployment, make Processing Option as Full instead of Default. Server Mode as Deploy All instead of Deploy Changes Only. Server as the server name used till now instead of localhost. Apply these changes.

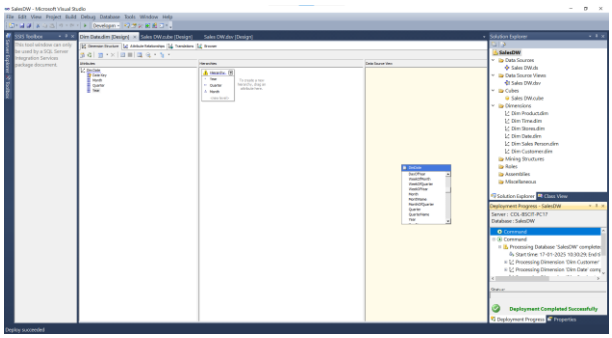




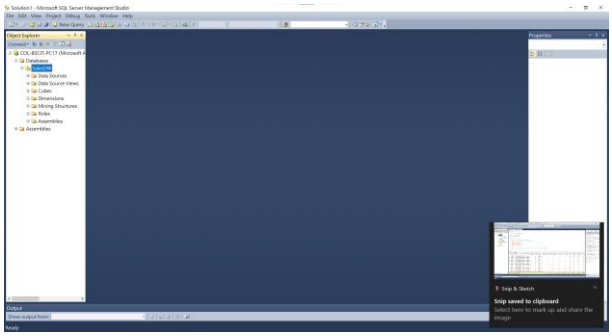


5) Right click on the file name and click on Deploy to deploy the project.



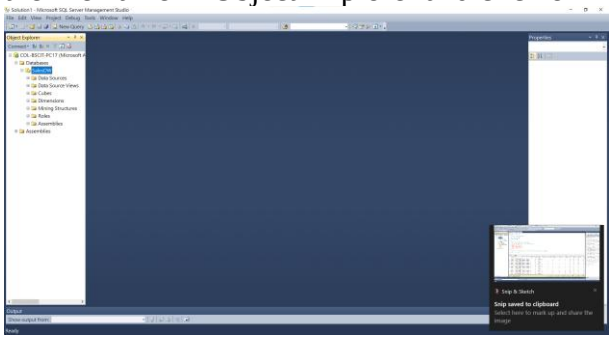


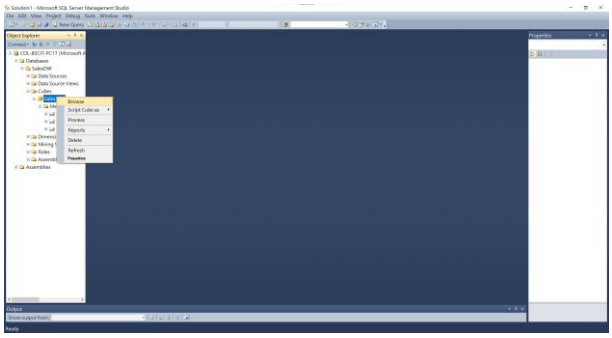
6) SalesDW is Shown in Analysis Server in SSMS.



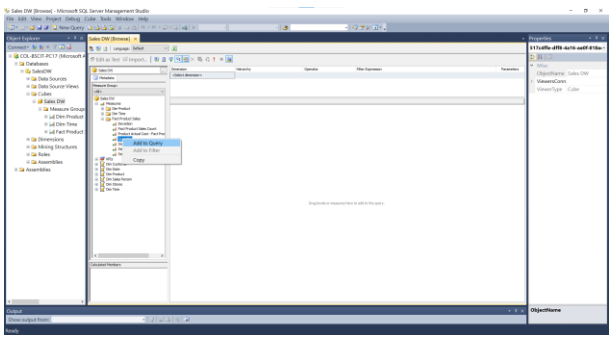
Practical 4B – Perform Multi-Dimensional Expressions (MDX) queries for OLAP database

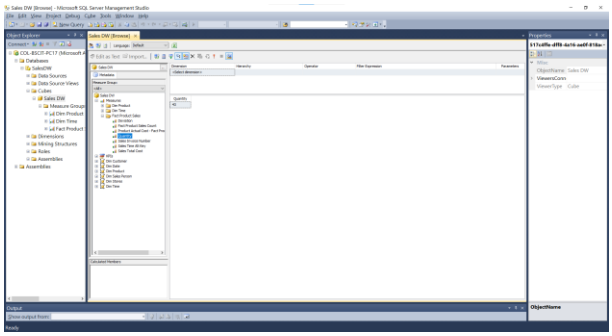
1) Continue from the above practical. To verify, in SQL Server Management right click on the file name in Object Explorer and click on Browse. Enlarge the Measures of SalesDW.

