

# **BUSINESS INTELLIGENCE & BIG DATA ANALYTICS**

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## Practical No. 1

**Aim :** Create tables using different applications.

**a. Table : Product**

ProdID	Brand_name	Prod_name	Price	CategoryID
1	Samsung	S4	\$600.00	1
2	LeTv	Le1s	\$180.00	1
3	Sony	Bravia	\$1,000.00	2
4	Classmate	A4 size book	\$0.80	5
5	Samsung	Gear 2	\$600.00	3
6	Apple	iWatch	\$620.00	3
7	Nestle	Maggie	\$0.20	4
8	Toshiba	32L5	\$550.00	2
9	Samsung	SUHD	\$2,000.00	2
*	(New)			

**b. Table : Category**

CategoryID	Category
1	Mobile
2	TV
3	Watch
4	Food
5	Stationary
*	(New)

**c. Table : Employee**

EmpID	Ename	ManagerID	Click to Add
1	John	67	
2	Steve	289	
3	Adam	113	
4	Andrew	54	
5	Peter	92	
6	Stuart	532	
7	Mathew	190	
8	Chris	12	
9	Billy	112	
10	Chuck	201	
11	Mike	234	
*	(New)		

**d. Table : Store**

StoreID	StoreName	City	Country
1	Vijay Sales	Mumbai	India
2	Reliance store	Bangalore	India
3	E-Zone	Delhi	India
4	Star Store	Hyderabad	India
5	Big Bazaar	Delhi	India
6	D-mart	Kolkata	India
*	(New)		

e. **Table : SaleFact**

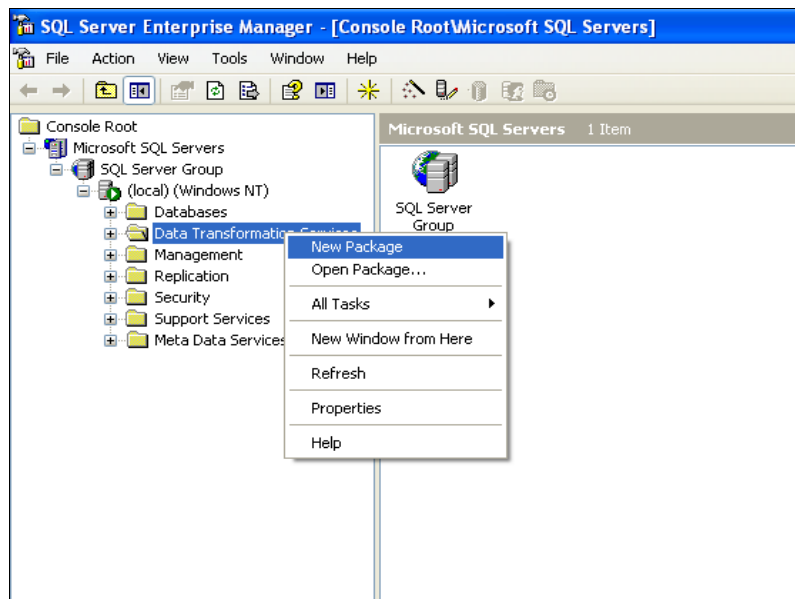
» Category Employee Store <b>SaleFact</b> Product							
Navigation Pane	FactID	Mon	StoreID	ProdID	EmpID	Sales	Quantity
	1	6/9/2015	1	3	2	\$12,000.00	12
	2	9/15/2015	2	1	4	\$90,000.00	150
	3	8/11/2015	3	5	5	\$63,000.00	105
	4	7/21/2015	4	9	6	\$60,000.00	30
	5	2/12/2016	5	2	7	\$72,000.00	400
	6	1/29/2016	6	4	1	\$134,400.00	168000
	7	10/11/2015	2	6	8	\$124,000.00	200
	8	6/28/2015	3	7	3	\$40,000.00	200000
	9	7/22/2014	4	1	2	\$30,600.00	170
	10	5/2/2013	5	2	9	\$180,000.00	300
	*	(New)					

## Practical No. 2

**Aim :** Develop an application to design a warehouse by importing various tables from external sources.

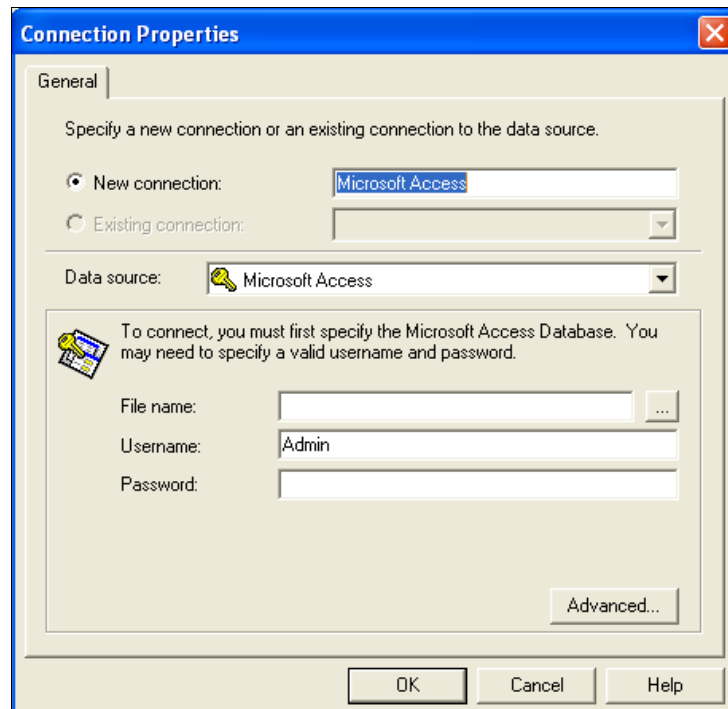
**Step 1:-** To create a DTS Package.

- a. Click on start -> SQL server-> Enterprise Manager.
- b. Expand MS SQL server
- c. Right click on **DTS** and select **NewPackage**, it will open editor to create new DTS Package.

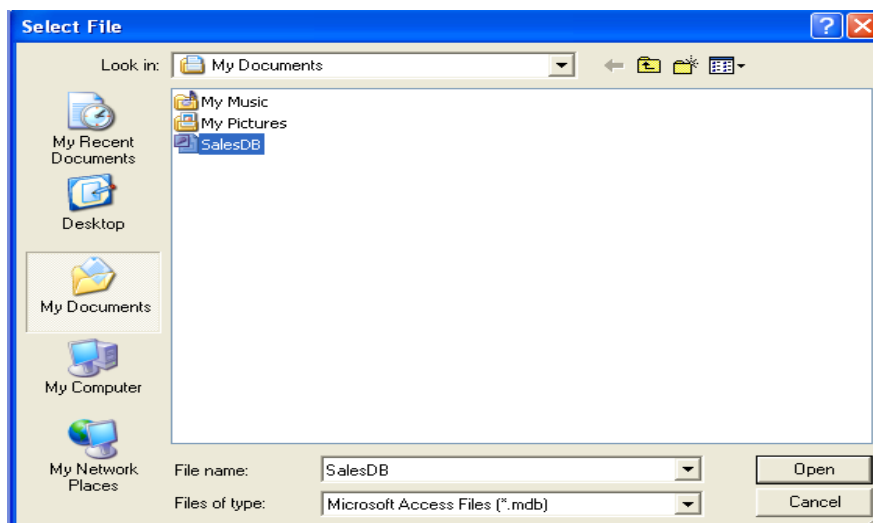


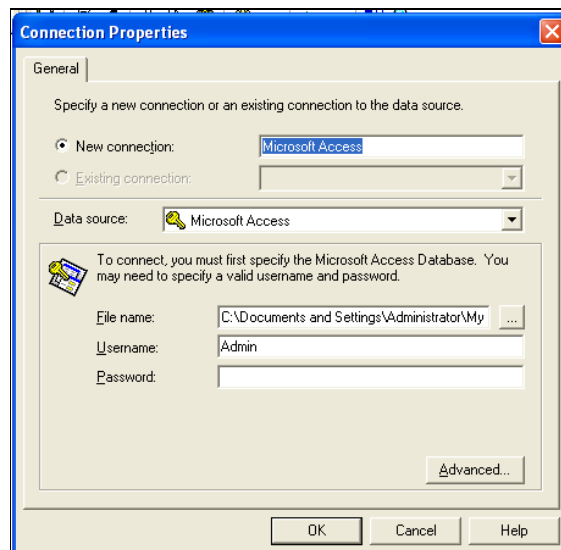
**Step 2:-** Design DTS Package.

- a. Drag & drop **MS Access** connection to canvas from toolbar.

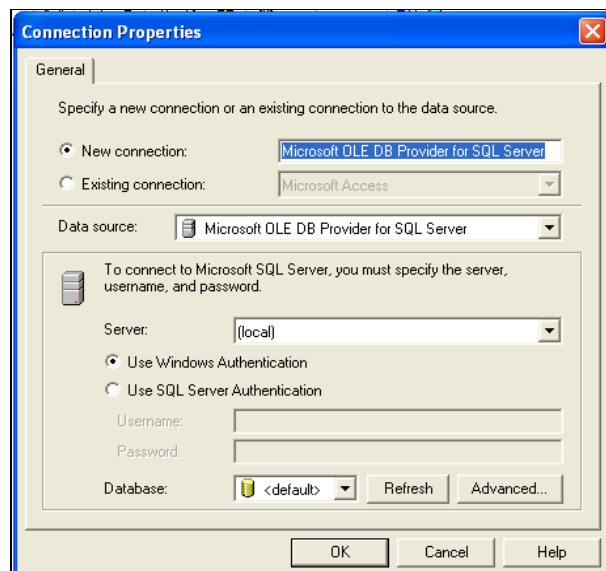


- b. Browse the source file i.e. SalesDB.mdb-> Click **ok**.

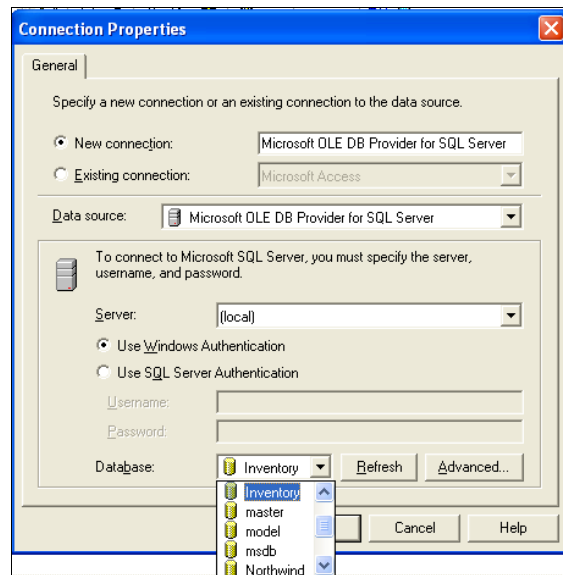




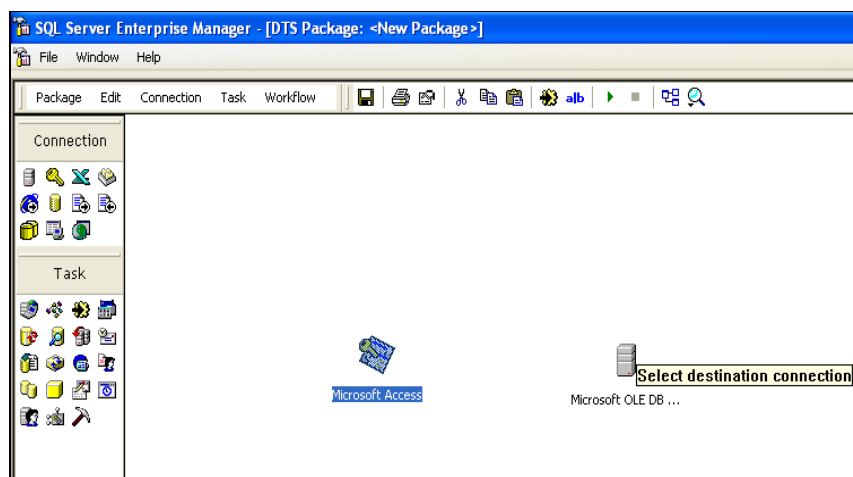
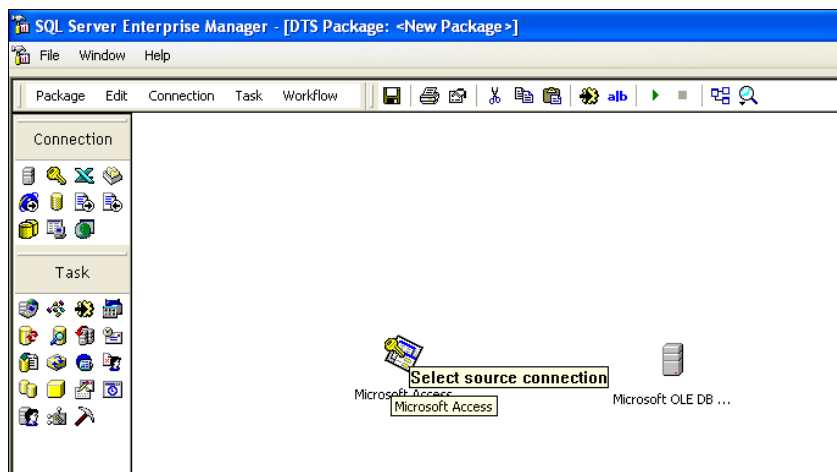
- c. Drag and drop **MS OLEDB** from toolbar to canvas.



- d. Select destination DB (if required create new DB)



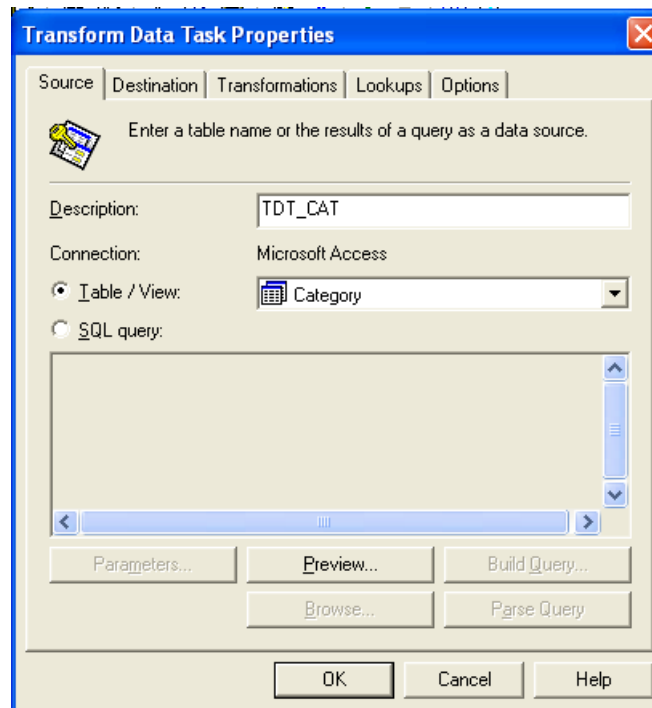
- e. To transform data from source to target.->Select **Transform data task** from toolbar and specify Source connection & Destination connection.



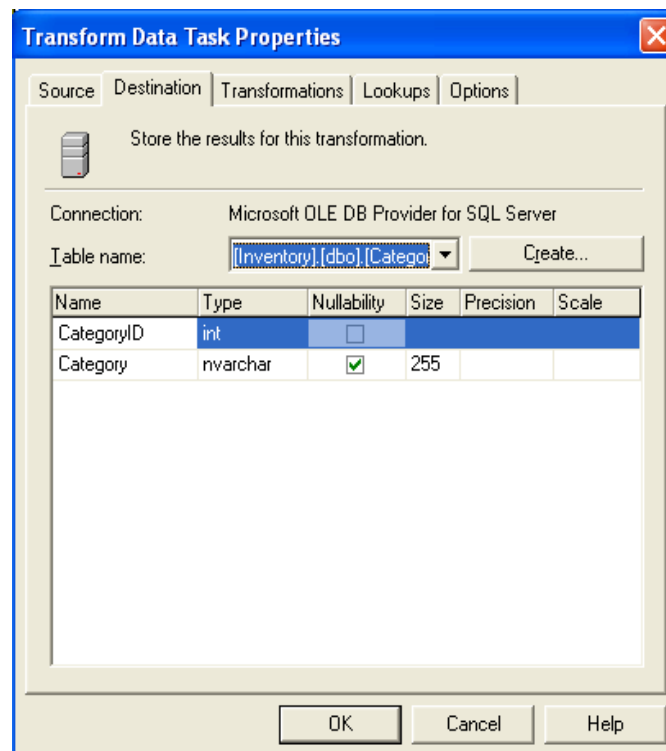


**Step 3 :** Right click on **transform data task** and select **Properties->Rename data transformations task** and specify description (if required).

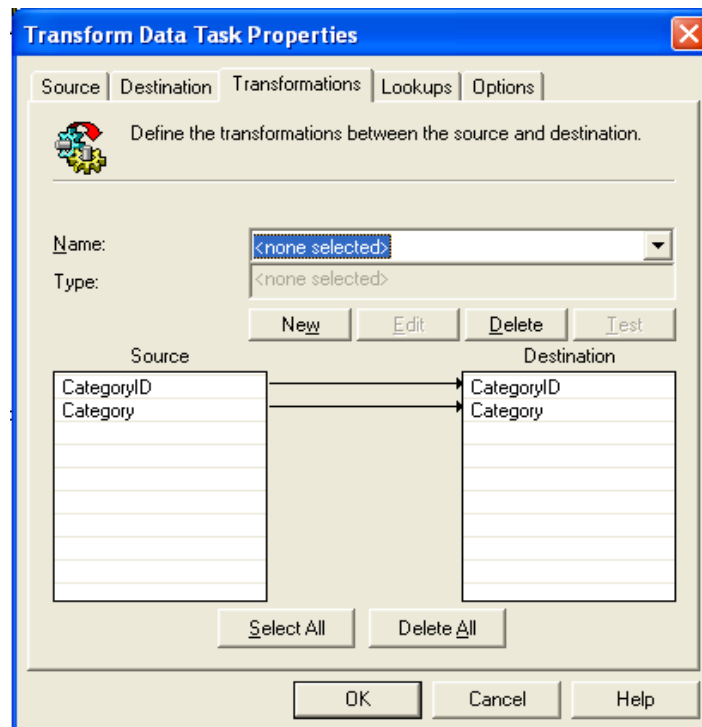
- a. In tables and views, select source table.



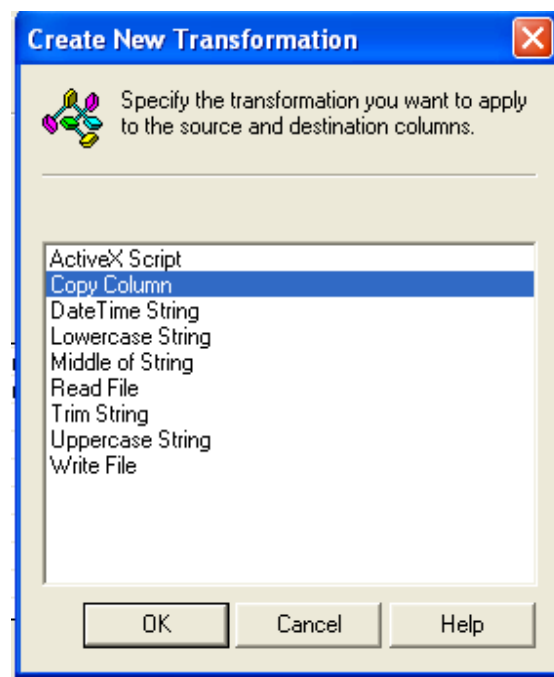
- b. Click on **destination** tab-> specify destination table from drop-down (if it does not exist then create table). It will generate script for destination table.



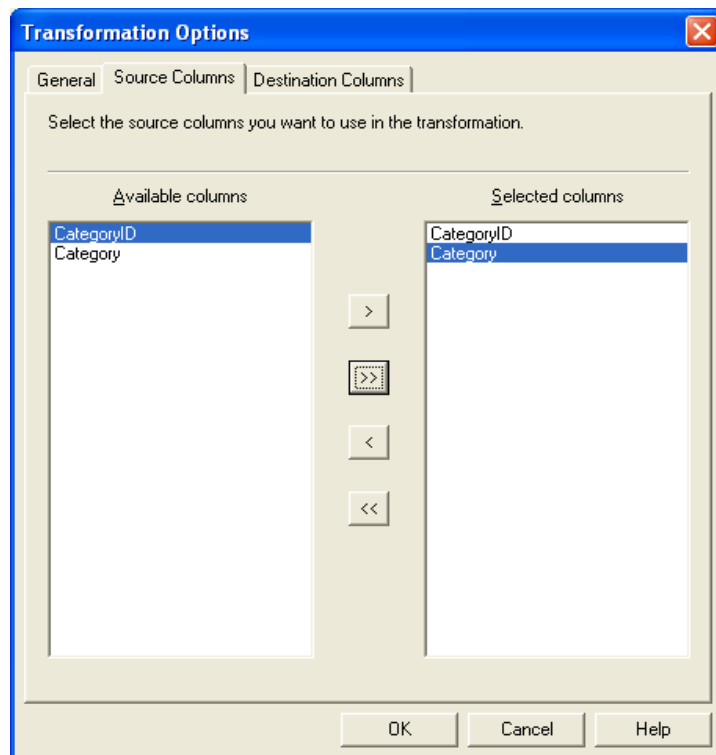
- c. Click on **transformation** tab and delete all the existing default transformations.



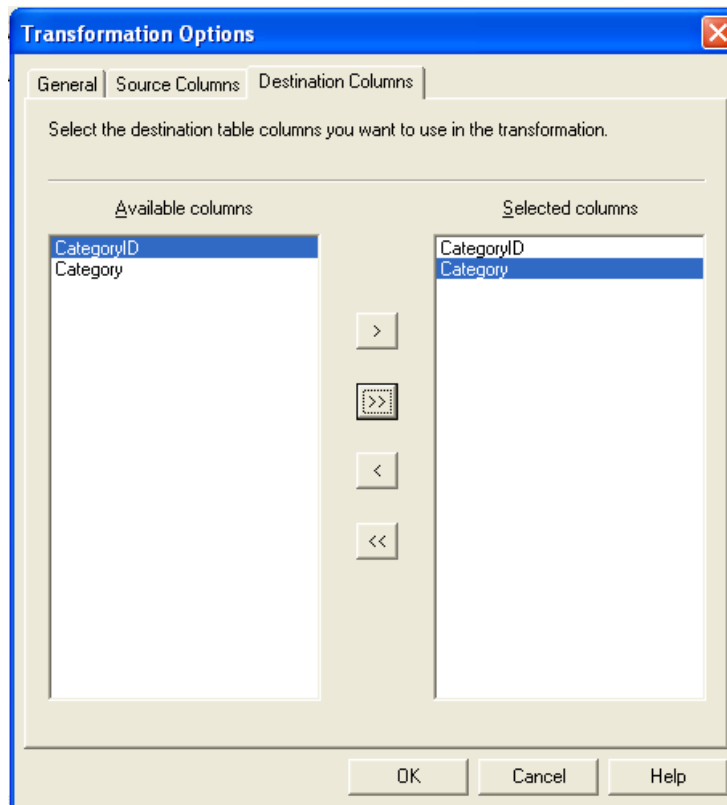
- d. Click on **new** button to create new transformation->Specify transformation task as **copy columns**. It will open a window to map source & destination columns.



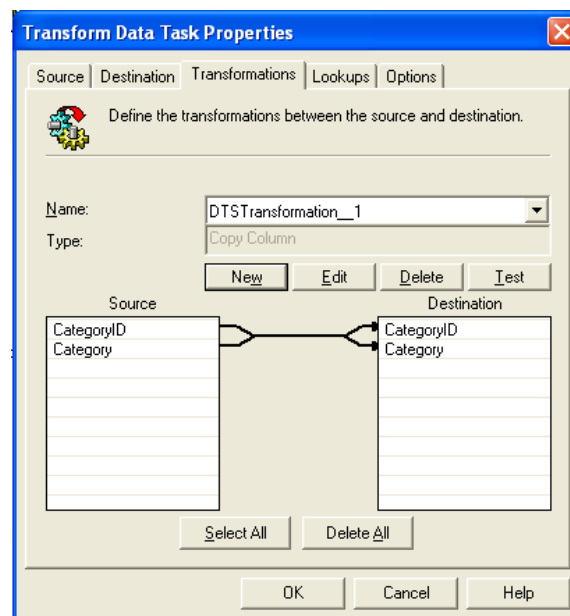
- e. Specify source columns->Select all columns of source by clicking on '>>'



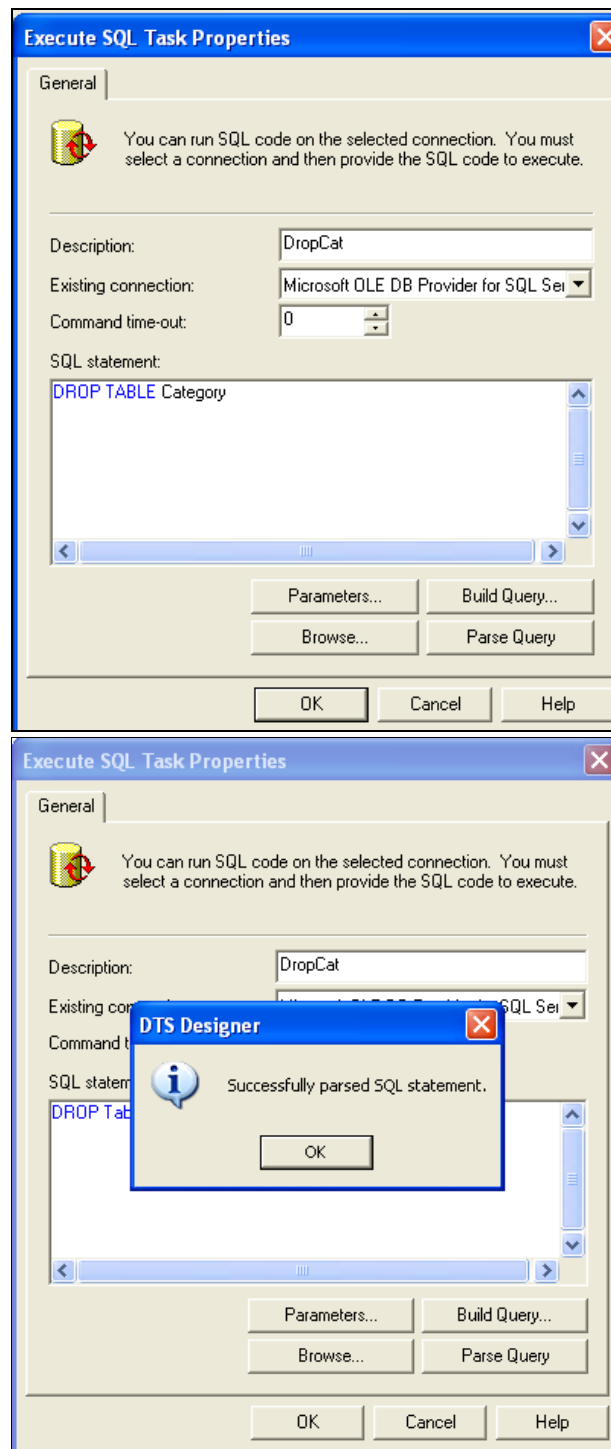
- f. Click on destination tab select all columns by clicking on '>>>' . -> It will show mapping of Source and destination.

