BUSINESS INTELLIGENCE

&

BIG DATA ANALYTICS

INDEX

Practical No. 1

Aim : Create tables using different applications.

a. **Table :** Product

Category | Employee | Store | SaleFact | **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

b. **Table :** Category

Category | Employee | S

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

c. **Table :** Employee

Employee

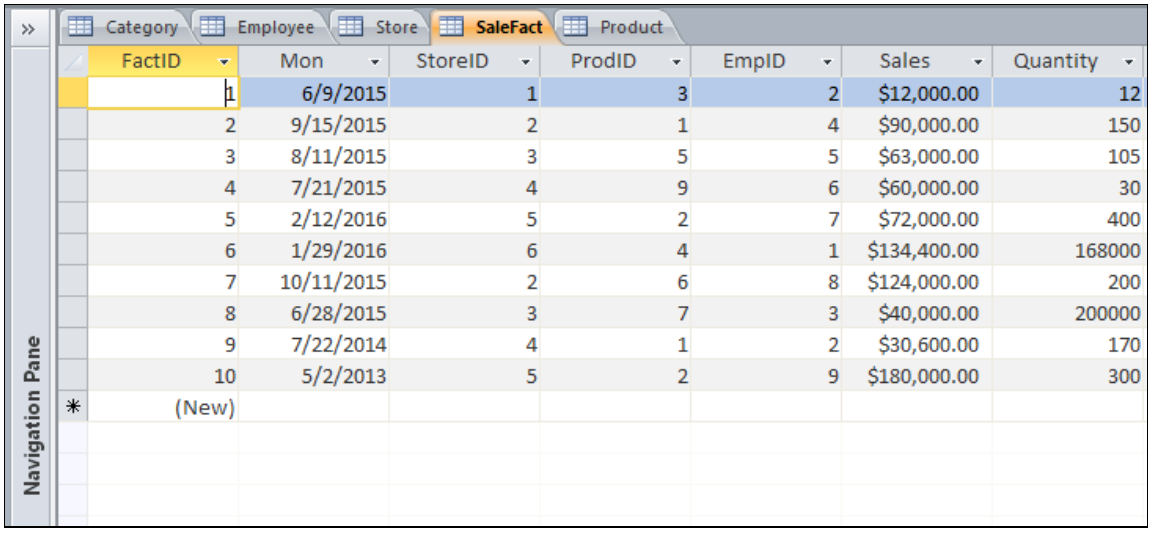
EmpID	Ename	ManagerID	Click to Add
1	John	67	
2	Steve	289	
3	Adam	113	
4	Andrew	54	
5	Peter	92	
6	Stuart	532	
7	Mathew	190	
8	Chris	12	
9	Billy	112	
10	Chuck	201	
11	Mike	234	
(New)			

d. **Table :** Store

Category | Employee | **Store** | SaleFact | Product

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 | SaleFact | 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

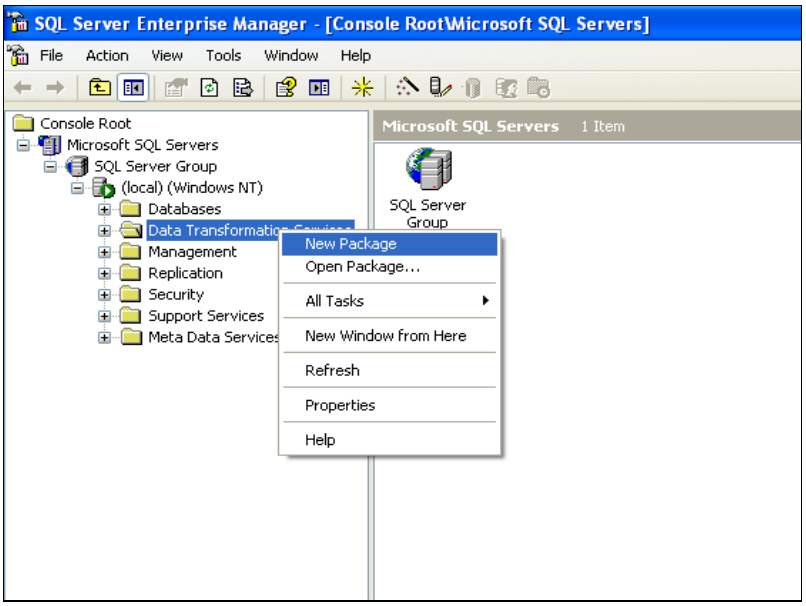
Aim : Develop an application to design a warehouse by importing various tables from external sources.

Step 1:- To create a DTS Package.

a. Click on start -> SQL server-> Enterprise Manager.

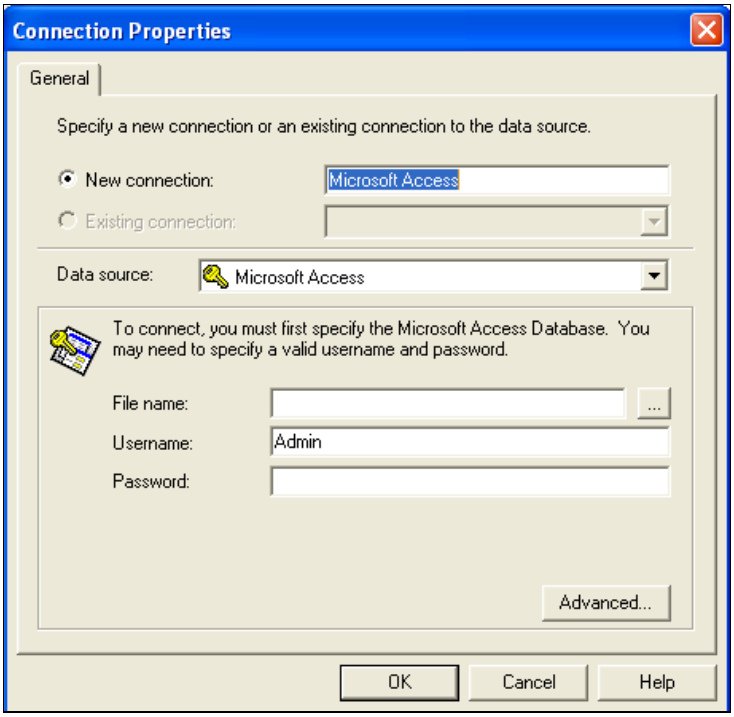
b. Expand MS SQL server

c. Right click on **DTS** and select **NewPackage**, it will open editor to create new DTS Package.

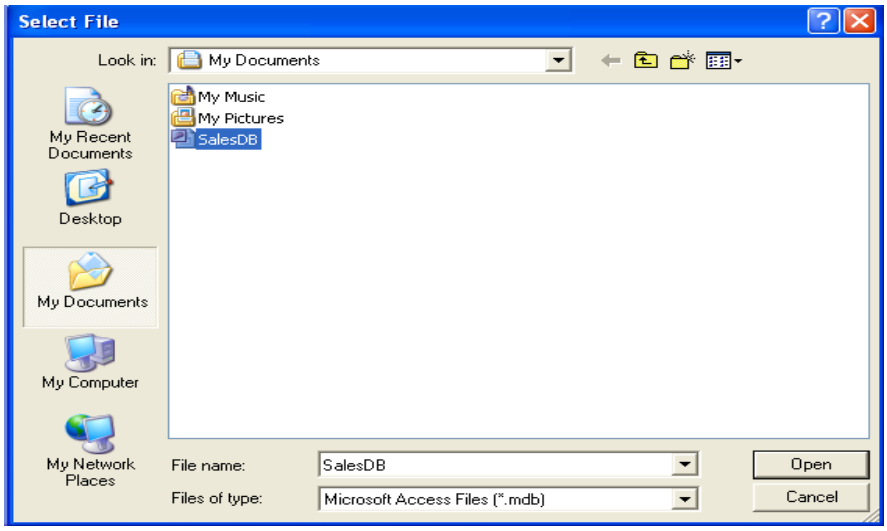


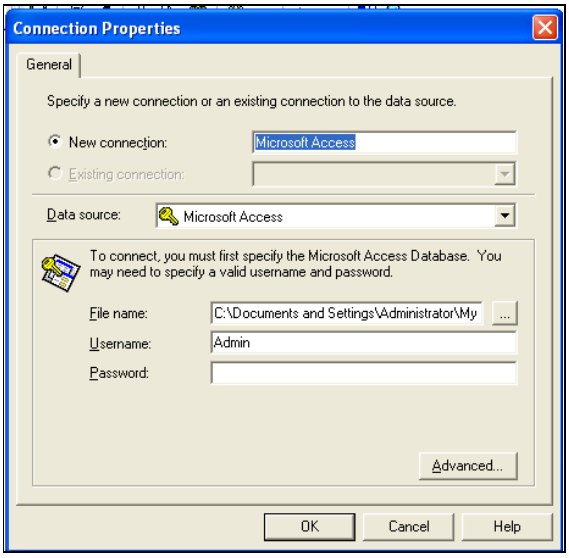
Step 2:- Design DTS Package.

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

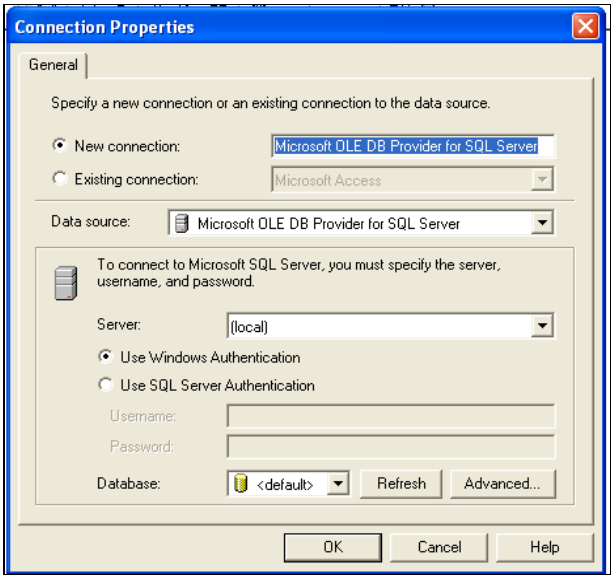


b. Browse the source file i.e. SalesDB.mdb-> Click **ok**.

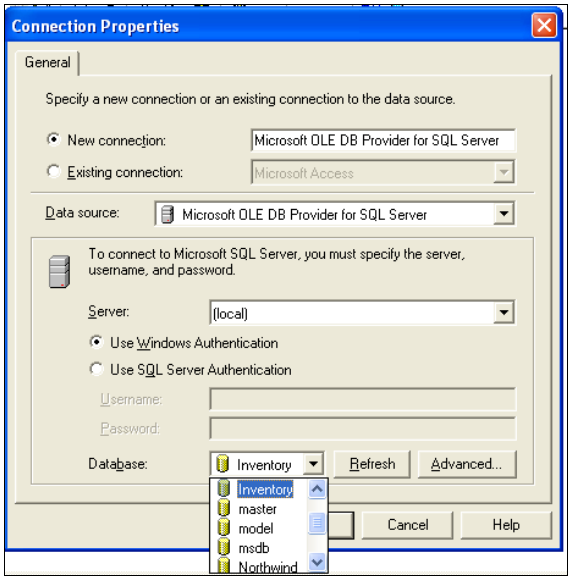




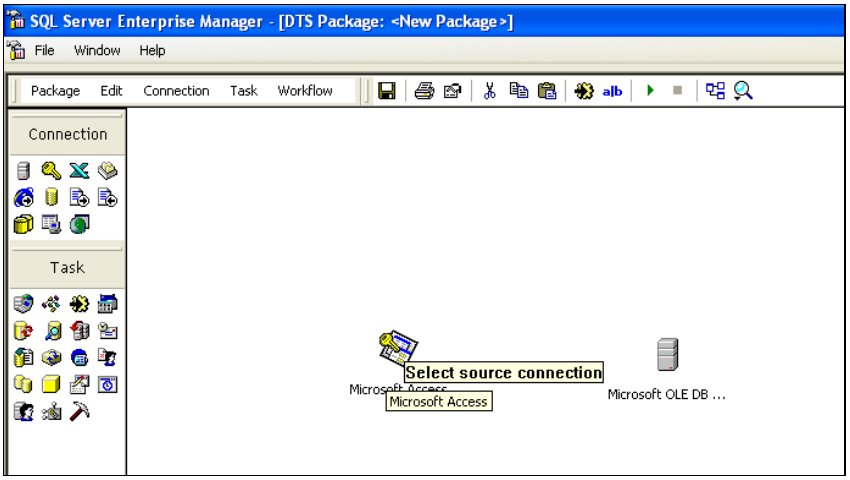
c. Drag and drop **MS OLEDB** from toolbar to canvas.

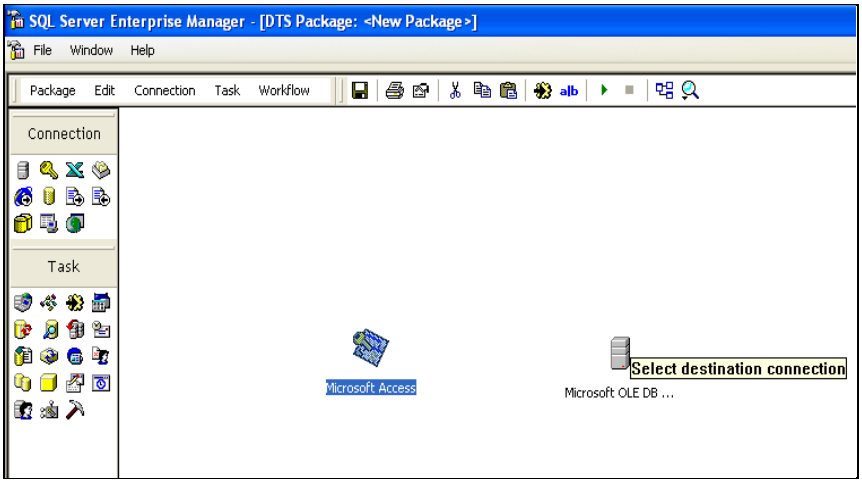


d. Select destination DB (if required create new DB)



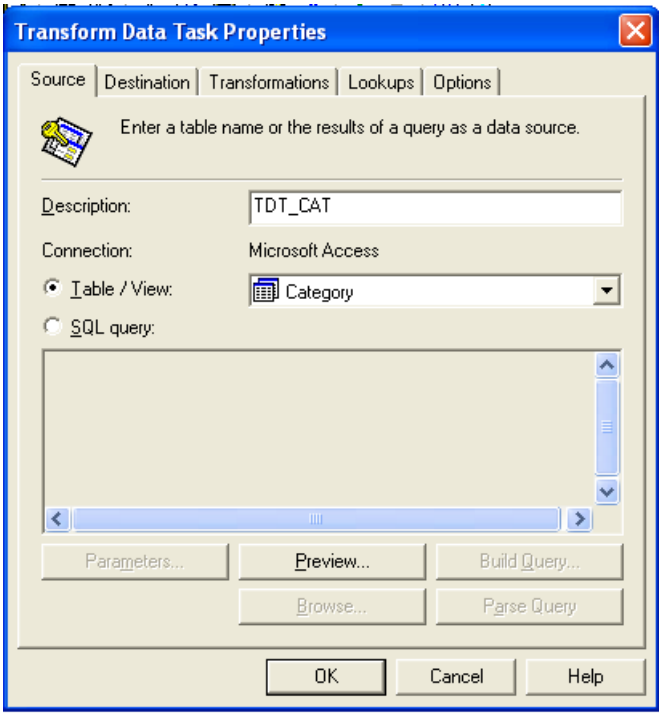
e. To transform data from source to target.->Select **Transform data task** from toolbar and specify Source connection & Destination connection.



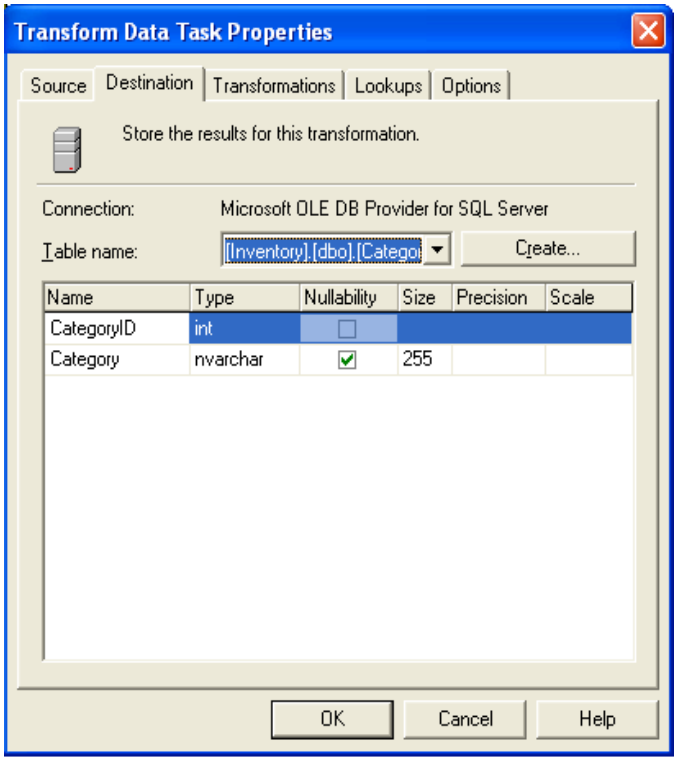


Step 3 : Right click on **transform data task** and select **Properties**->Rename data transformations task and specify description (if required).

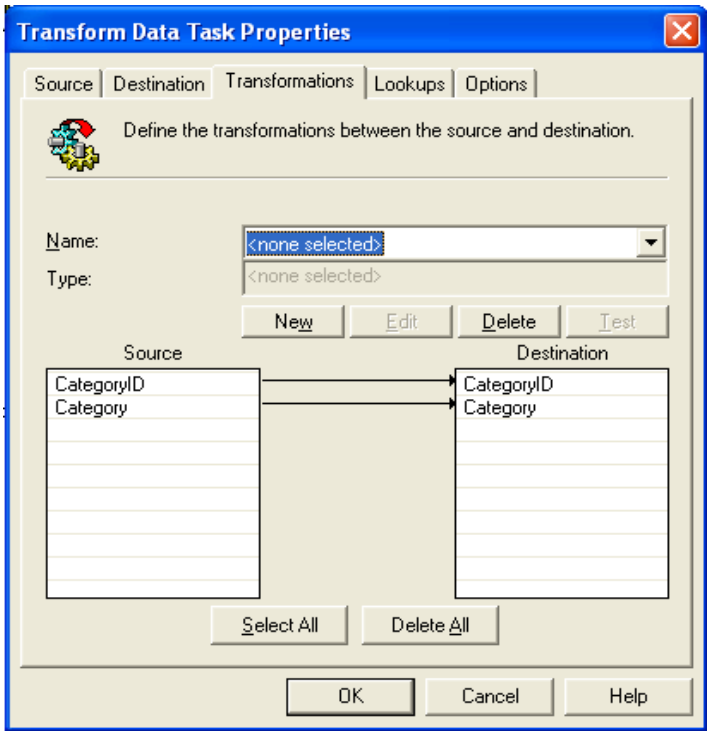
a. In tables and views, select source table.



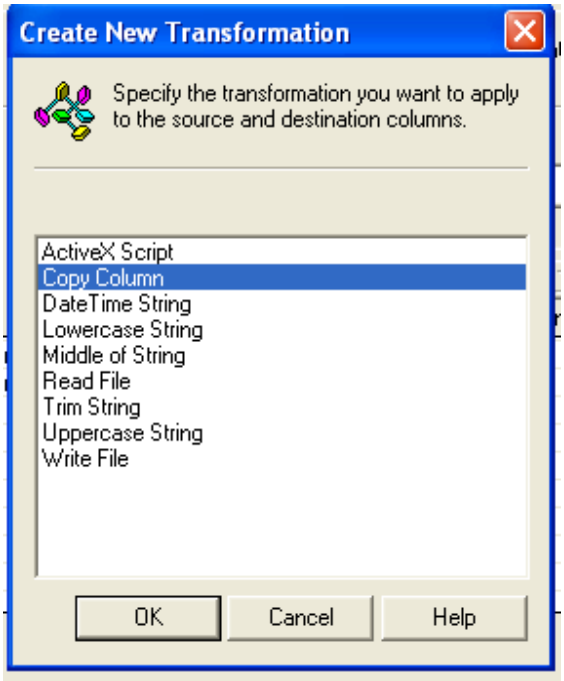
b. Click on **destination** tab-> specify destination table from drop-down (if it does not exist then create table). It will generate script for destination table.



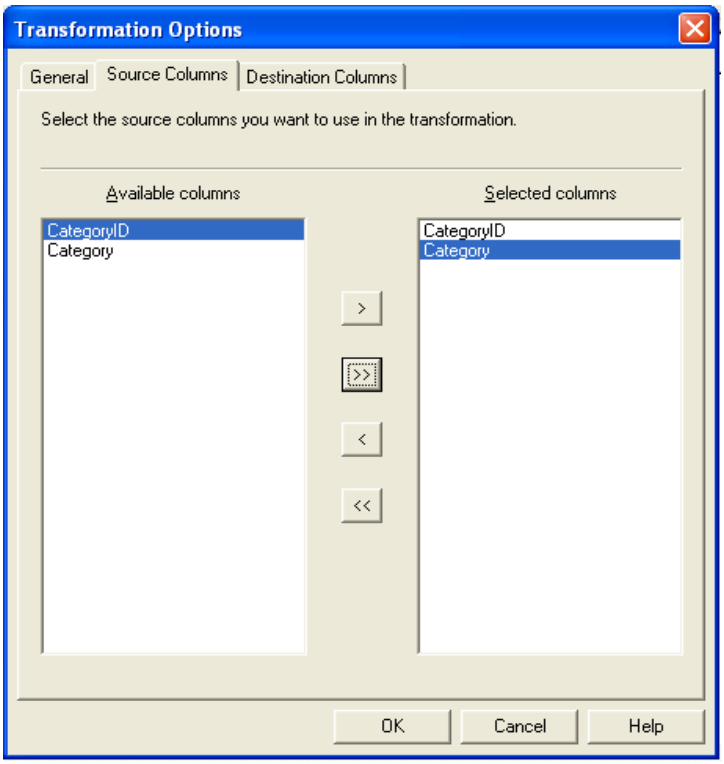
c. Click on **transformation** tab and delete all the existing default transformations.