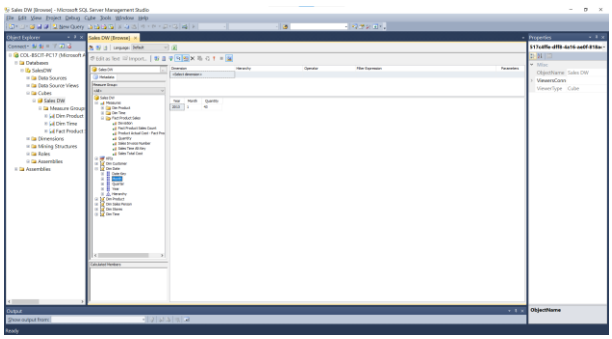




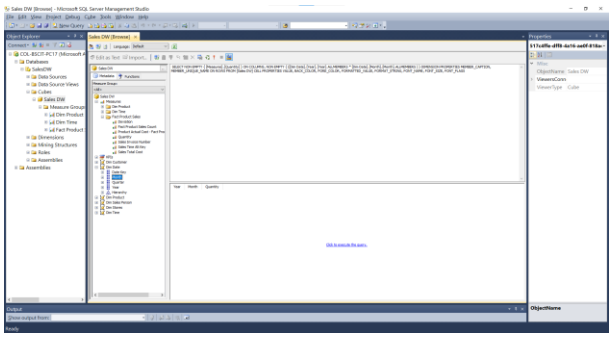
2) On selecting Quantity under Fact Product Sales the value shown will be 43. Select Month and Year as well from Dim Date.

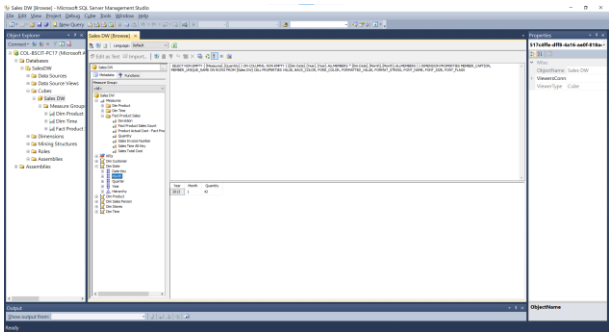




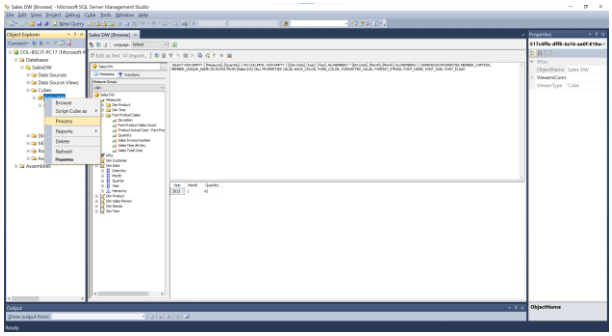


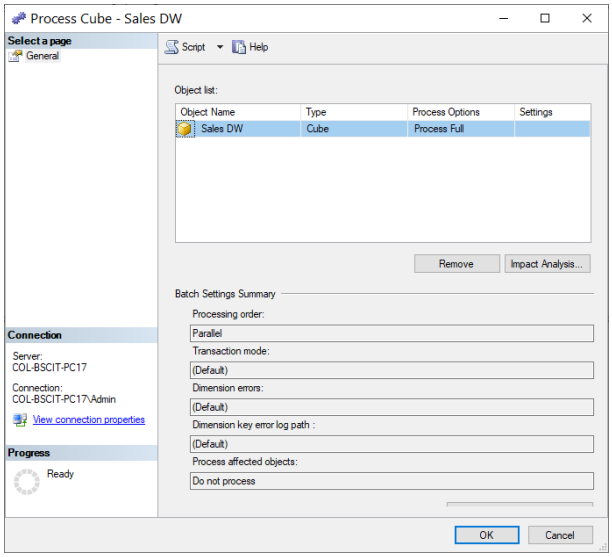
3) Go in Design Mode and click on the line that says ‘Click to execute the query.’ The entries will be shown on the screen.

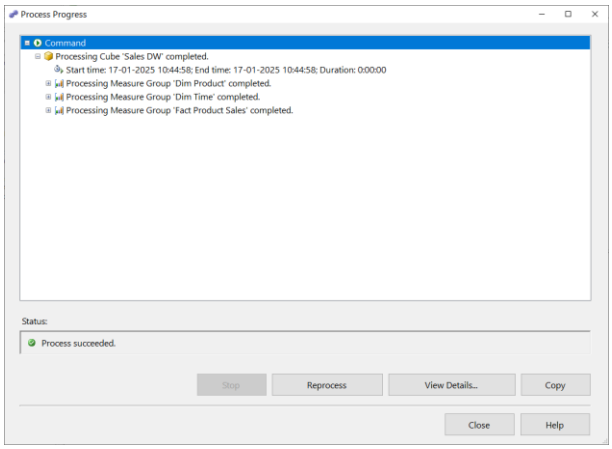




4) Right click on the file name and select Process. Select the file and click on Run. Process succeeded is the status.