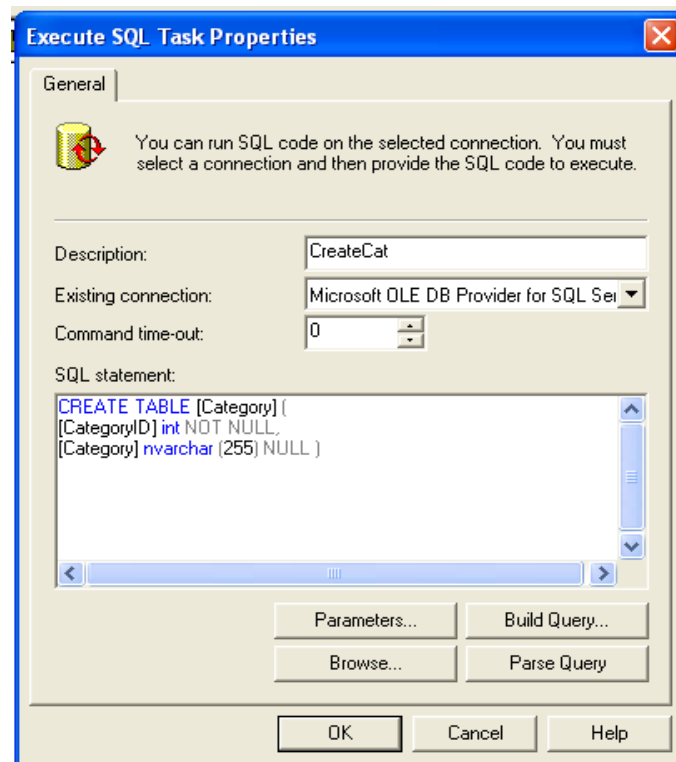


g. Then click **ok**.

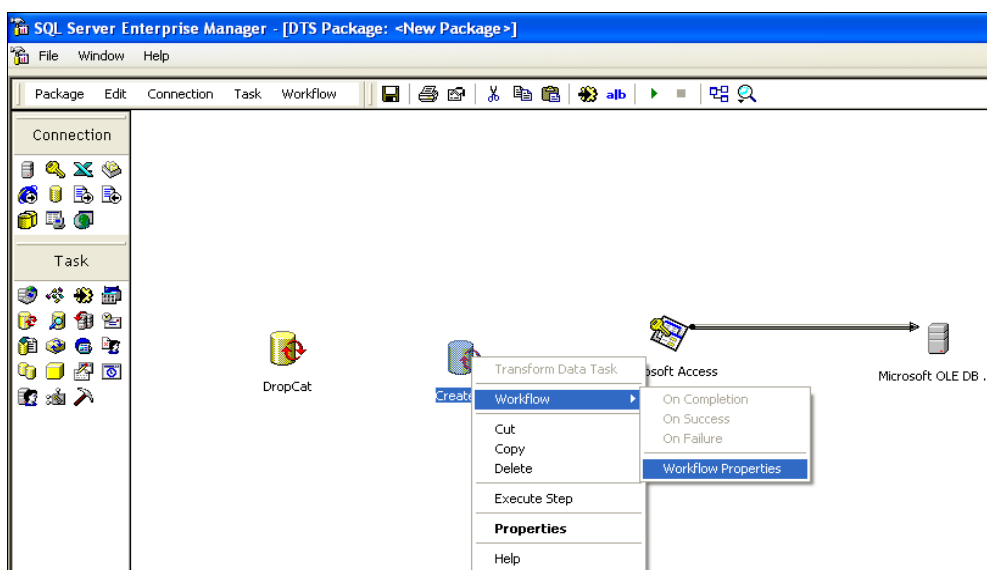


h. Drag & drop **Execute SQL task** from toolbar to canvas -> then provide Description/Name. ->After that write a SQL query and Parse query.

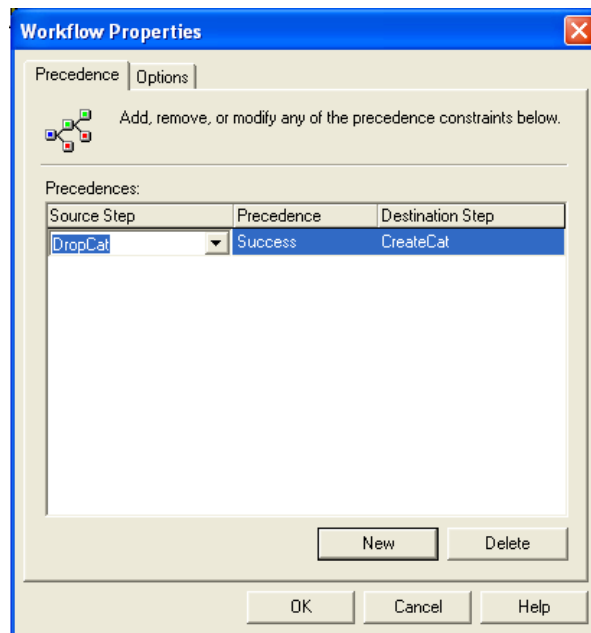




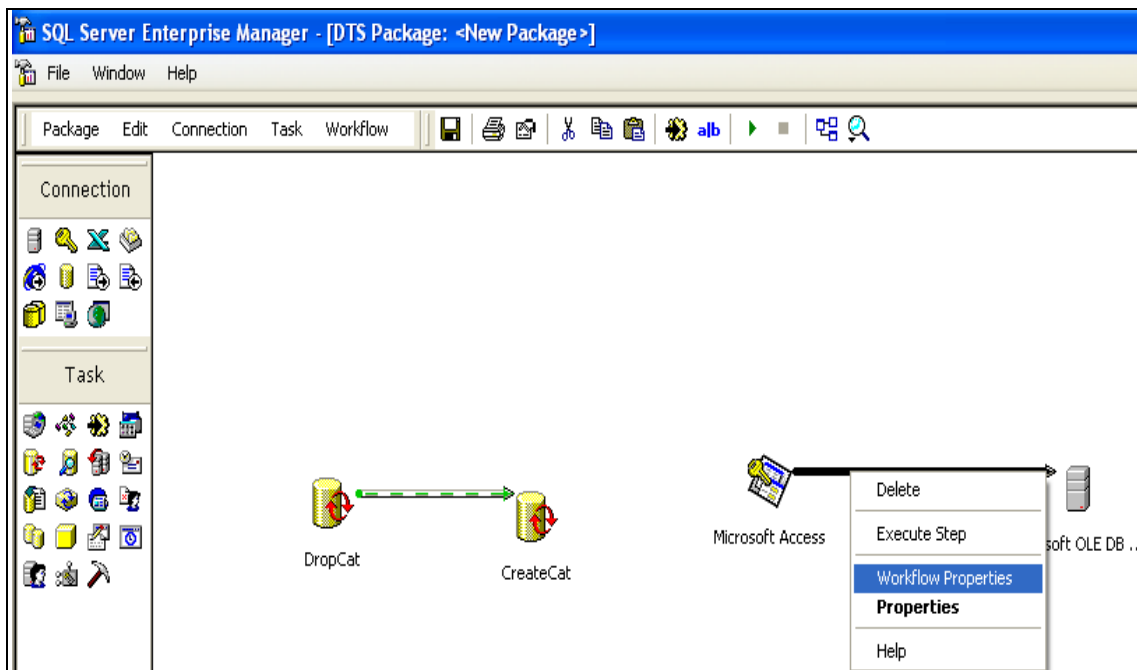
- i. Right click on **Execute SQL Task** and select **Workflow-> Workflow Properties**.



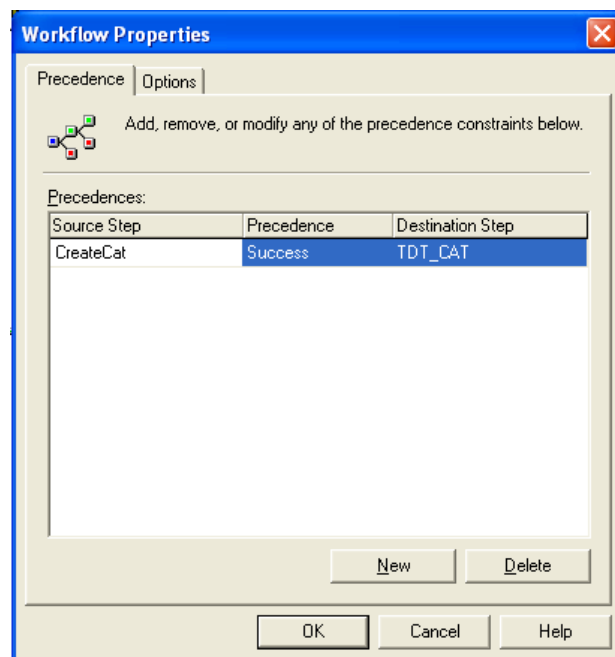
- j. It will Open a window, in **Precedence** tab click on **Source Step** column select appropriate name from Drop down list & Click **Ok**.



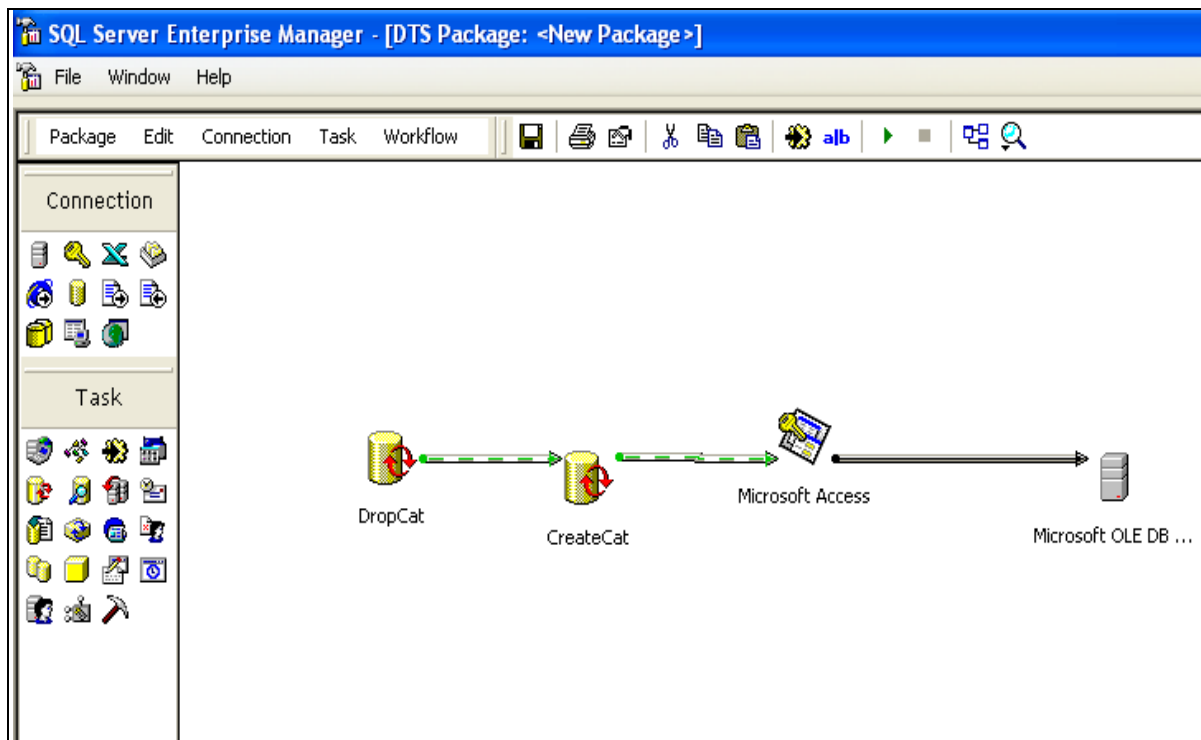
- k. Right click on **Transform Data Task** that connects MS Access Database to MS OLE DB -> select **Workflow Properties**.



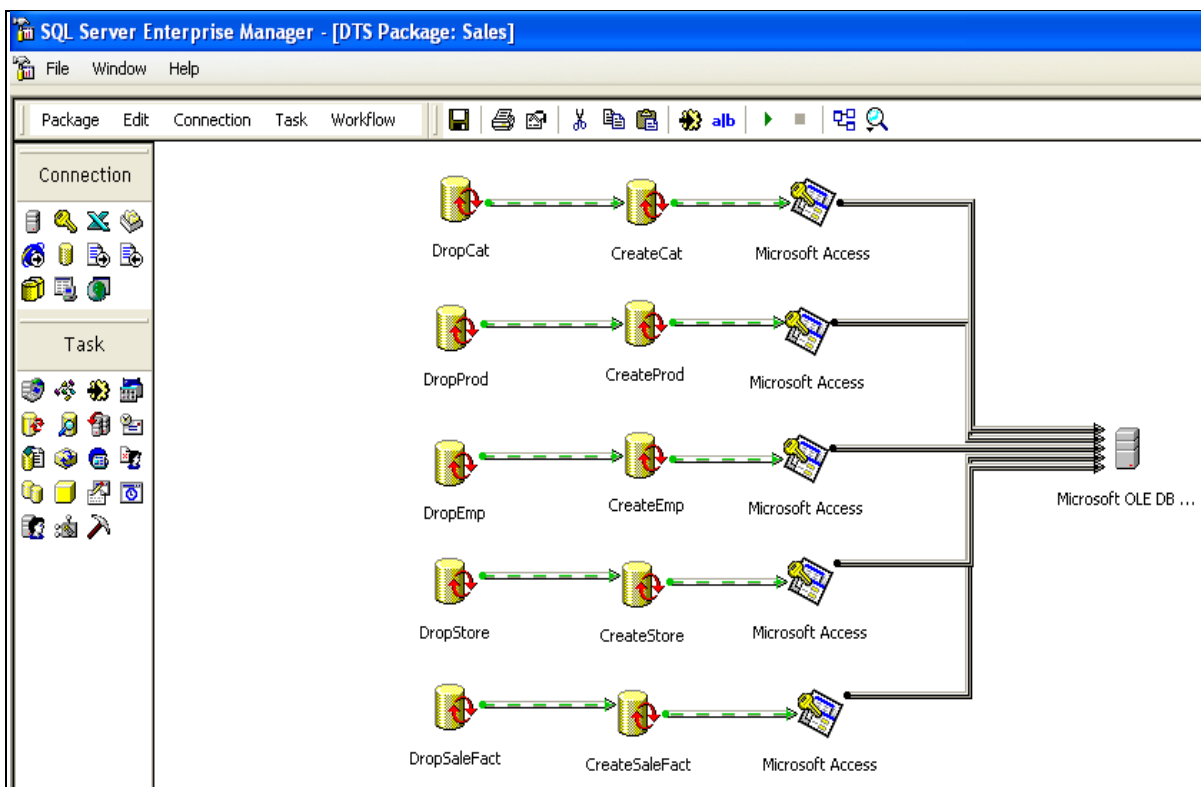
1. It will open a window, in **Precedence** tab click on Source Step column select appropriate name from Drop down list & Click **Ok**.



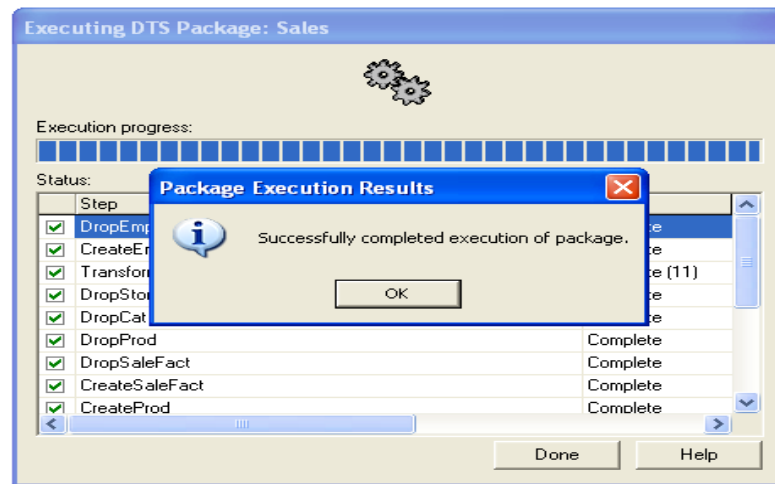




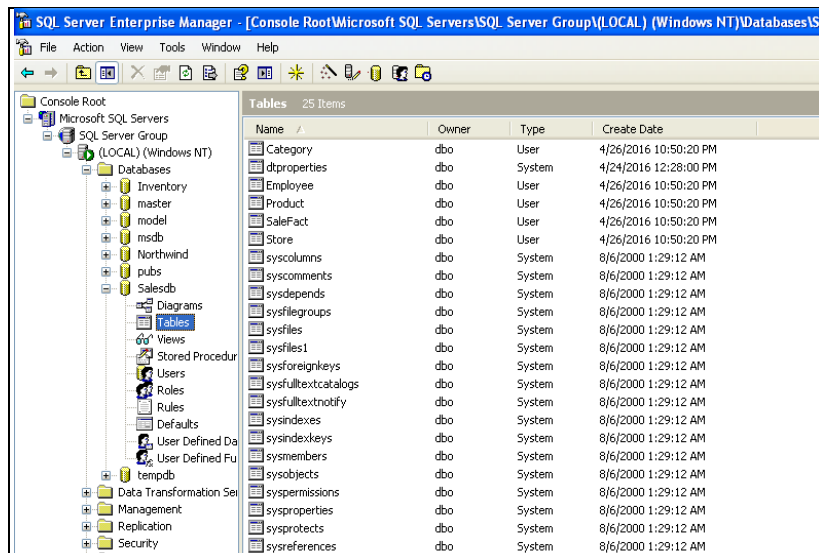
m. Repeat same procedure from **(Step 3)a.** to l.



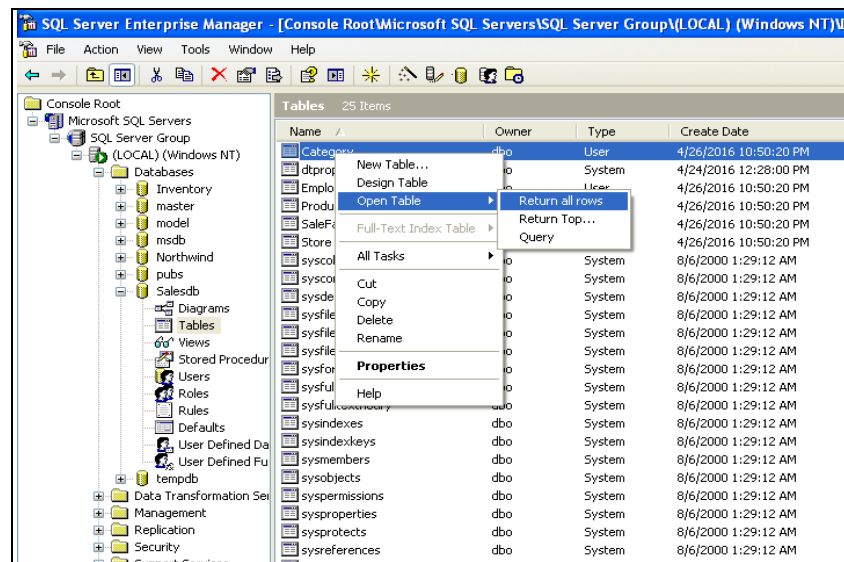
**Step 4:-** Finally run the whole Package.



**Step 5.** In salesDb -> open tables.



**Step 6.** Right click on Table-> Select Open Table -> Return all rows.



a. Output of Category Table.

The screenshot shows the 'Data in Table 'Categories'' view. The table has two columns: 'CategoryID' and 'Category'. The data is as follows:

CategoryID	Category
1	Mobile
2	TV
3	Watch
4	Food
5	Stationary
6	Music

b. Output of Employee Table.

The screenshot shows the 'Data in Table 'Employee'' view. The table has four columns: 'EmpID', 'Ename', 'ManagerID', and 'Oerator\_column'. The data is as follows:

EmpID	Ename	ManagerID	Oerator_column
1	John	67	<NULL>
2	Steve	289	<NULL>
3	Adam	113	<NULL>
4	Andrew	54	<NULL>
5	Peter	92	<NULL>
6	Stuart	532	<NULL>
7	Mathew	190	<NULL>
8	Chris	12	<NULL>
9	Billy	112	<NULL>
10	Chuck	201	<NULL>
11	Mike	234	<NULL>

c. Output of Product Table.

SQL Server Enterprise Manager - [Data in Table 'Product' in 'Salesdb' on '(LOCAL)']

	ProdID	Brand_name	Prod_name	Price	CategoryID
1	1	Samsung	S4	600	1
2	2	LeTv	Le1s	180	1
3	3	Sony	Bravia	1000	2
4	4	Classmate	A4 size book	0.8	5
5	5	Samsung	Gear 2	600	3
6	6	Apple	iWatch	620	3
7	7	Nestle	Maggie	0.2	4
8	8	Toshiba	32L5	550	2
9	9	Samsung	SUHD	2000	2

d. Output of SaleFact Table.

SQL Server Enterprise Manager - [Data in Table 'SaleFact' in 'Salesdb' on '(LOCAL)']

	FactID	Mon	StoreID	ProdID	EmpID	Total Sale	Quantity Order
1	1	6/9/2015	1	3	2	12000	12
2	2	9/15/2015	2	1	4	90000	150
3	3	8/11/2015	3	5	5	63000	105
4	4	7/21/2015	4	9	6	60000	30
5	5	2/12/2016	5	2	7	72000	400
6	6	1/29/2016	6	4	1	134400	168000
7	7	10/11/2015	2	6	8	124000	200
8	8	6/28/2015	3	7	3	40000	200000
9	9	7/22/2014	4	1	2	30600	170
10	10	5/2/2013	5	2	9	180000	300

e. Output of Store Table.

SQL Server Enterprise Manager - [Data in Table 'Store' in 'Salesdb' on '(LOCAL)']

	StoreID	StoreName	City	Country
1	1	Vijay Sales	Mumbai	India
2	2	Reliance store	Bangalore	India
3	3	E-Zone	Delhi	India
4	4	Star Store	Hyderabad	India
5	5	Big Bazaar	Delhi	India
6	6	D-mart	Kolkata	India

### Practical No. 3

**Aim :** Develop an application to creating a fact table and measures in a cube.

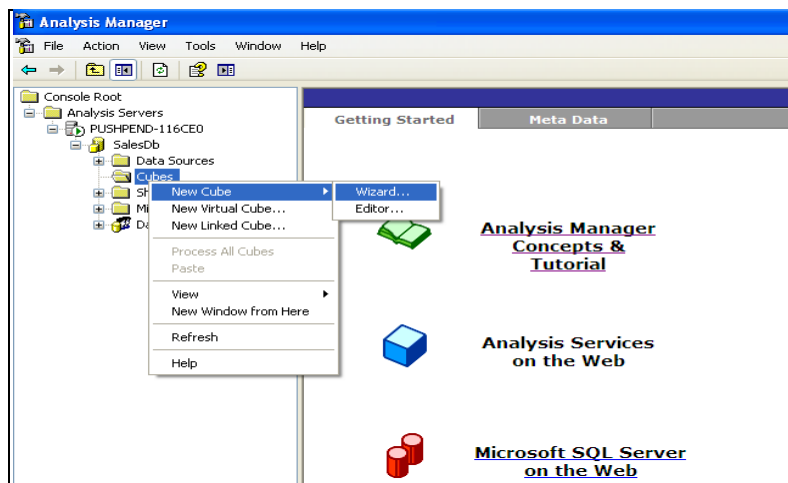
#### Cube Creation

Create a new OLAP database

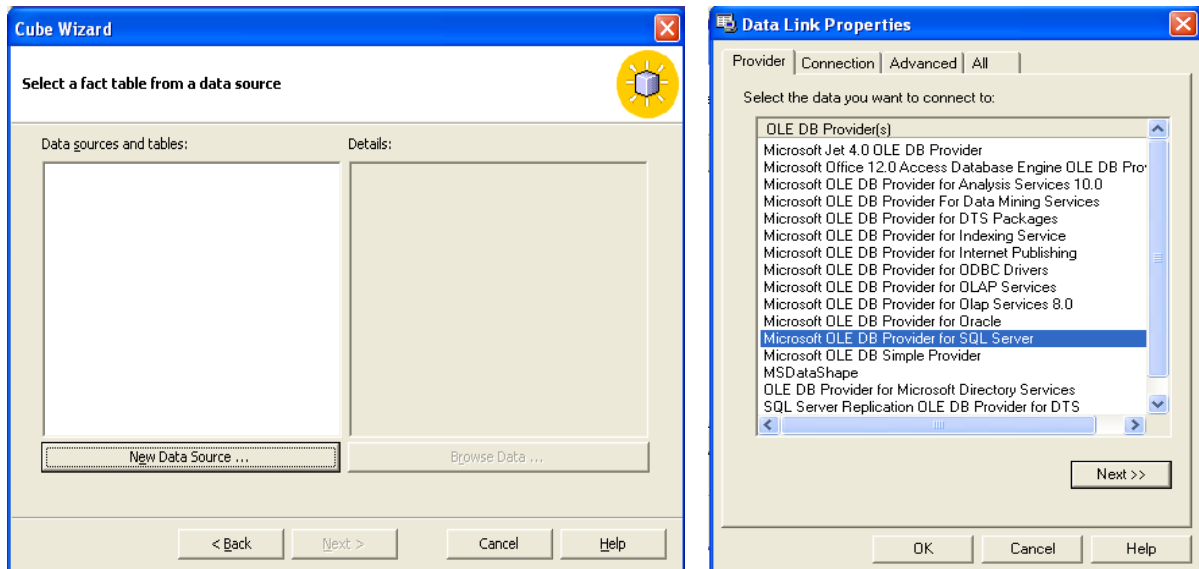
1. Open Programs → Microsoft SQL Server → Analysis Services → Analysis Manager.
2. Right click the server in the console tree, and click New Database to display the Database dialog Box.
3. Type 'SalesDb' as the database name.
4. Click **OK** to close the dialog box and to create the database.