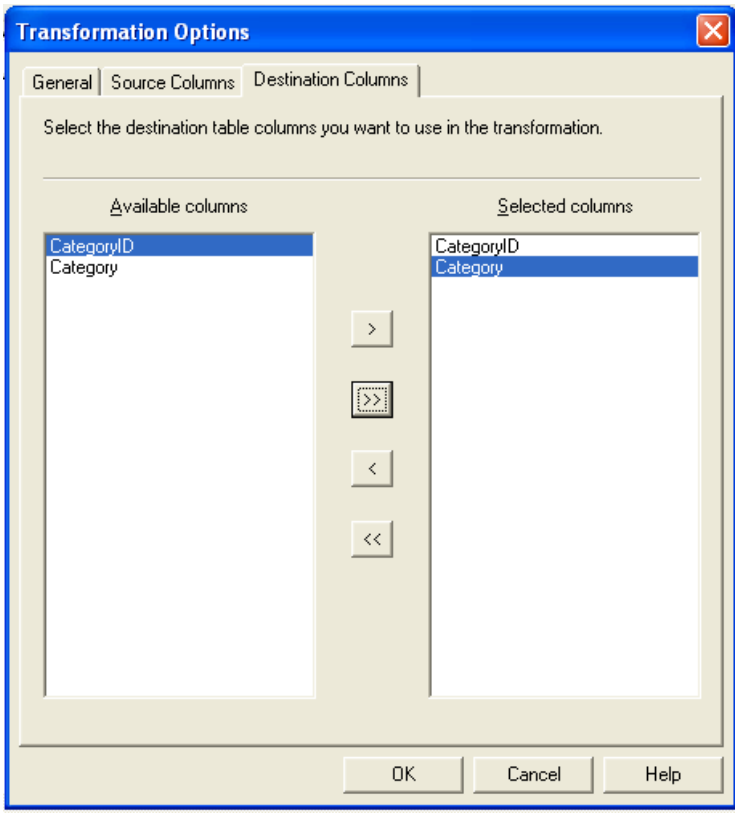
d. Click on **new** button to create new transformation->Specify transformation task as **copy columns**. It willopen a window to map source & destination columns.



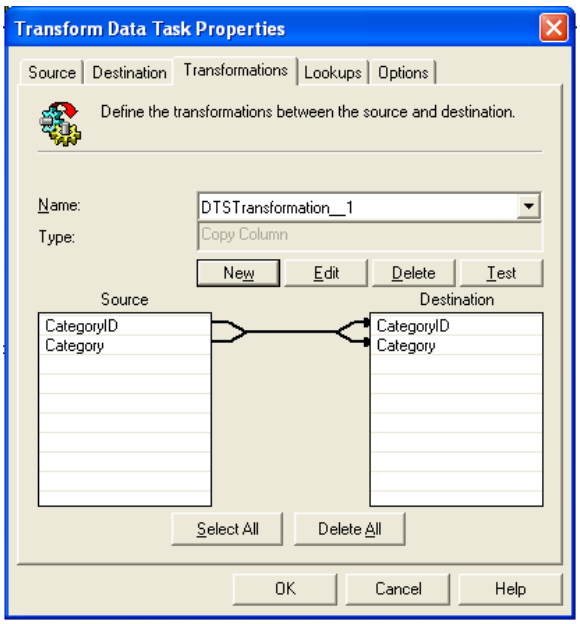
e. Specify source columns->Select all columns of source by clicking on '>>'



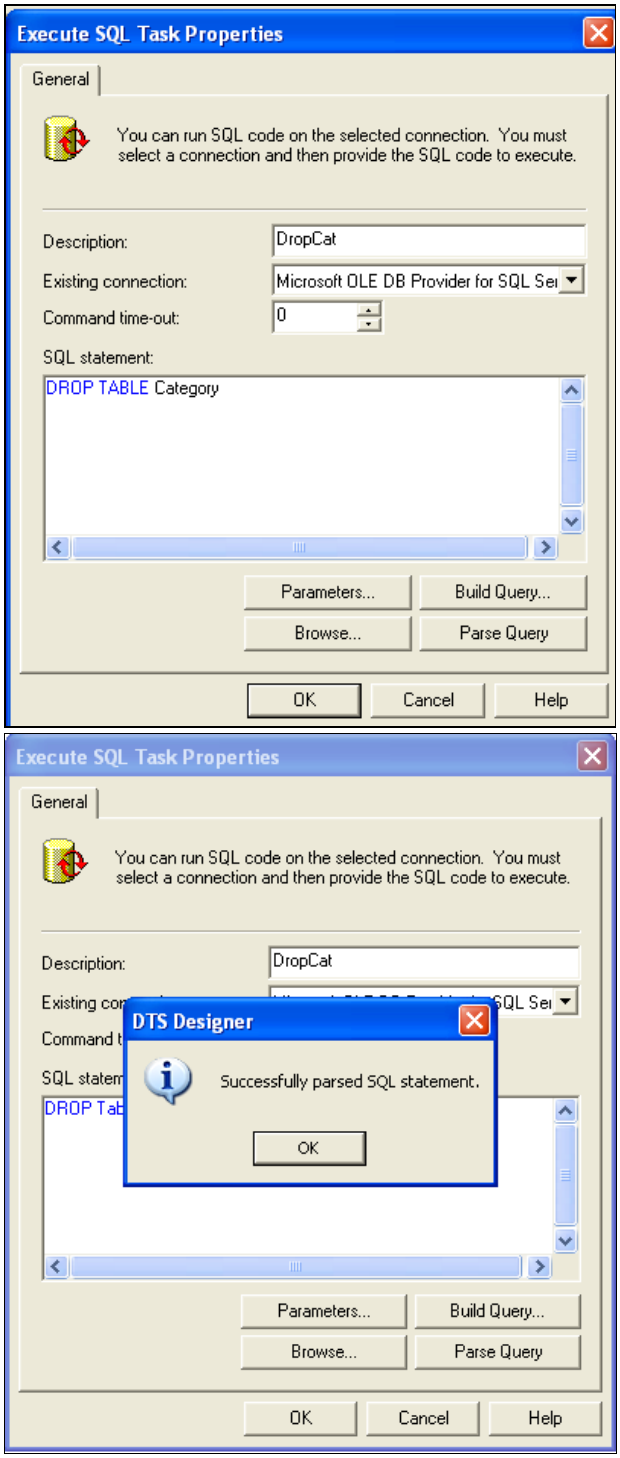
f. Click on destination tab select all columns by clicking on '>>' . -> It will show mapping of Source and destination.

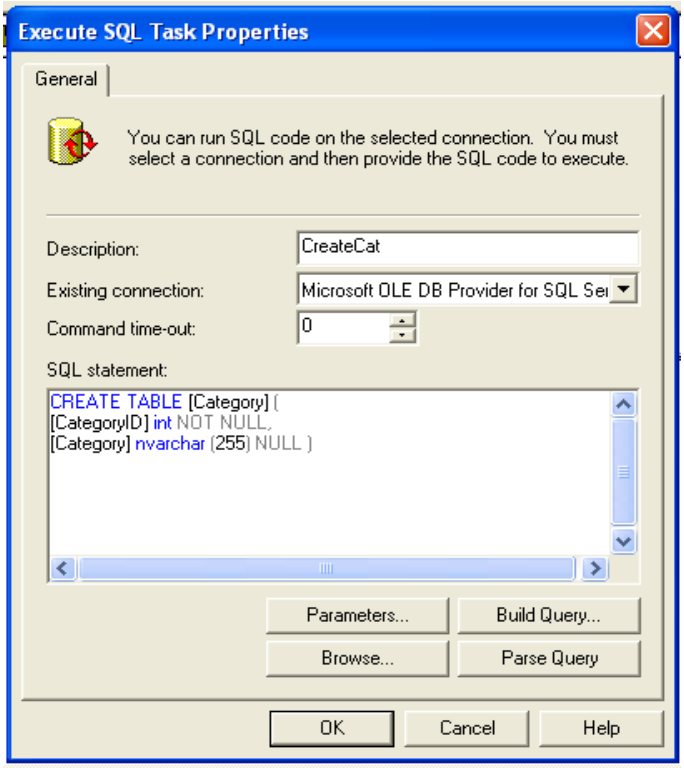


g. Then click **ok**.

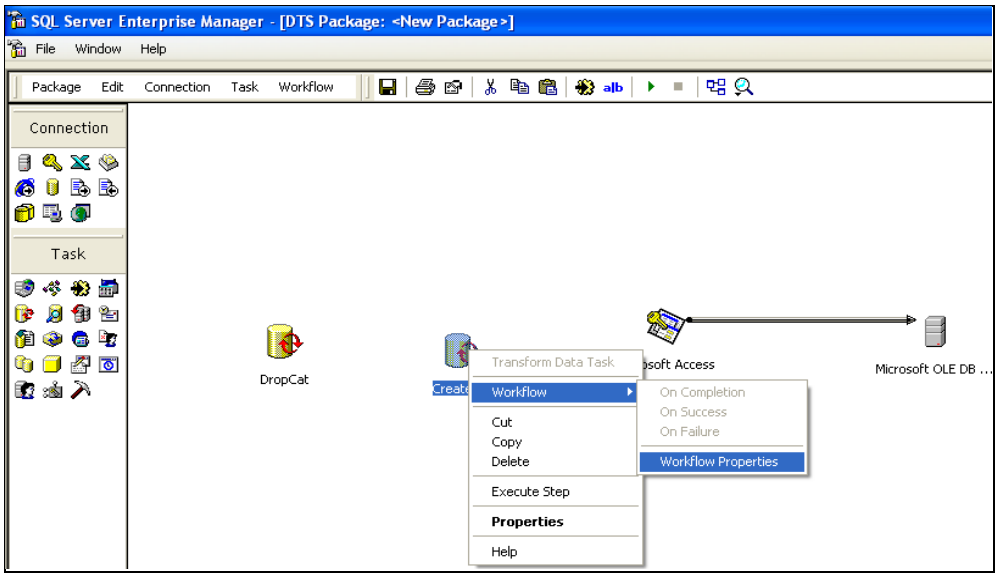


h. Drag & drop **Execute SQL task** from toolbar to canvas -> then provide Description/Name. ->After that write a SQL query and Parse query.

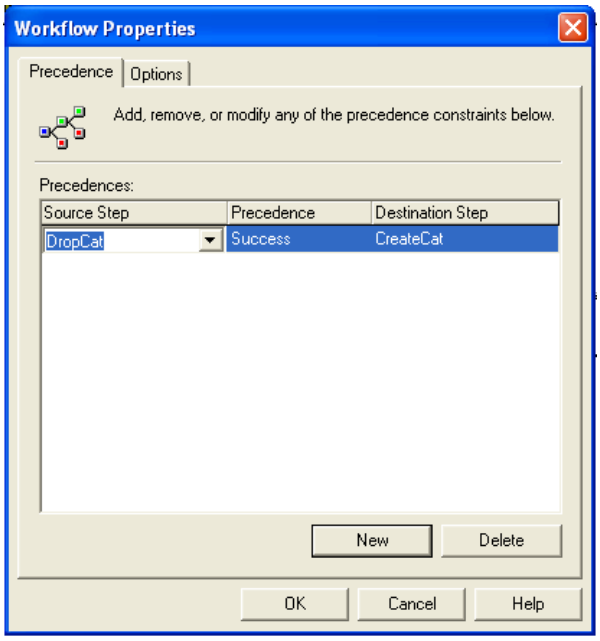

Execute SQL Task Properties
General
You can run SQL code on the selected connection. You must select a connection and then provide the SQL code to execute.
Description:
DropCat
Existing connection:
Microsoft OLE DB Provider for SQL Ser
Command time-out:
0
SQL statement:
DROP TABLE Category
Parameters...
Build Query...
Browse...
Parse Query
OK
Cancel
Help
Execute SQL Task Properties
General
You can run SQL code on the selected connection. You must select a connection and then provide the SQL code to execute.
Description:
DropCat
DTS Designer
Successfully parsed SQL statement.
OK
Parameters...
Build Query...
Browse...
Parse Query
OK
Cancel
Help



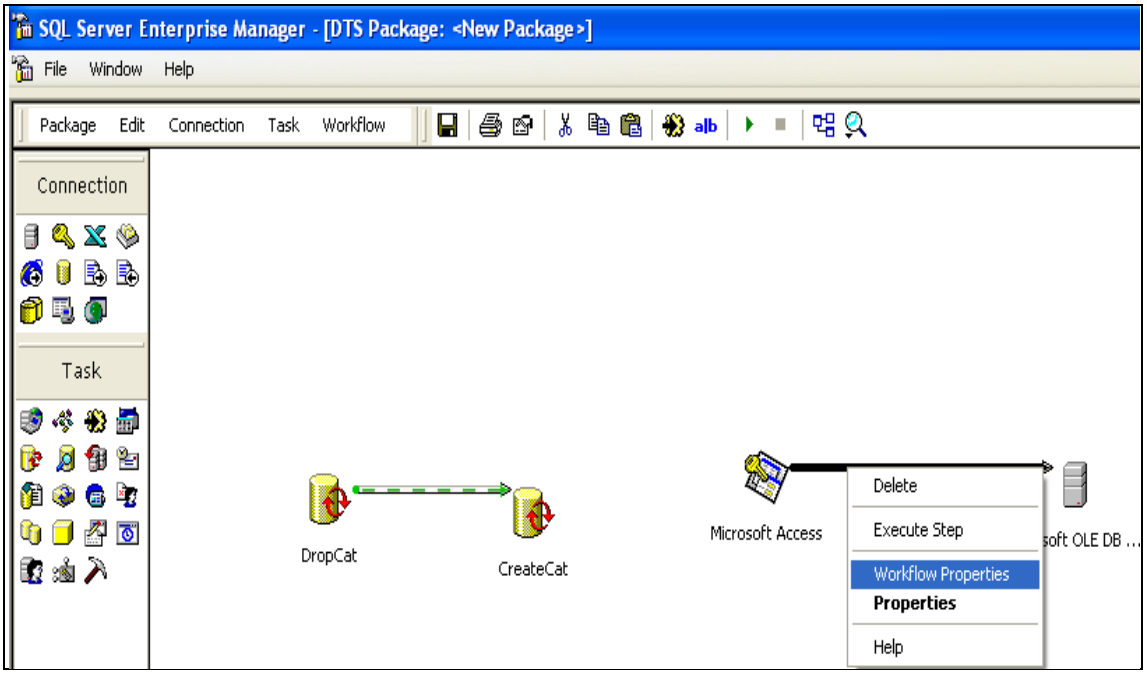
i. Right click on **Execute SQL Task** and select **Workflow-> Workflow Properties**.



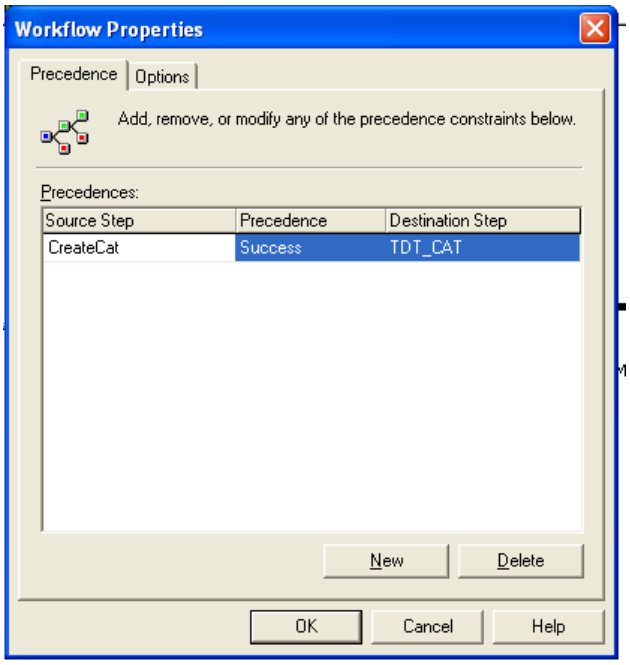
j. It will Open a window, in **Precedence** tab click on **Source Step** column select appropriate name from Drop down list & Click **Ok**.

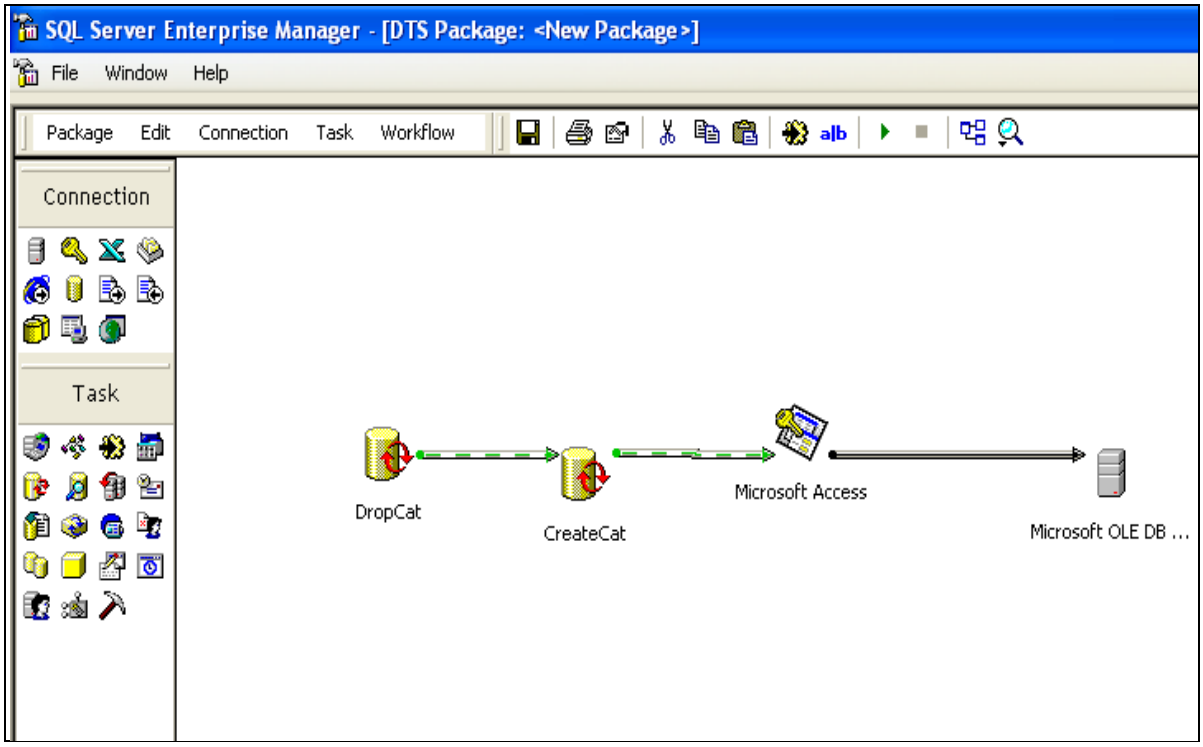


k. Right click on **Transform Data Task**that connects MS Access Database to MS OLE DB -> select **Workflow Properties**.

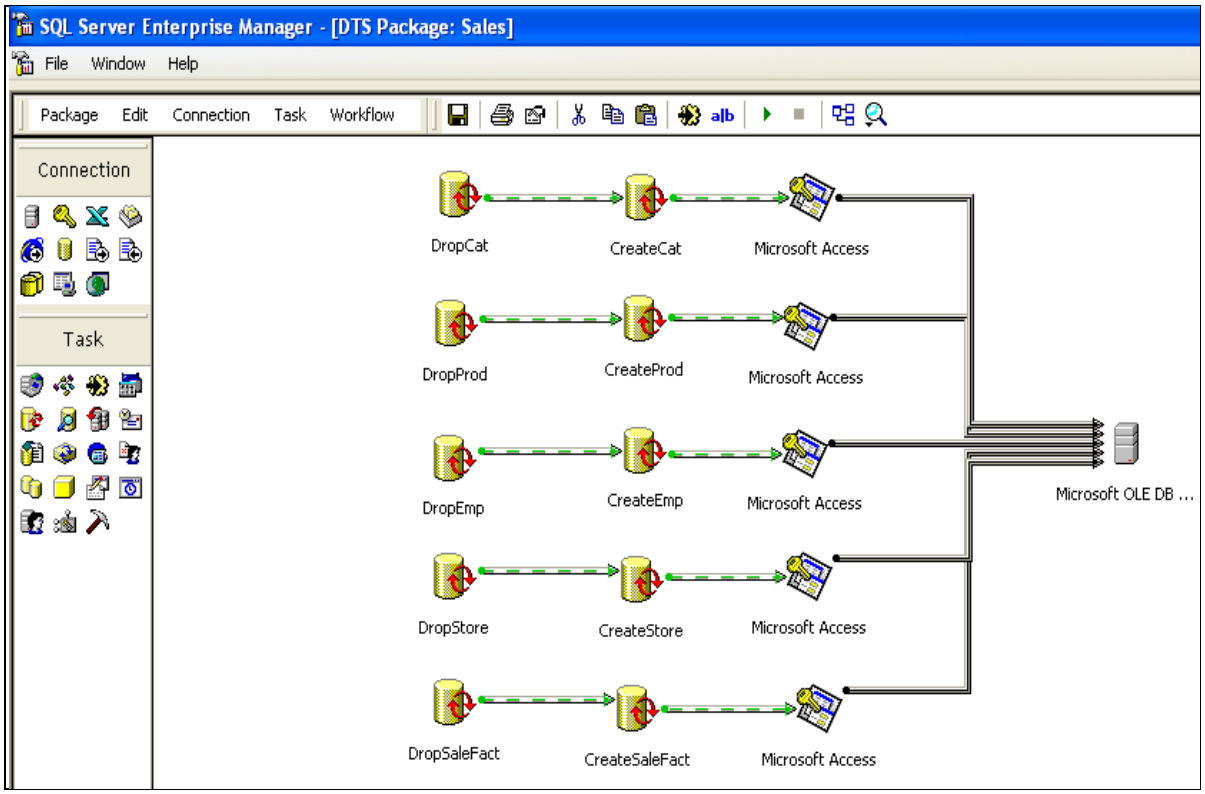


l. It will open a window, in **Precedence** tab click on Source Step column select appropriate name from Drop down list & Click **Ok**.