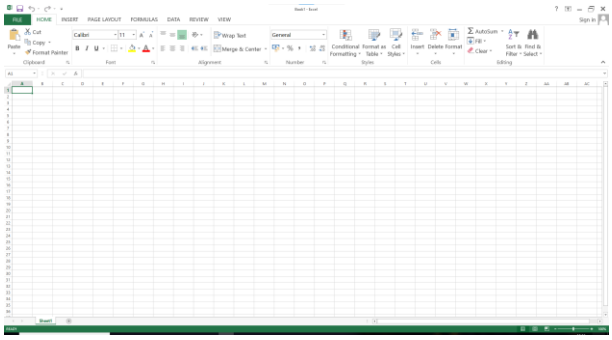


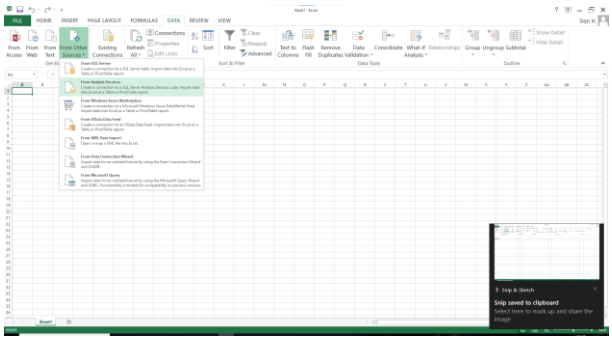




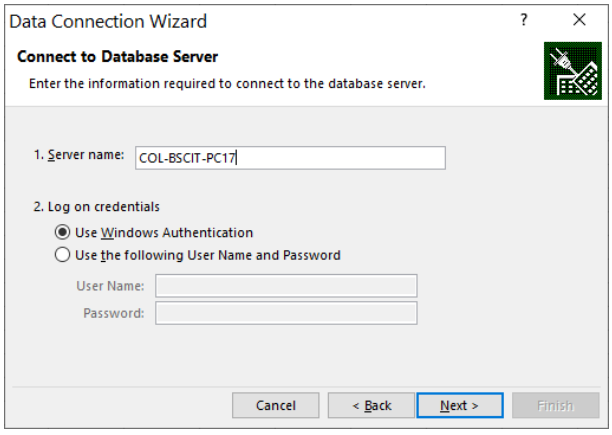
Practical 5A – Import the data warehouse in Microsoft Excel and create Pivot Table to perform Data Analytics

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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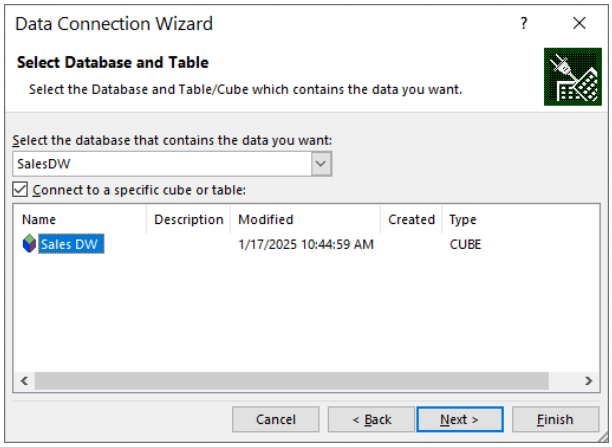
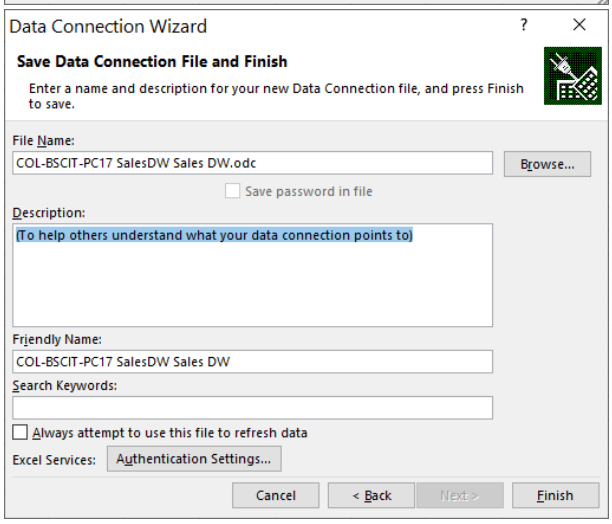
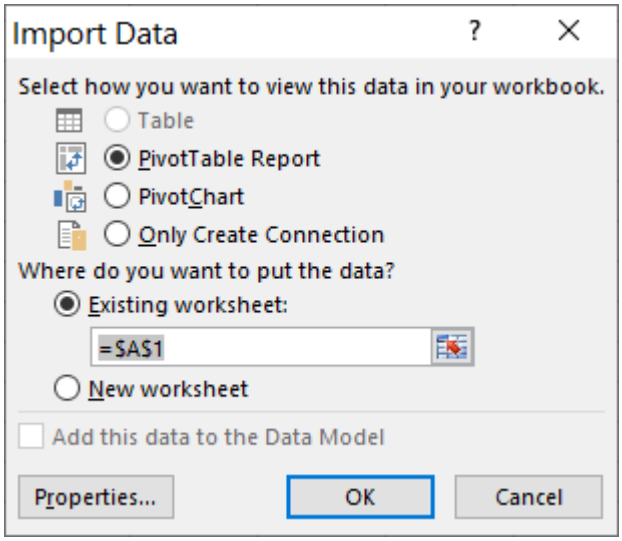
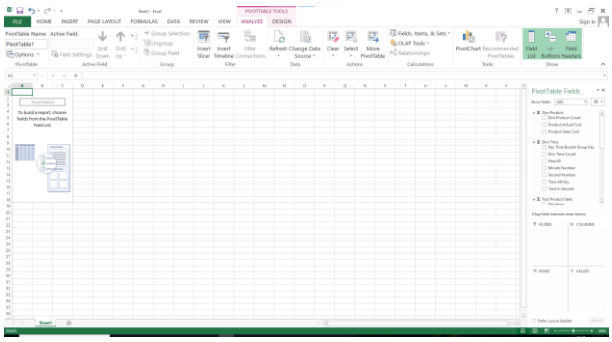
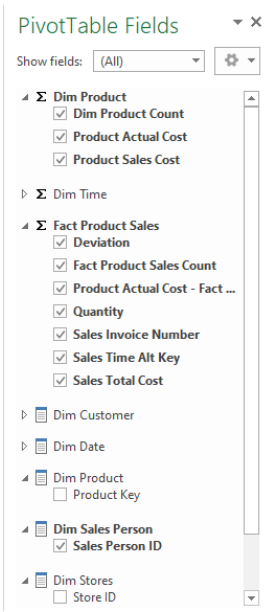