#### **Specify a data source**

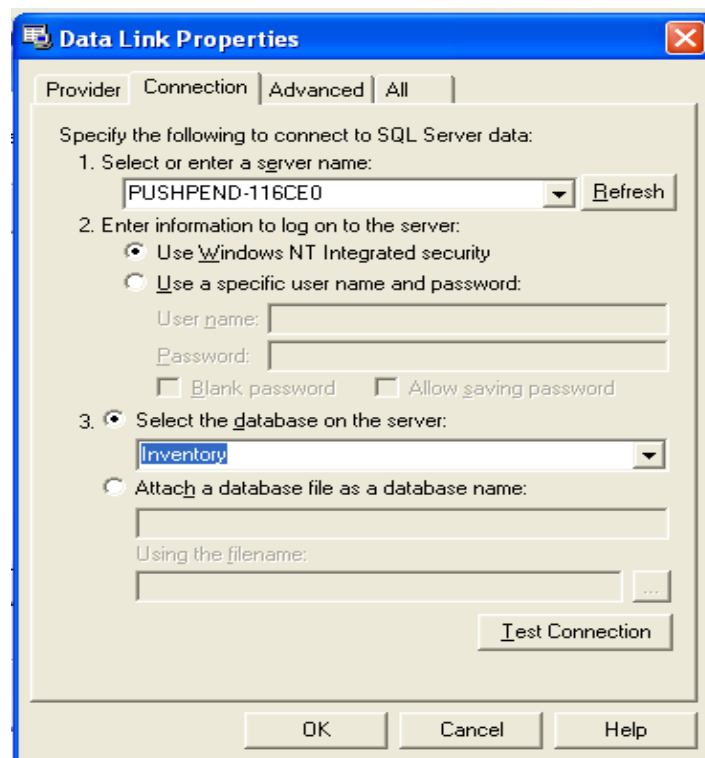
1. Expand the 'SalesDb' folder. Right-click on **Cubes** Folder -> Select **New Cube** -> Select **Wizard**.



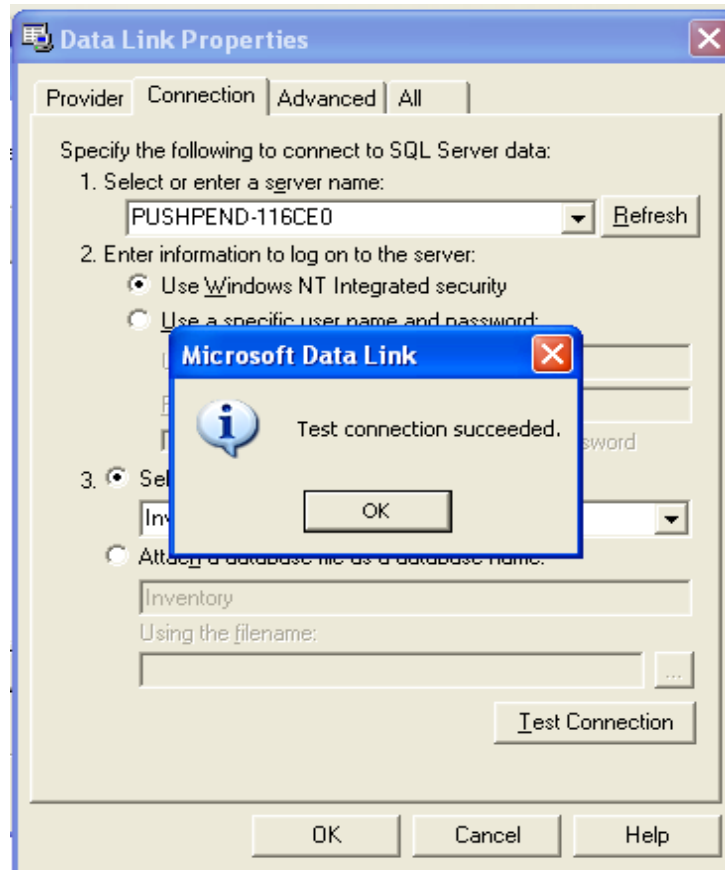
2. Click **New Data Source** -> Select **Microsoft OLE DB Provider for SQL Server**, and click **Next**.



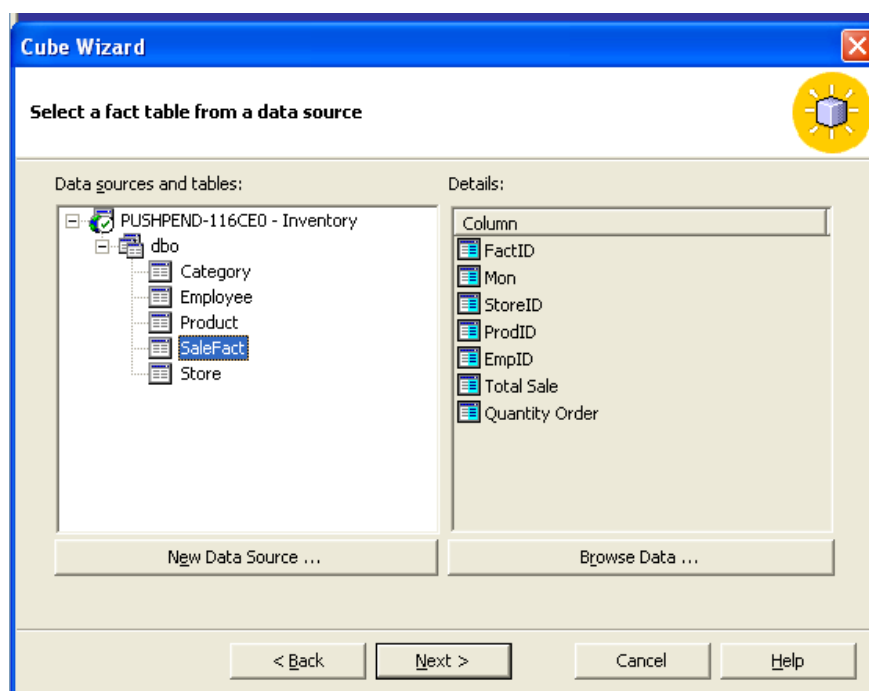
3. In the **connection** Tab Select or enter Server Name. -> Select DB on the server from drop down list.



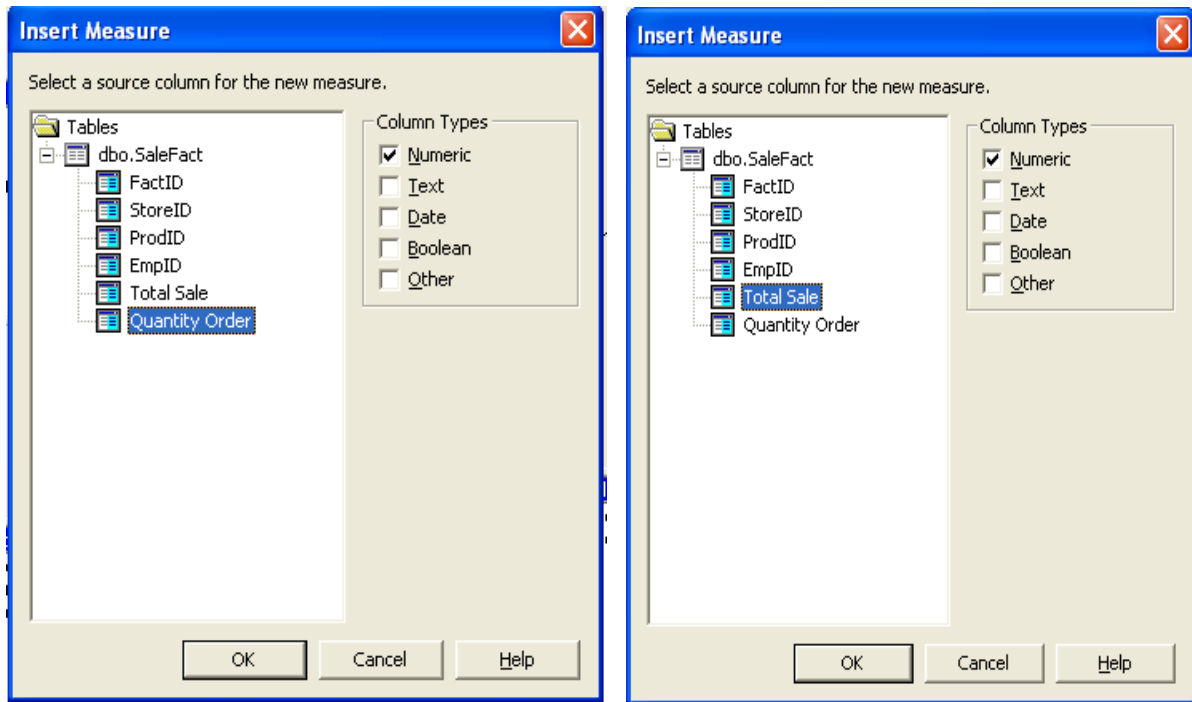
4. Click **Test Connection** to make sure the data source definition is correct. Then click **OK** to close the dialog box.



5. Select **SaleFact** table from the list of tables.



6. Right click on Sales\_cube and select **Edit**. It will open Cube editor->Right Click on Sales\_Cube and Select **New Measures**->Now create two new measures: **Total Sales**, **Quantity Order**

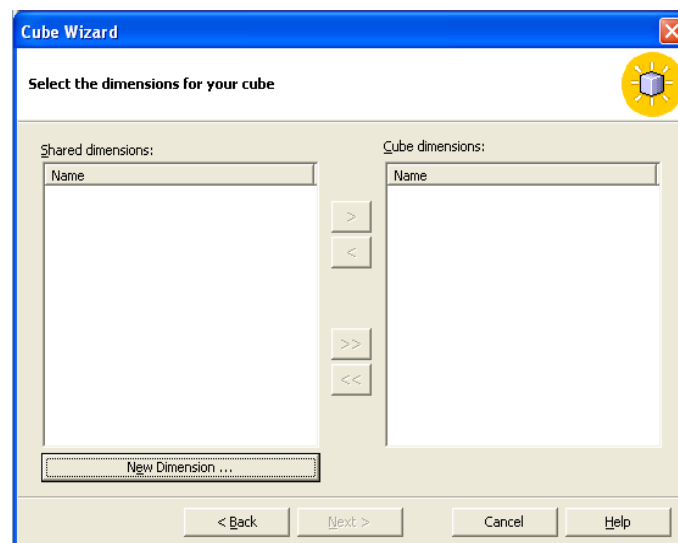


### Practical No. 4

**Aim :** Develop an application to create dimension tables in a cube and form star schema.

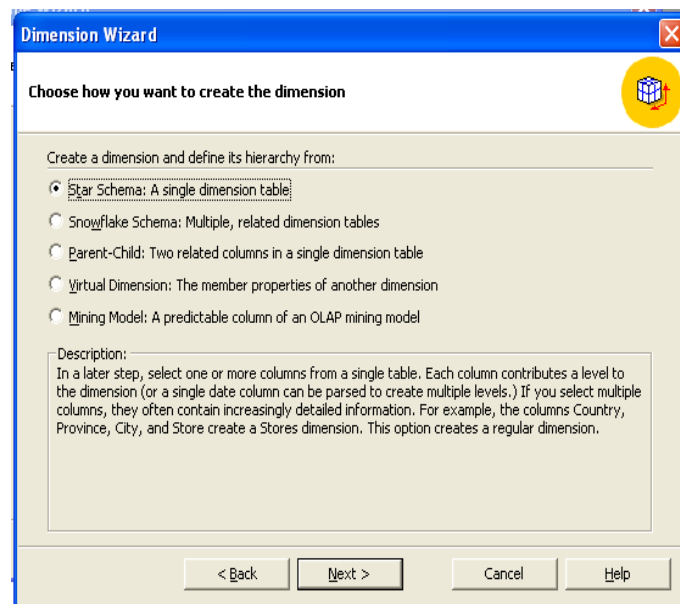
**Create a dimension from a Star Schema table:**

1. Click a **New Dimension** in the Wizard to start the Dimension Wizard. Select the option to skip the welcome screen, and then click on **Next**.

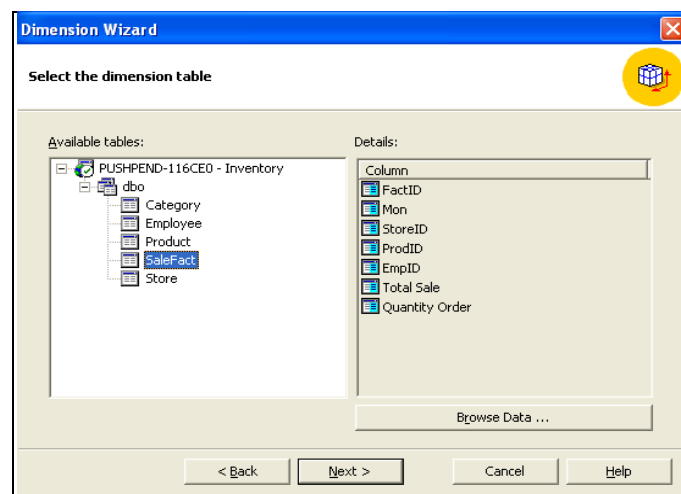




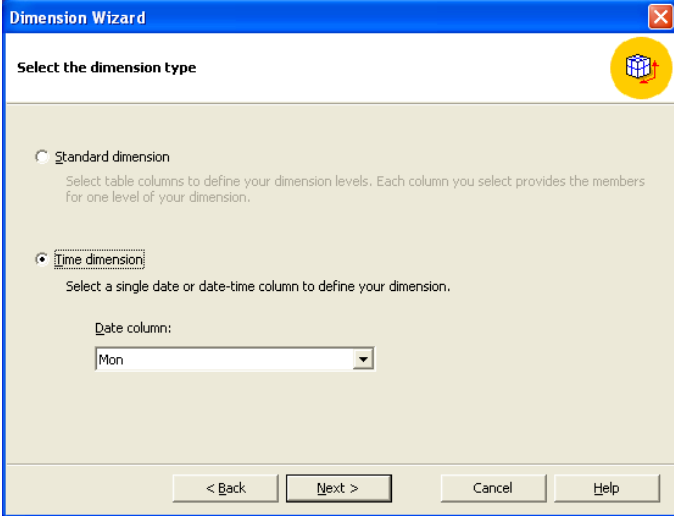
2. Click the Option **Star Schema: A Single Dimension Table**, and then click **Next**.



3. Select **SaleFact** from **Available Tables** and click **next**.



4. Select Time Dimension ->Select Date column From Drop Down : **Mon.** & Click **Next**.



**Dimension Wizard**

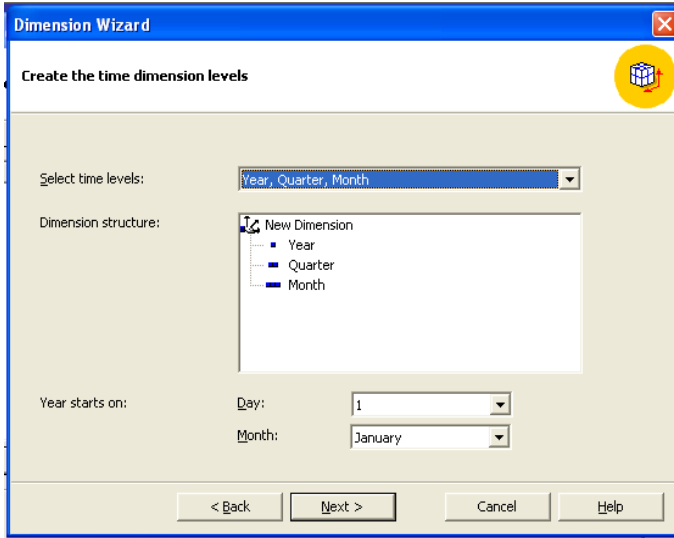
**Select the dimension type**

☐ Standard dimension  
 Select table columns to define your dimension levels. Each column you select provides the members for one level of your dimension.

☒ Time dimension  
 Select a single date or date-time column to define your dimension.

Date column:

5. Select Time Level : **Year, Quater, Month** ->Click **Next**.



**Dimension Wizard**

**Create the time dimension levels**

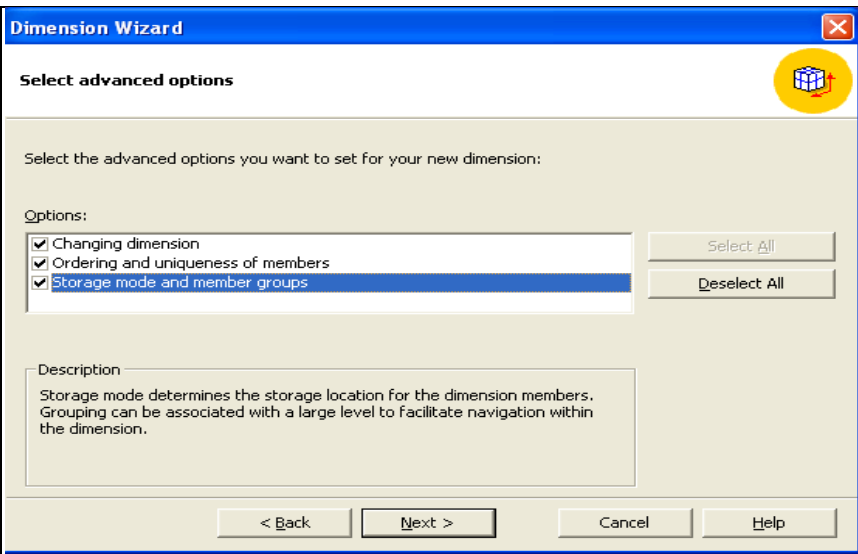
Select time levels:

Dimension structure:

- New Dimension
  - Year
  - Quarter
  - Month

Year starts on: Day:  Month:

6. Select all and click **Next**.



**Dimension Wizard**

**Select advanced options**

Select the advanced options you want to set for your new dimension:

Options:

- ☒ Changing dimension
- ☒ Ordering and uniqueness of members
- ☒ Storage mode and member groups

Description

Storage mode determines the storage location for the dimension members. Grouping can be associated with a large level to facilitate navigation within the dimension.

**Dimension Wizard**

**Specify ordering and uniqueness**

Ordering specifies the sequence to use for ordering the members of a level. By default, the level is ordered by key.

Uniqueness ensures that no duplicate values are entered for members within a level. It can be specified for keys and names separately.

Levels:

Name	Order by	Keys unique	Names unique
Mon	<Name>	Among level members	Among level members

< Back    Next >    Cancel    Help

**Dimension Wizard**

**Specify storage mode and member groups**

Determine the location and form of a dimension's data.

☒ **Store as multidimensional OLAP (MOLAP)**  
Provides better query performance, but not suitable for extremely large dimensions.

☐ Create member groups for the lowest level  
If the lowest level of your dimension contains more than 64,000 children per parent, the wizard will create the grouping level.

☐ Store as relational OLAP (ROLAP)  
ROLAP dimensions are available only if you install Analysis Services for SQL Server 2000 Enterprise Edition.

< Back    Next >    Cancel    Help

7. Give Dimension Name: TimeDimension.-> Click **Finish**.

**Dimension Wizard**

**Finish the Dimension Wizard**

Dimension name: TimeDimension

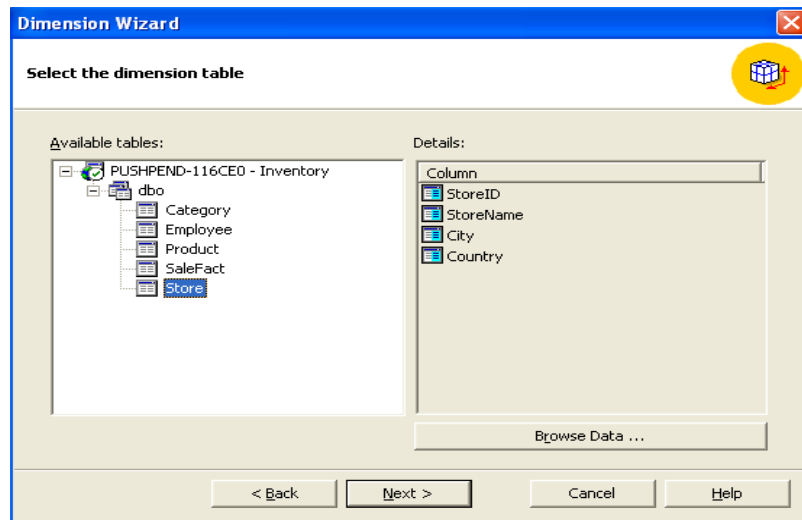
☐ Create a hierarchy of a dimension

Preview: All New Dimension

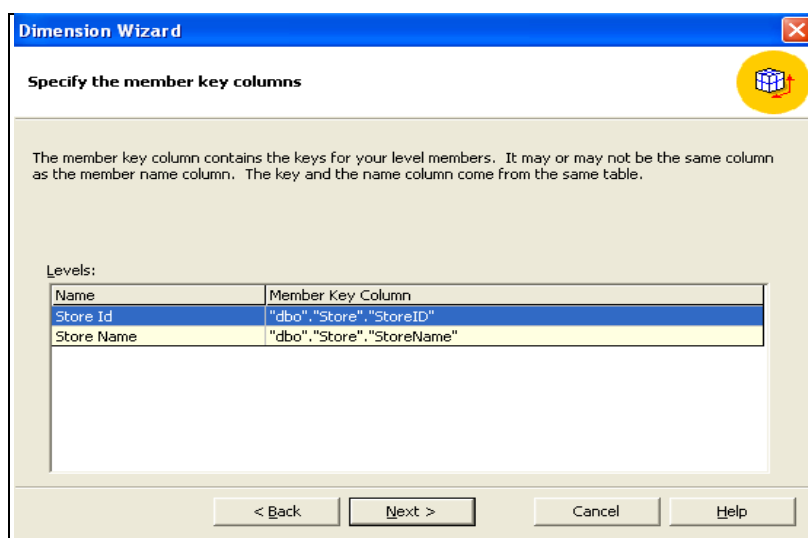
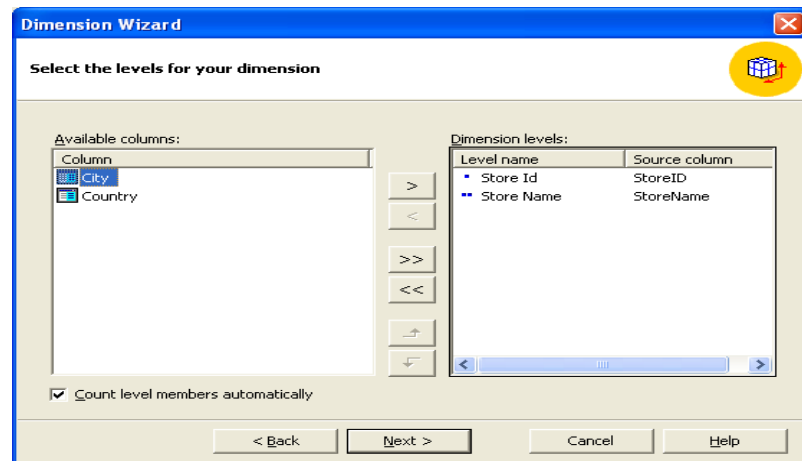
☒ Share this dimension with other cubes

< Back    Finish    Cancel    Help

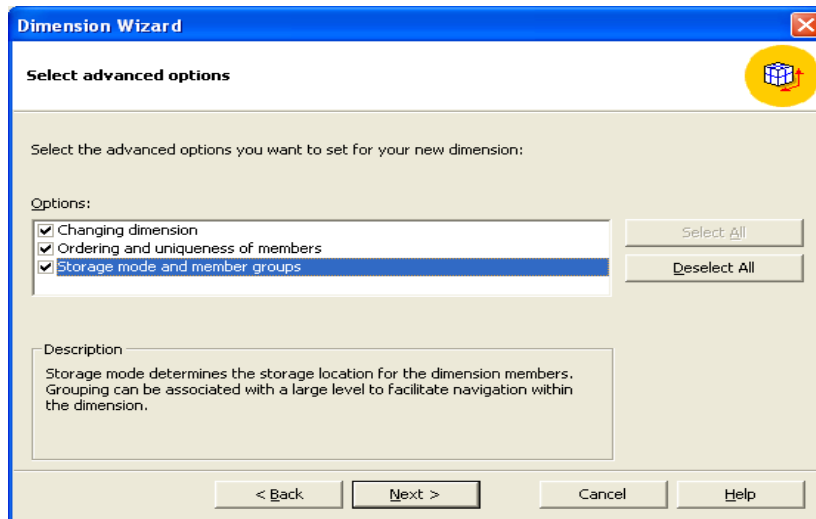
Create one more dimension: **StoreDimension**.



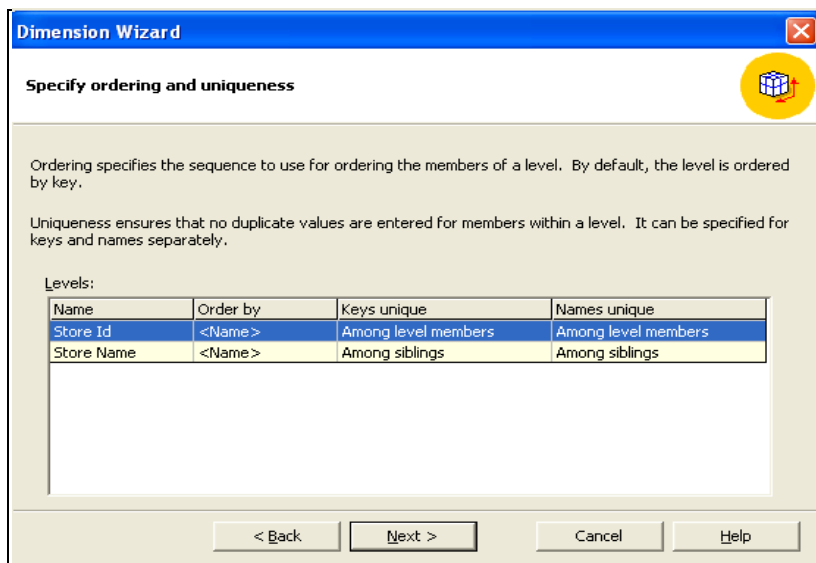
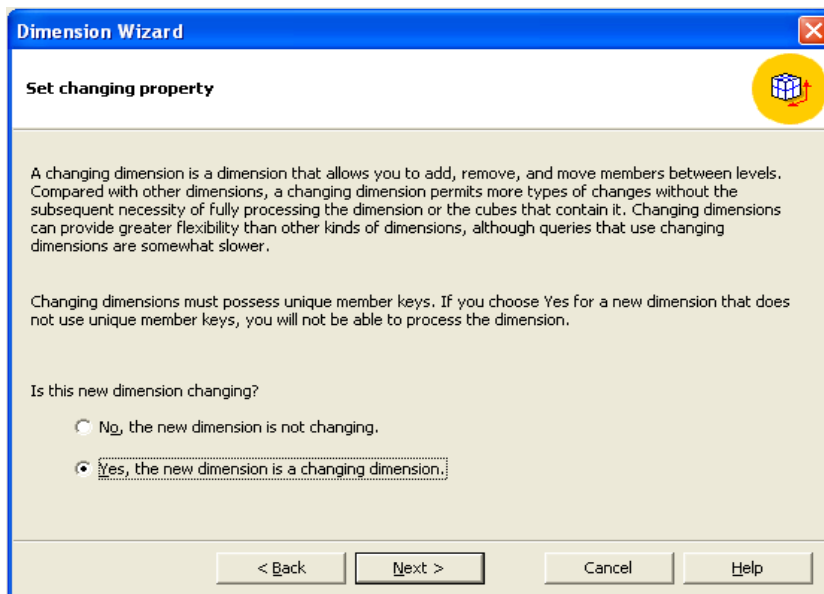
8. Specify Dimension Level : **StoreId, Store Name**-> Click **Next**.