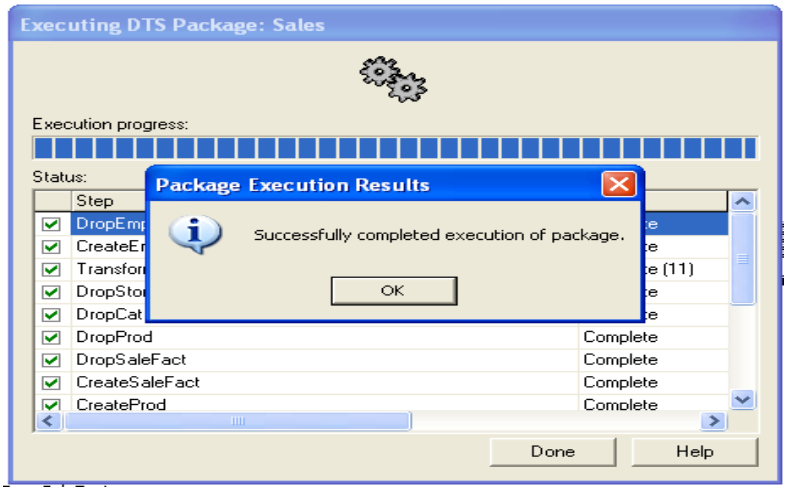




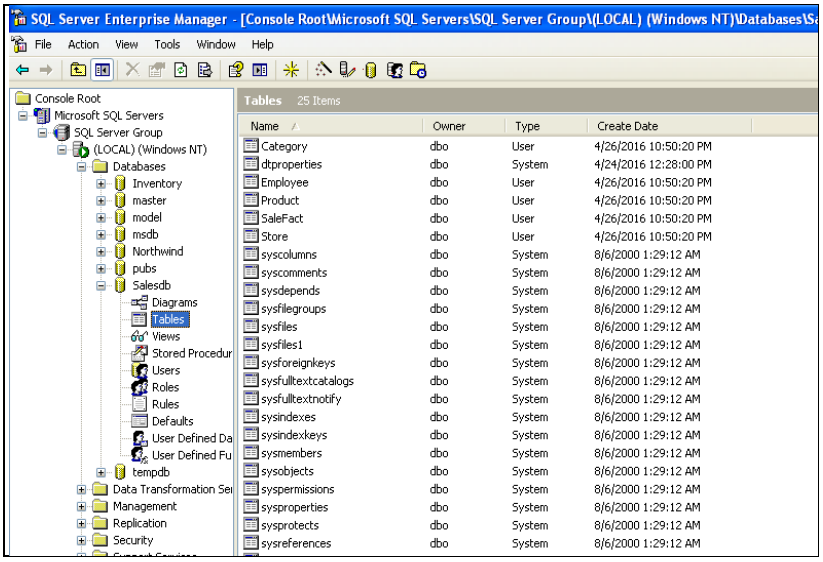
m. Repeat same procedure from **(Step 3)**a. to l.



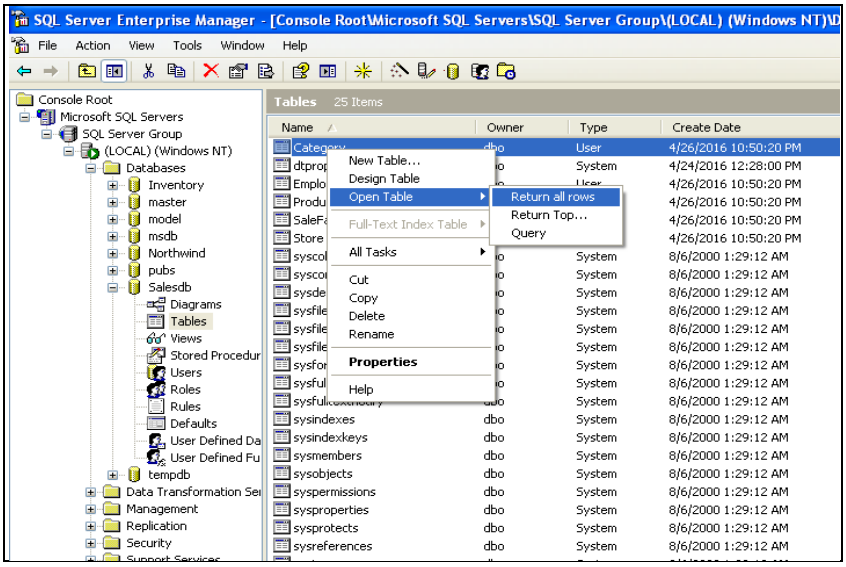
Step 4:- Finally run the whole Package.



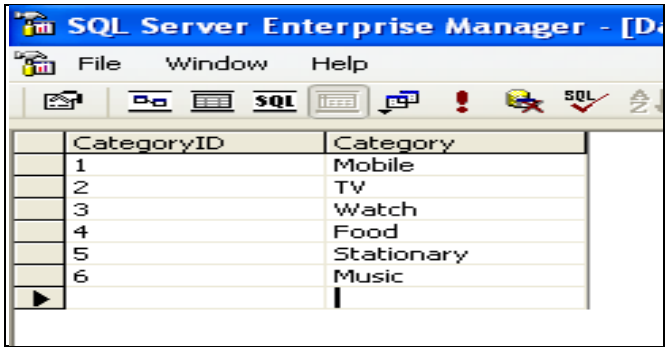
Step 5. In salesDb -> open tables.



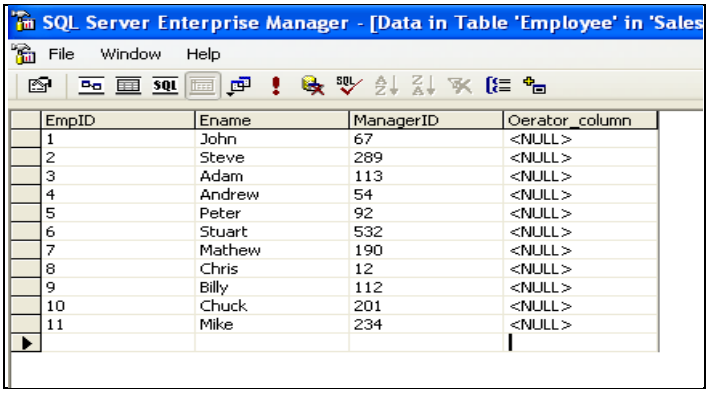
Step 6. Right click on Table-> Select Open Table -> Return all rows.



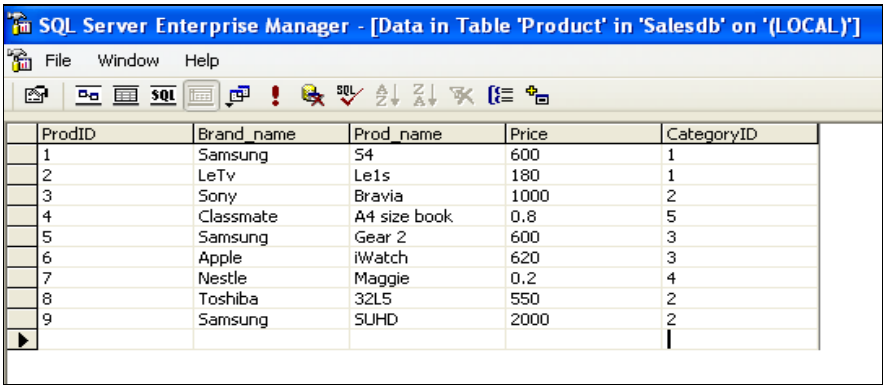
a. Output of Category Table.



b. Output of Employee Table.

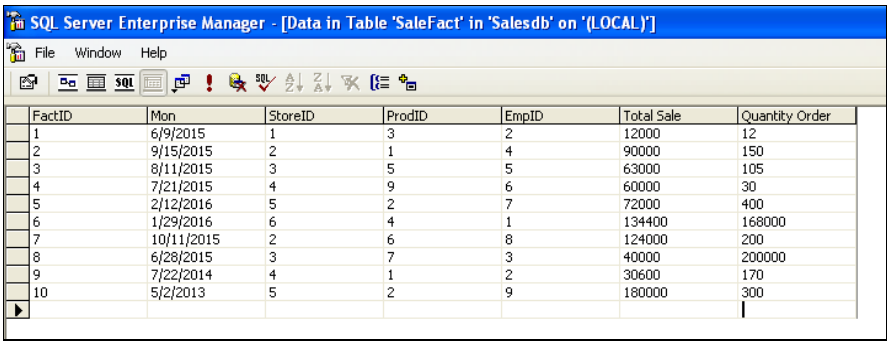


c. Output of Product Table.



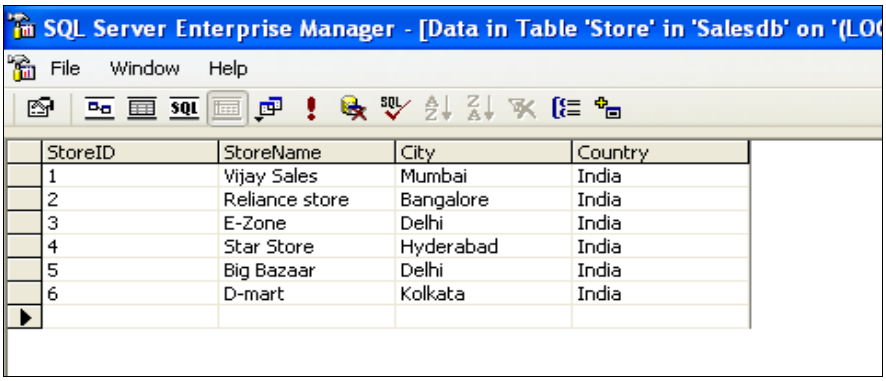
ProdID	Brand_name	Prod_name	Price	CategoryID
1	Samsung	S4	600	1
2	LeTv	Le1s	180	1
3	Sony	Bravia	1000	2
4	Classmate	A4 size book	0.8	5
5	Samsung	Gear 2	600	3
6	Apple	iWatch	620	3
7	Nestle	Maggie	0.2	4
8	Toshiba	32L5	550	2
9	Samsung	SUHD	2000	2

d. Output of SaleFact Table.



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

e. Output of Store Table.



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

Practical No. 3

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

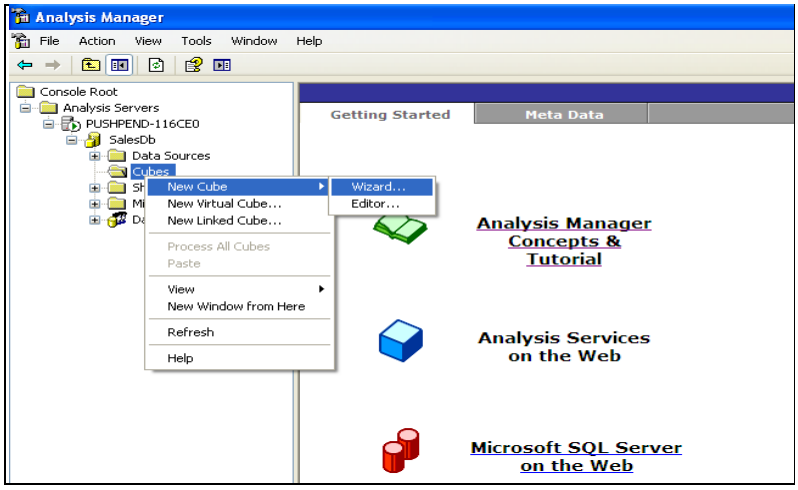
Cube Creation

Create a new OLAP database

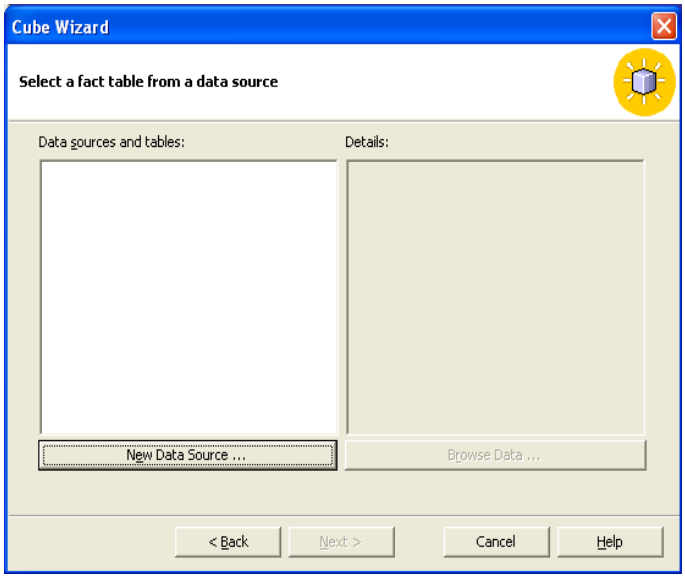
1. Open Programs → Microsoft SQL Server → Analysis Services → Analysis Manager.
2. Right click the server in the console tree, and click New Database to display the Database dialog Box.
3. Type 'SalesDb' as the database name.
4. Click **OK** to close the dialog box and to create the database.

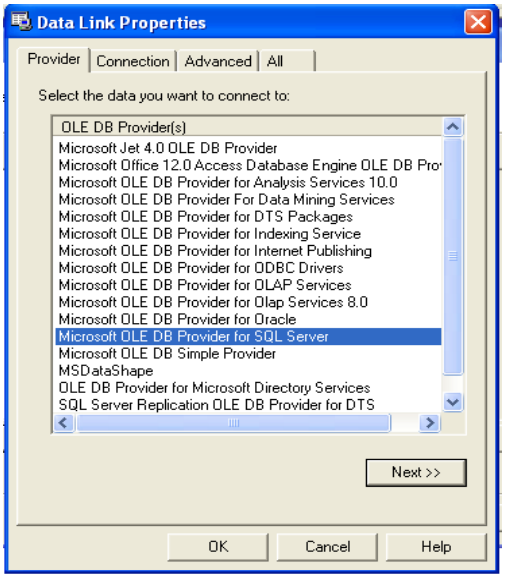
Specify a data source

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

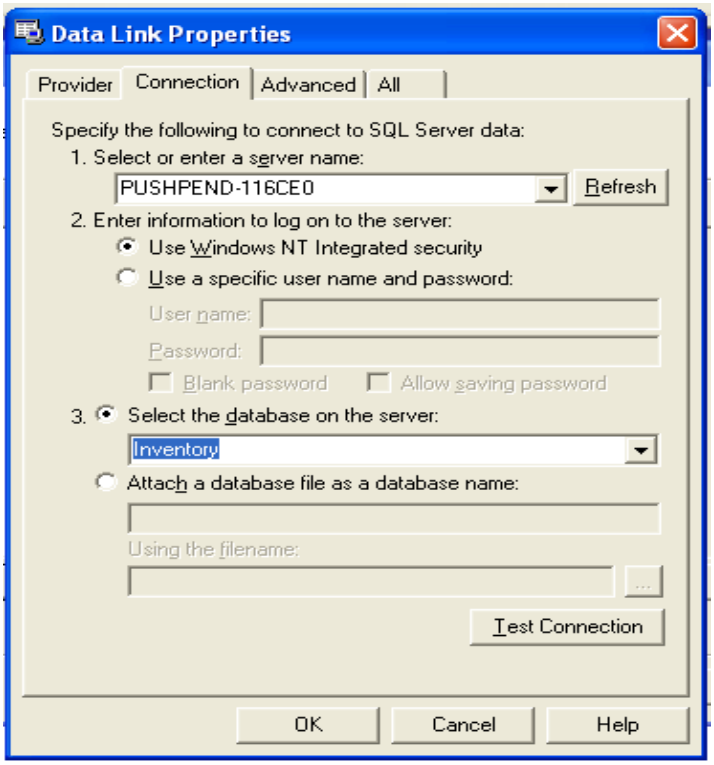


2. Click **New Data Source** ->Select **Microsoft OLE DB Provider for SQL Server**, and click **Next**.

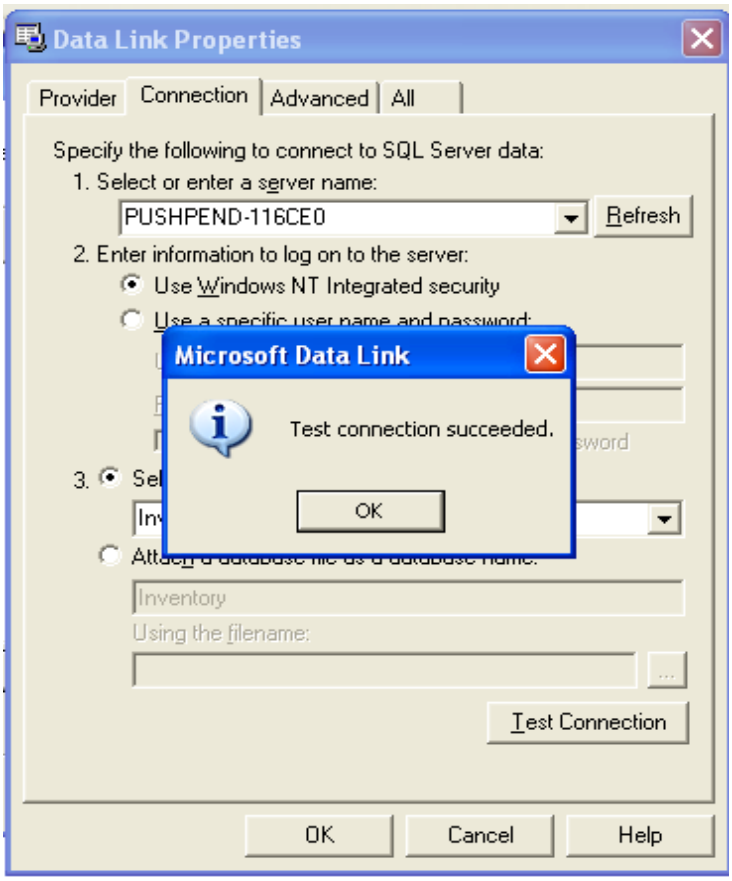




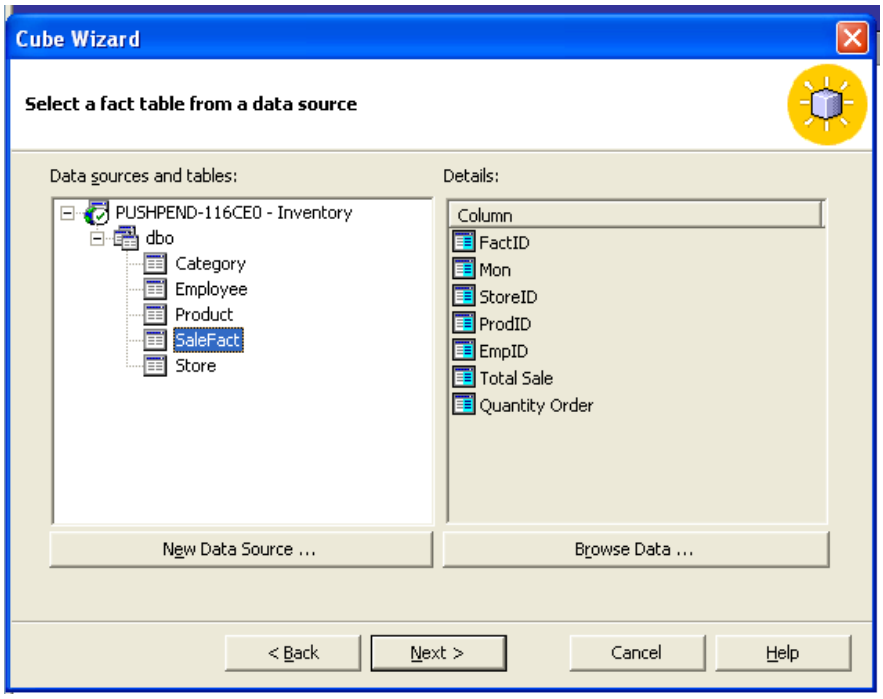
3. In the **connection** Tab Select or enter Server Name. -> Select DB on the server from drop down list.



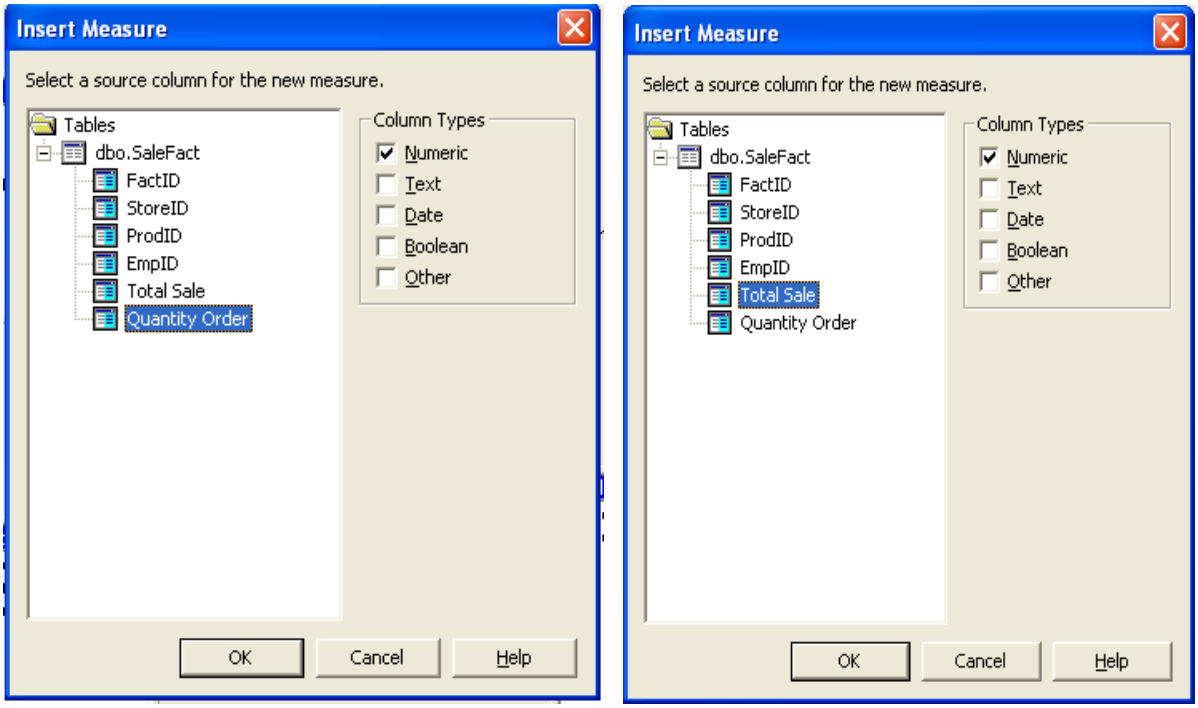
4. Click **Test Connection** to make sure the data source definition is correct. Then click **OK** to close the dialog box.