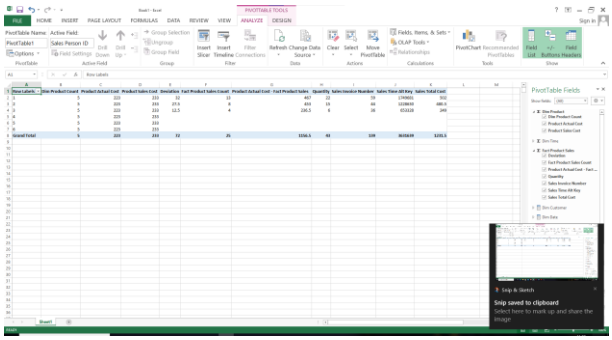


3) Select Fields to show



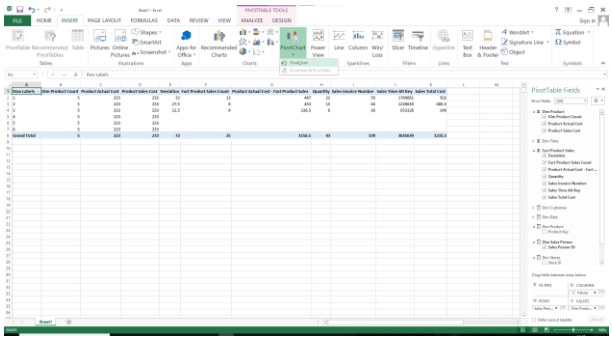


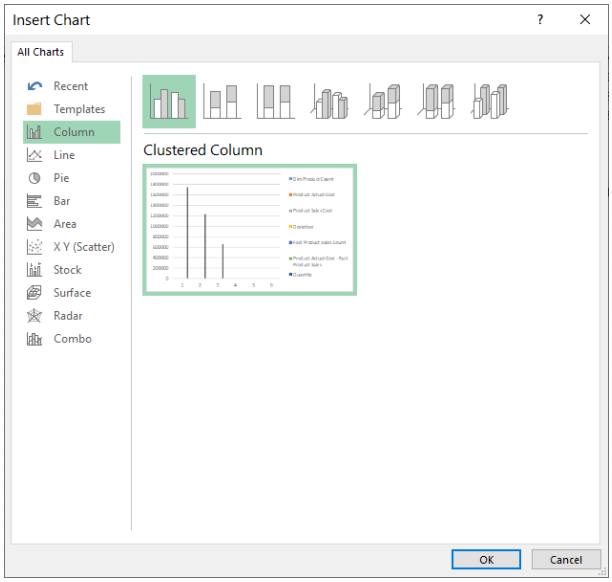
4) Pivot Table is shown



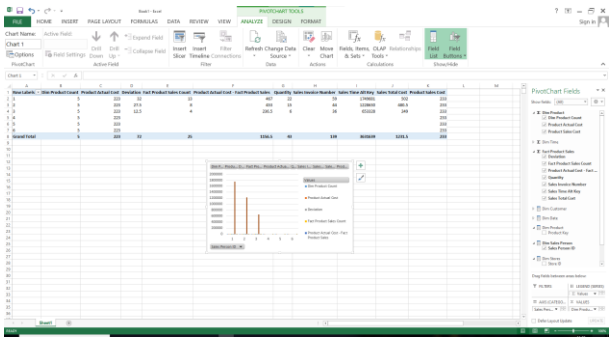
Practical 5B – Import the cube in Microsoft Excel and create the Pivot Chart to perform Data Modelling

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



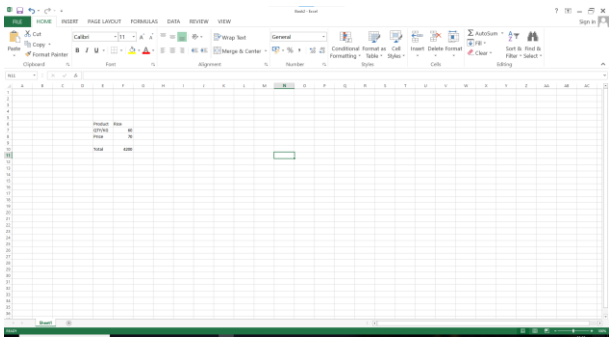


2) Chart is shown

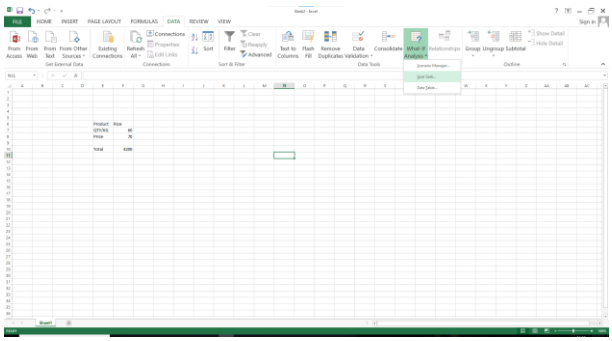


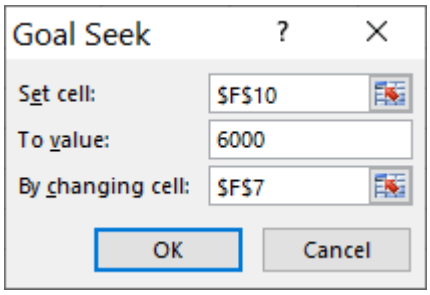
Practical 6 – Perform the What-If Analysis for Data Visualization