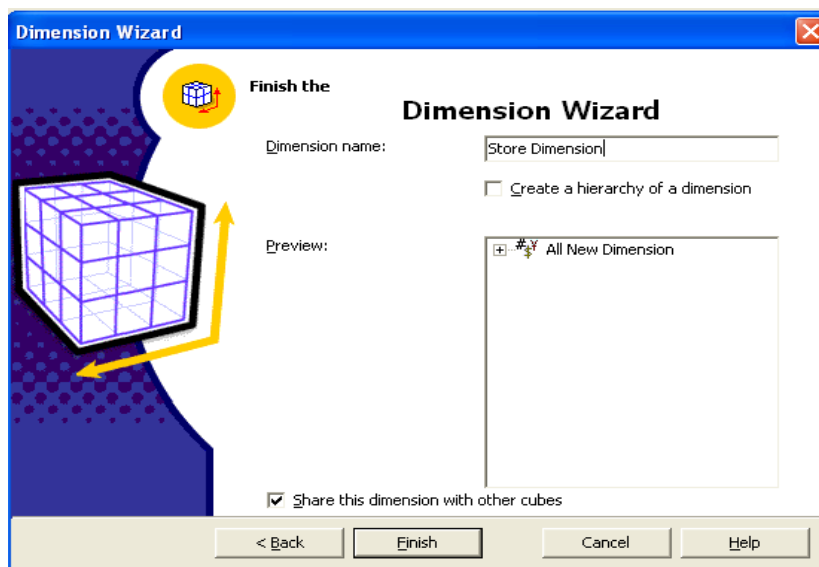
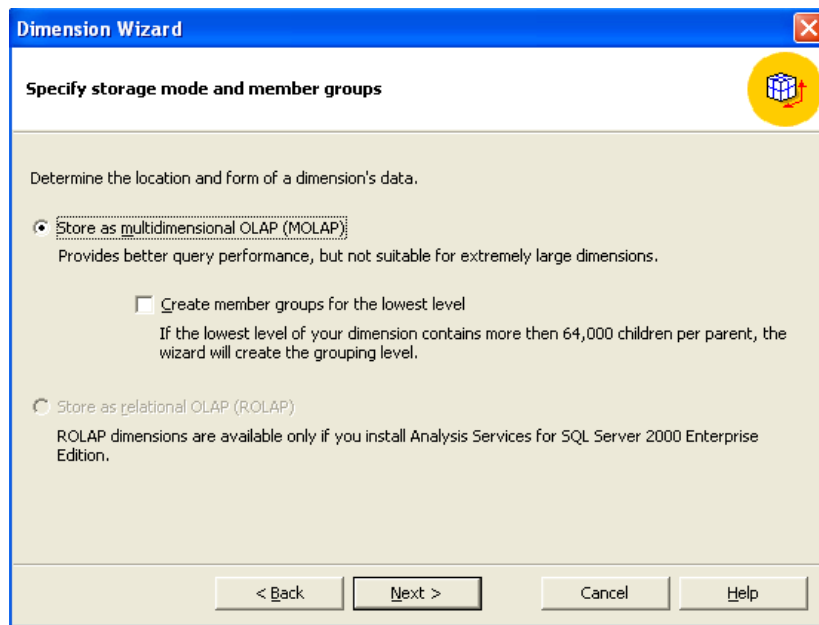


9. Select all and Click Next.

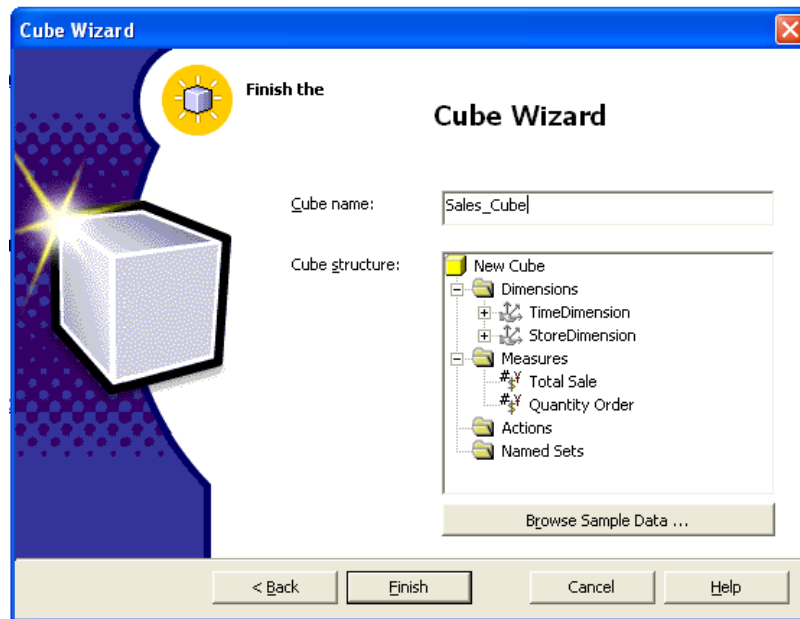


10. Select **Yes....** -> Click **Next**.





11. Finally cube is created. -> Cube Name :**Sales\_Cube**.

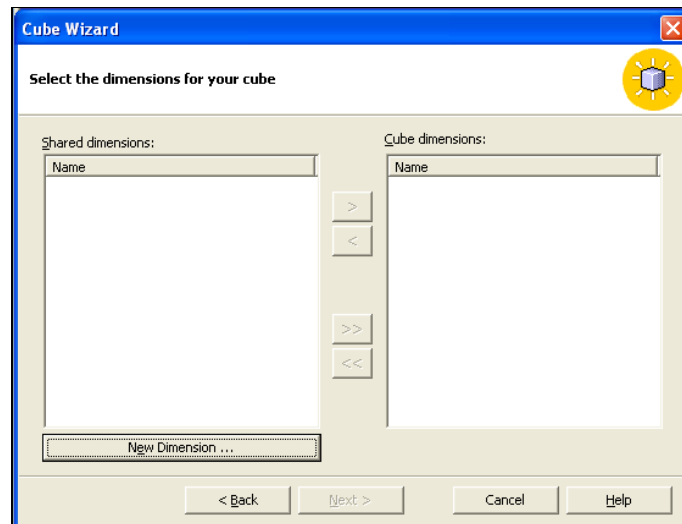


## Practical No. 5

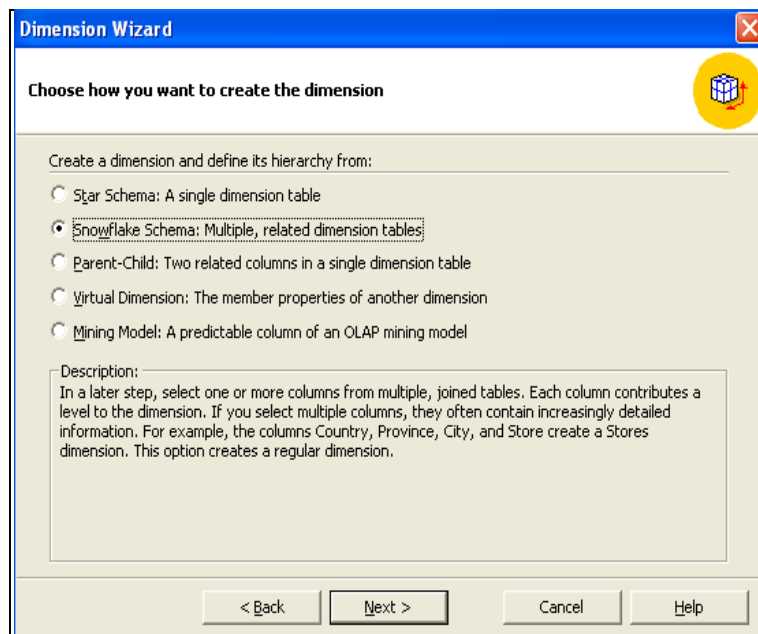
**Aim :** Develop an application to create dimension tables in a cube and form snowflake schema.

### Create a dimension from Snowflake schema tables:

1. Click a **New Dimension** in the Wizard to start the Dimension Wizard. Select the option to skip the welcome screen, and then click on **Next**.

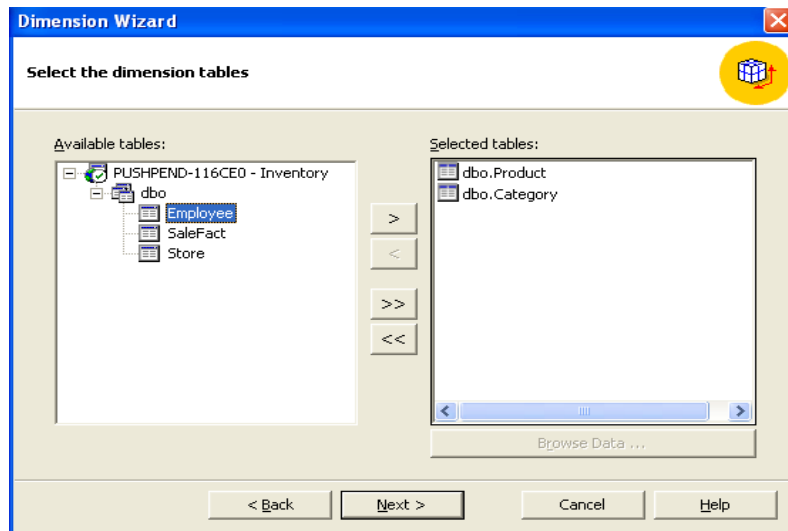


2. Click the Option **Snowflake Schema: Multiple, related dimension tables.** and the click **Next**.

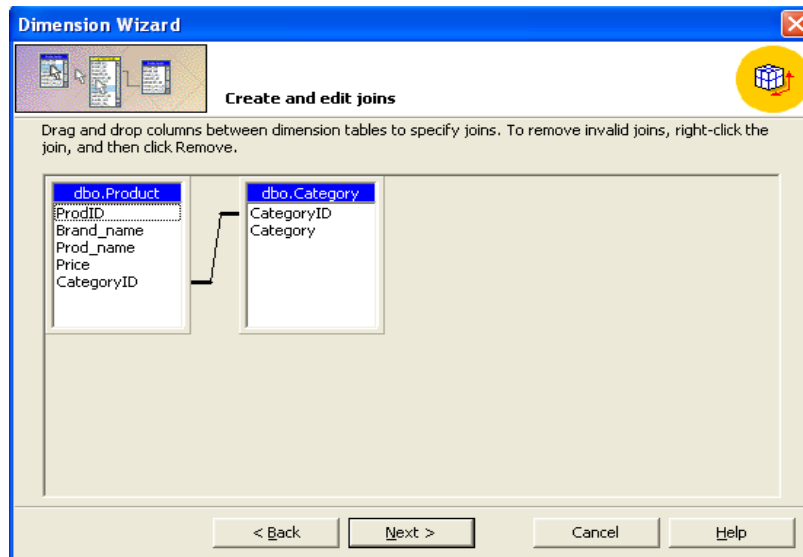




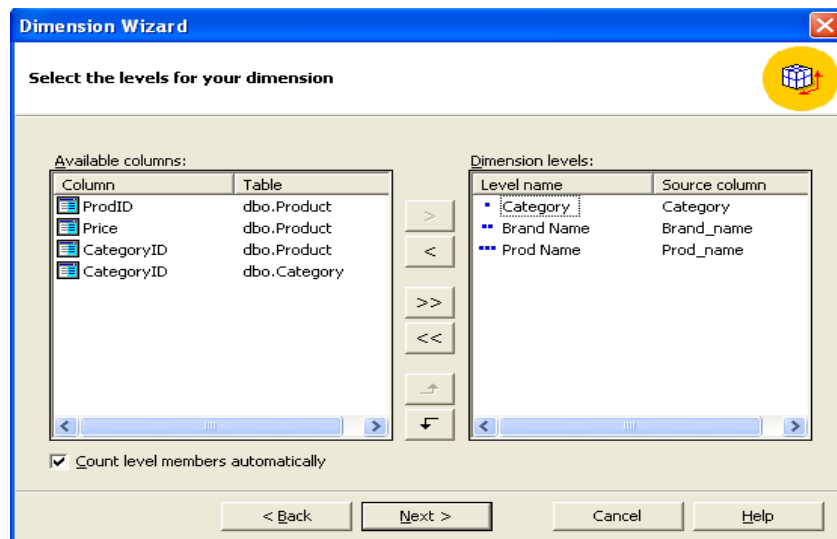
3. Select **Product, Category** table from **Available Tables** and click **next**.



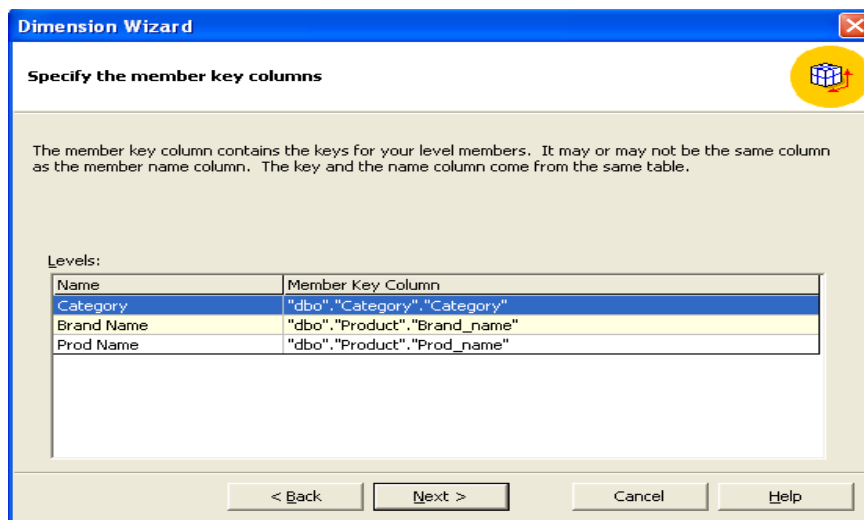
4. Click Next.



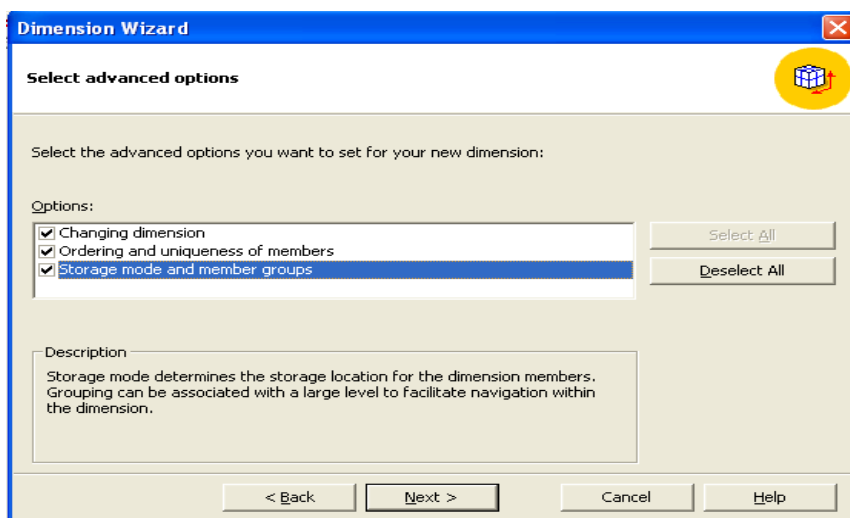
5. Select Dimension levels : **Category, Brand Name, Product Name**.



6. Click **Next**.



7. Select all and Click **Next**.



8. Select **yes** and click **Next**.

**Dimension Wizard**

**Set changing property**

A changing dimension is a dimension that allows you to add, remove, and move members between levels. Compared with other dimensions, a changing dimension permits more types of changes without the subsequent necessity of fully processing the dimension or the cubes that contain it. Changing dimensions can provide greater flexibility than other kinds of dimensions, although queries that use changing dimensions are somewhat slower.

Changing dimensions must possess unique member keys. If you choose Yes for a new dimension that does not use unique member keys, you will not be able to process the dimension.

Is this new dimension changing?

☐ No, the new dimension is not changing.

☒ Yes, the new dimension is a changing dimension.

< Back   Next >   Cancel   Help

**Dimension Wizard**

**Specify ordering and uniqueness**

Ordering specifies the sequence to use for ordering the members of a level. By default, the level is ordered by key.

Uniqueness ensures that no duplicate values are entered for members within a level. It can be specified for keys and names separately.

Levels:

Name	Order by	Keys unique	Names unique
Category	<Name>	Among level members	Among level members
Brand Name	<Name>	Among siblings	Among siblings
Prod Name	<Name>	Among level members	Among level members

< Back   Next >   Cancel   Help

**Dimension Wizard**

**Specify storage mode and member groups**

Determine the location and form of a dimension's data.

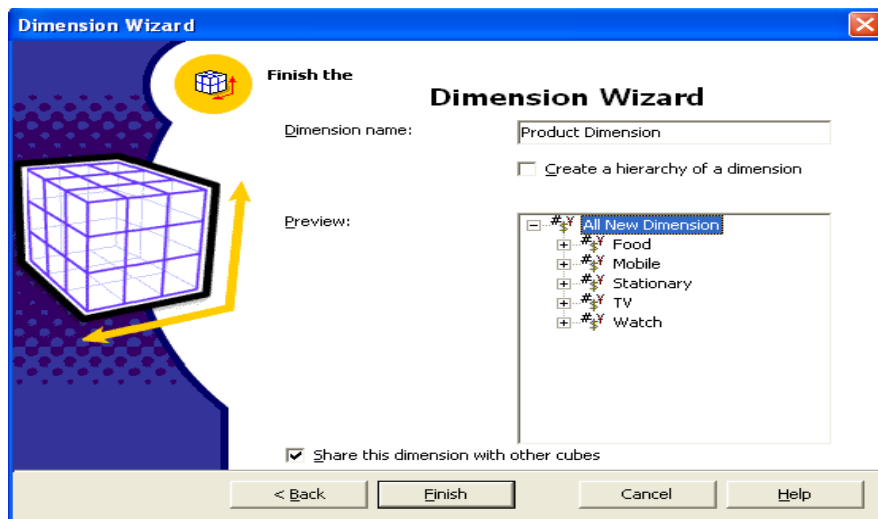
☒ Store as multidimensional OLAP (MOLAP)  
Provides better query performance, but not suitable for extremely large dimensions.

☐ Create member groups for the lowest level  
If the lowest level of your dimension contains more than 64,000 children per parent, the wizard will create the grouping level.

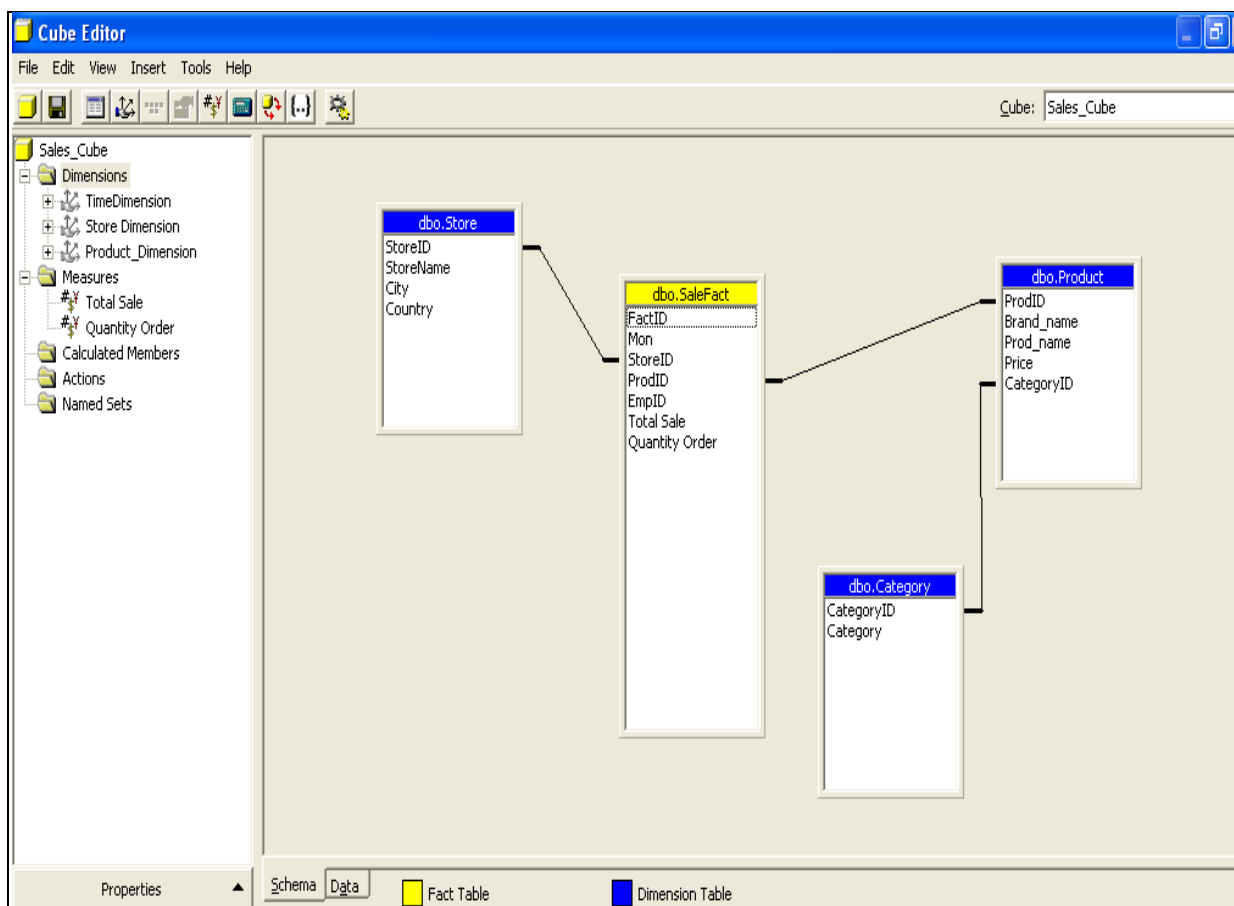
☐ Store as relational OLAP (ROLAP)  
ROLAP dimensions are available only if you install Analysis Services for SQL Server 2000 Enterprise Edition.

< Back   Next >   Cancel   Help

9. Name the dimension as : **Product Dimension.**



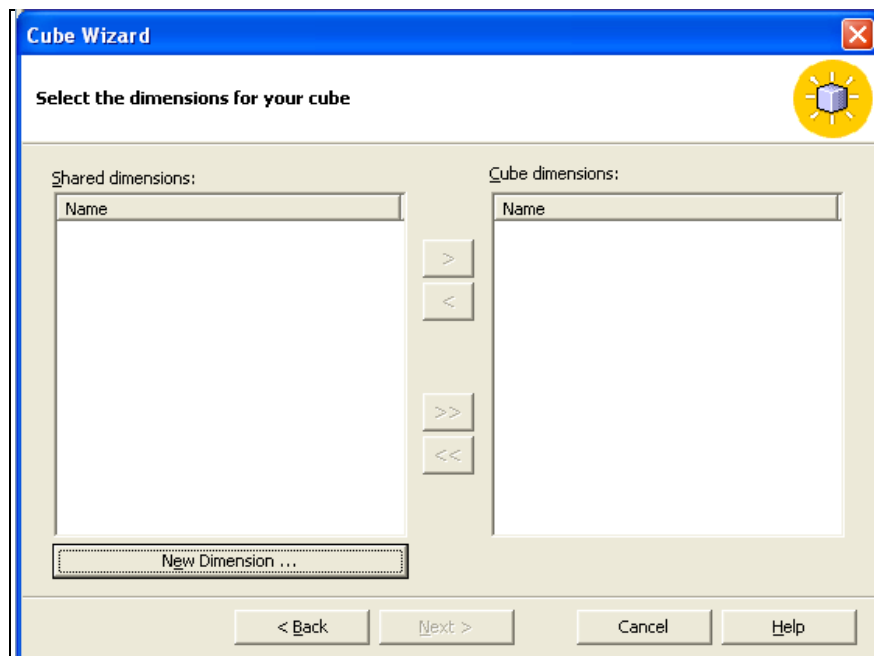
### View of SnowFlake Schema.



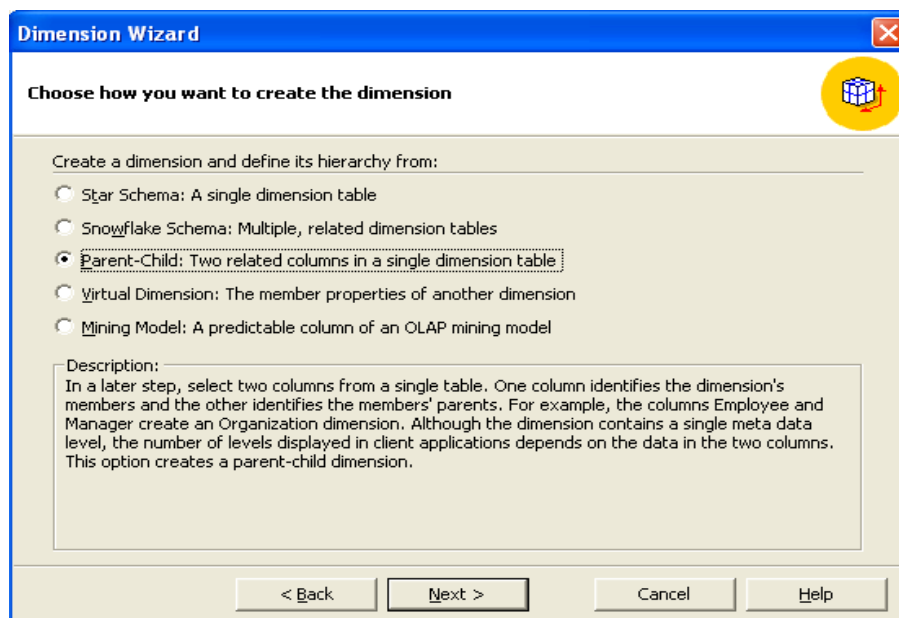
## Practical No. 6

**Aim :** Develop an application to create a dimension table from Parent-Child schema.

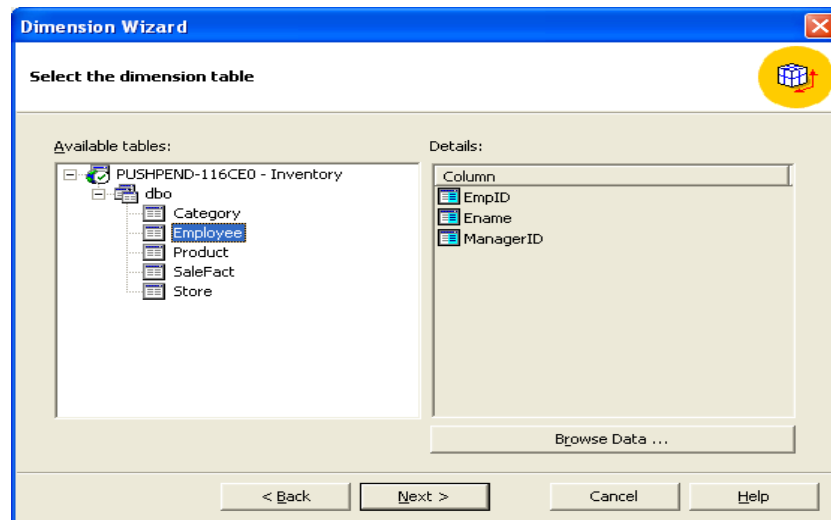
1. Click a **New Dimension** in the Wizard to start the Dimension Wizard. Select the option to skip the welcome screen, and then click on **Next**.