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**

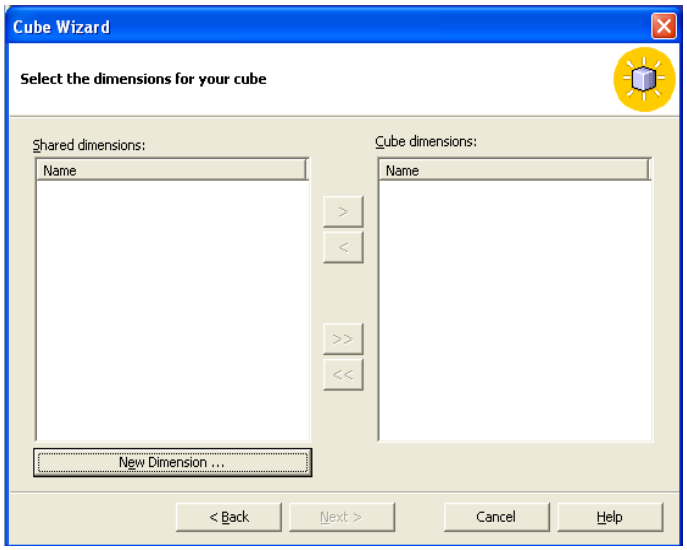


Practical No. 4

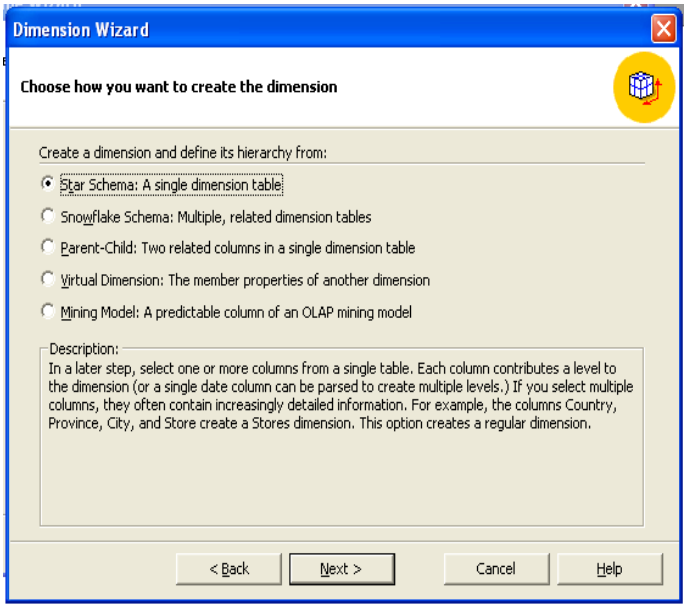
Aim : Develop an application to create dimension tables in a cube and form star schema.

Create a dimension from a Star Schema table:

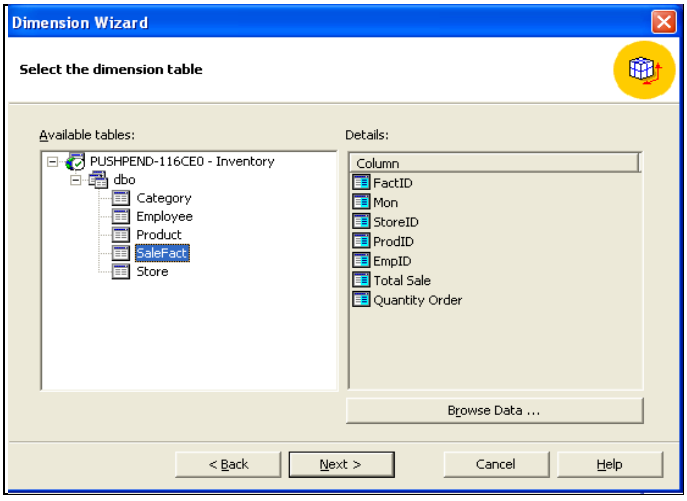
1. Click a **New Dimension** in the Wizard to start the Dimension Wizard. Select the option to skip the welcome screen, and then click on **Next**.



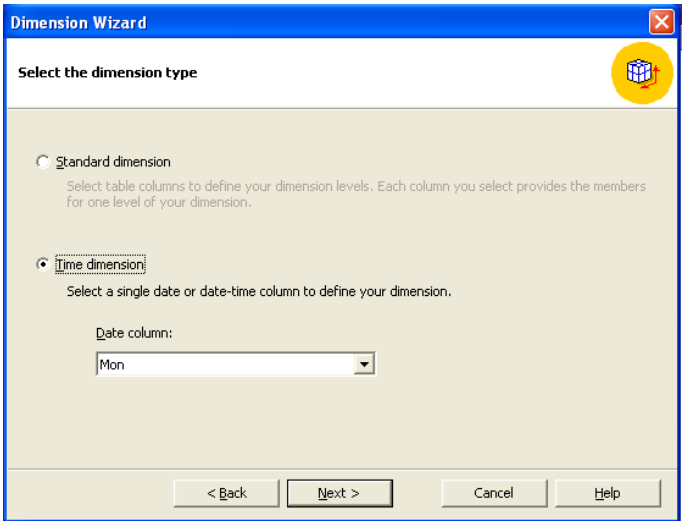
2. Click the Option **Star Schema**: A Single Dimension Table, and the click **Next**.



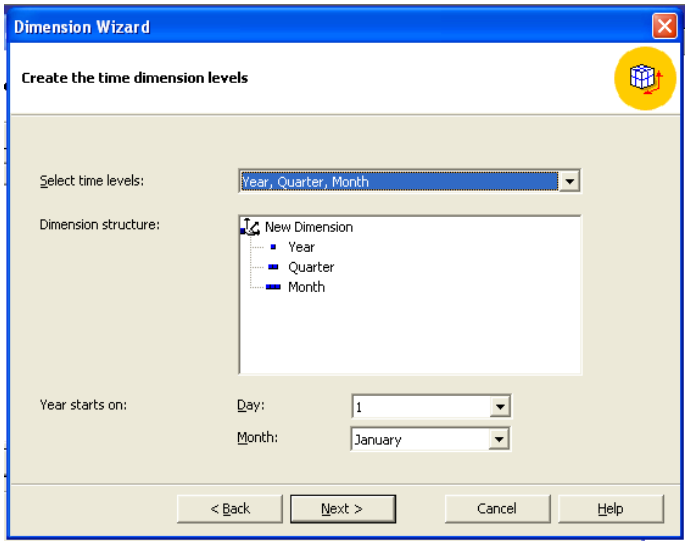
3. Select SaleFact from **Available Tables** and click **next.**



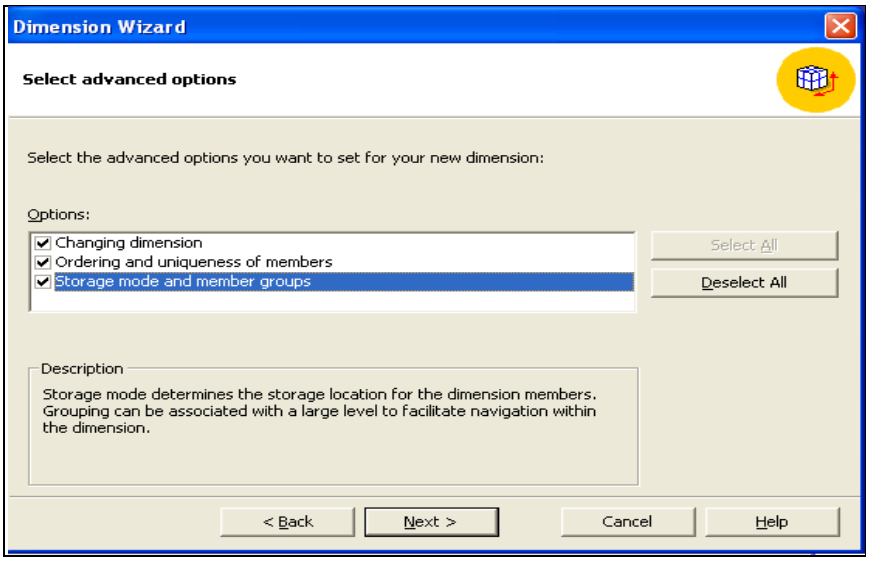
4. Select Time Dimension ->Select Date column From Drop Down : **Mon**. & Click **Next**.

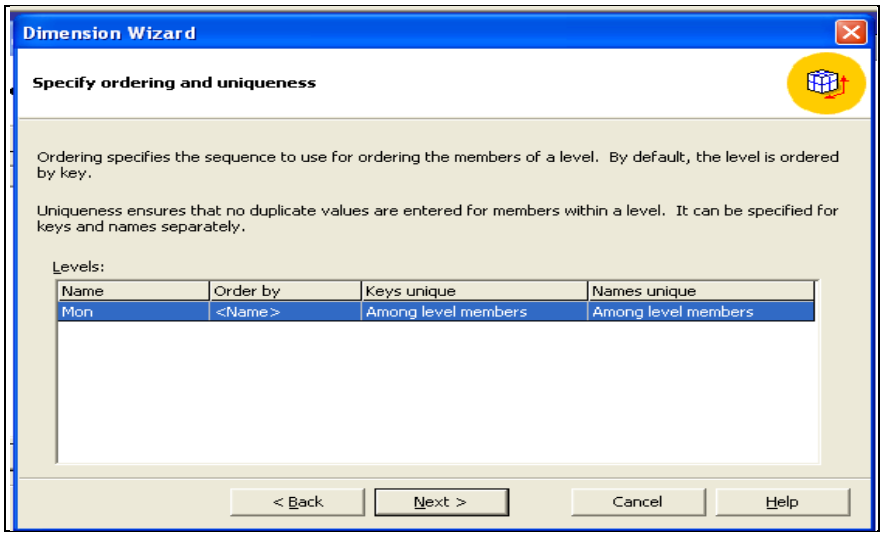


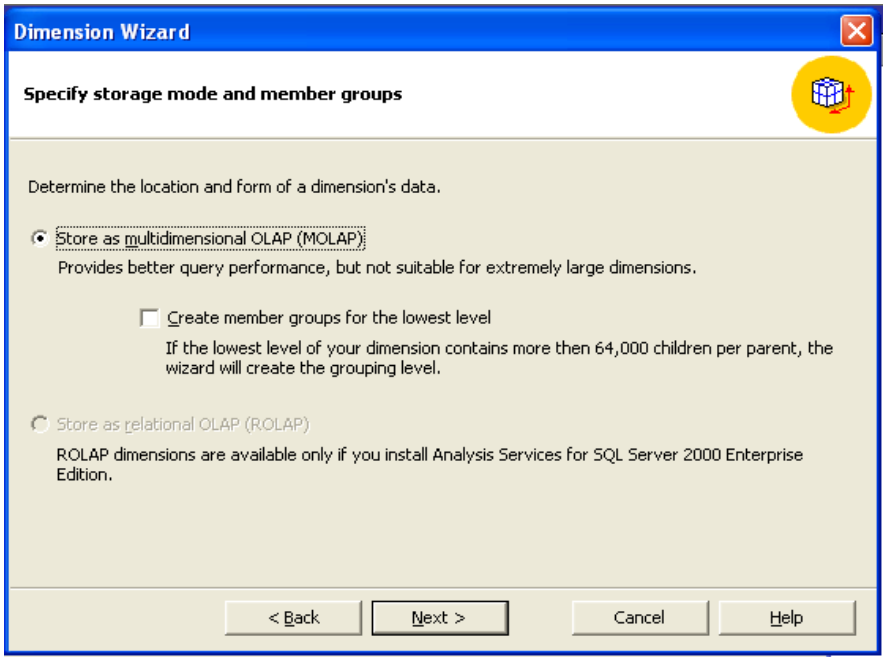
5. Select Time Level : **Year, Quater, Month** ->Click **Next.**



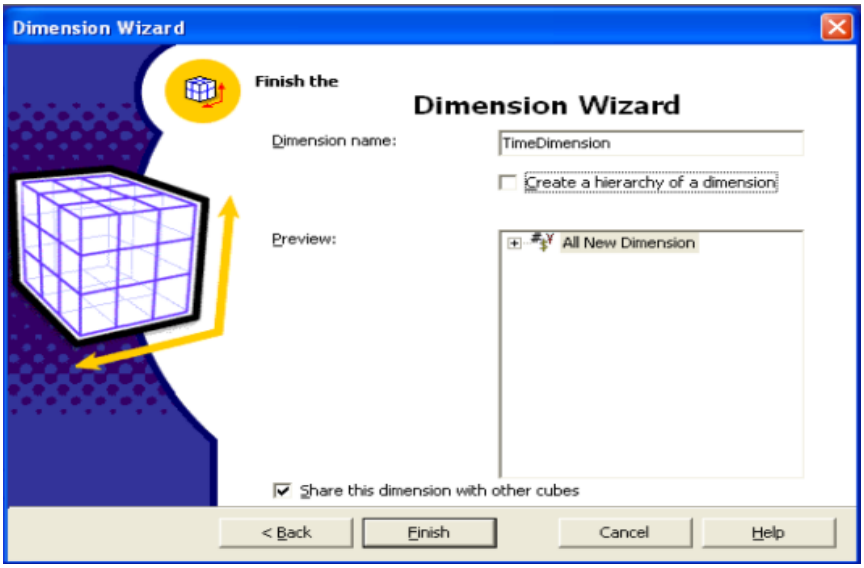
6. Select all and click **Next.**



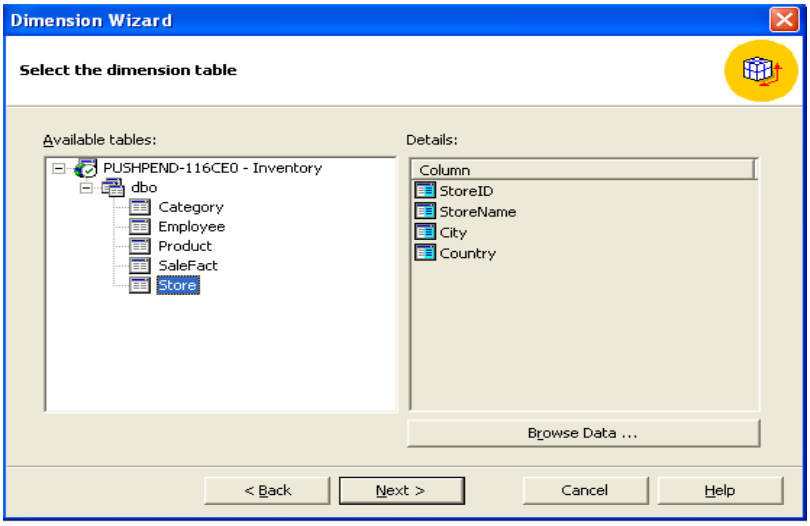




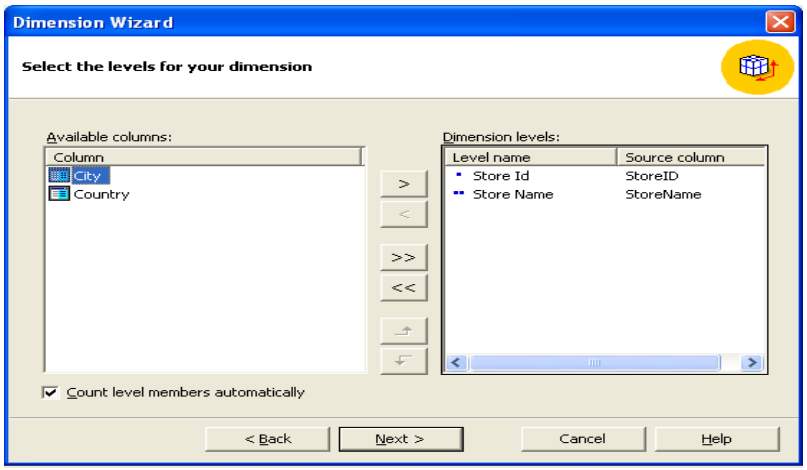
7. Give Dimension Name: TimeDimension.-> Click **Finish**.

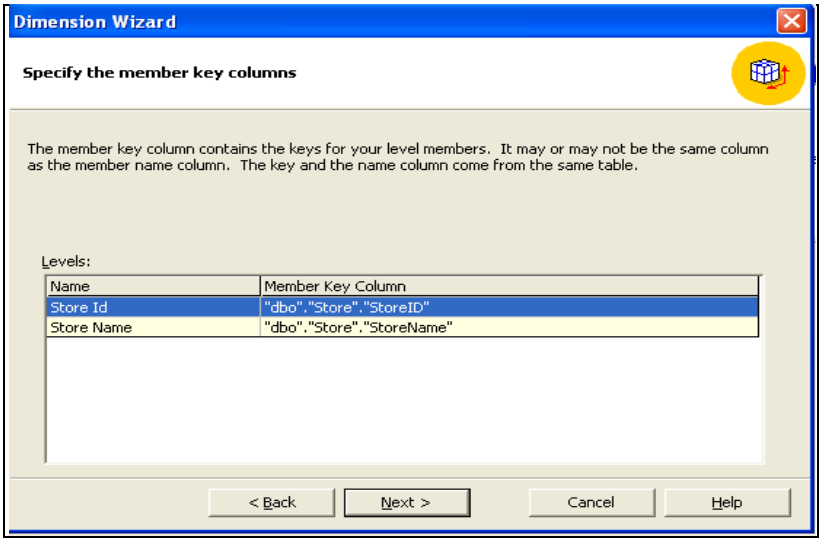


Create one more dimension: **StoreDimension.**

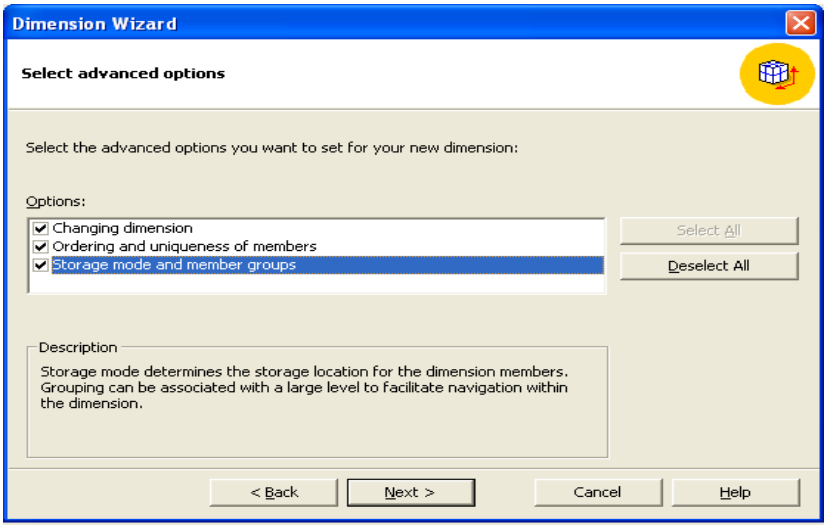


8. Specify Dimension Level : **StoreId, Store Name**-> Click **Next**.

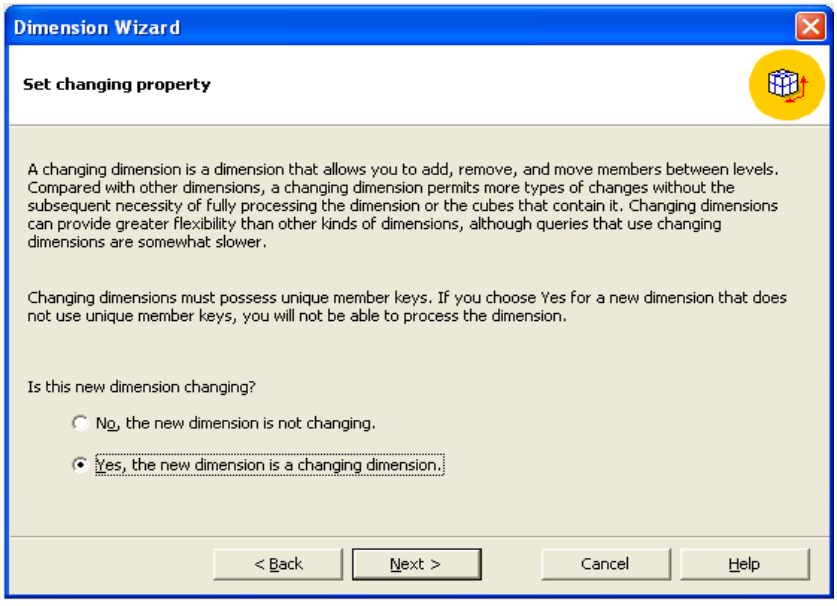


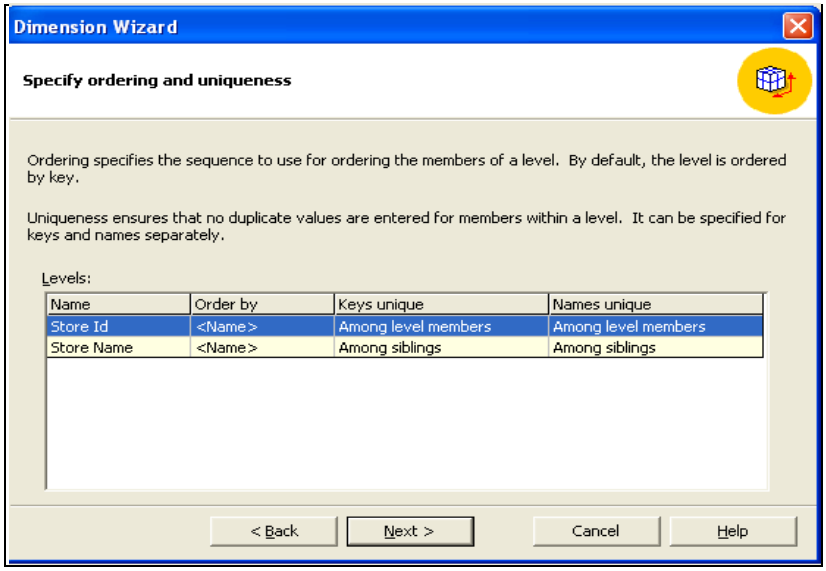


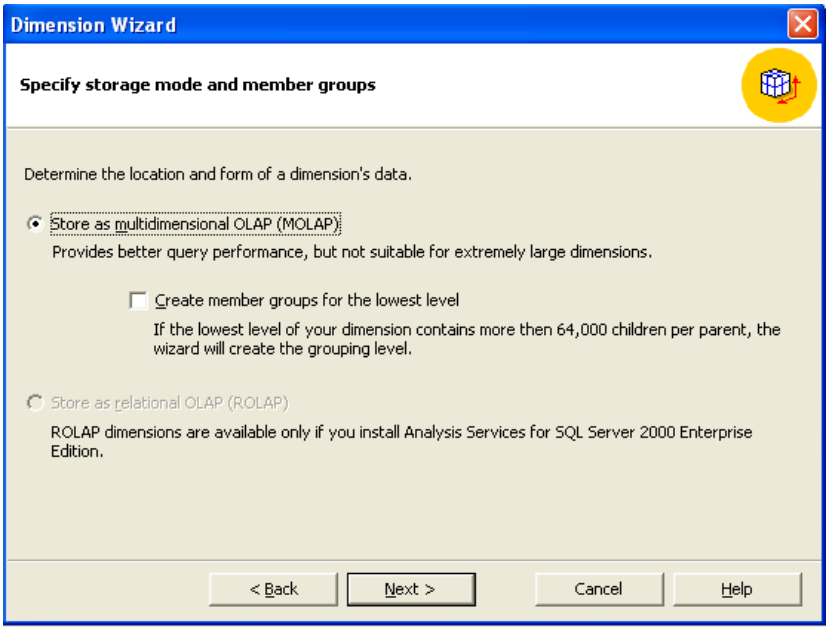
9. Select all and Click Next.