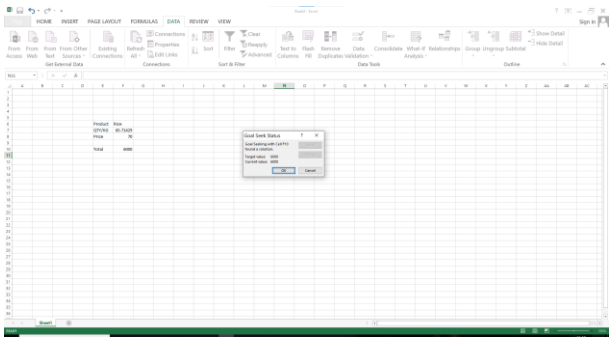
1) Create a Excel Sheet > Create a Table



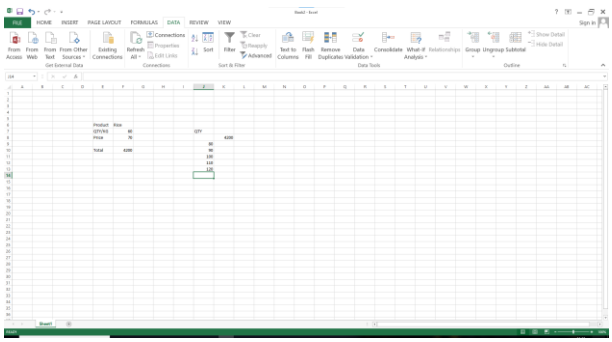
2) Go to Data > What-If Analysis > Goal Seek > Select Sells and Target Value. Values Change

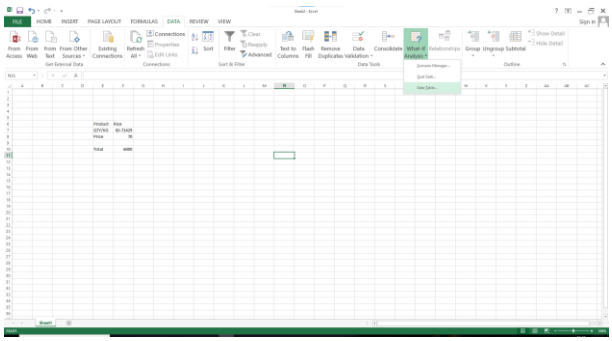


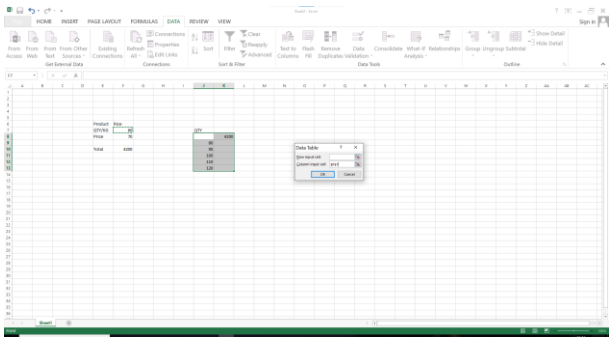


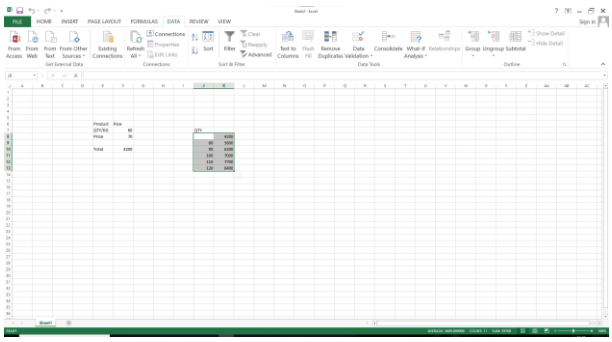


3) Create another table > Select Table Values > What-If Analysis > Data Table > Column Input > Select Original Quantity (F7) > OK. Values are shown.