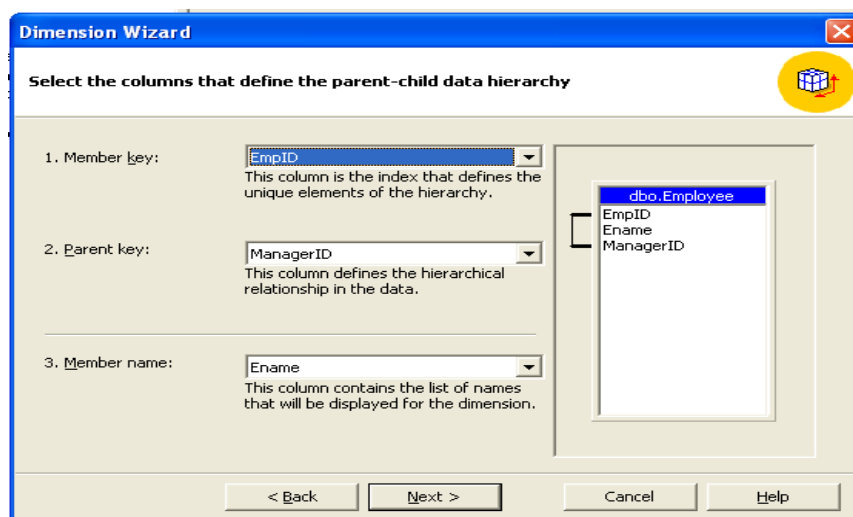
2. Click the Option **Parent-Child Schema: A Single Dimension Table**, and the click **Next**.



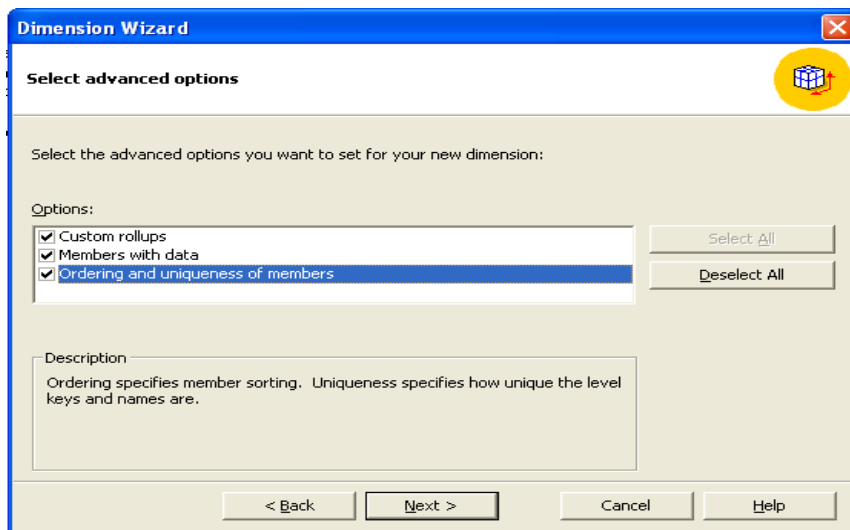
3. Select **Product**, **Category** table from **Available Tables** and click **next**.



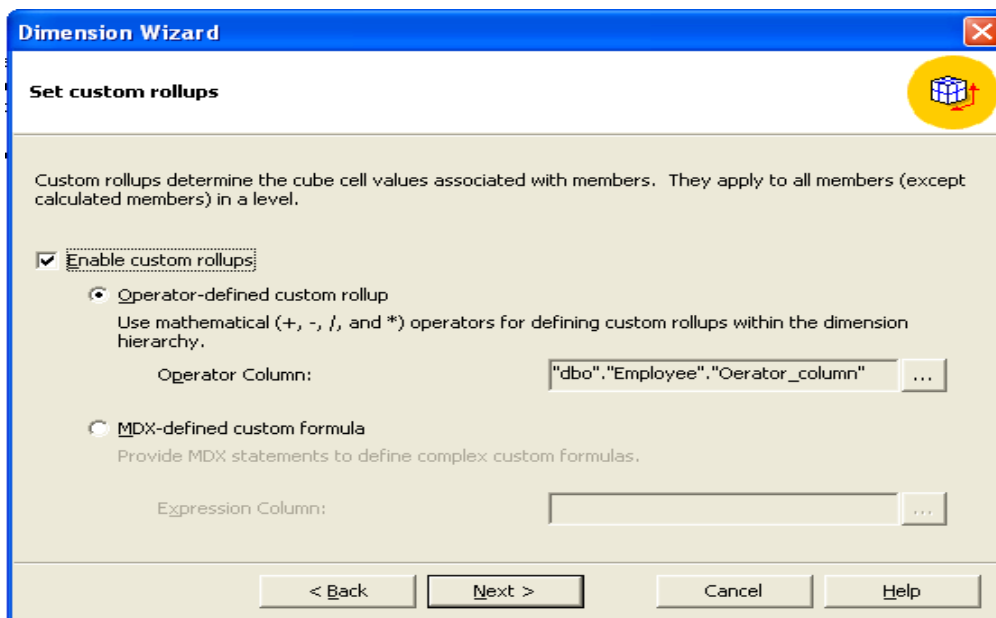
4. Select a. MemberKey: a. **EmpID** from drop down, b. Parent Key :**ManagerID** from drop down, c. Member Name: **Ename** from drop down. -> Click **Next**.



5. Select all and click **Next**.



6. Enable CustomRollups and click **next**.



7. Check the option and click **next**.

**Dimension Wizard**

**Set members with data property**

This property determines what members in a dimension can have associated data in the fact table. By default, only leaf members have associated data.

☒ Nonleaf members have associated data:

☒ Data members are visible  
The data member for nonleaf members is shown and aggregated with the values of the regular children of that member.

☐ Data members are hidden  
The data member for nonleaf members overrides the aggregate value of the regular children of that member.

< Back   Next >   Cancel   Help

**Dimension Wizard**

**Specify ordering and uniqueness**

Ordering specifies the sequence to use for ordering the members of a level.

Uniqueness ensures that no duplicate values are entered for members.

Order members by:

Names are unique among:

< Back   Next >   Cancel   Help

8. Name the Dimension: **Employee Dimension.**

**Dimension Wizard**

**Finish the Dimension Wizard**

Dimension name:

☐ Create a hierarchy of a dimension

Preview:

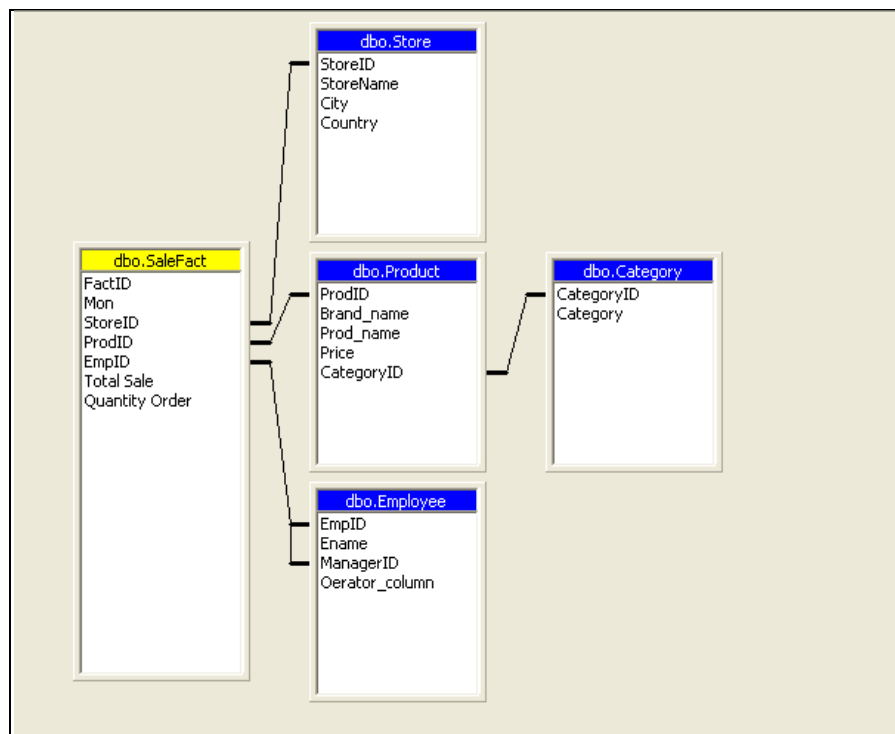
☒ Share this dimension with other cubes

< Back   Finish   Cancel   Help

**All New Dimension**

- # Chris
- # Andrew
- # John
- # Peter
- # Billy
- # Adam
- # Mathew
- # Chuck
- # Mike
- # Steve
- # Stuart

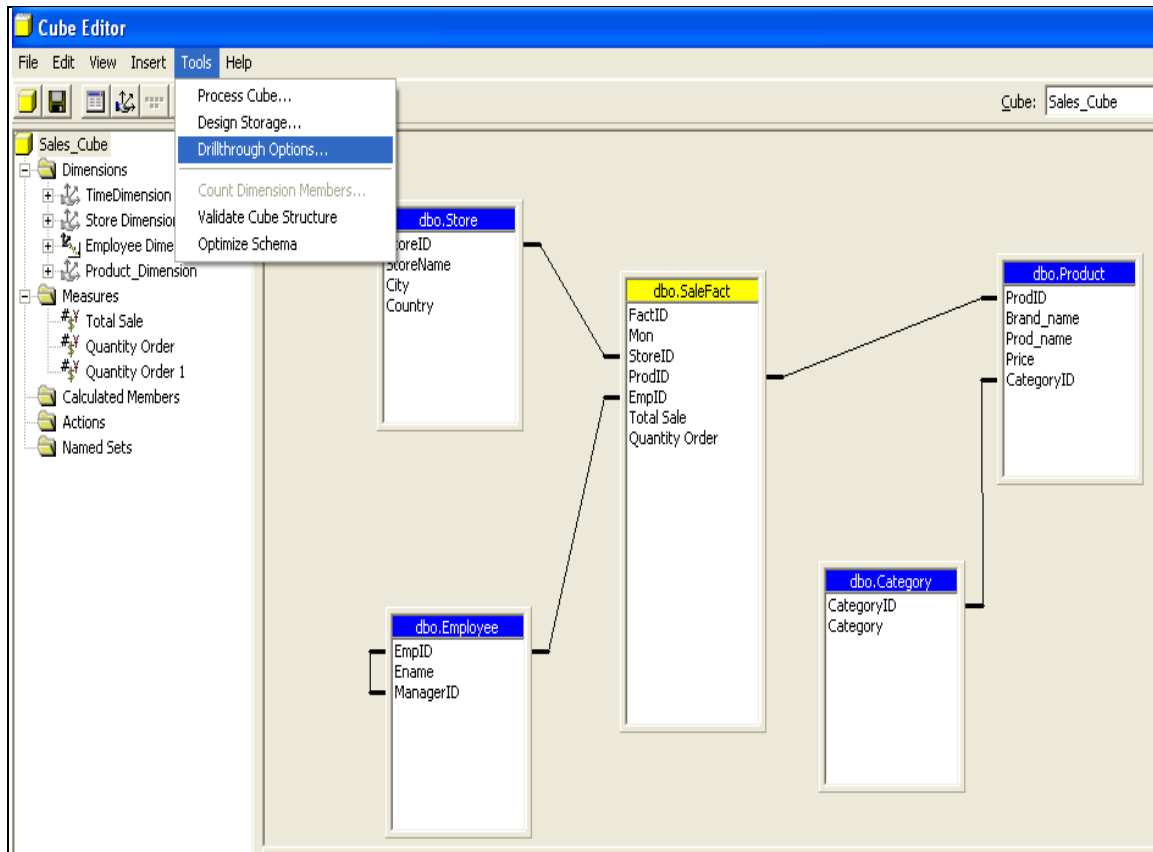


**View of Parent-Child Schema :**

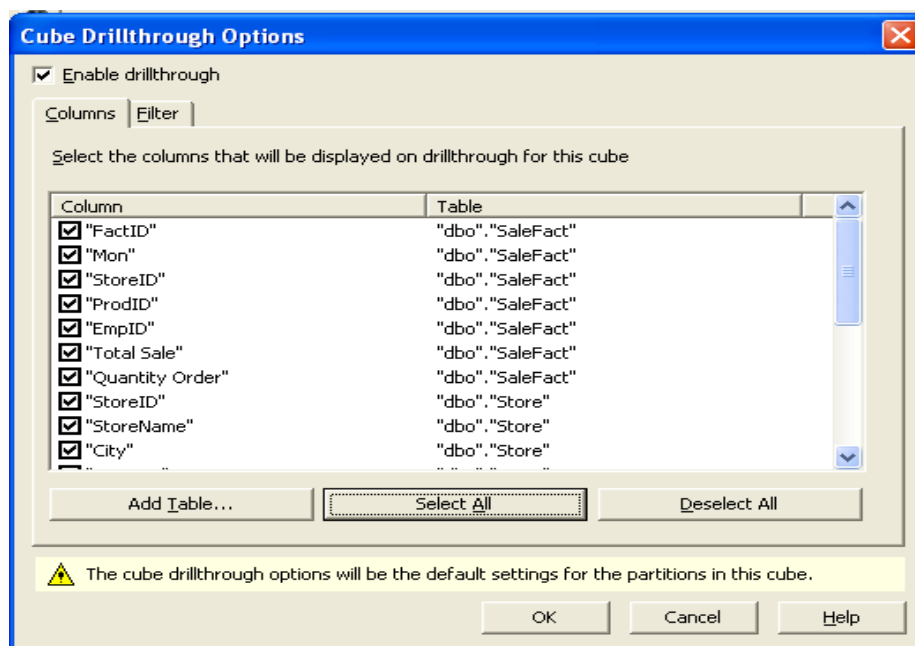
### Practical No. 7

**Aim :** Develop an application to demonstrate operations like roll-up, drill-down, slice, and dice.

1. Click on **Tools** in menu bar and select **Drillthrough options...** to perform drill-through operation on cube.



2. Check **Enabledrillthrough** option -> Click on **Select all** button and click **Ok**.



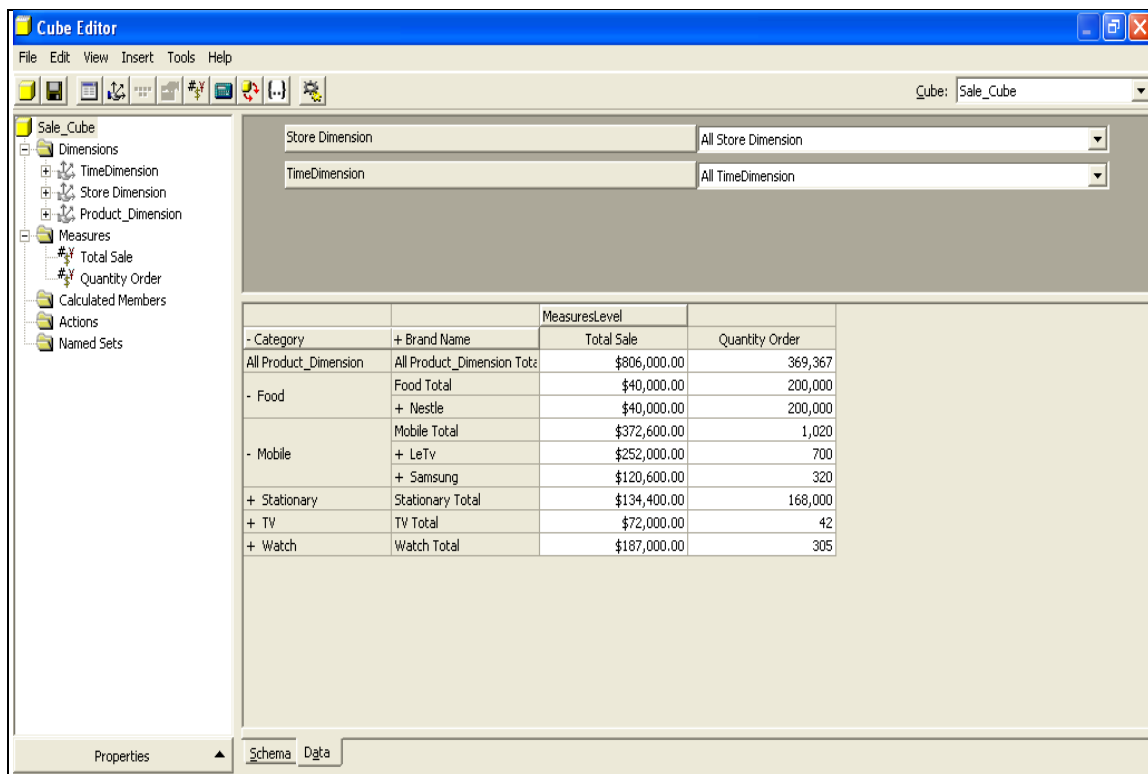
## 3. View of drill-through Data.

	FactID	Mon	StoreID	ProdID	EmpID	Total Sale	Quantity Order	StoreName	City	Country	Ename	ManagerID	CategoryID	Category	Brand_name	Prod_name	Price
1	6	1/29/2016	6	4	1	134400	168000	D-mart	Kolkata	India	John	67	5	Stationary	Classmate	A4 size book	0.8
2	1	6/9/2015	1	3	2	12000	12	Vijay Sales	Mumbai	India	Steve	289	2	TV	Sony	Bravia	1000
3	9	7/22/2014	4	1	2	30600	170	Star Store	Hyderabad	India	Steve	289	1	Mobile	Samsung	S4	600
4	8	6/28/2015	3	7	3	40000	200000	E-Zone	Delhi	India	Adam	113	4	Food	Nestle	Maggie	0.2
5	2	9/15/2015	2	1	4	90000	150	Reliance store	Bangalore	India	Andrew	54	1	Mobile	Samsung	S4	600
6	3	8/11/2015	3	5	5	63000	105	E-Zone	Delhi	India	Peter	92	3	Watch	Samsung	Gear 2	600
7	4	7/21/2015	4	9	6	60000	30	Star Store	Hyderabad	India	Stuart	532	2	TV	Samsung	SUHD	2000
8	5	2/12/2016	5	2	7	72000	400	Big Bazaar	Delhi	India	Mathew	190	1	Mobile	LeTv	Le1s	180
9	7	10/11/2015	2	6	8	124000	200	Reliance store	Bangalore	India	Chris	12	3	Watch	Apple	iWatch	620
10	10	5/2/2013	5	2	9	180000	300	Big Bazaar	Delhi	India	Billy	112	1	Mobile	LeTv	Le1s	180

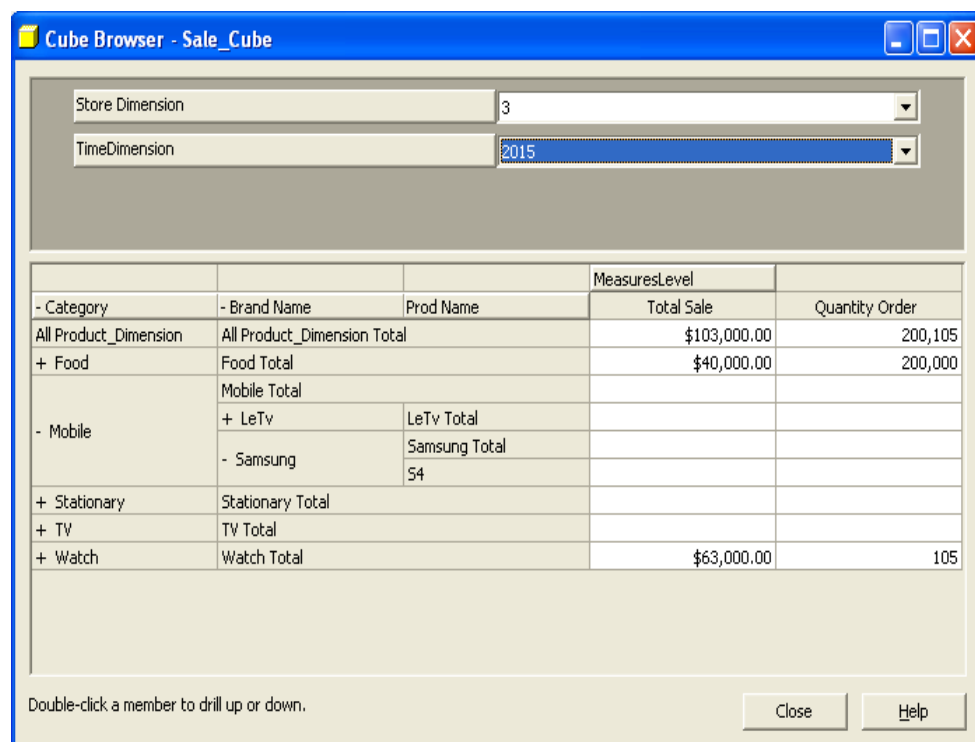
1. To perform roll up/down-> Right click on your cube -> Select **Browse Data** option

File Edit View Insert Tools Help																																																																							
Cube: Sale_Cube																																																																							
Dimensions <ul style="list-style-type: none"> <li>TimeDimension</li> <li>Store Dimension</li> <li>Product_Dimension</li> </ul>		Store Dimension: All Store Dimension TimeDimension: All TimeDimension																																																																					
Measures <ul style="list-style-type: none"> <li>Total Sale</li> <li>Quantity Order</li> <li>Calculated Members</li> <li>Actions</li> <li>Named Sets</li> </ul>																																																																							
<table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">MeasuresLevel</th> </tr> <tr> <th>- Category</th> <th>+ Brand Name</th> <th>Total Sale</th> <th>Quantity Order</th> </tr> </thead> <tbody> <tr> <td>All Product_Dimension</td> <td>All Product_Dimension Total</td> <td>\$806,000.00</td> <td>369,367</td> </tr> <tr> <td>- Food</td> <td>Food Total</td> <td>\$40,000.00</td> <td>200,000</td> </tr> <tr> <td></td> <td>+ Nestle</td> <td>\$40,000.00</td> <td>200,000</td> </tr> <tr> <td></td> <td>Mobile Total</td> <td>\$372,600.00</td> <td>1,020</td> </tr> <tr> <td>- Mobile</td> <td>+ LeTv</td> <td>\$252,000.00</td> <td>700</td> </tr> <tr> <td></td> <td>+ Samsung</td> <td>\$120,600.00</td> <td>320</td> </tr> <tr> <td>- Stationary</td> <td>Stationary Total</td> <td>\$134,400.00</td> <td>168,000</td> </tr> <tr> <td></td> <td>+ Classmate</td> <td>\$134,400.00</td> <td>168,000</td> </tr> <tr> <td>- TV</td> <td>TV Total</td> <td>\$72,000.00</td> <td>42</td> </tr> <tr> <td></td> <td>+ Samsung</td> <td>\$60,000.00</td> <td>30</td> </tr> <tr> <td></td> <td>+ Sony</td> <td>\$12,000.00</td> <td>12</td> </tr> <tr> <td></td> <td>+ Toshiba</td> <td></td> <td></td> </tr> <tr> <td>- Watch</td> <td>Watch Total</td> <td>\$187,000.00</td> <td>305</td> </tr> <tr> <td></td> <td>+ Apple</td> <td>\$124,000.00</td> <td>200</td> </tr> <tr> <td></td> <td>+ Samsung</td> <td>\$63,000.00</td> <td>105</td> </tr> </tbody> </table>						MeasuresLevel		- Category	+ Brand Name	Total Sale	Quantity Order	All Product_Dimension	All Product_Dimension Total	\$806,000.00	369,367	- Food	Food Total	\$40,000.00	200,000		+ Nestle	\$40,000.00	200,000		Mobile Total	\$372,600.00	1,020	- Mobile	+ LeTv	\$252,000.00	700		+ Samsung	\$120,600.00	320	- Stationary	Stationary Total	\$134,400.00	168,000		+ Classmate	\$134,400.00	168,000	- TV	TV Total	\$72,000.00	42		+ Samsung	\$60,000.00	30		+ Sony	\$12,000.00	12		+ Toshiba			- Watch	Watch Total	\$187,000.00	305		+ Apple	\$124,000.00	200		+ Samsung	\$63,000.00	105
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	+ Samsung	\$63,000.00	105																																																																				
Properties		Schema Data																																																																					

2. To roll up/down through cube -> Double click on + to **roll-down** and -to**roll-up**.



3. To perform **slice** operation-> Select a particular value for one dimension. Similarly to perform **dice** operation ->Select a value for each dimension, result will be a sub-cube containing a value with respect to other dimensions.