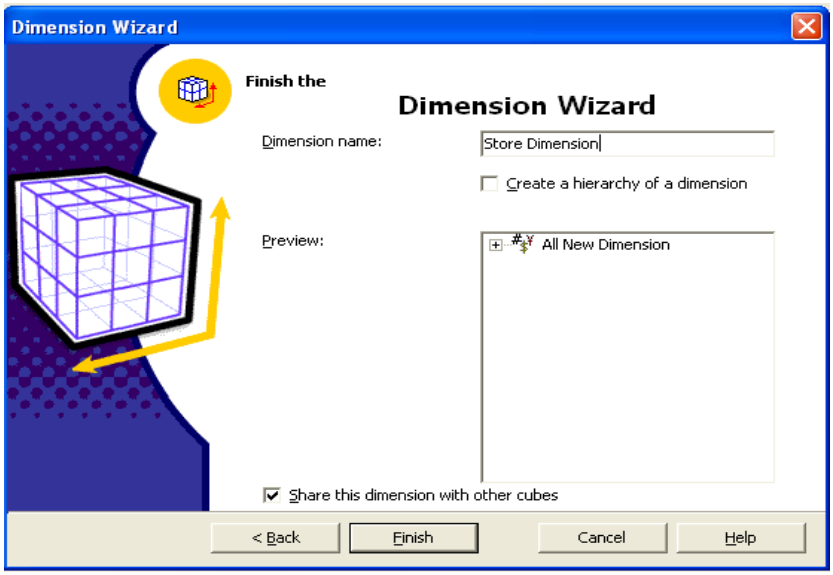


10. Select **Yes**.... -> Click **Next**.

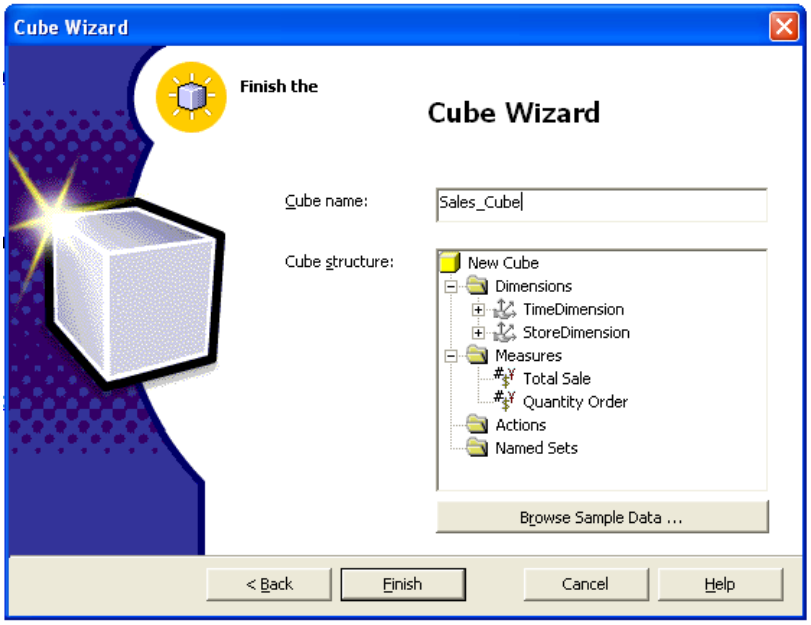








11. Finally cube is created. -> Cube Name :**Sales_Cube.**

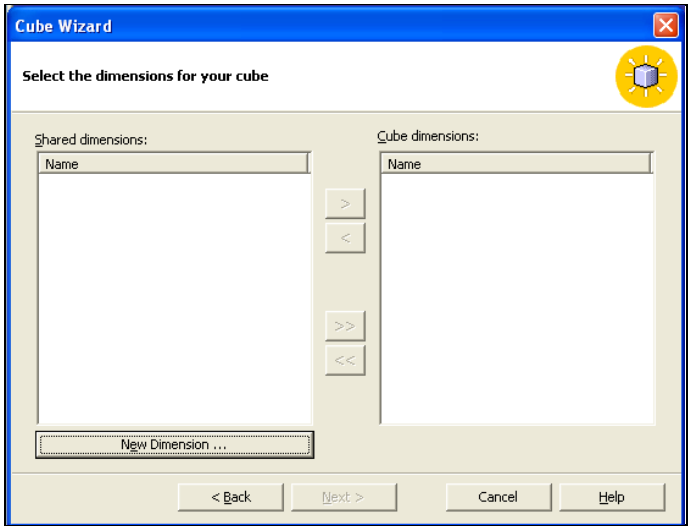

Cube Wizard
Finish the
Cube Wizard
Cube name:
Sales_Cube
Cube structure:
New Cube
Dimensions
TimeDimension
StoreDimension
Measures
Total Sale
Quantity Order
Actions
Named Sets
Browse Sample Data ...
< Back
Finish
Cancel
Help

Practical No. 5

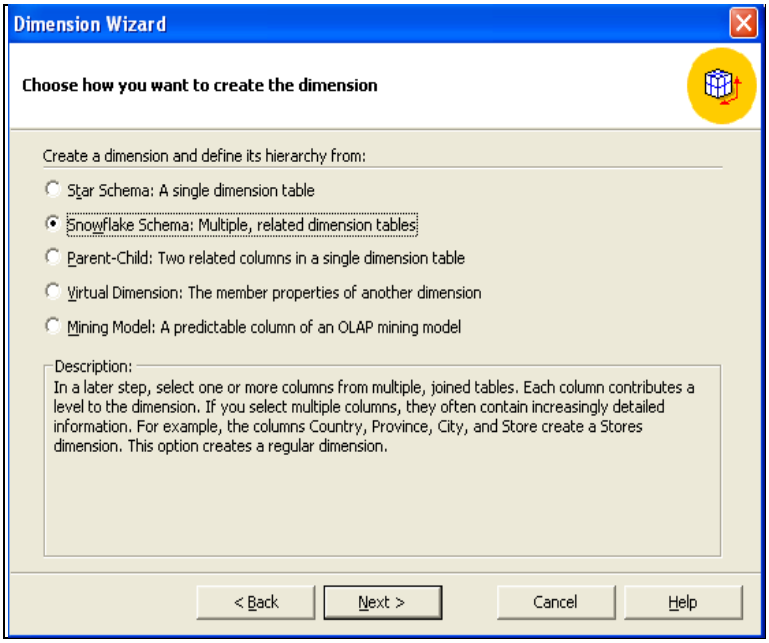
Aim : Develop an application to create dimension tables in a cube and form snowflake schema.

Create a dimension from Snowflake schema tables:

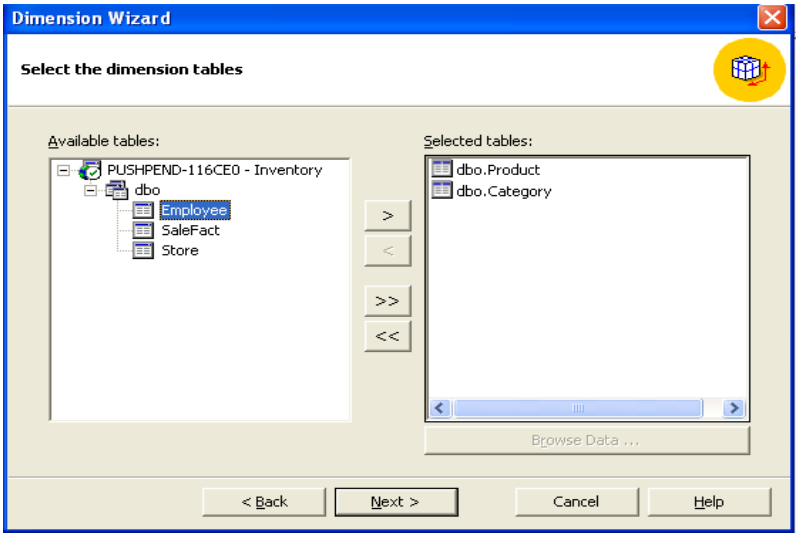
1. Click a **New Dimension** in the Wizard to start the Dimension Wizard. Select the option to skip the welcome screen, and then click on **Next**.



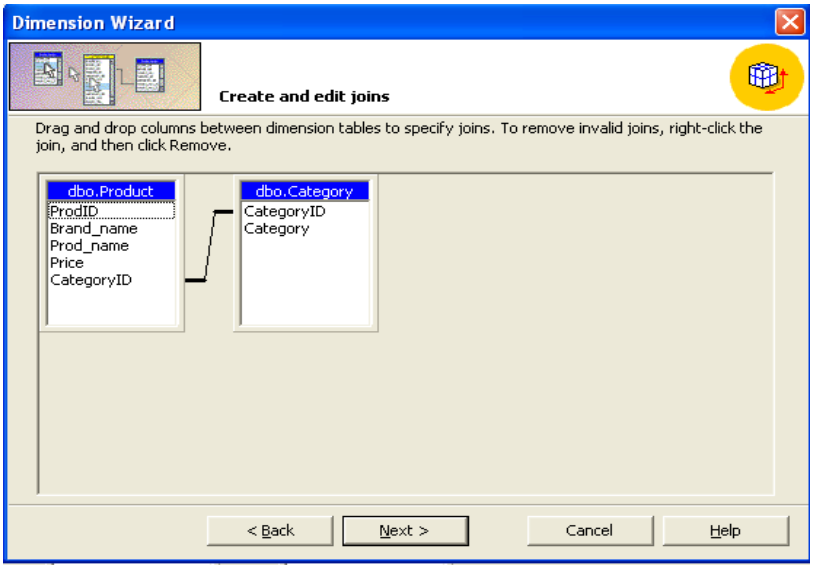
2. Click the Option **Snowflake Schema**: Multiple,related dimension tables.and the click **Next**.



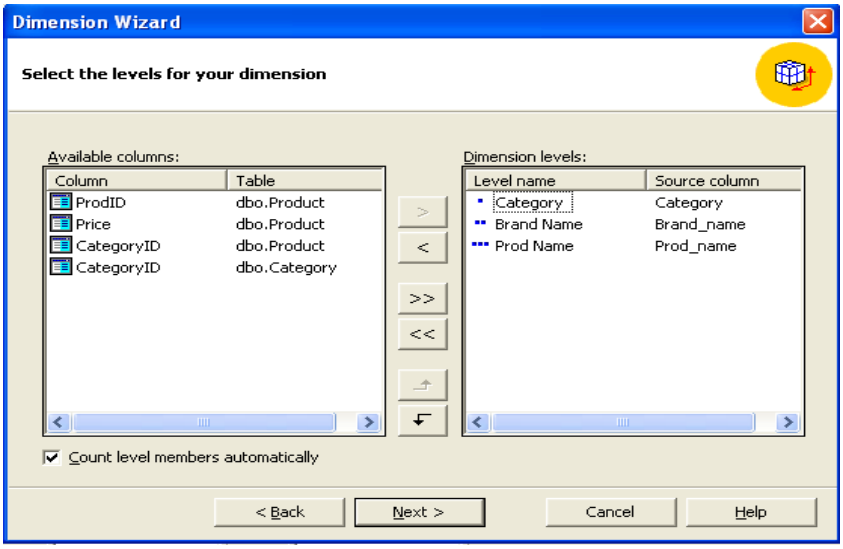
3. Select **Product, Category** table from **Available Tables** and click **next.**



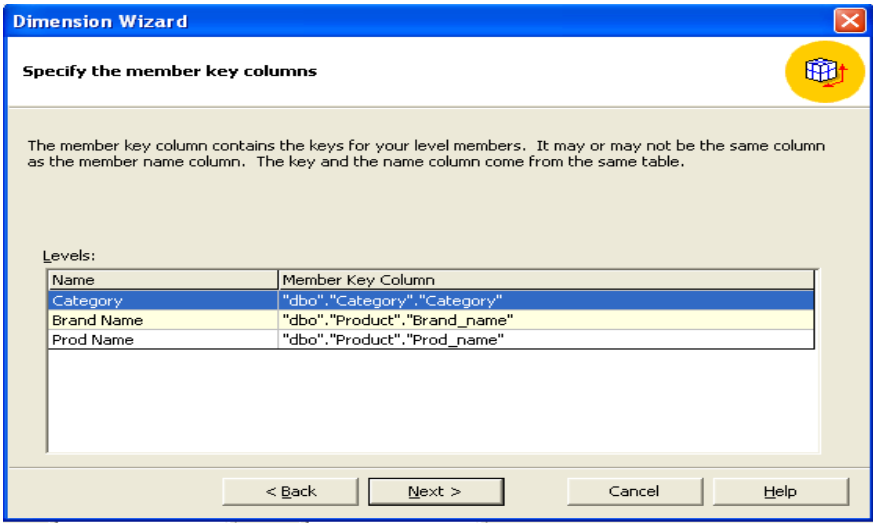
4. Click Next.



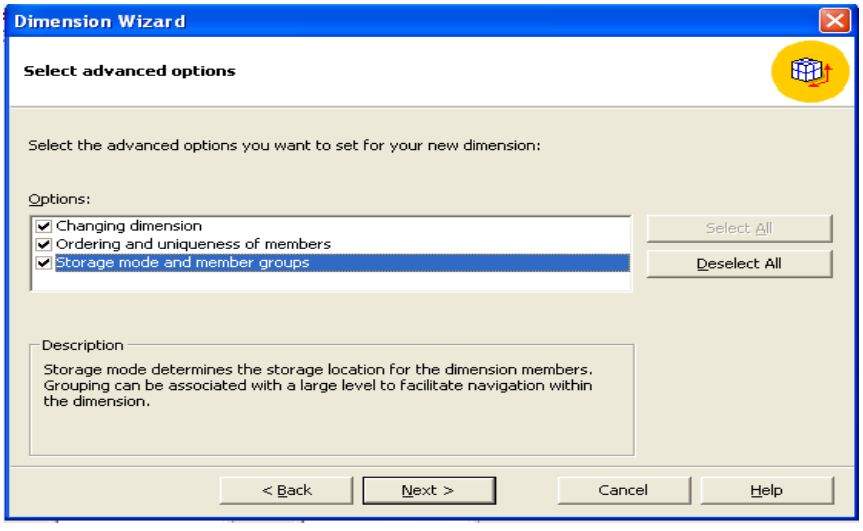
5. Select Dimension levels **: Category, Brand Name, Product Name.**