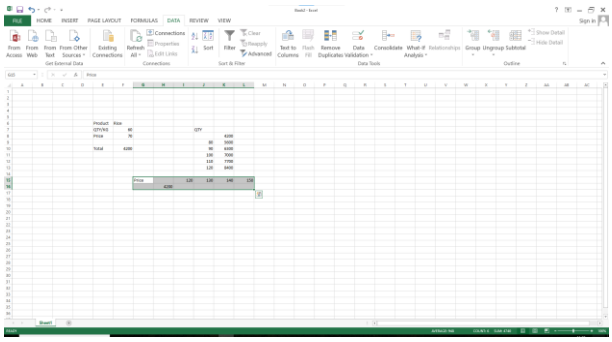


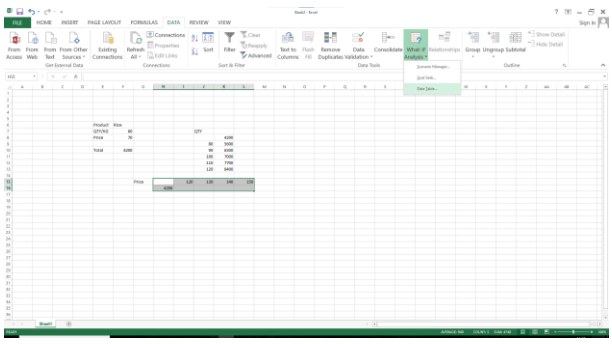


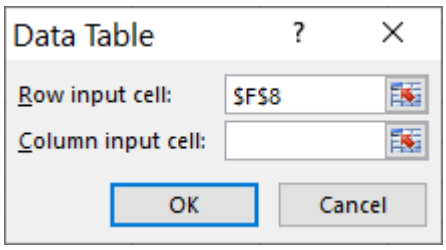


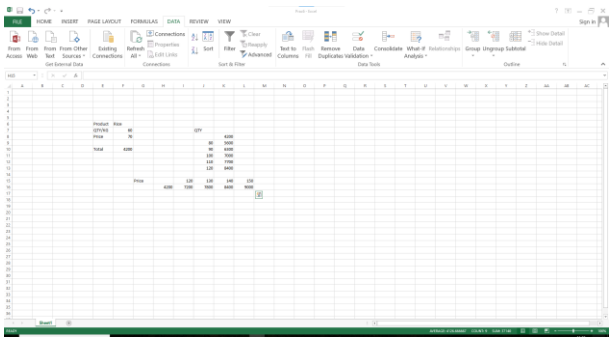


4) Create another table > Select Table Values > What-If Analysis > Data Table > Row Input > Select Original Price (F8) > OK. Values are shown.

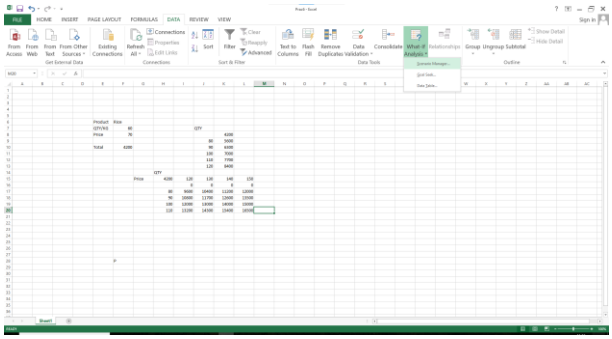


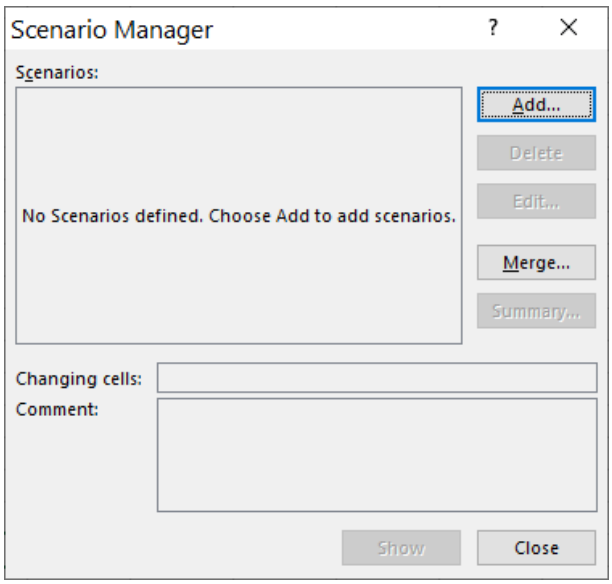






5) What-If Analysis > Scenario Manager > Add > Name and Cells > Change Value > Ok > Show. Values Change





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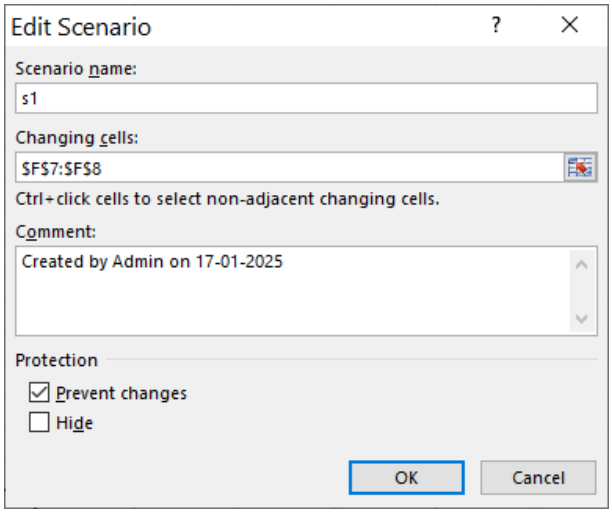