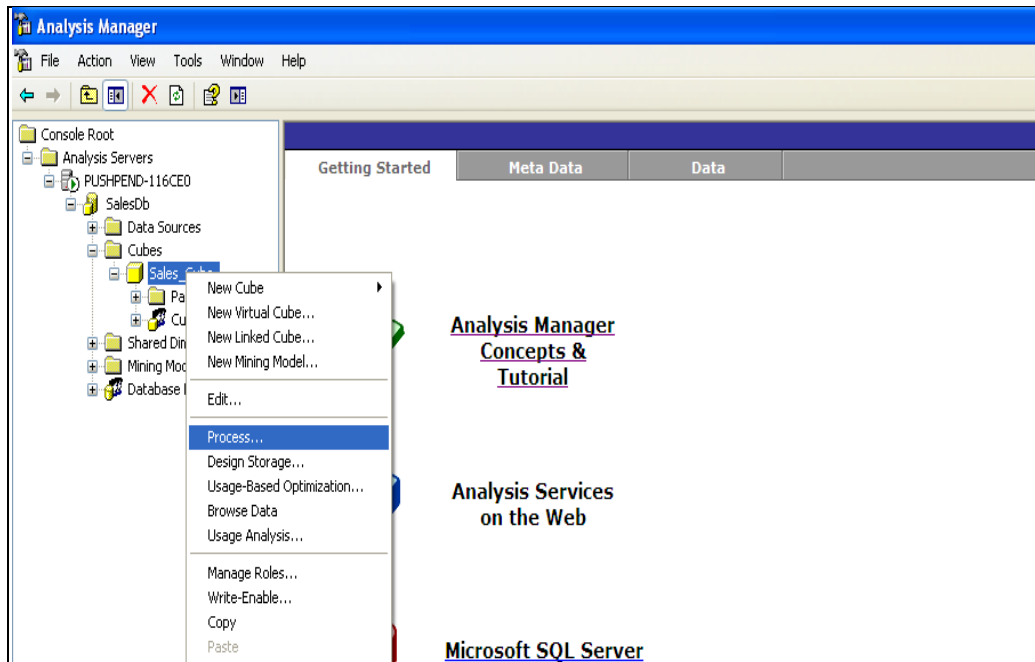


## Practical No. 8

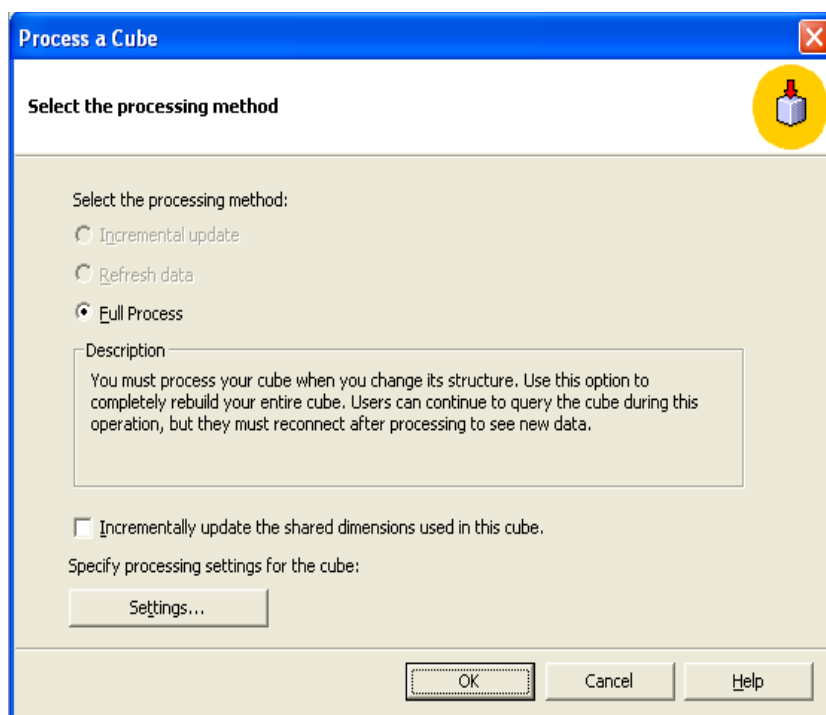
**Aim :** Develop an application to demonstrate processing and browsing data from a cube.

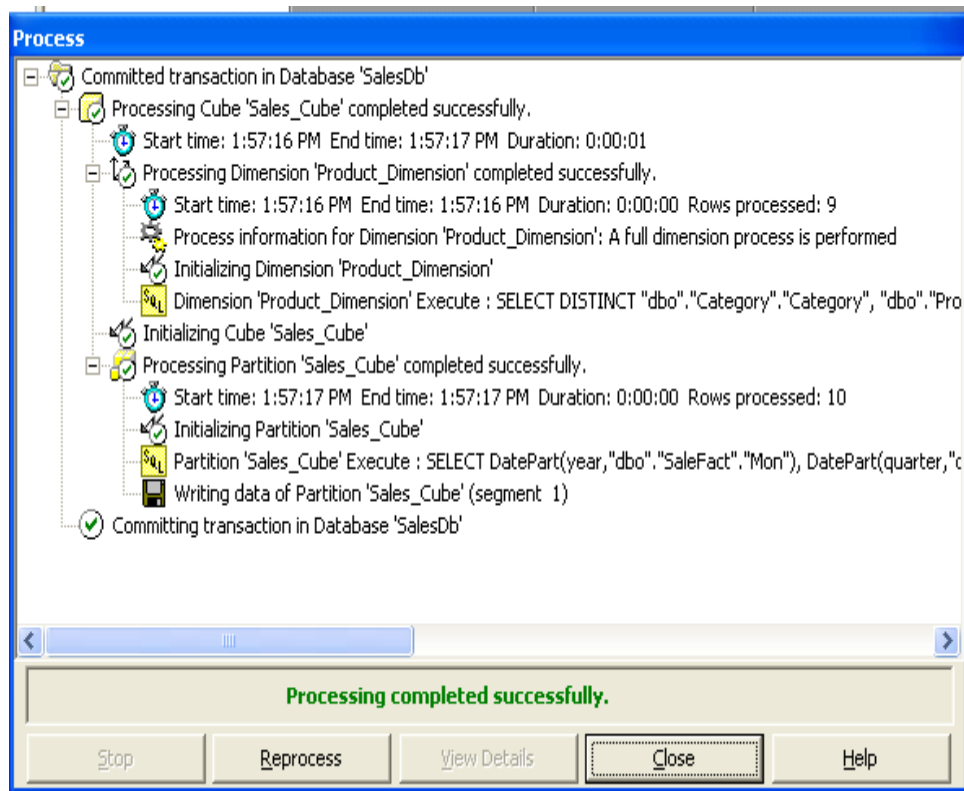
### Processing a cube:

Right click on existing cube and select Process.



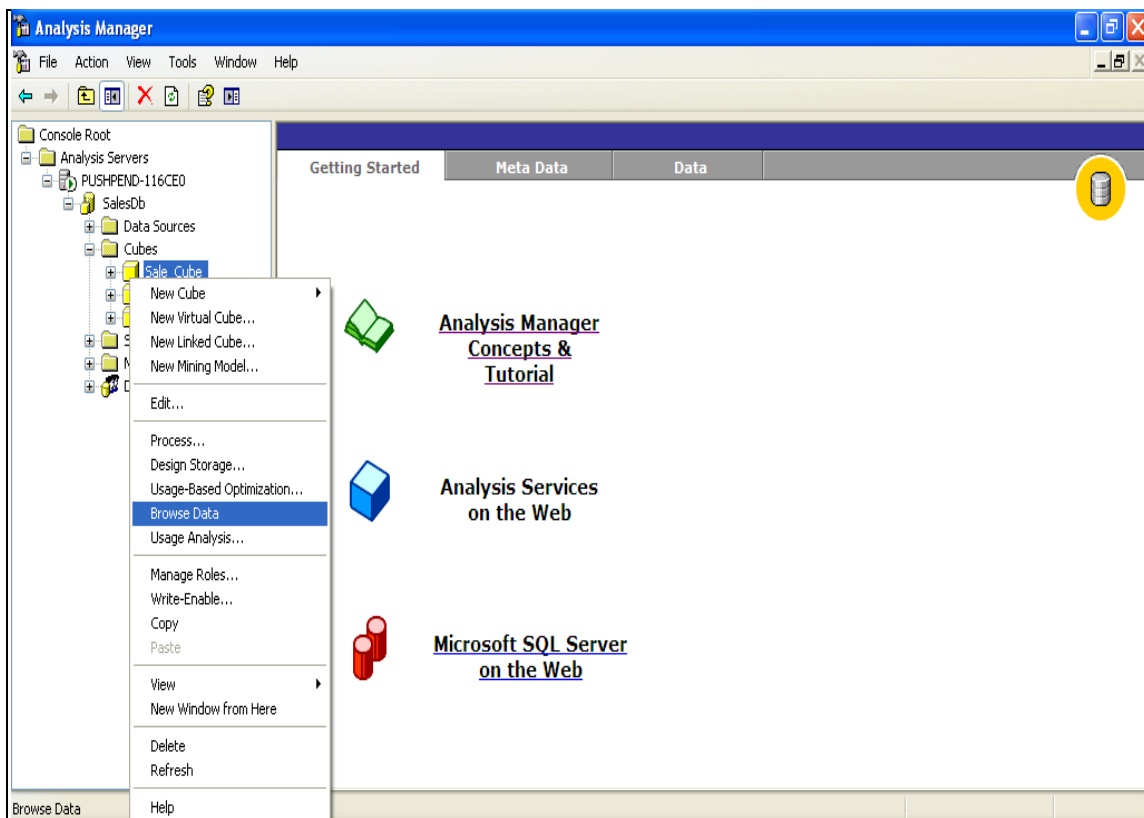
1. Select **Full Process** and Click **Ok**.



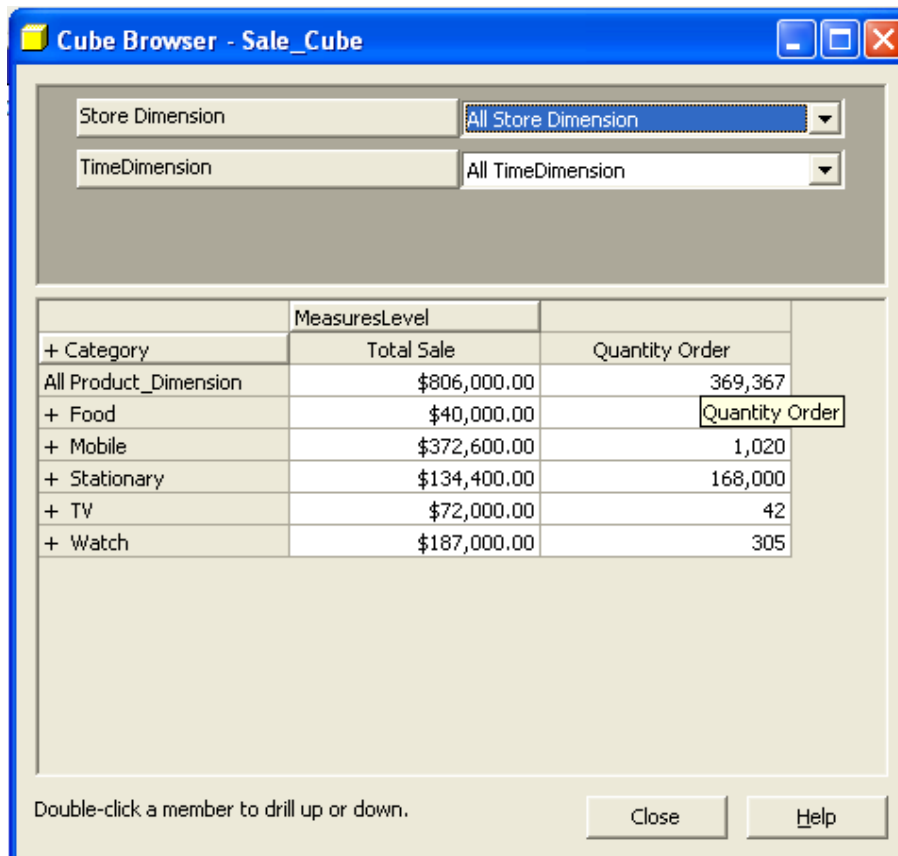


### Browsing data in a cube

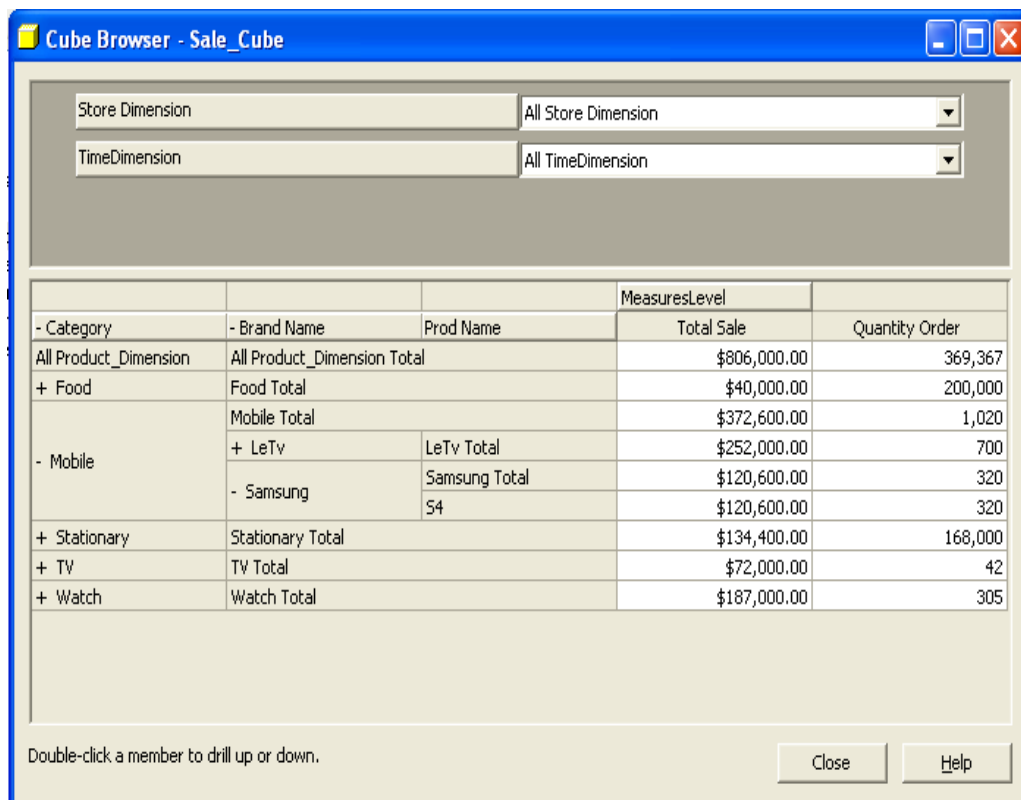
Right click on existing cube and select **Browse Data**.



1. A cube browser will be opened.



2. Double click a member to drill up(-) or down(+).



- To view data with respect to particular dimension, select particular value from drop-down to analyze.

**Cube Browser - Sale\_Cube**

Store Dimension: 3

TimeDimension: 2015

- Category	- Brand Name	Prod Name	MeasuresLevel Total Sale	Quantity Order
All Product_Dimension	All Product_Dimension Total		\$103,000.00	200,105
+ Food	Food Total		\$40,000.00	200,000
- Mobile	Mobile Total			
	+ LeTv	LeTv Total		
	- Samsung	Samsung Total		
		S4		
+ Stationary	Stationary Total			
+ TV	TV Total			
+ Watch	Watch Total		\$63,000.00	105

Double-click a member to drill up or down.

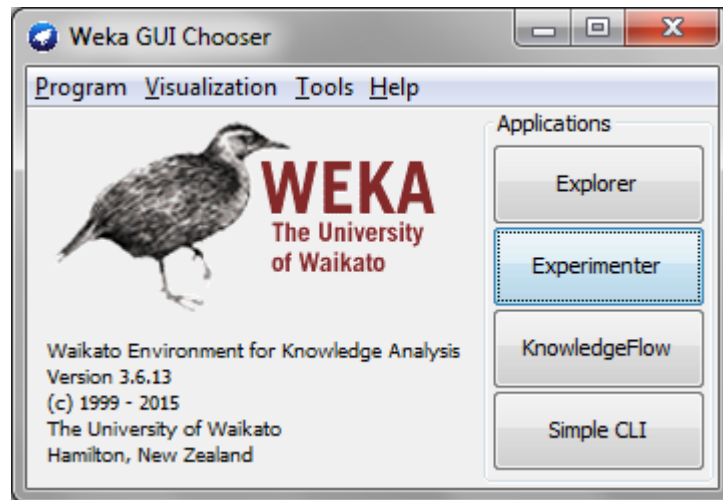
Close Help



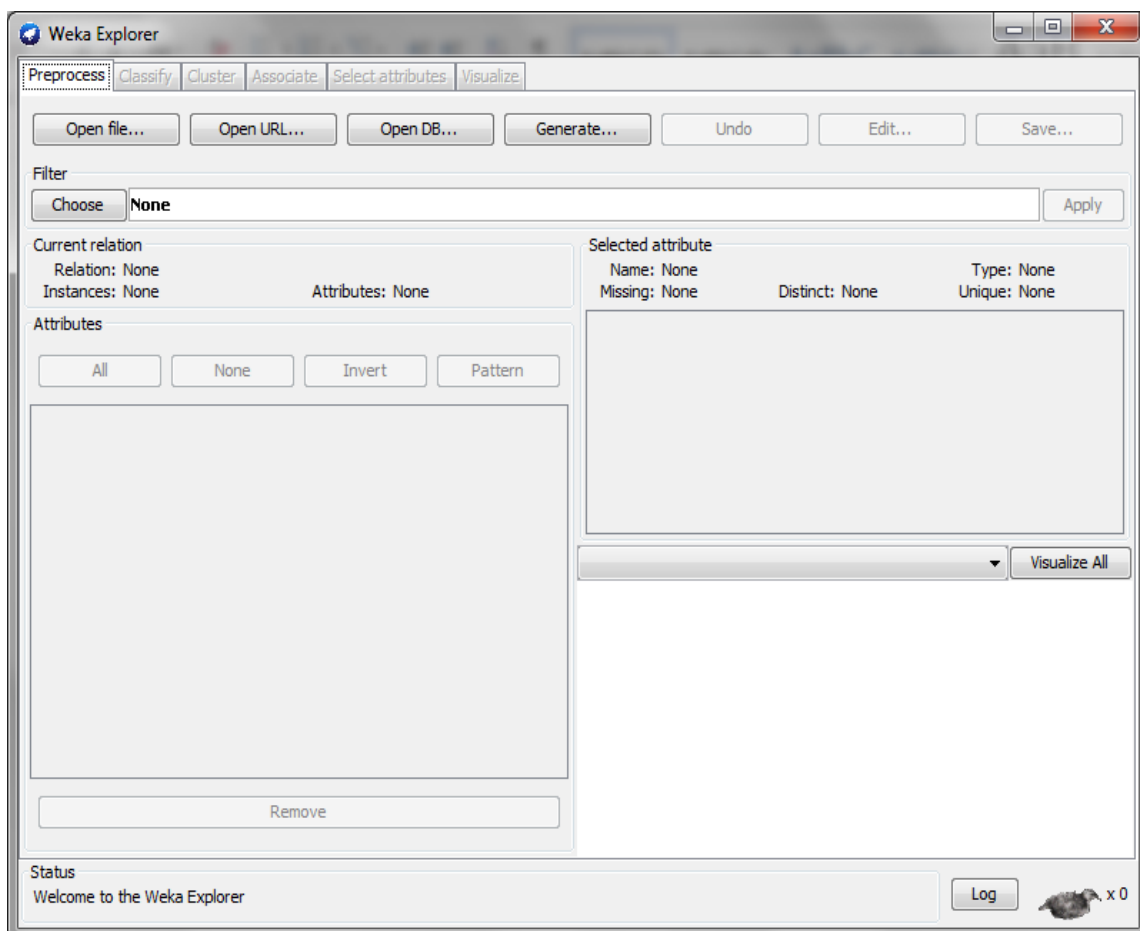
## Practical No. 9

**Aim :** Develop an application to pre process data imported from external sources.

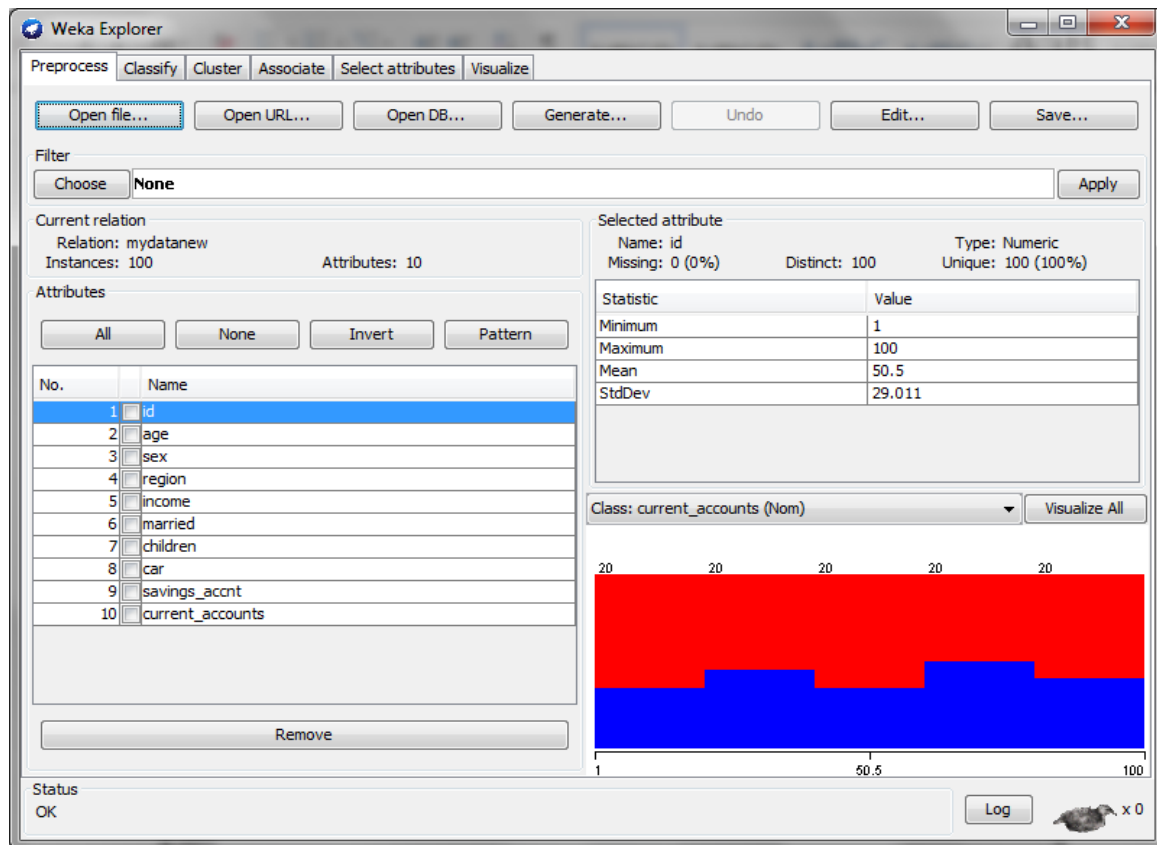
1. Open Weka 3.6 click on **Explorer**.



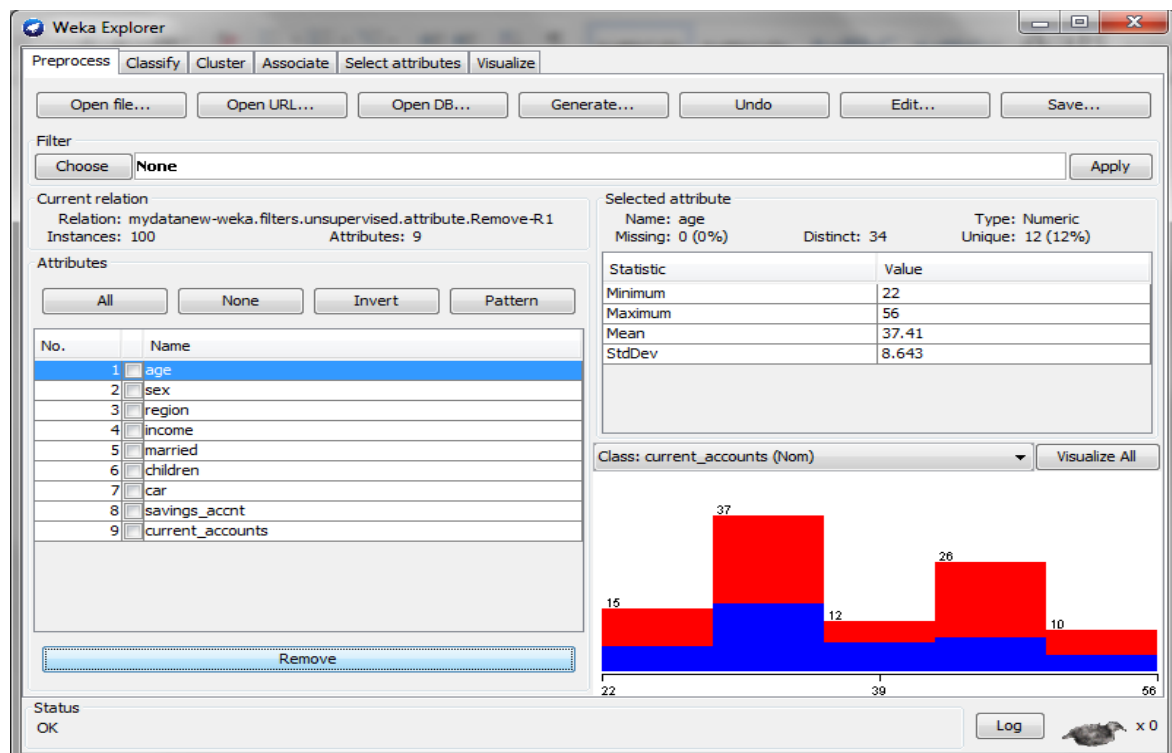
2. Once you get a “Weka Explorer” window click on “Open File” and select the **.csv** database file you want to preprocess.



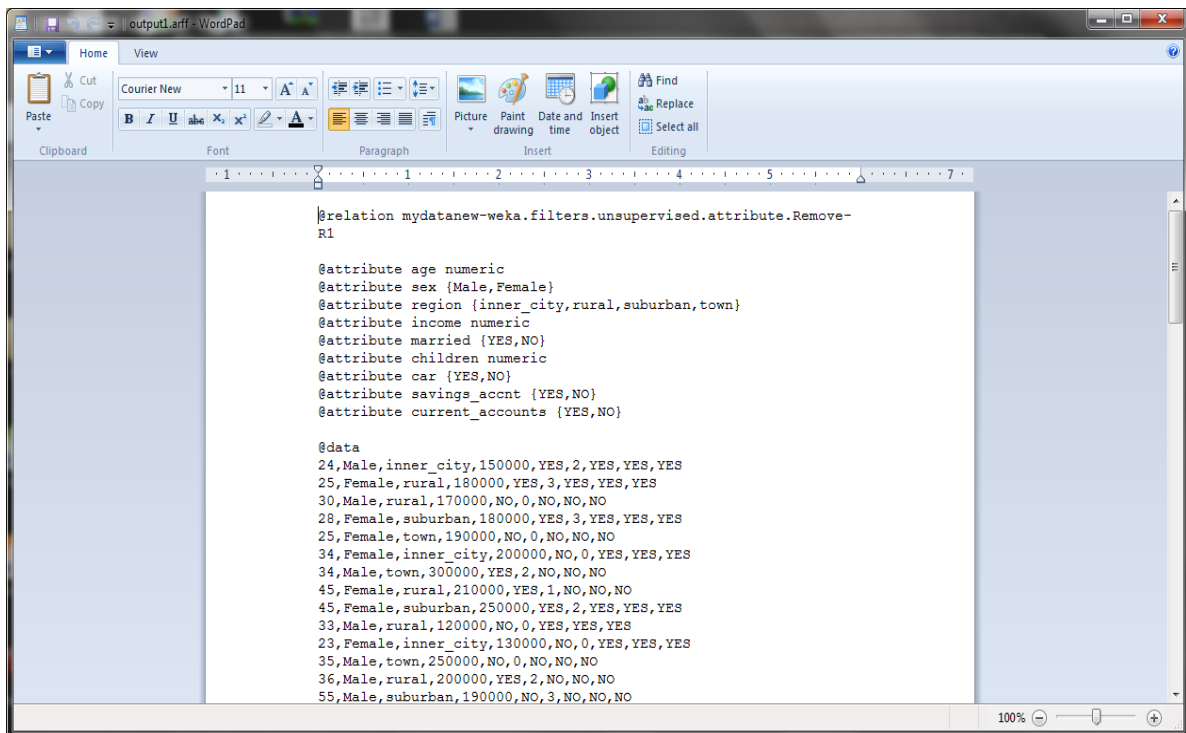
- After the database is loaded, WEKA will automatically detect the attributes and show the visualization of each one of them at the bottom right panel.