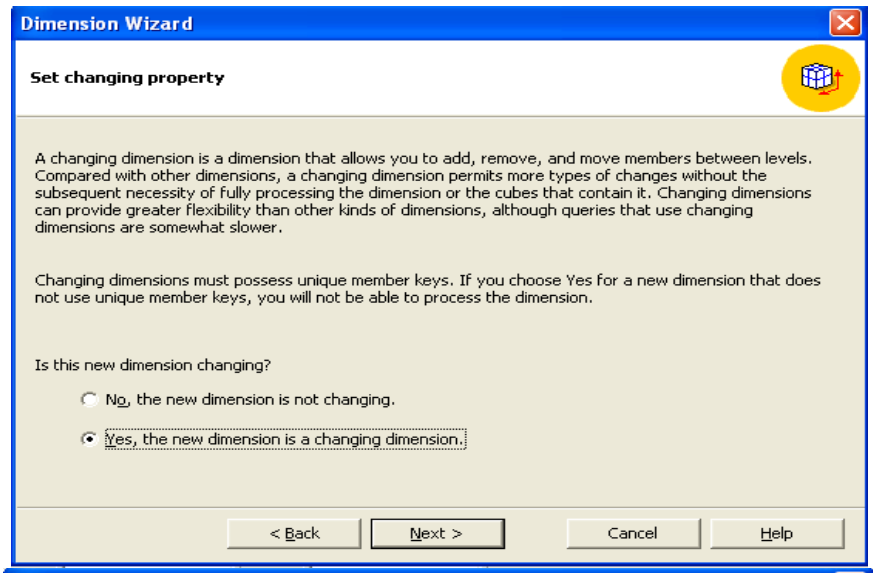
6. Click **Next.**

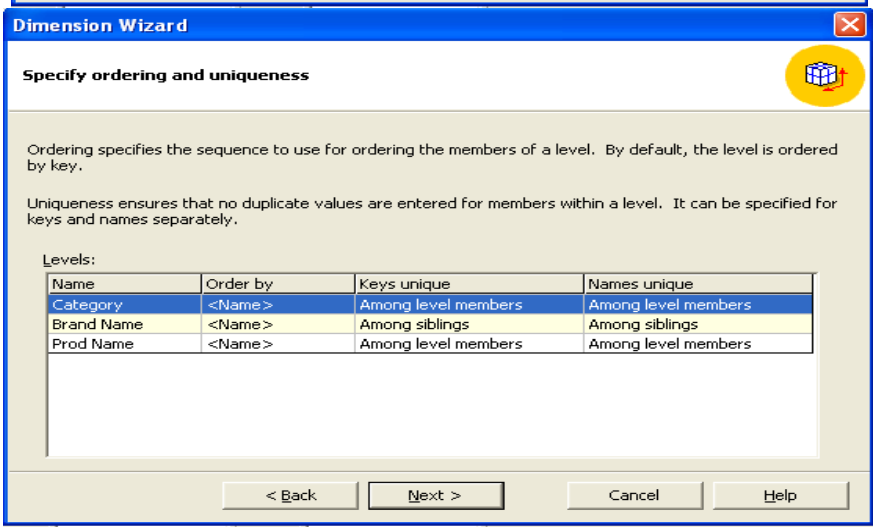


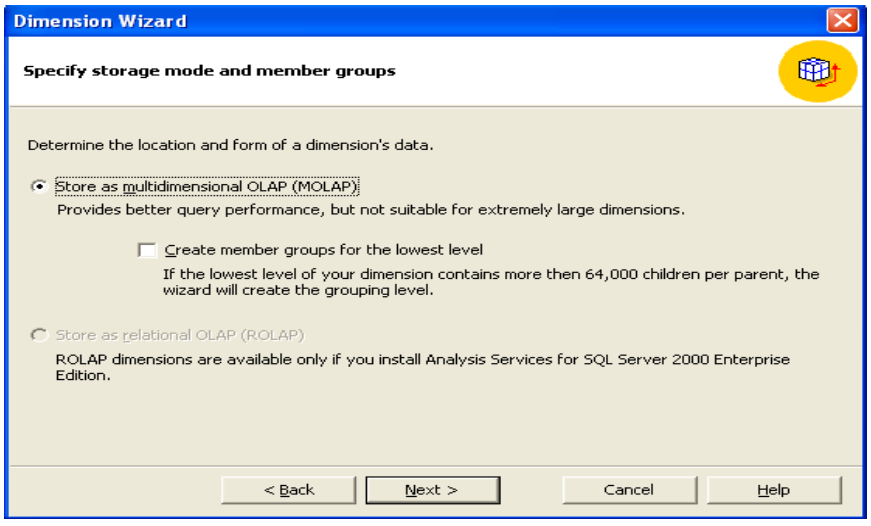
7. Select all and Click **Next.**



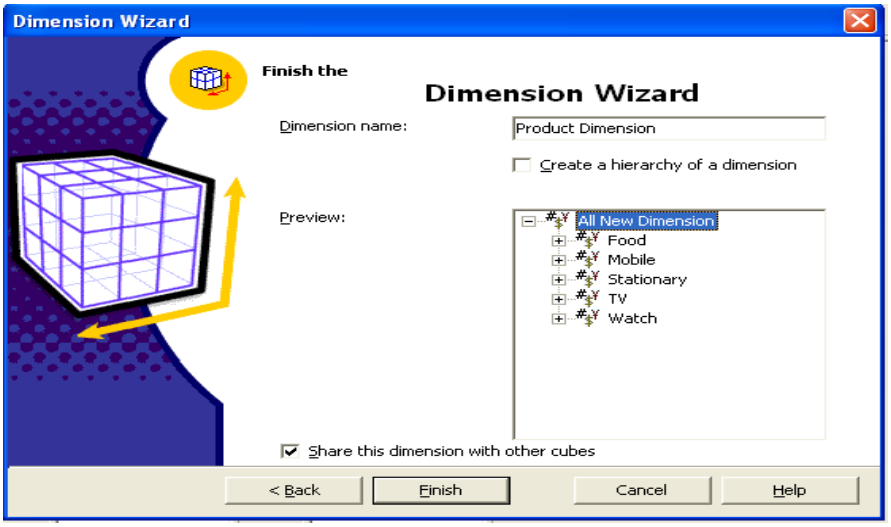
8. Select **yes** and click**Next.**



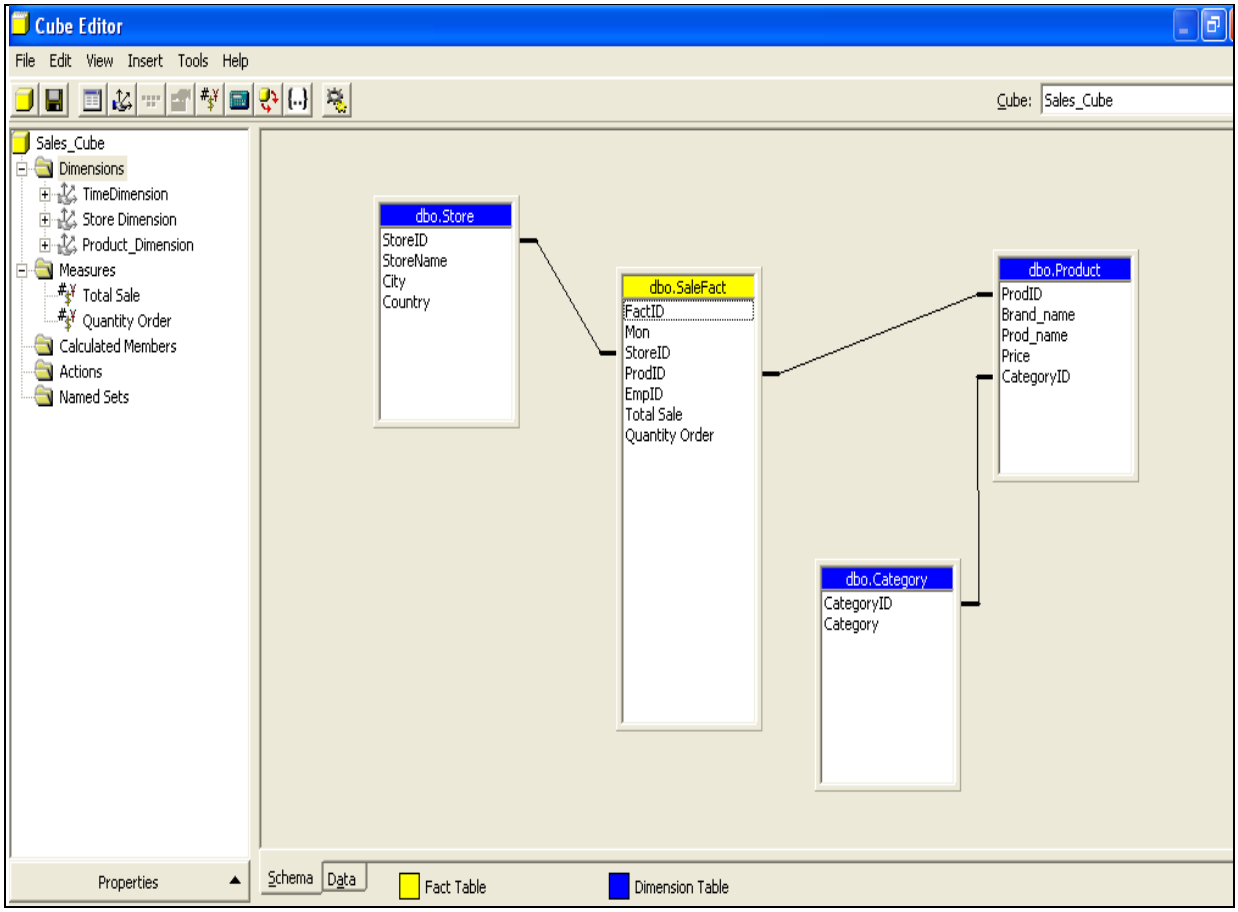




9. Name the dimension as : **Product Dimension.**



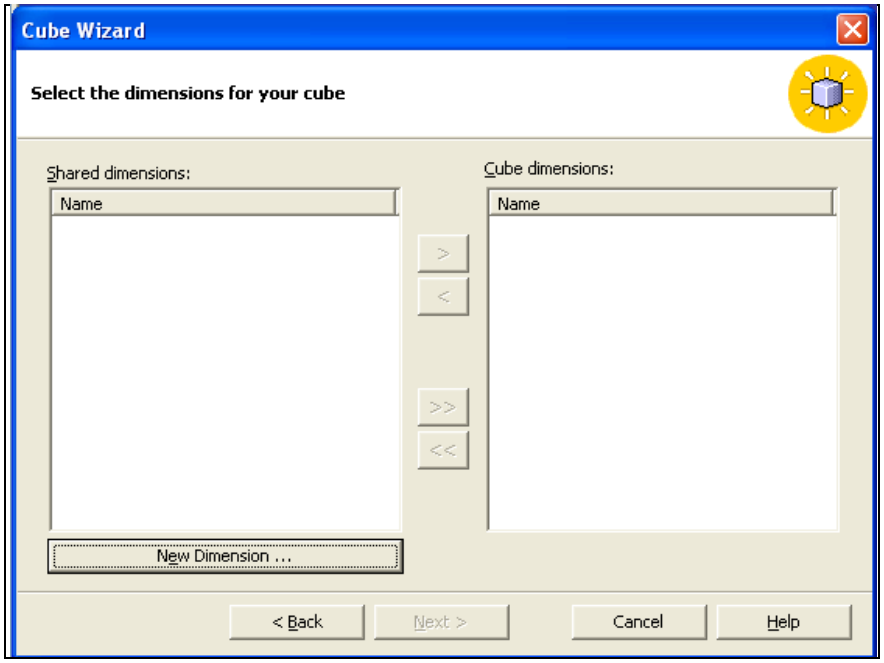
View of SnowFlake Schema.



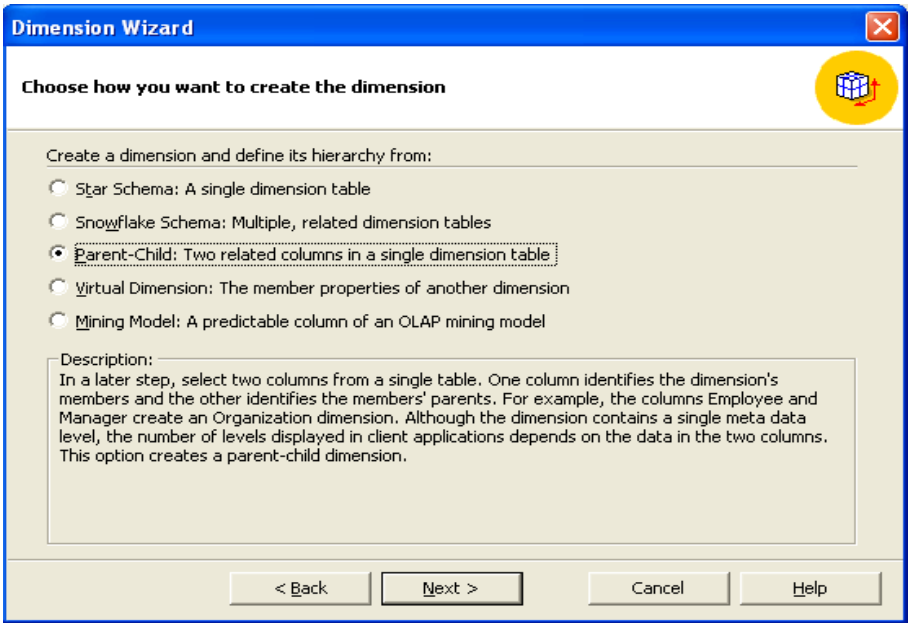
Practical No. 6

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

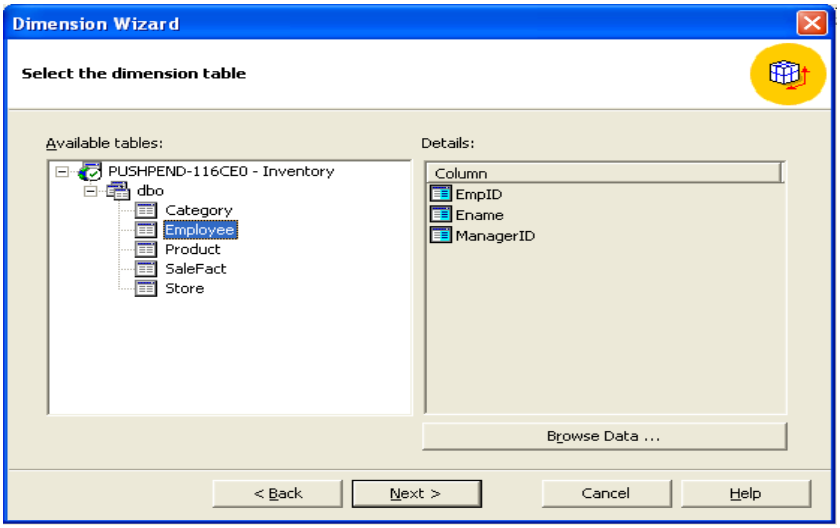
1. Click a **New Dimension** in the Wizard to start the Dimension Wizard. Select the option to skip the welcome screen, and then click on **Next**.



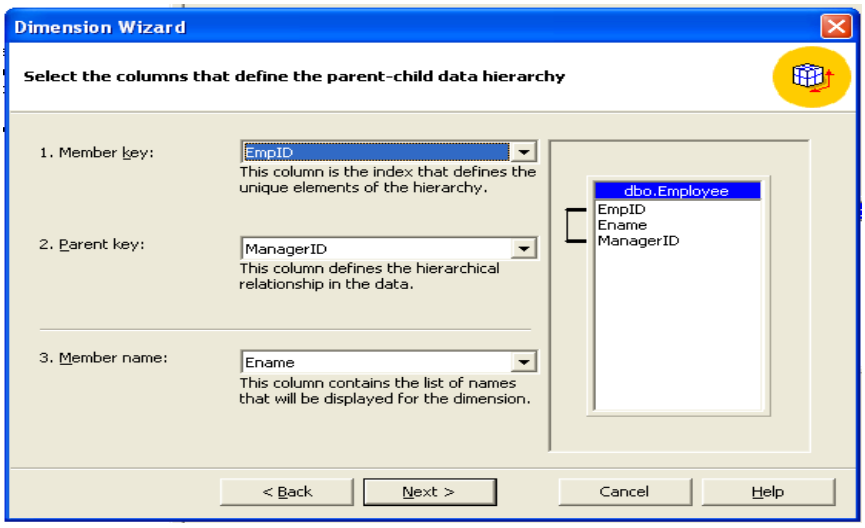
2. Click the Option **Parent-Child Schema**: A Single Dimension Table, and the click **Next**.



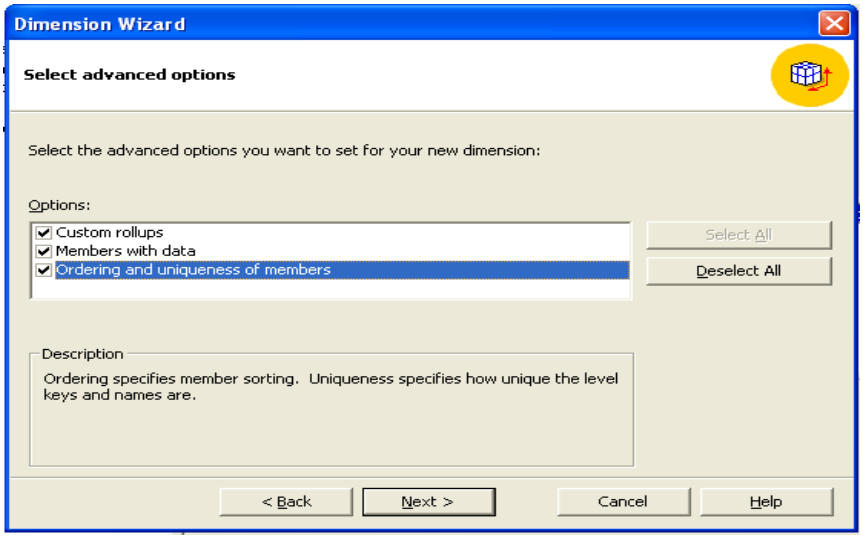
3. Select **Product, Category table** from **Available Tables** and click **next.**



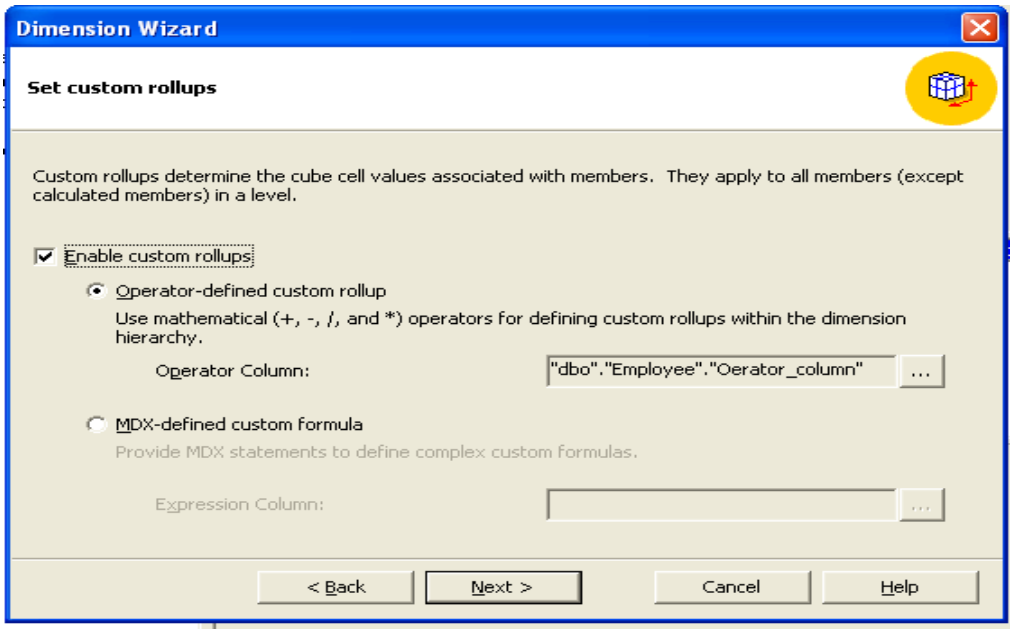
4. Select a. MemberKey: a. **EmpID** from drop down**,** b. Parent Key :**ManagerID from drop down,** c. Member Name: **Ename from drop down.** -> Click **Next**.



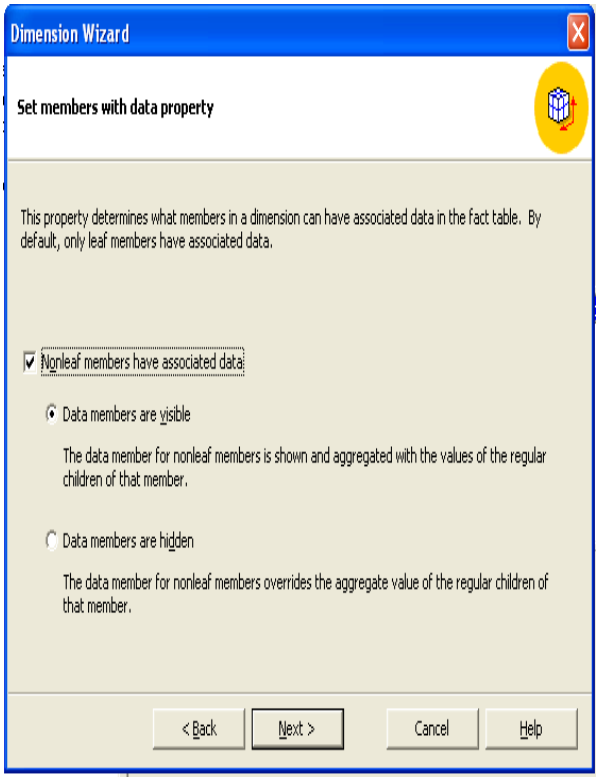
5. Select all and click **Next**.

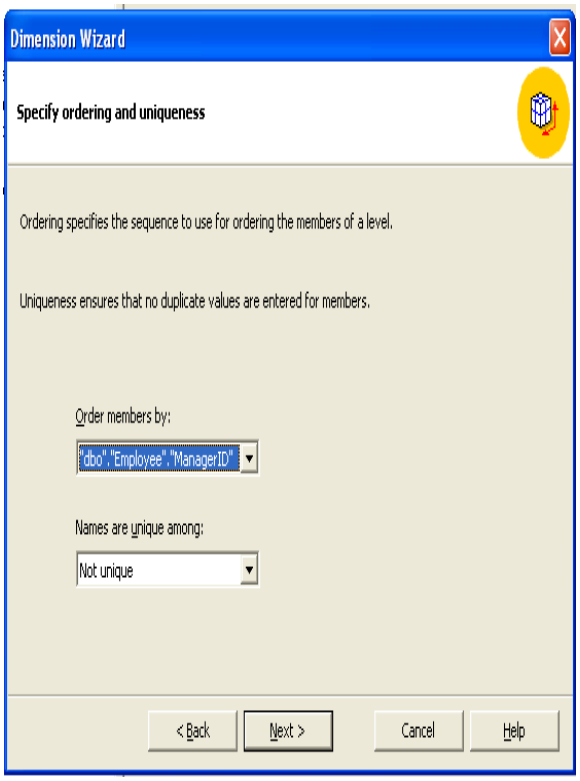


6. Enable CustomRollups and click **next**.

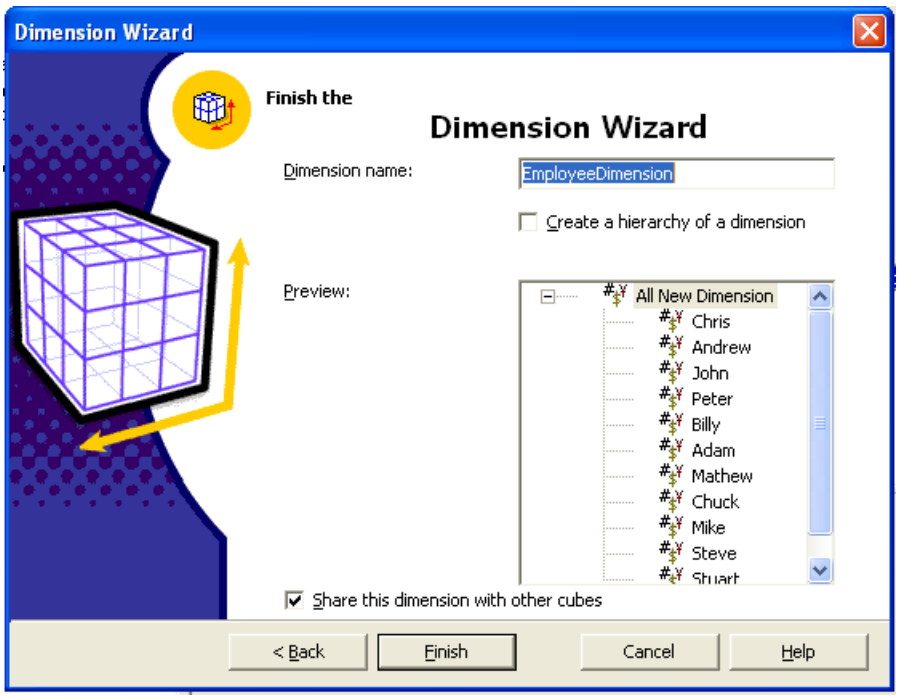


7. Check the option and click **next**.

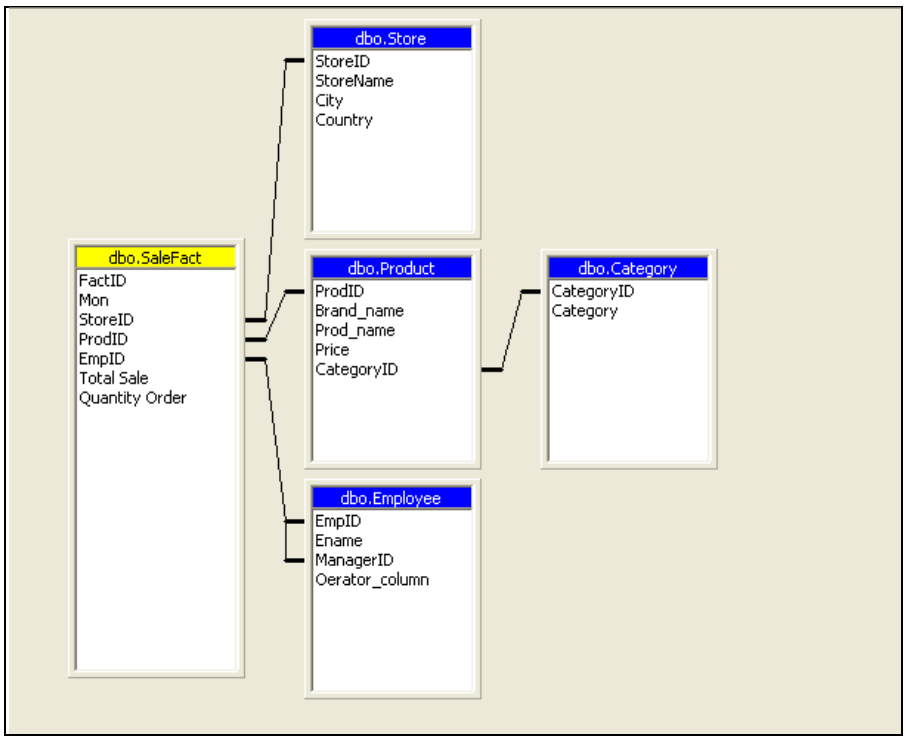




8. Name the Dimension: **Employee Dimension.**



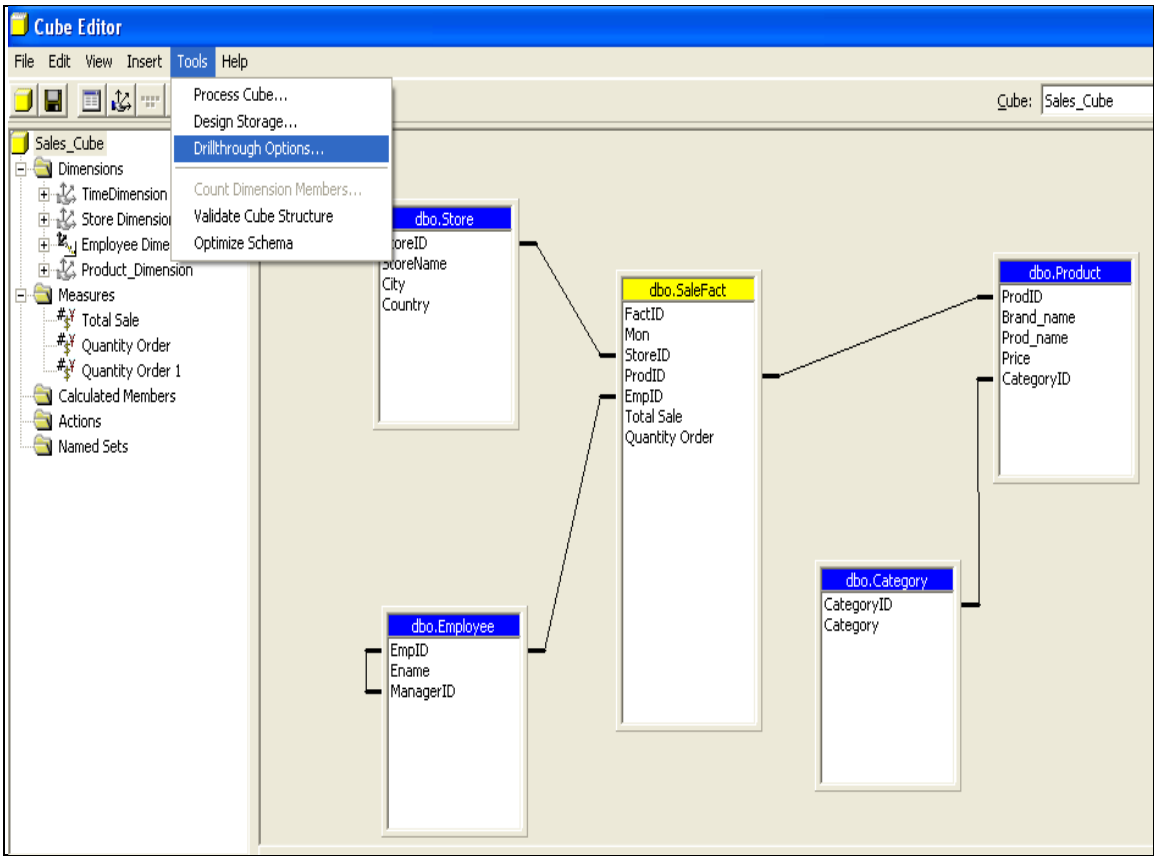
View of Parent-Child Schema :