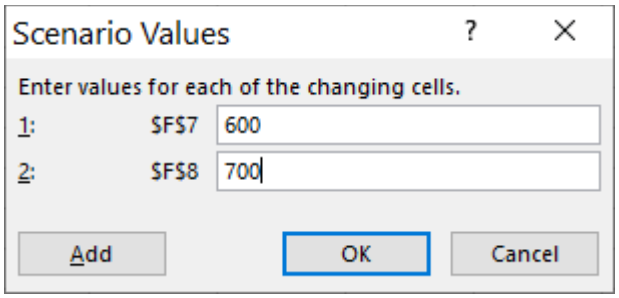

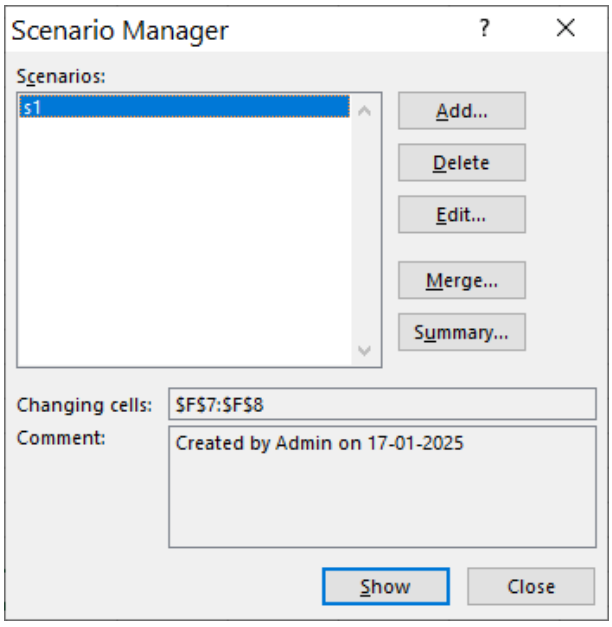

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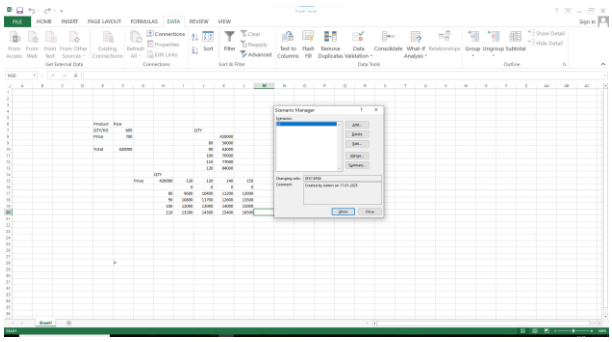
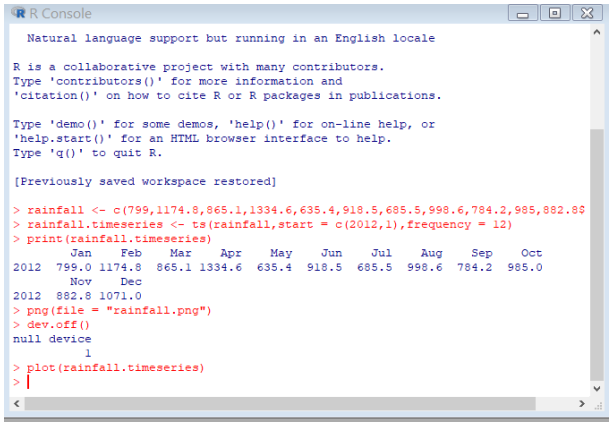
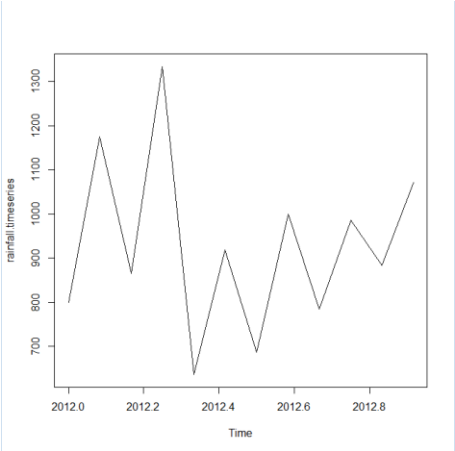


Practical 7 – Data Analysis using Time Series Analysis

1) Open RGui. Type the code and run it.

2) The output will be shown as this.





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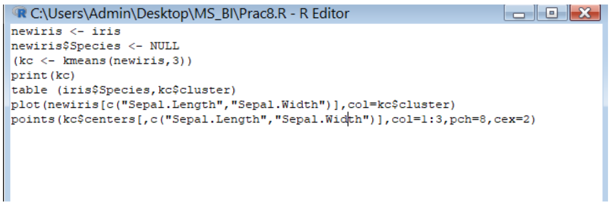
Practical 8 – K-Means Clustering using R Programming

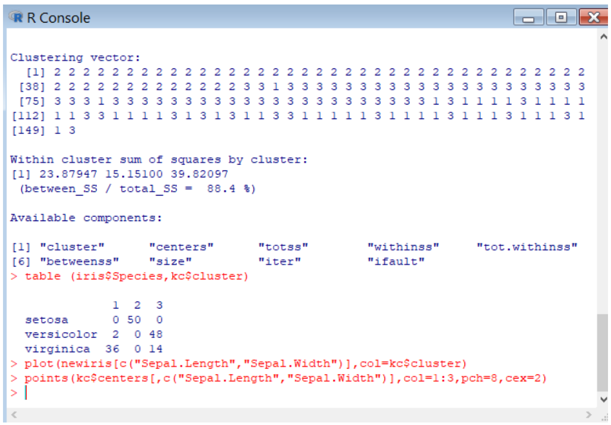
1) Open RGui. Type the code and run it.



C:\Users\Admin\Desktop\MS_BI\Prac8.R - R Editor

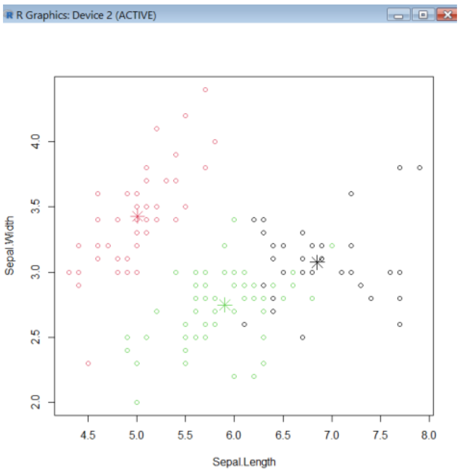
```
newiris <- iris
newiris$Species <- NULL
(kc <- kmeans(newiris,3))
print(kc)
table (iris$Species,kc$cluster)
plot(newiris[c("Sepal.Length","Sepal.Width")],col=kc$cluster)
points(kc$centers[,c("Sepal.Length","Sepal.Width")],col=1:3,pch=8,cex=2)
```

2) The output will be shown as this.