- Select the “id” attribute and click on “Remove” to remove the “id” attribute from the database. Now save the database.



5. Go to the newly saved database file and open it with wordpad.

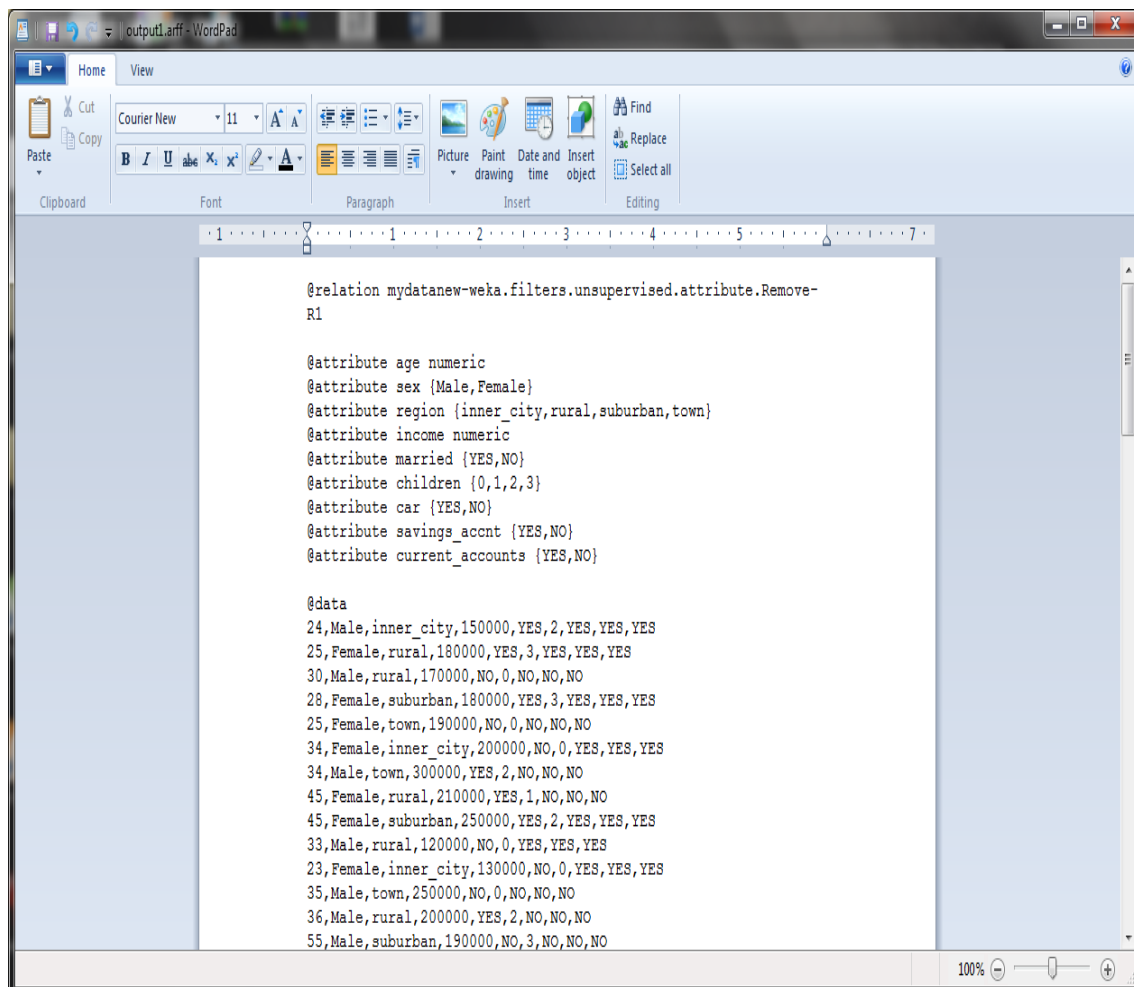


```
@relation mydatanew-weka.filters.unsupervised.attribute.Remove-
R1

@attribute age numeric
@attribute sex {Male,Female}
@attribute region {inner_city,rural,suburban,town}
@attribute income numeric
@attribute married {YES,NO}
@attribute children numeric
@attribute car {YES,NO}
@attribute savings_acct {YES,NO}
@attribute current_accounts {YES,NO}

@data
24,Male,inner_city,150000,YES,2,YES,YES,YES
25,Female,rural,180000,YES,3,YES,YES,YES
30,Male,rural,170000,NO,0,NO,NO,NO
28,Female,suburban,180000,YES,3,YES,YES,YES
25,Female,town,190000,NO,0,NO,NO,NO
34,Female,inner_city,200000,NO,0,YES,YES,YES
34,Male,town,300000,YES,2,NO,NO,NO
45,Female,rural,210000,YES,1,NO,NO,NO
45,Female,suburban,250000,YES,2,YES,YES,YES
33,Male,rural,120000,NO,0,YES,YES,YES
23,Female,inner_city,130000,NO,0,YES,YES,YES
35,Male,town,250000,NO,0,NO,NO,NO
36,Male,rural,200000,YES,2,NO,NO,NO
55,Male,suburban,190000,NO,3,NO,NO,NO
```

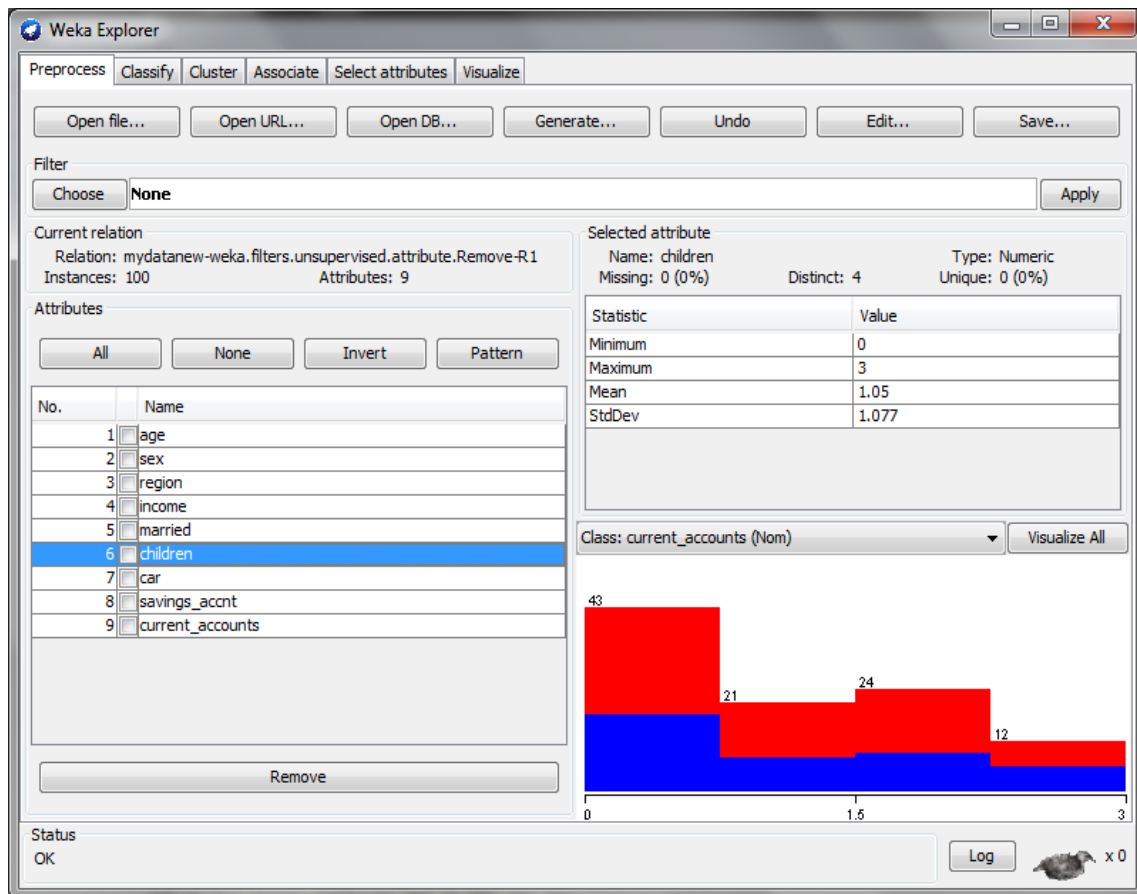
6. Change the attribute value of “children” from “numeric” to {0,1,2,3} and save the file.



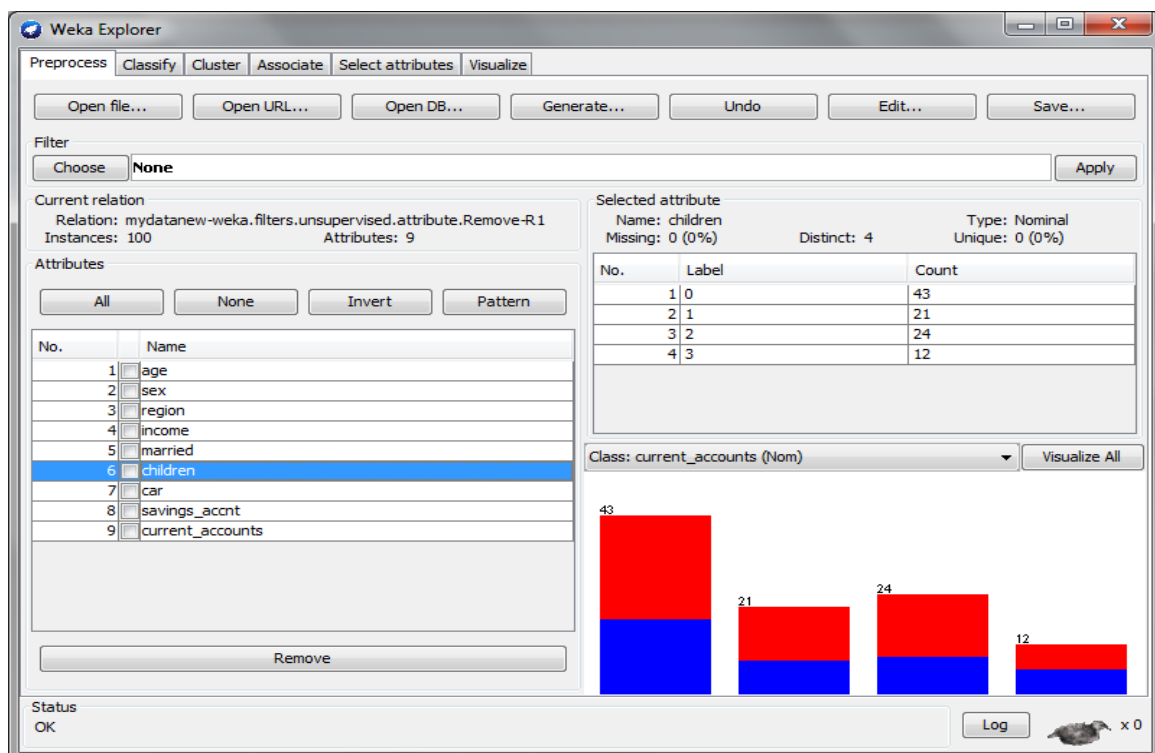
```
@relation mydatanew-weka.filters.unsupervised.attribute.Remove-
R1

@attribute age numeric
@attribute sex {Male,Female}
@attribute region {inner_city,rural,suburban,town}
@attribute income numeric
@attribute married {YES,NO}
@attribute children {0,1,2,3}
@attribute car {YES,NO}
@attribute savings_acct {YES,NO}
@attribute current_accounts {YES,NO}

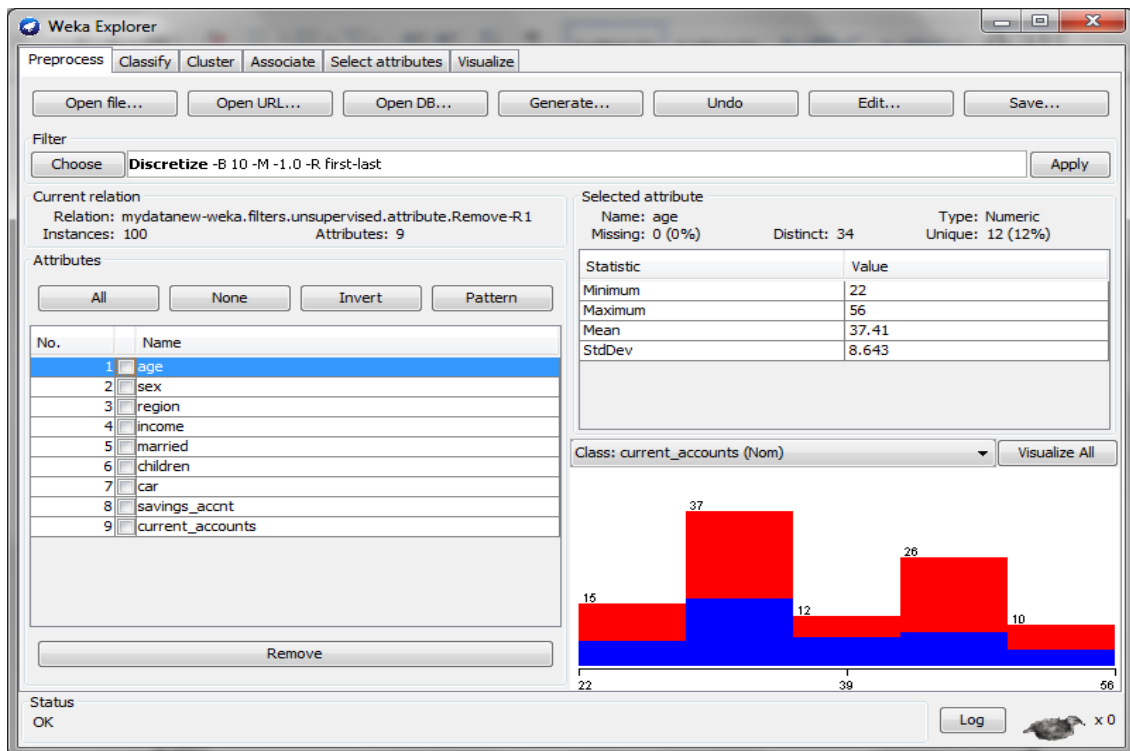
@data
24,Male,inner_city,150000,YES,2,YES,YES,YES
25,Female,rural,180000,YES,3,YES,YES,YES
30,Male,rural,170000,NO,0,NO,NO,NO
28,Female,suburban,180000,YES,3,YES,YES,YES
25,Female,town,190000,NO,0,NO,NO,NO
34,Female,inner_city,200000,NO,0,YES,YES,YES
34,Male,town,300000,YES,2,NO,NO,NO
45,Female,rural,210000,YES,1,NO,NO,NO
45,Female,suburban,250000,YES,2,YES,YES,YES
33,Male,rural,120000,NO,0,YES,YES,YES
23,Female,inner_city,130000,NO,0,YES,YES,YES
35,Male,town,250000,NO,0,NO,NO,NO
36,Male,rural,200000,YES,2,NO,NO,NO
55,Male,suburban,190000,NO,3,NO,NO,NO
```



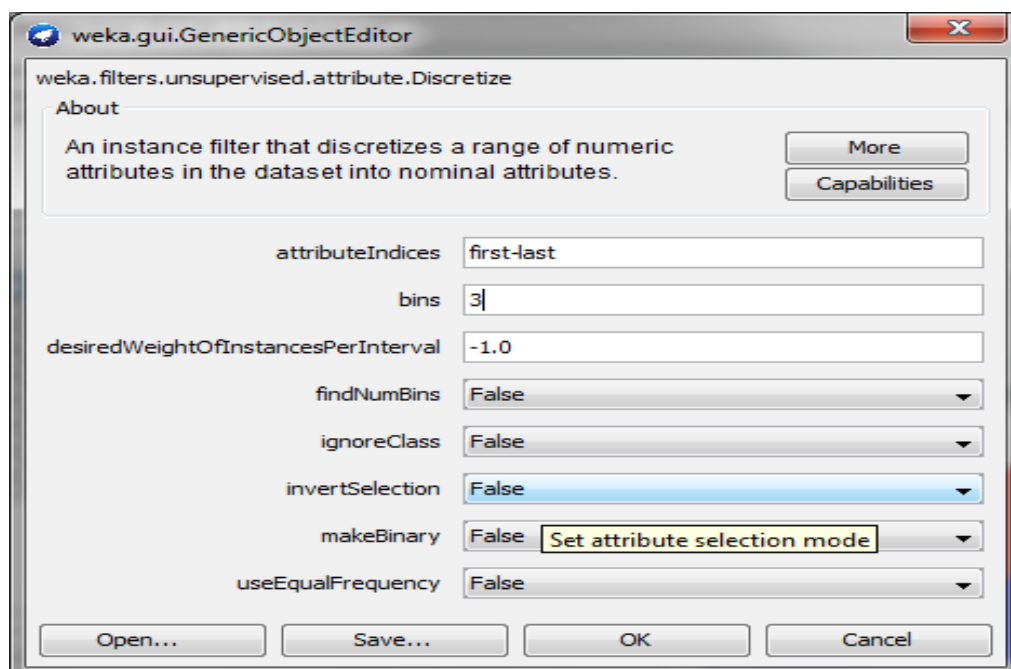
- Open the newly saved file in WEKA. The continuous values of the attribute “children” are now discrete, as we have clustered the data in 4 discrete clusters.

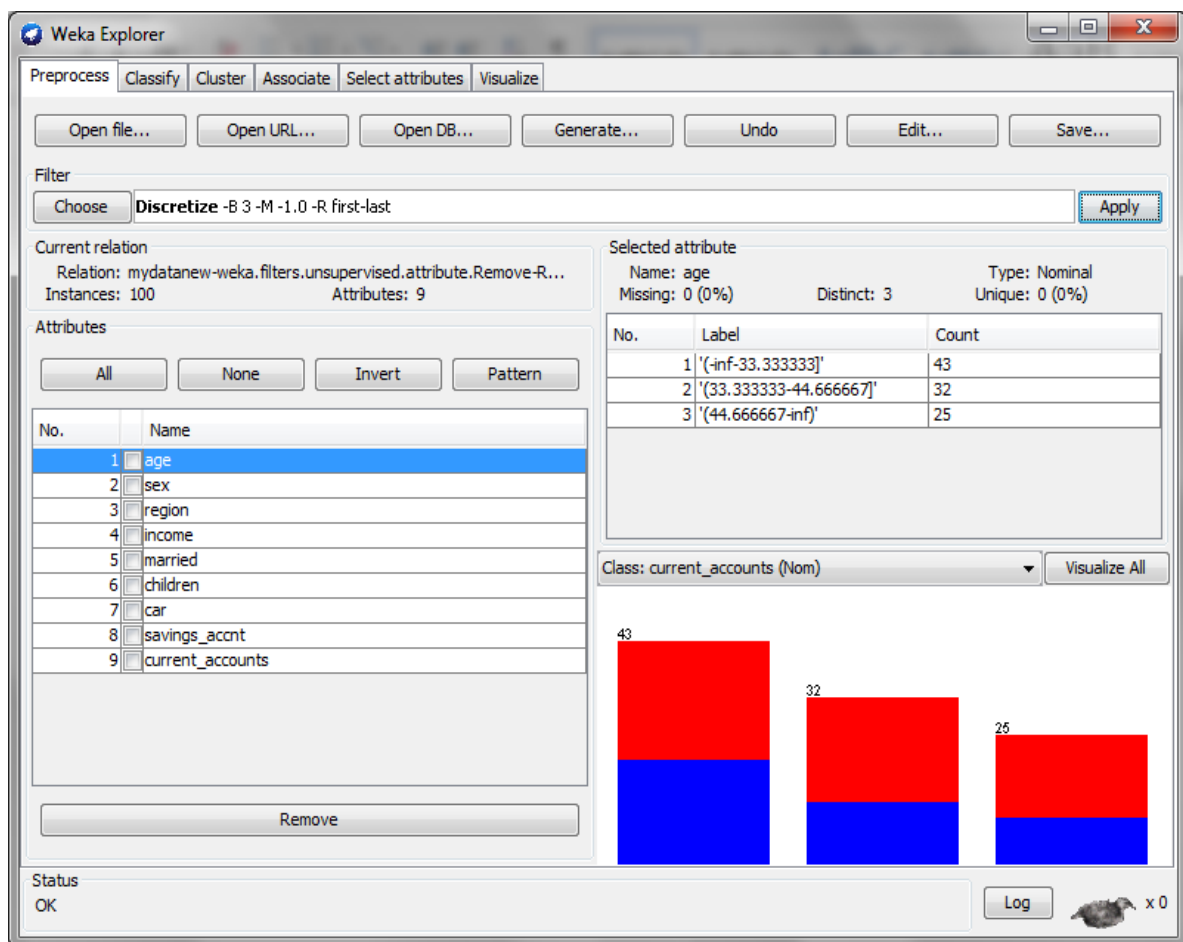


8. Select the “age” attribute, go to “Filter”-Choose-filters-unsupervised-attributes, Select Discretize.



9. Click on the Discretize Text-Box. In the **GenericObjectEditor** change the bins value to “3”, click on OK->**Apply** Button. In the visualization 3 clusters of “age” attribute is being created.





10. Open the database file with WordPad. Replace all the values of age attribute as shown in the figure below. Do the same for values of income attribute.

Replace

Find what: `\(-inf-33.333333\]` Find Next

Replace with: `0_34` Replace

☐ Match whole word only Replace All

☐ Match case Cancel

Replace

Find what: `\(33.333333-44.666667\]` Find Next

Replace with: `34_45` Replace

☐ Match whole word only Replace All

☐ Match case Cancel

Replace

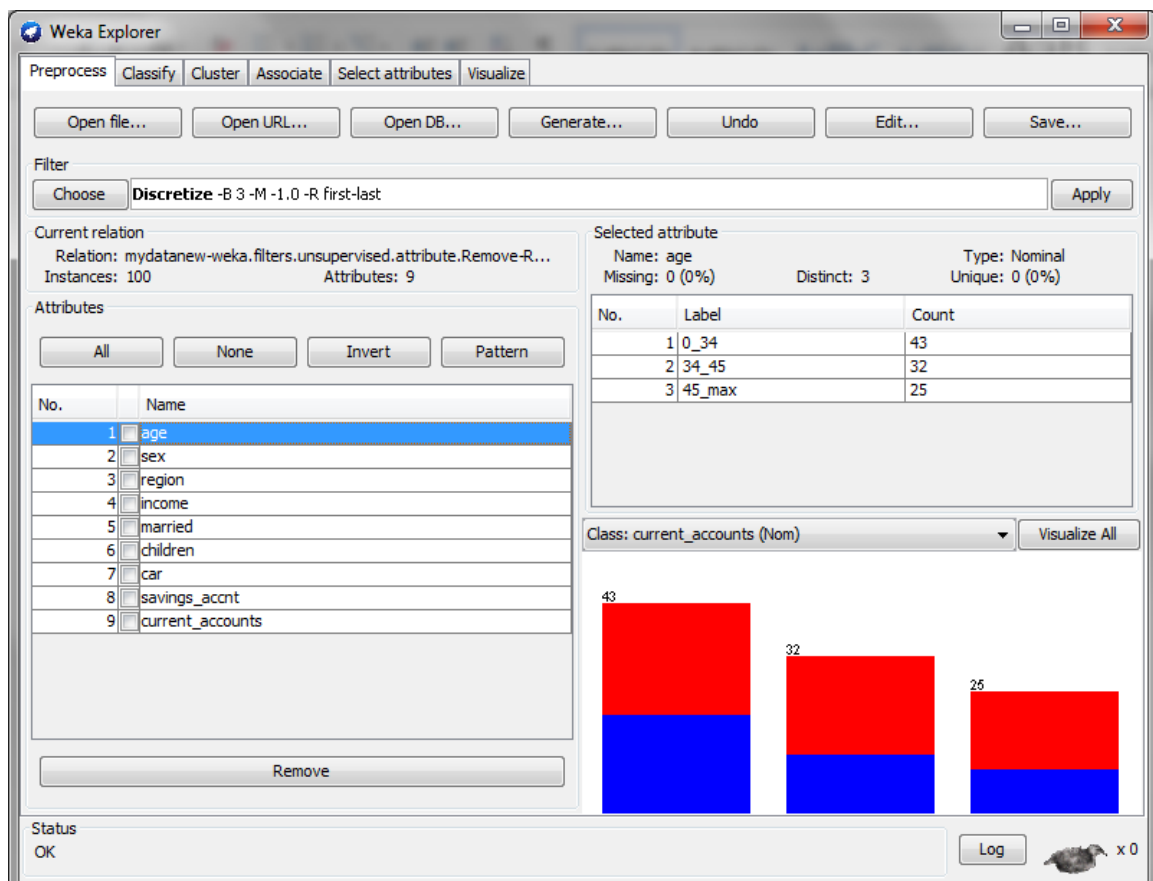
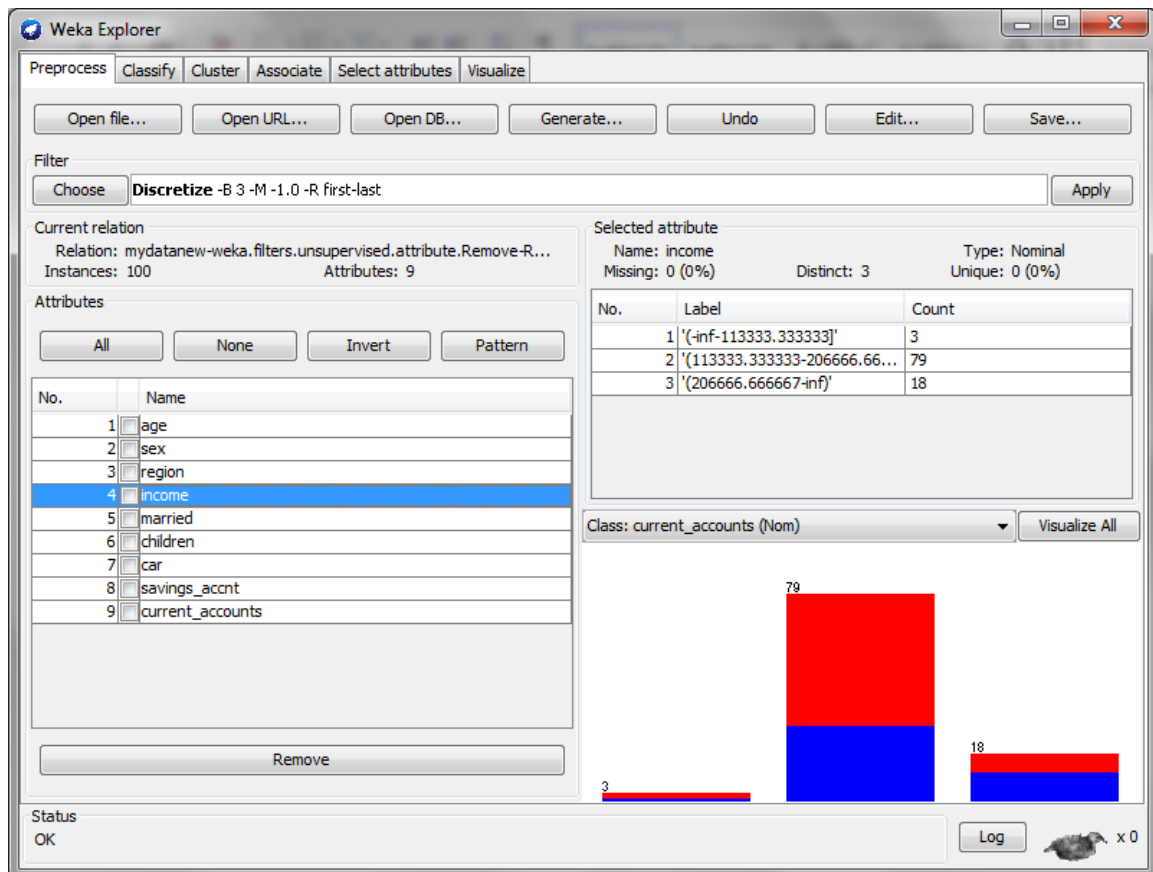
Find what: `\(44.666667-inf\]` Find Next