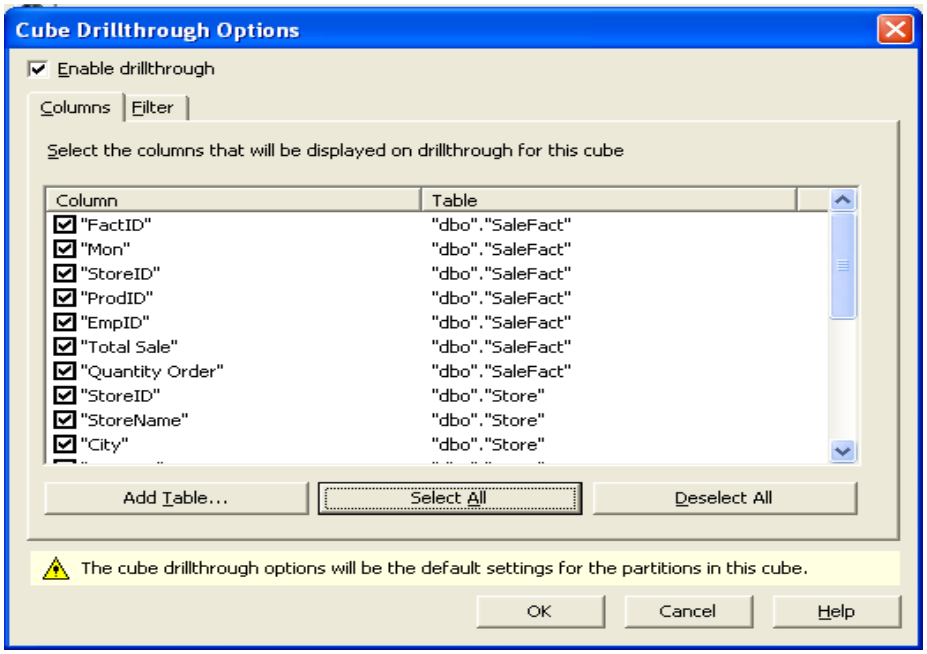
Practical No. 7

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.

Drillthrough Data (first 1000 rows)

	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

Cube Editor

File Edit View Insert Tools Help

Cube: Sale_Cube

Sale_Cube
- Dimensions
  - TimeDimension
  - Store Dimension
  - Product_Dimension
- Measures
  - Total Sale
  - Quantity Order
- Calculated Members
- Actions
- Named Sets

Store Dimension: All Store Dimension

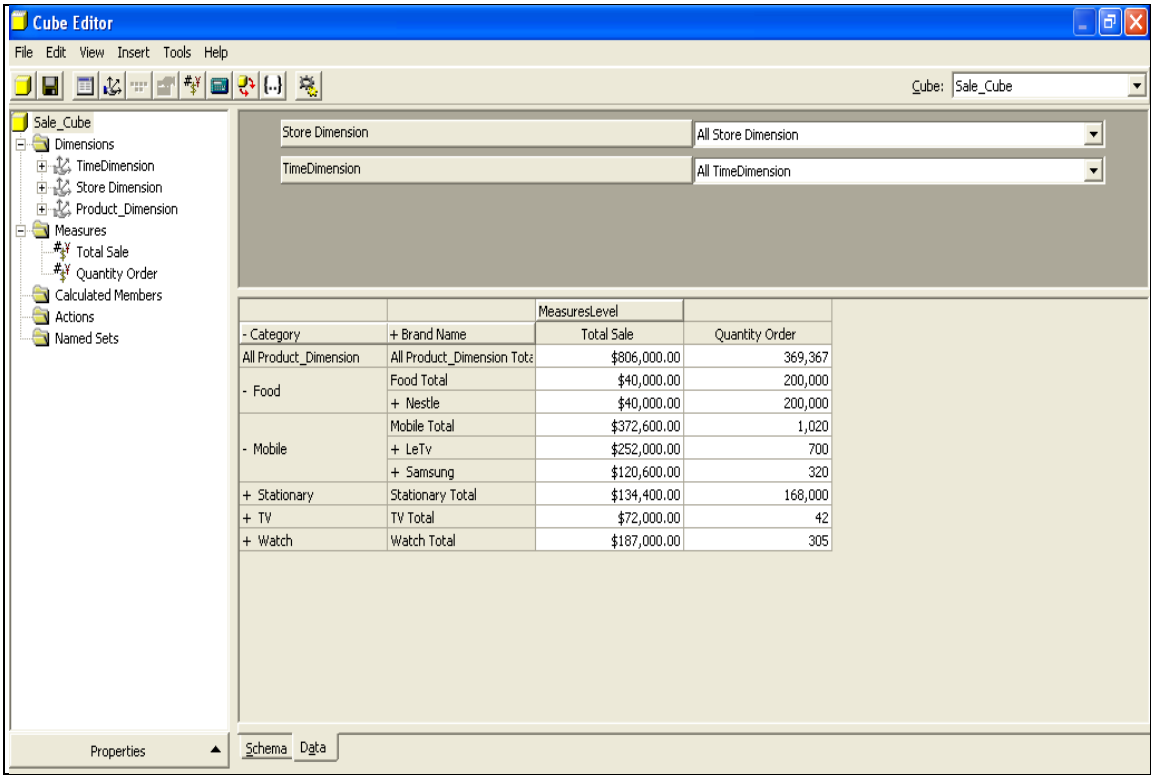
TimeDimension: All TimeDimension

		MeasuresLevel	
- Category	+ Brand Name	Total Sale	Quantity Order
All Product_Dimension	All Product_Dimension Tota	$806,000.00	369,367
- Food	Food Total	$40,000.00	200,000
	+ Nestle	$40,000.00	200,000
- Mobile	Mobile Total	$372,600.00	1,020
	+ 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

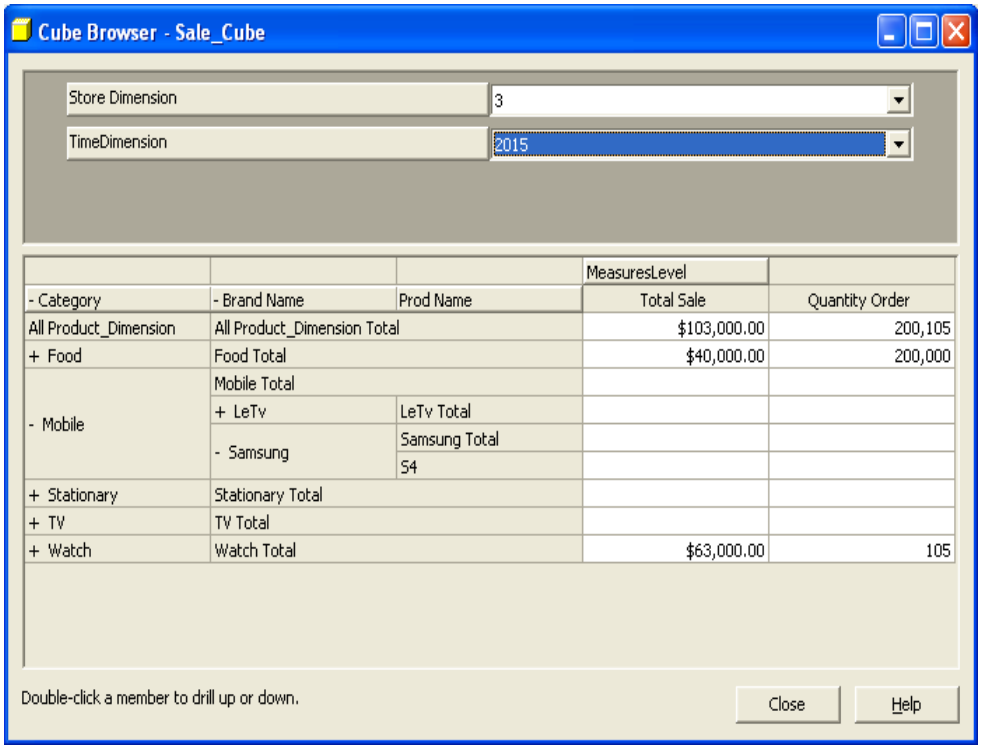
Properties

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.

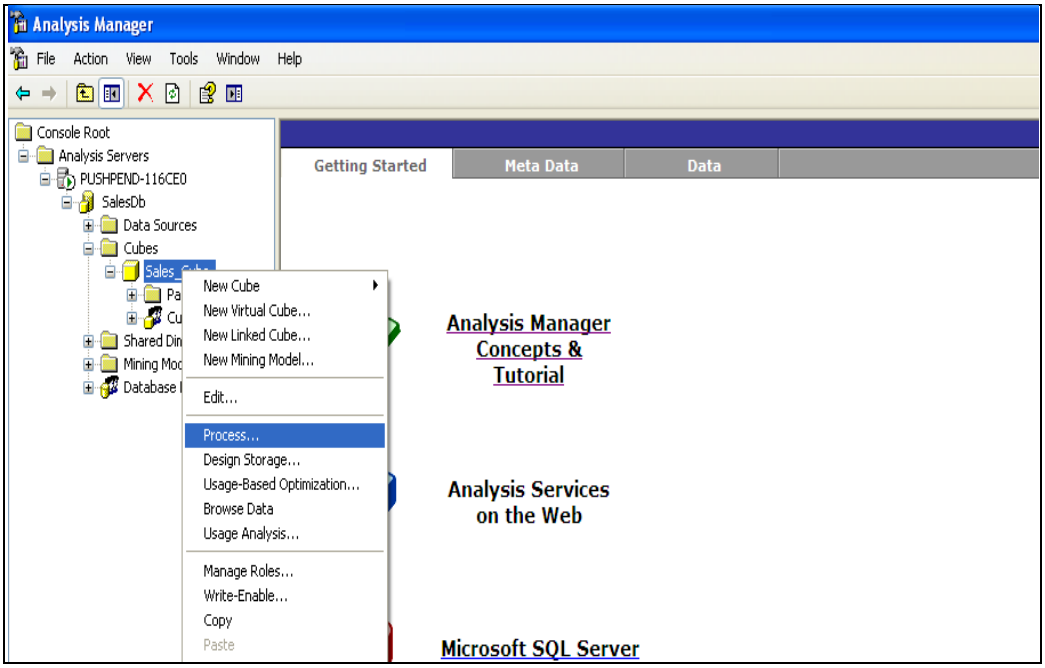


Practical No. 8

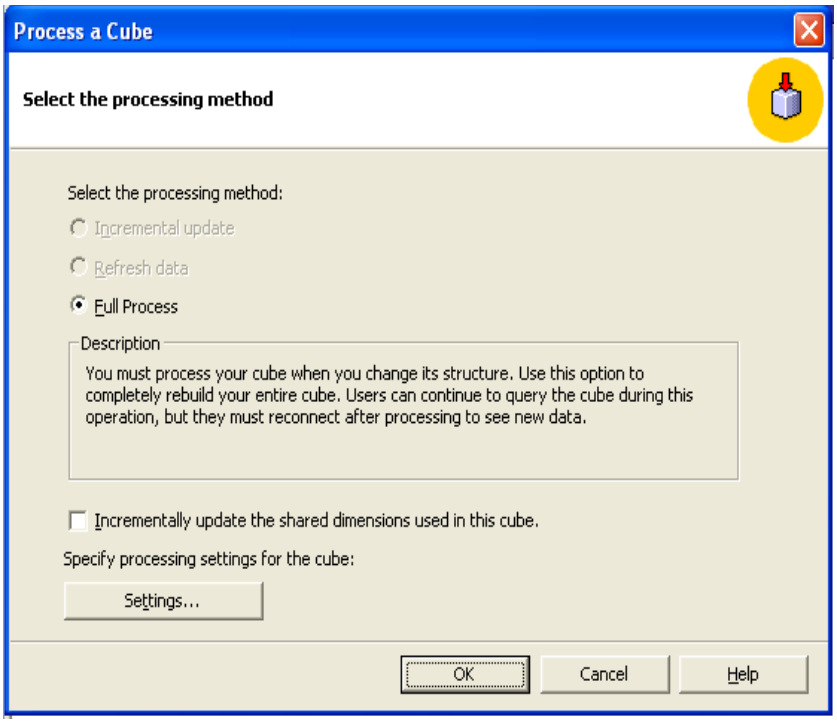
Aim : Develop an application to demonstrate processing and browsing data from a cube.

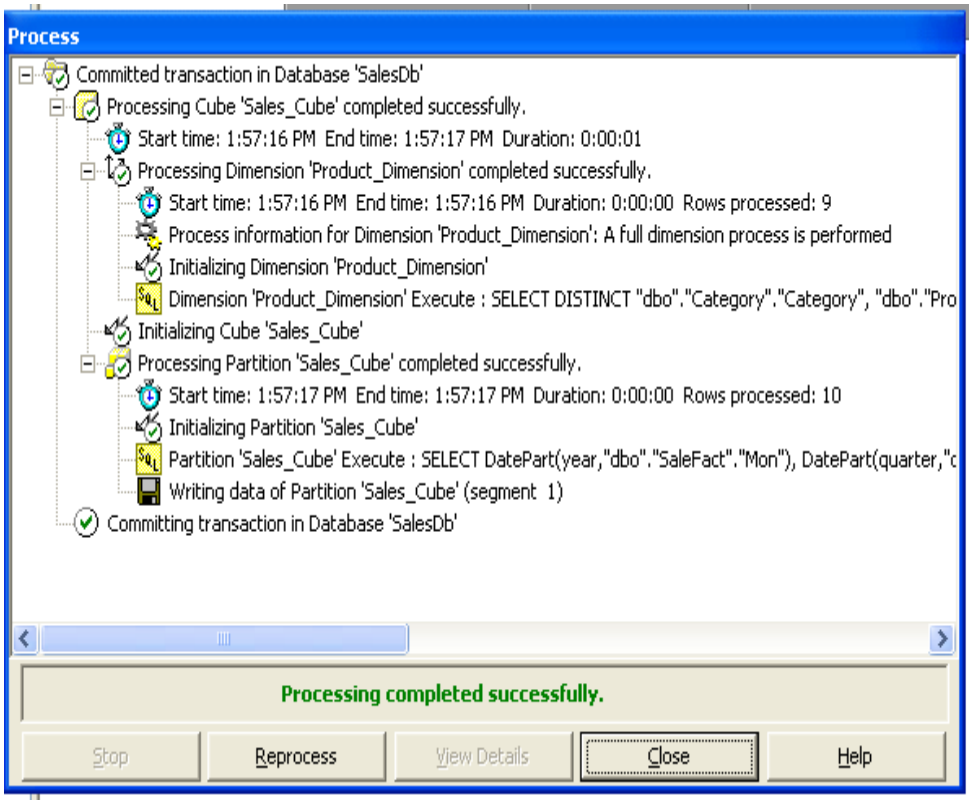
Processing a cube:

Right click on existing cube and select Process.



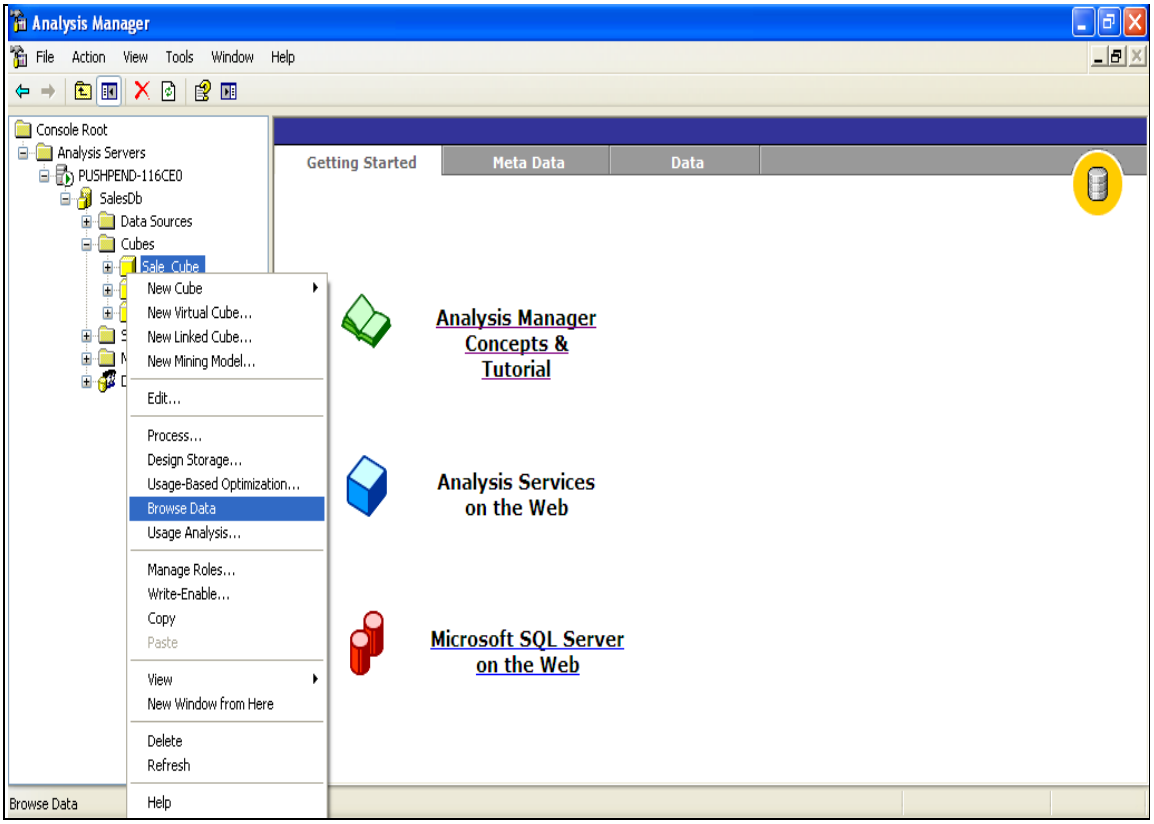
1. Select **Full Process** and Click **Ok**.