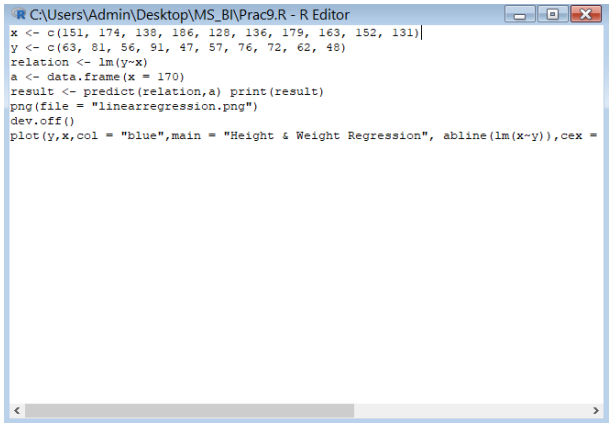
R Console

```
Clustering vector:
  [1] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
 [38] 2 2 2 2 2 2 2 2 2 2 2 2 2 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
 [75] 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 3 1 1 1 1 3 1 1 1 1
[112] 1 1 3 3 1 1 1 1 3 1 3 1 3 1 1 3 3 1 1 1 1 1 3 1 1 1 1 3 1 1 1 3 1 1 1 3 1
[149] 1 3

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

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss"
[6] "betweenss"    "size"         "iter"         "ifault"
> table (iris$Species,kc$cluster)

              1  2  3
  setosa      0 50  0
  versicolor  2  0 48
  virginica  36  0 14
> 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)
> 
```

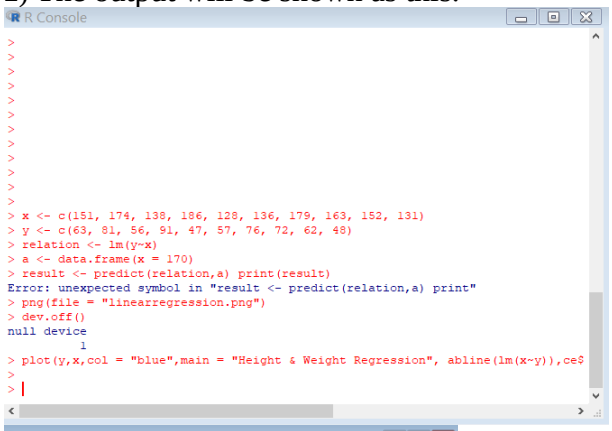


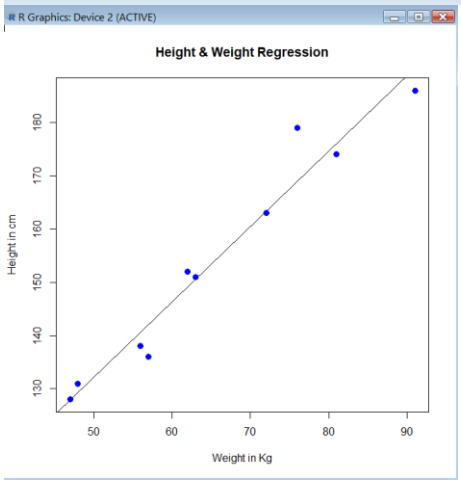
Practical 9 – Prediction using Linear Regression

1) Open RGui. Type the code and run it.



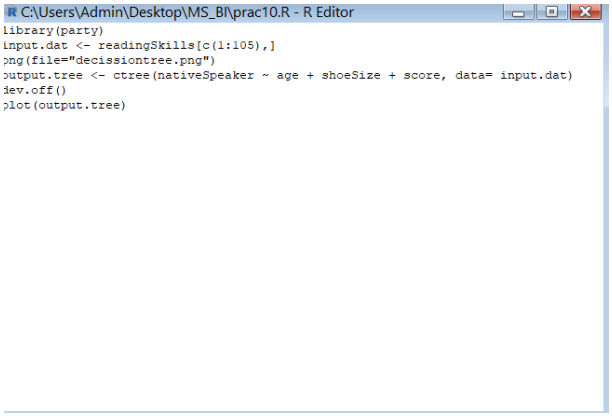
2) The output will be shown as this.



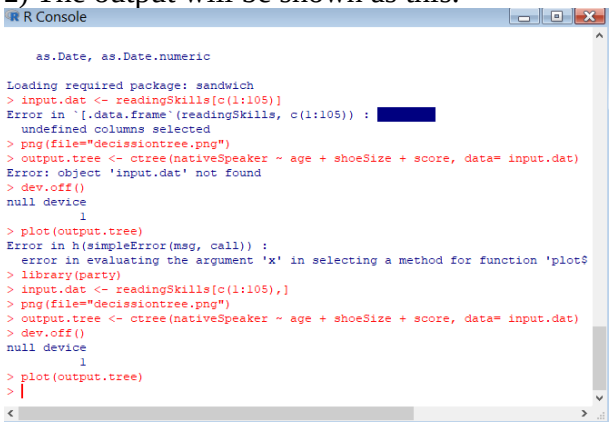


Practical 10 – Implementation of Decision Tree using R Tool

1) Open RGui. Type the code and run it.



2) The output will be shown as this.



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