Replace with: `45_max` Replace

☐ Match whole word only Replace All

☐ Match case Cancel

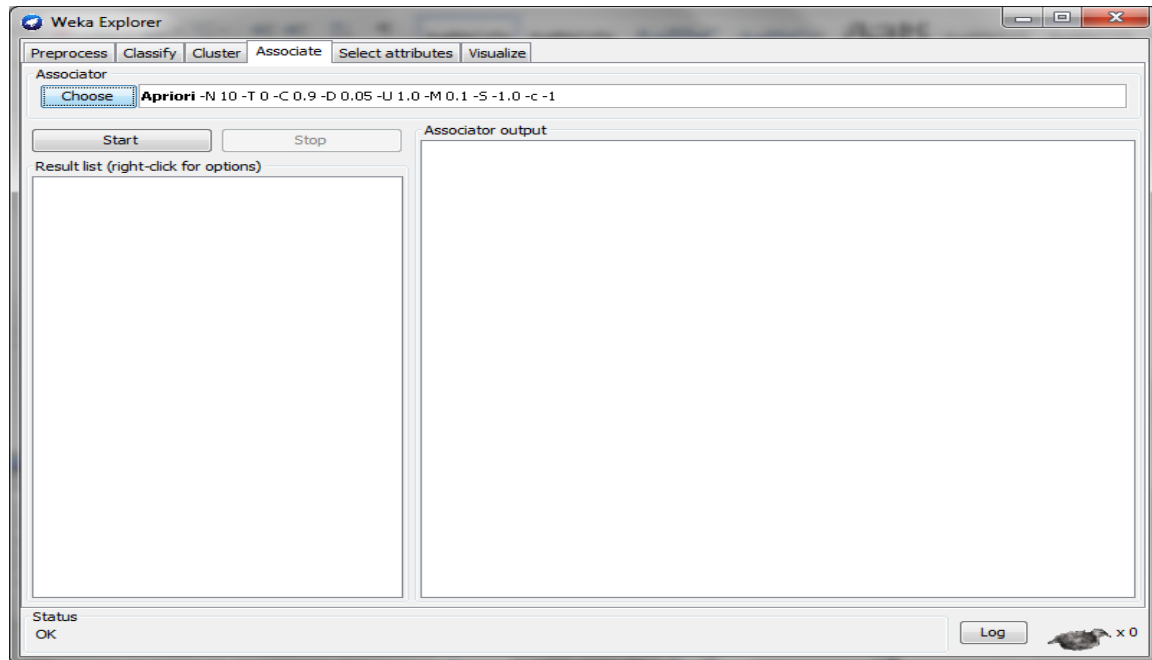
## 11. Check the final output.



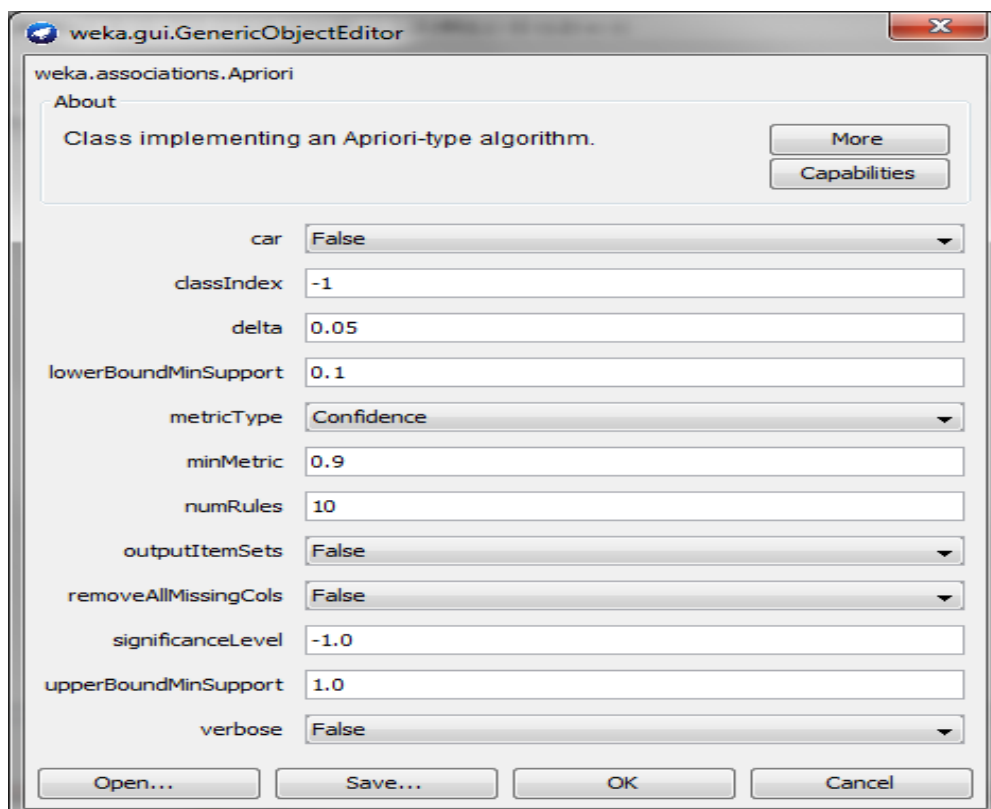
## Practical No. 10

**Aim :** Create association rules by considering suitable parameters.

1. Open Weka Explorer->GotoAssociate tab-> Choose **Apriori**.

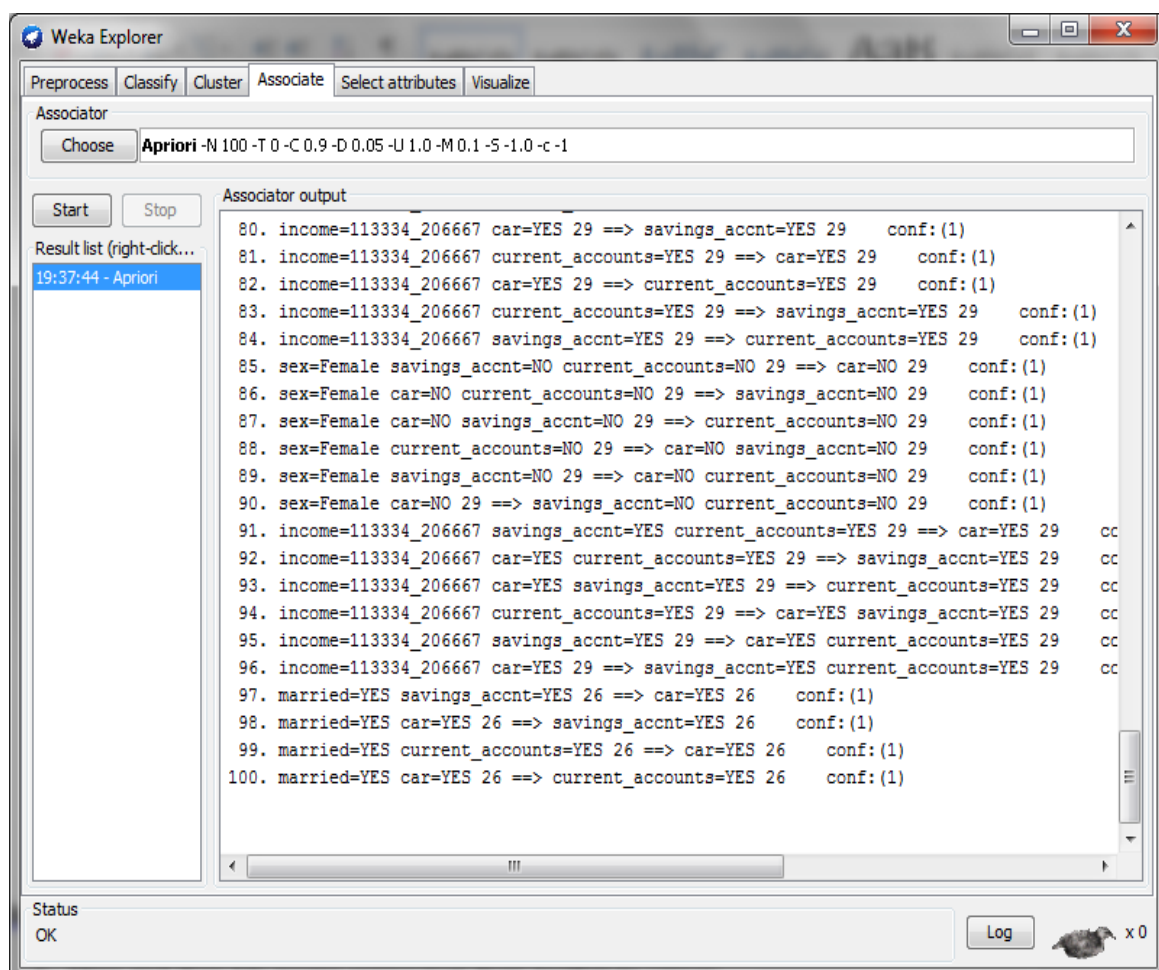
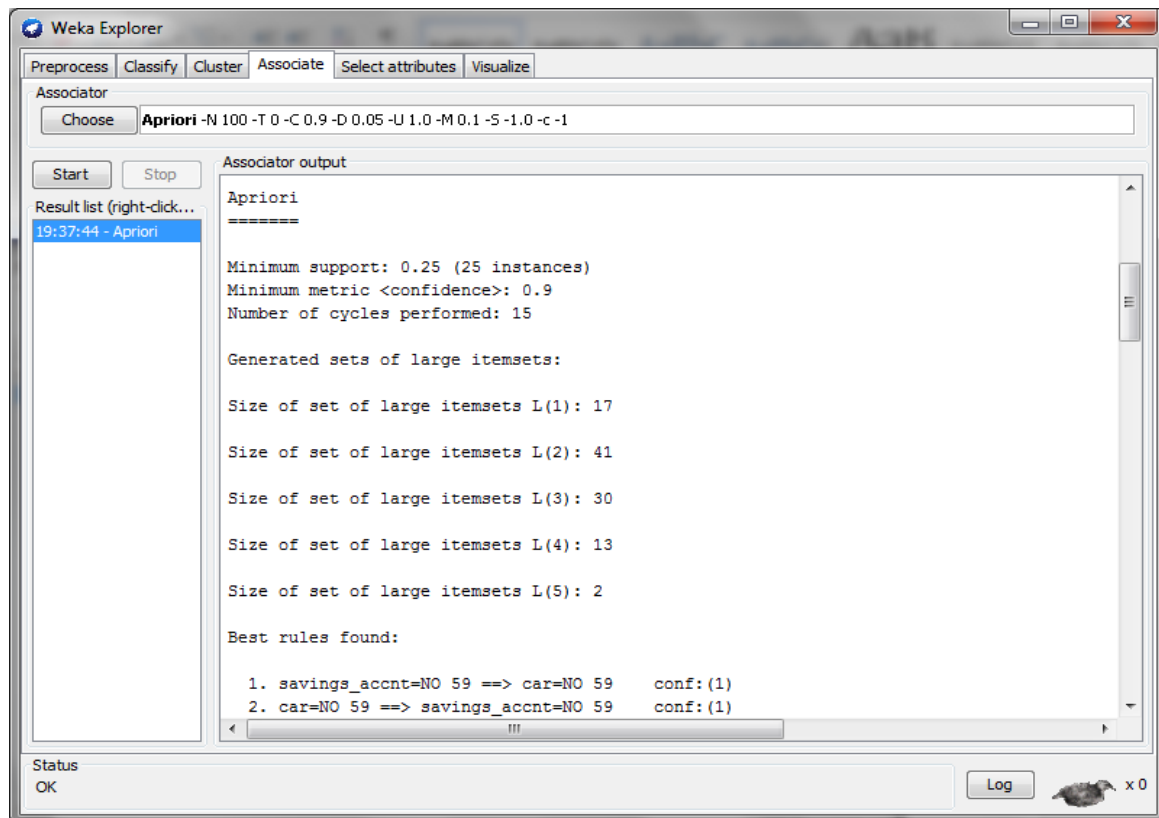


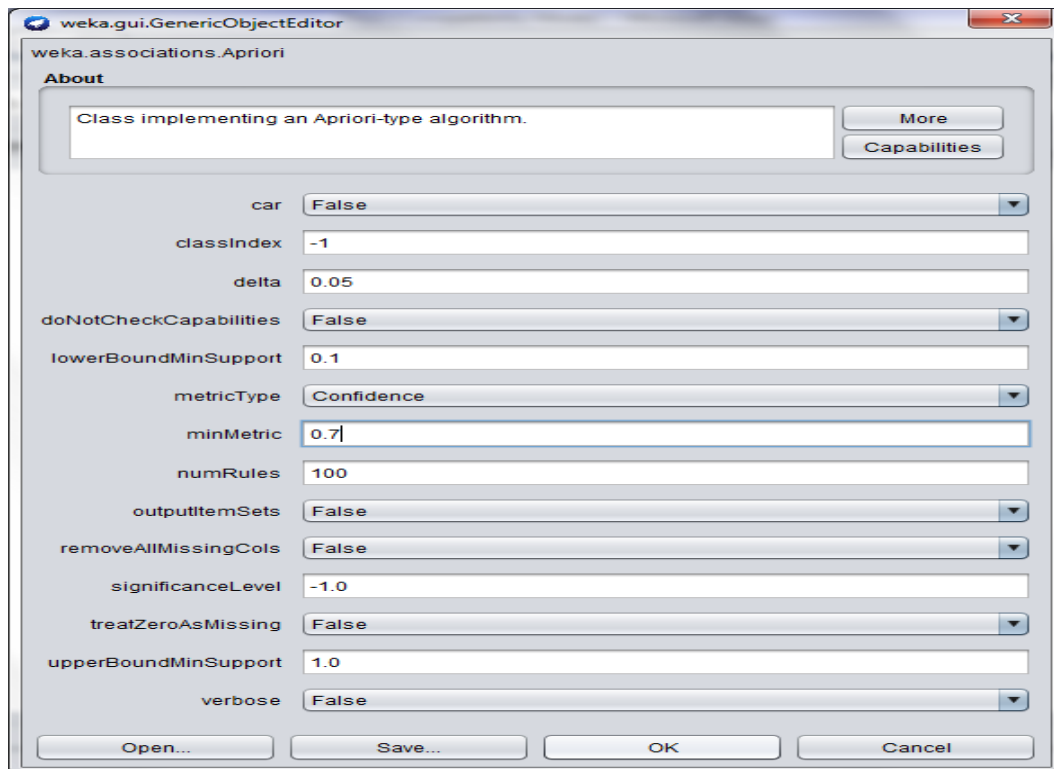
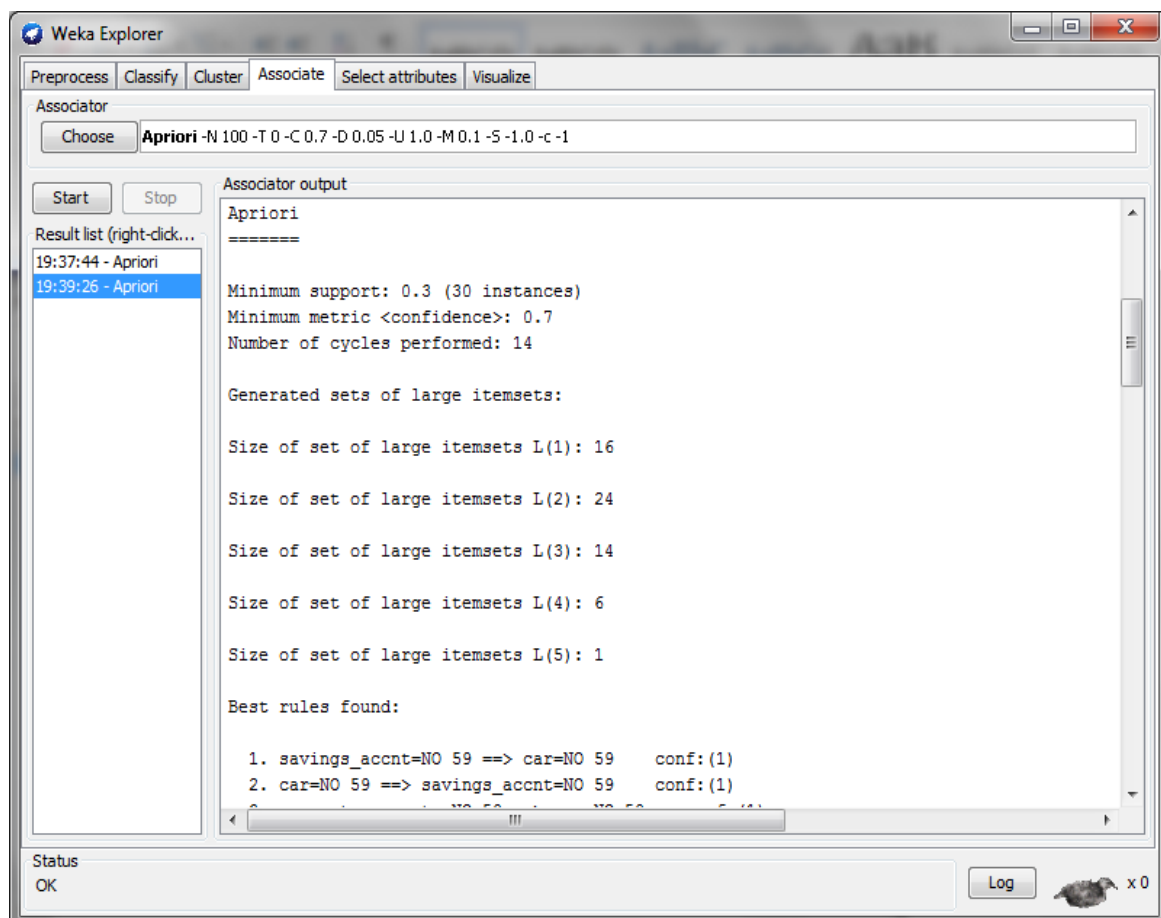
2. In the Generic-Object-Editor change the **numRules** value from **10** to **100**. Click on **Ok** -> Click **Start**.

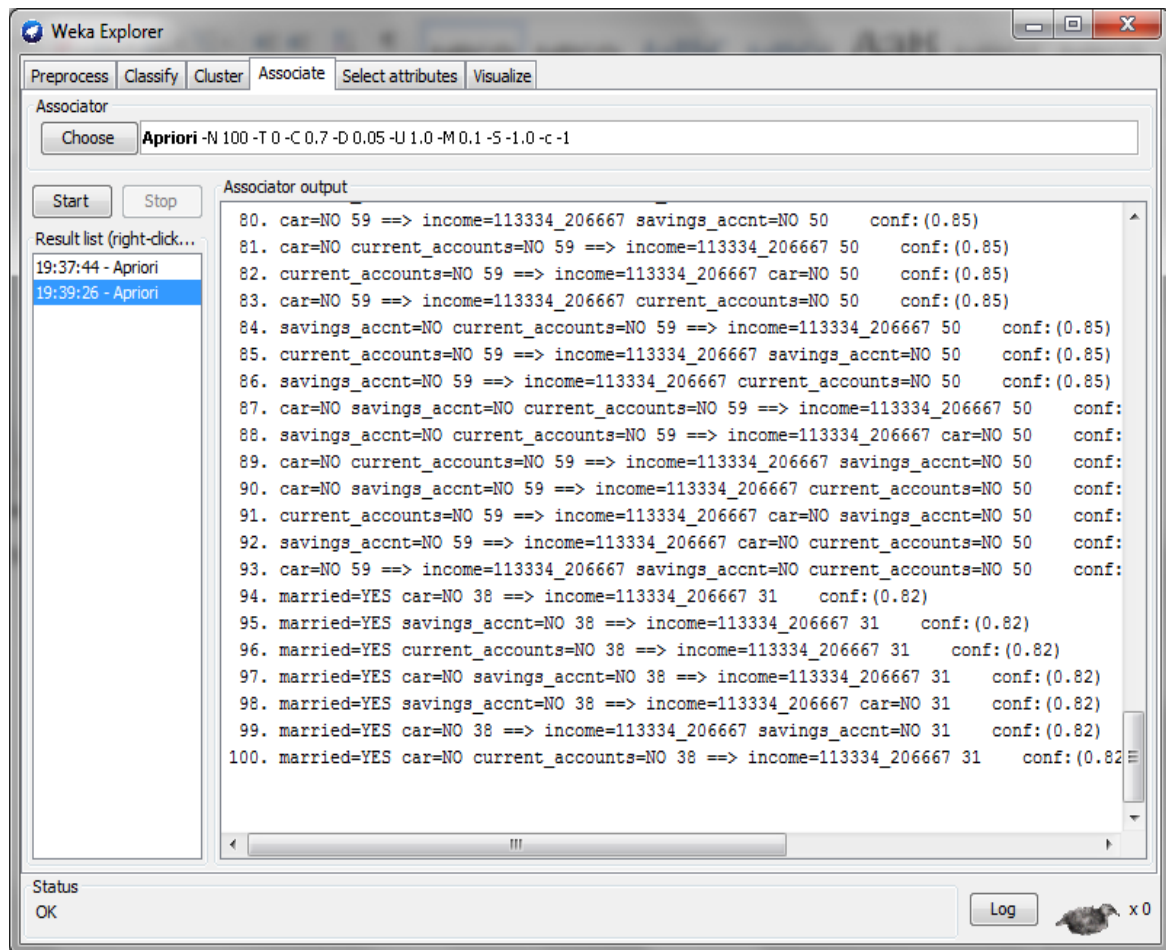




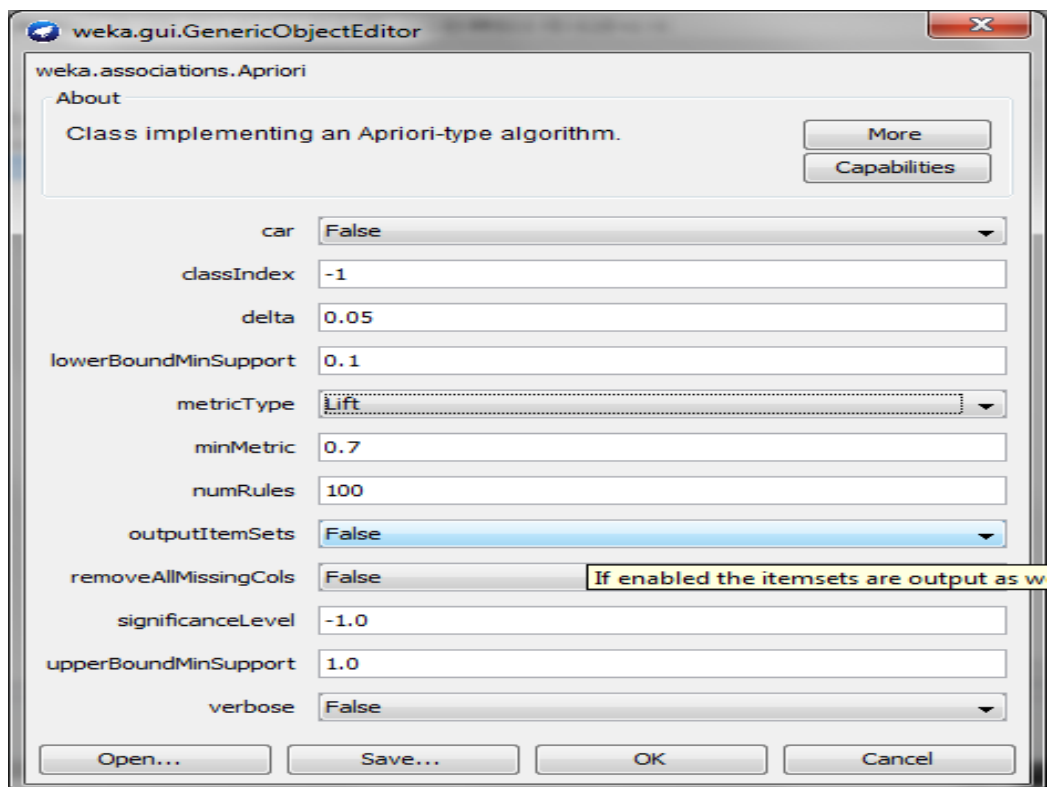
## 3. Output of rules generated with respect to Confidence.



4. Changing **minMetric** value from **0.9** to **0.7**.5. Output of rules generated with respect to **Confidence**.



6. Change the metricType to “Lift”.



7. Output of rules generated with respect to **Lift**.