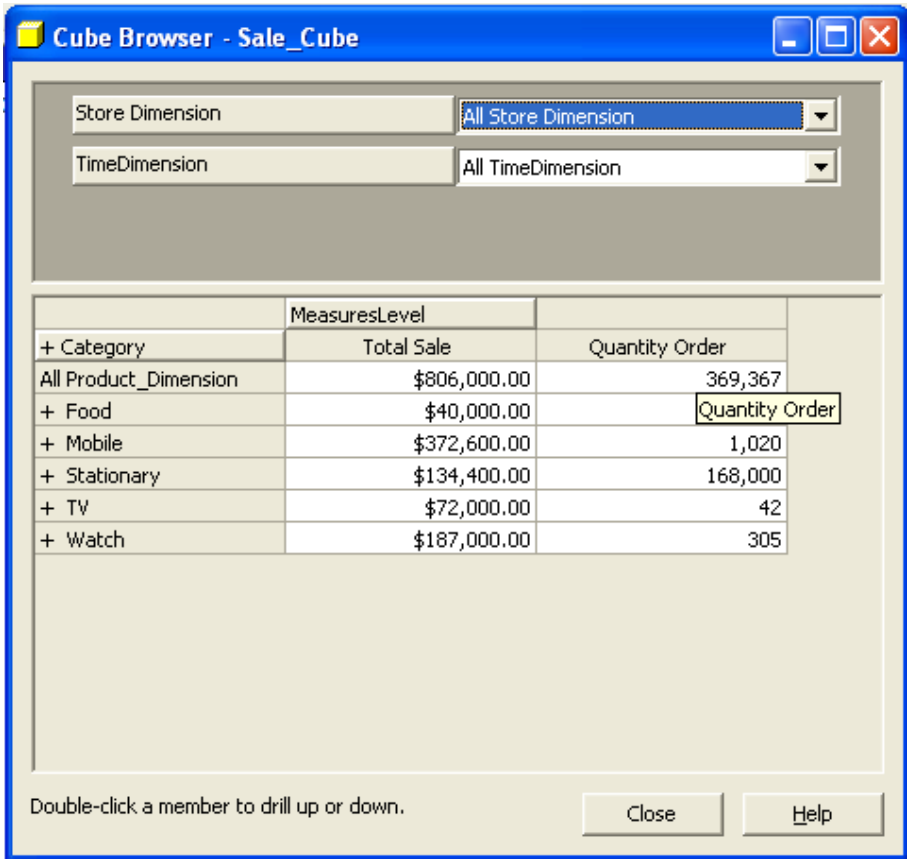


Browsing data in a cube

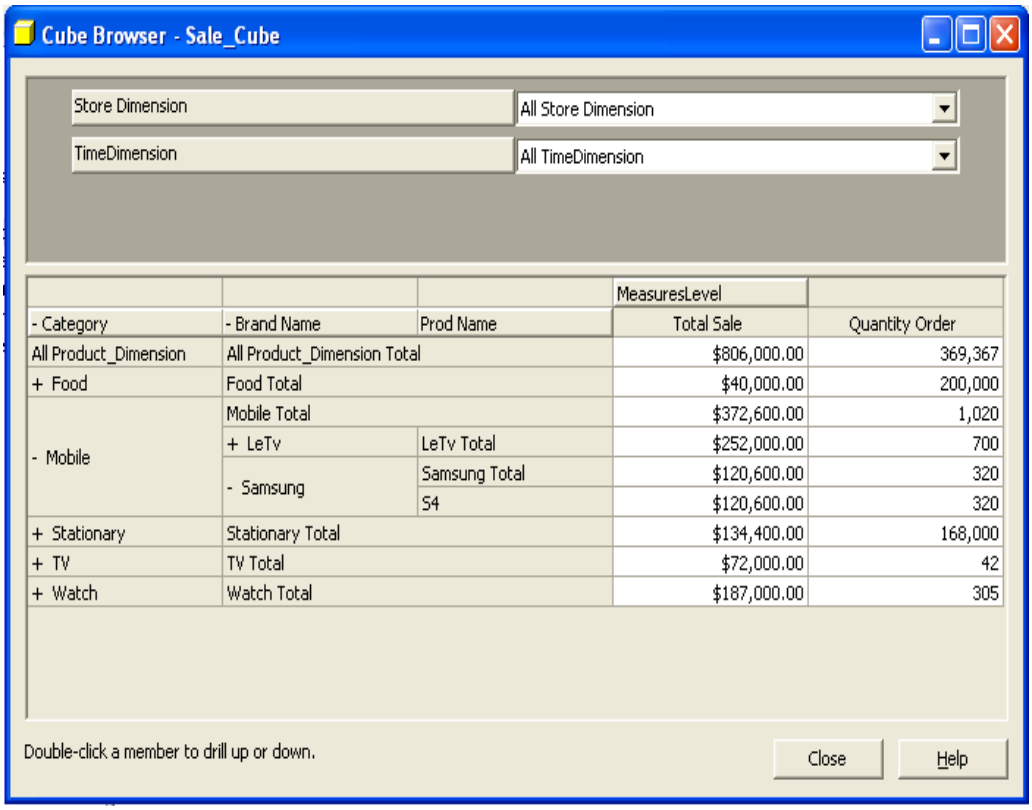
Right click on existing cube and select **Browse Data.**



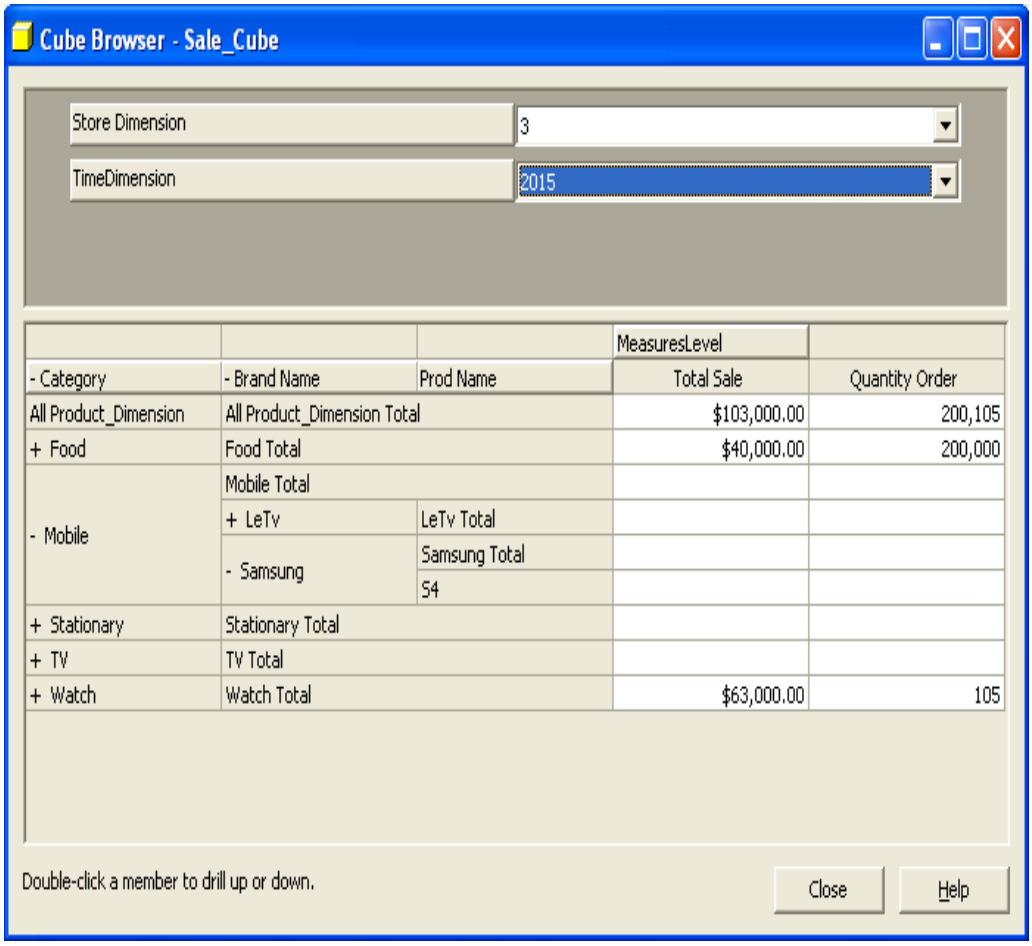
1. A cube browser will opened.



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



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

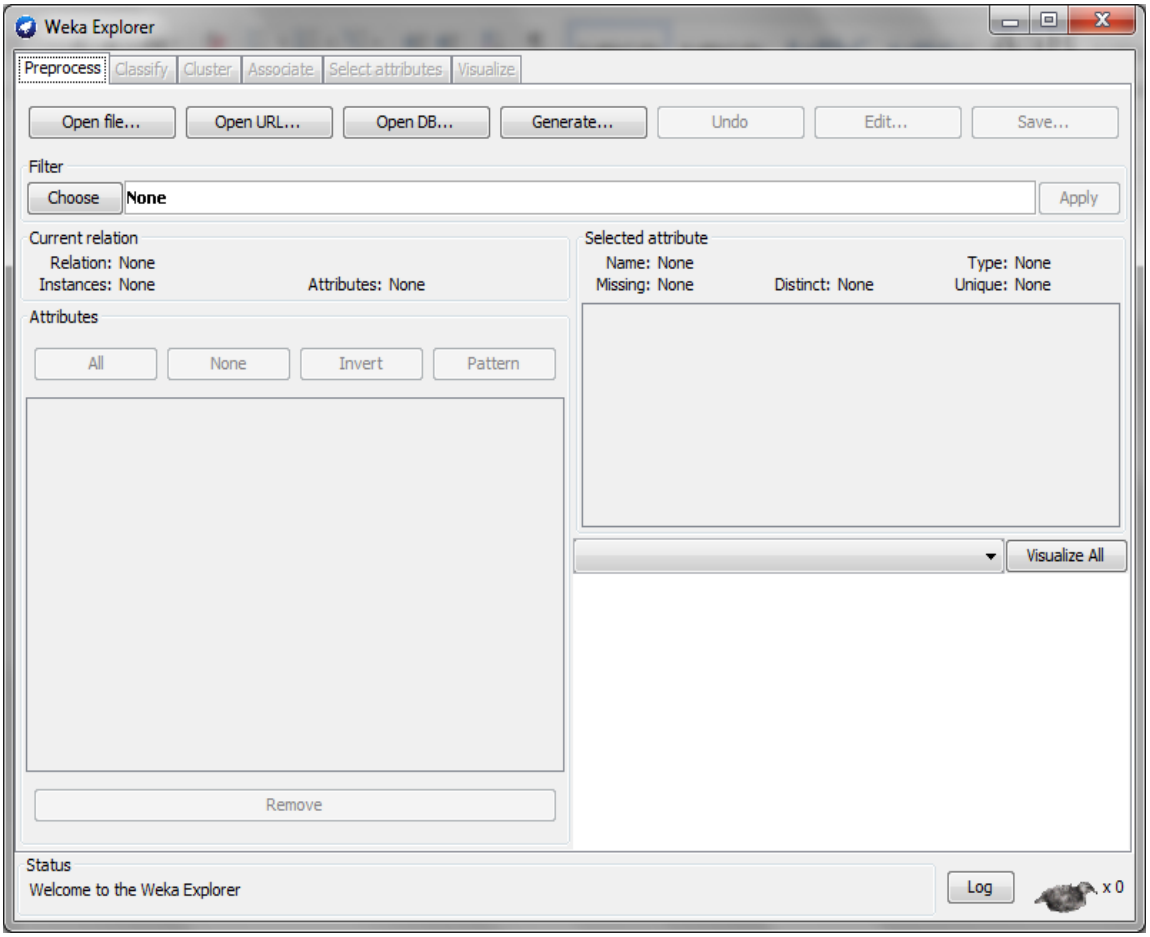


Practical No. 9

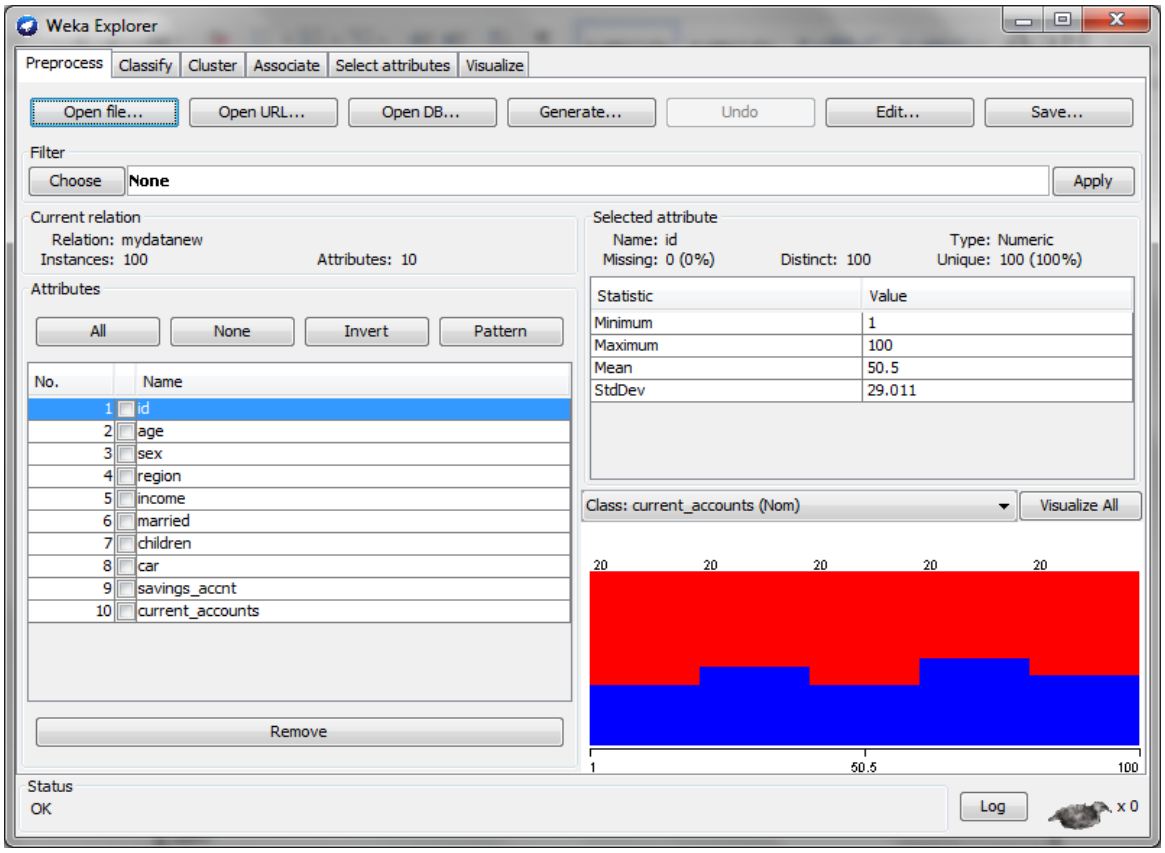
Aim : Develop an application to pre process data imported from external sources.

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

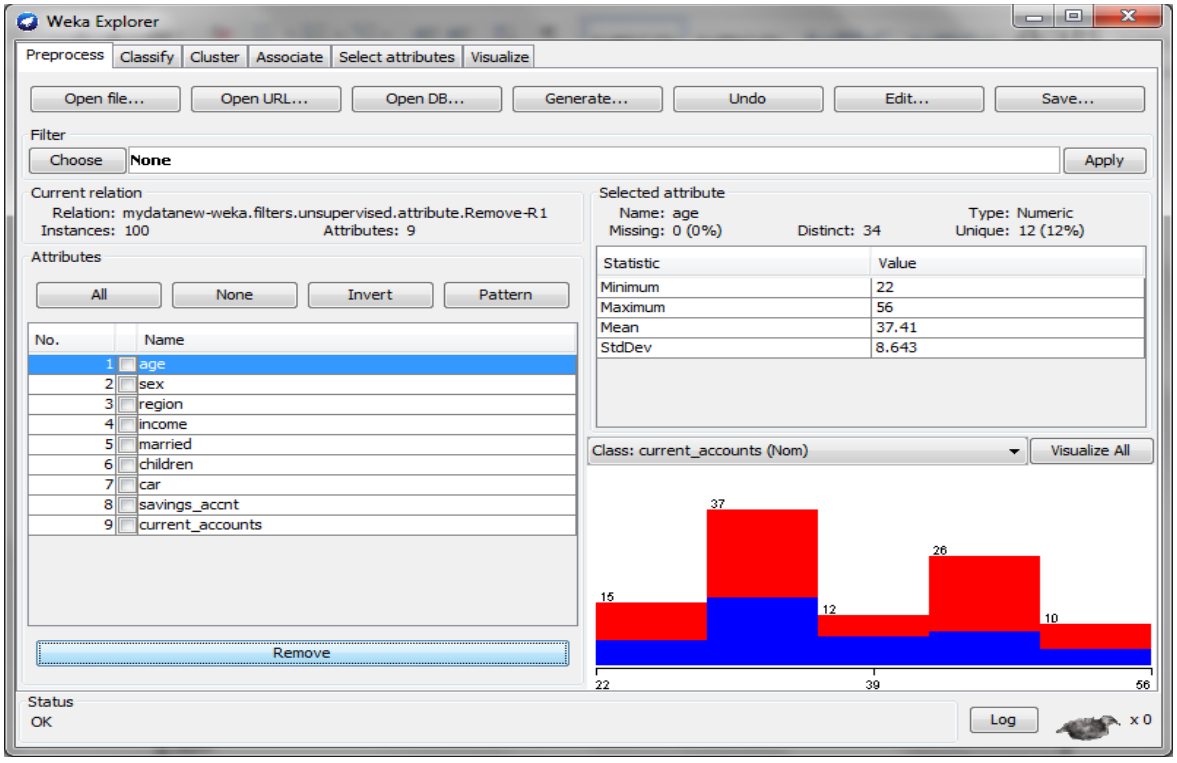
2. Once you get a "Weka Explorer" window click on "Open File" and select the **.csv** database file you want to preprocess.



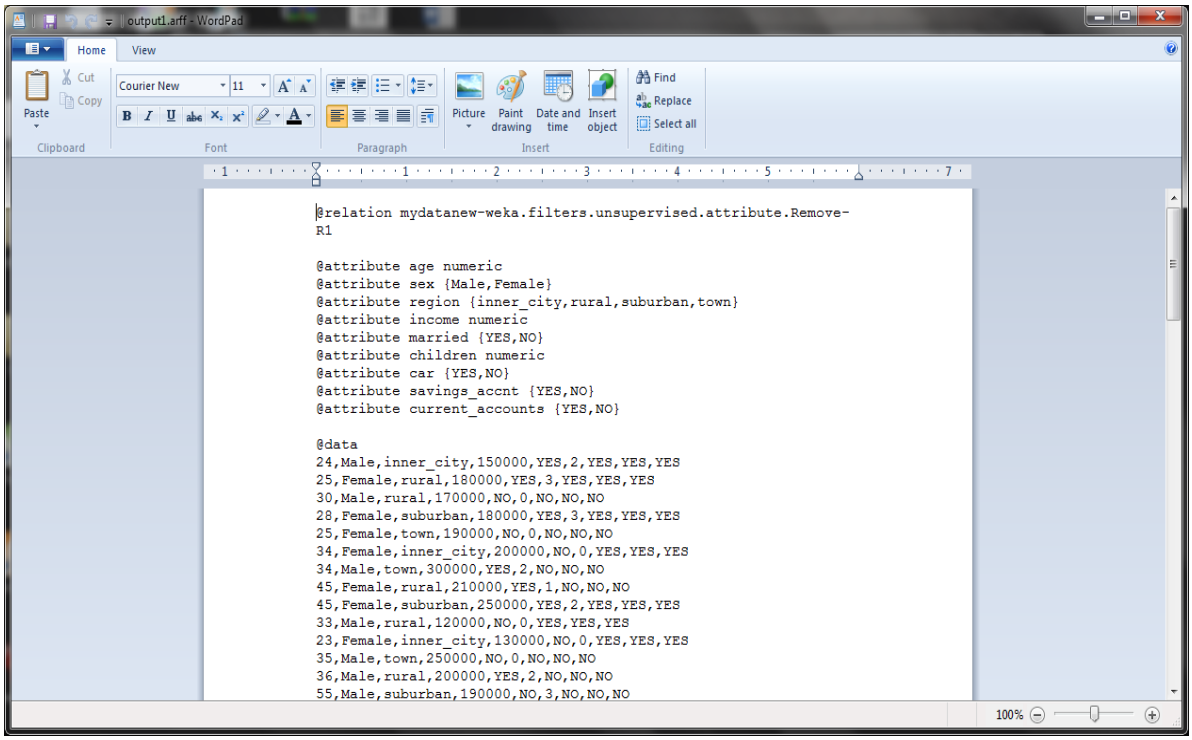
3. After the database is loaded, WEKA will automatically detect the attributes and show the visualization of each one of them at the bottom right panel.



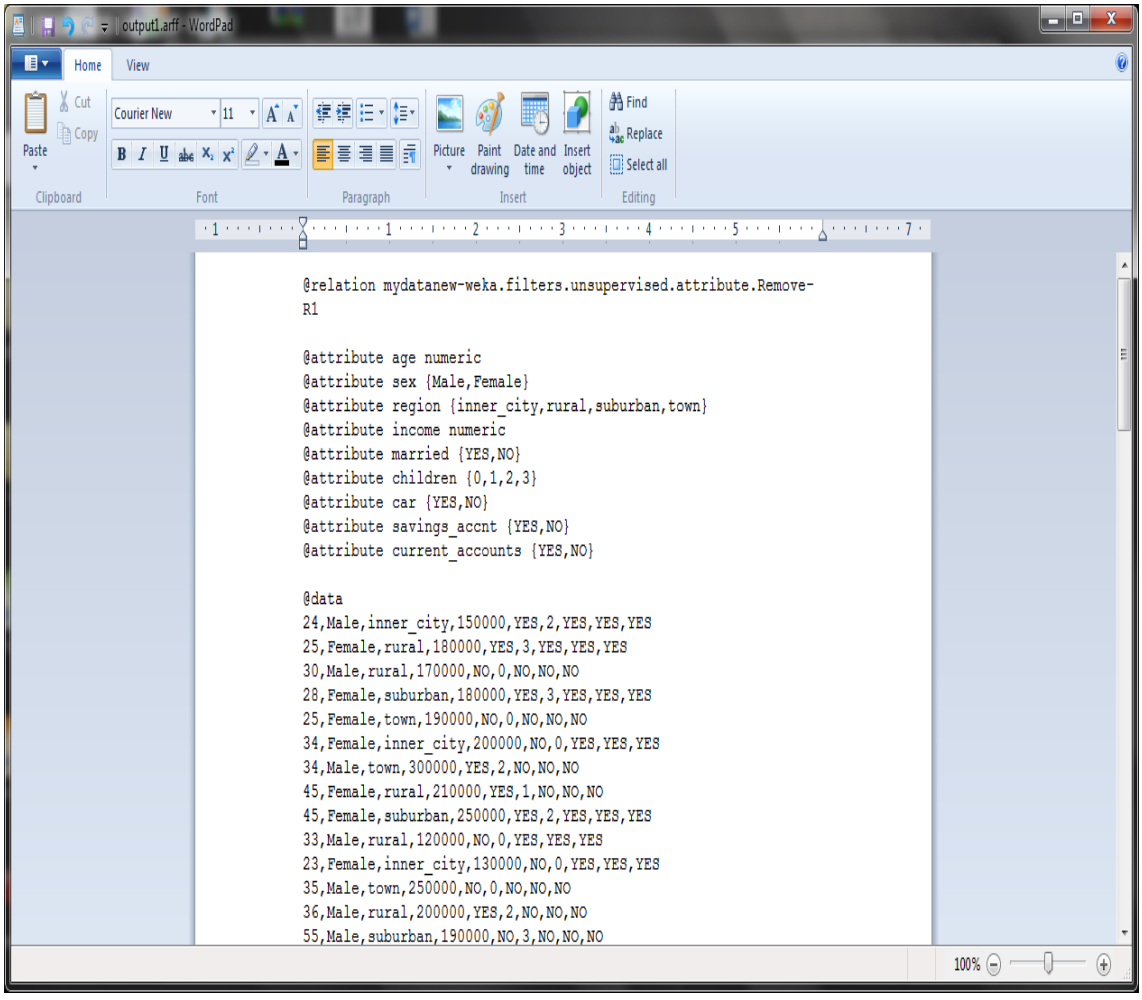
4. Select the “id” attribute and click on “Remove” to remove the “id” attribute from the database. Now save the database.

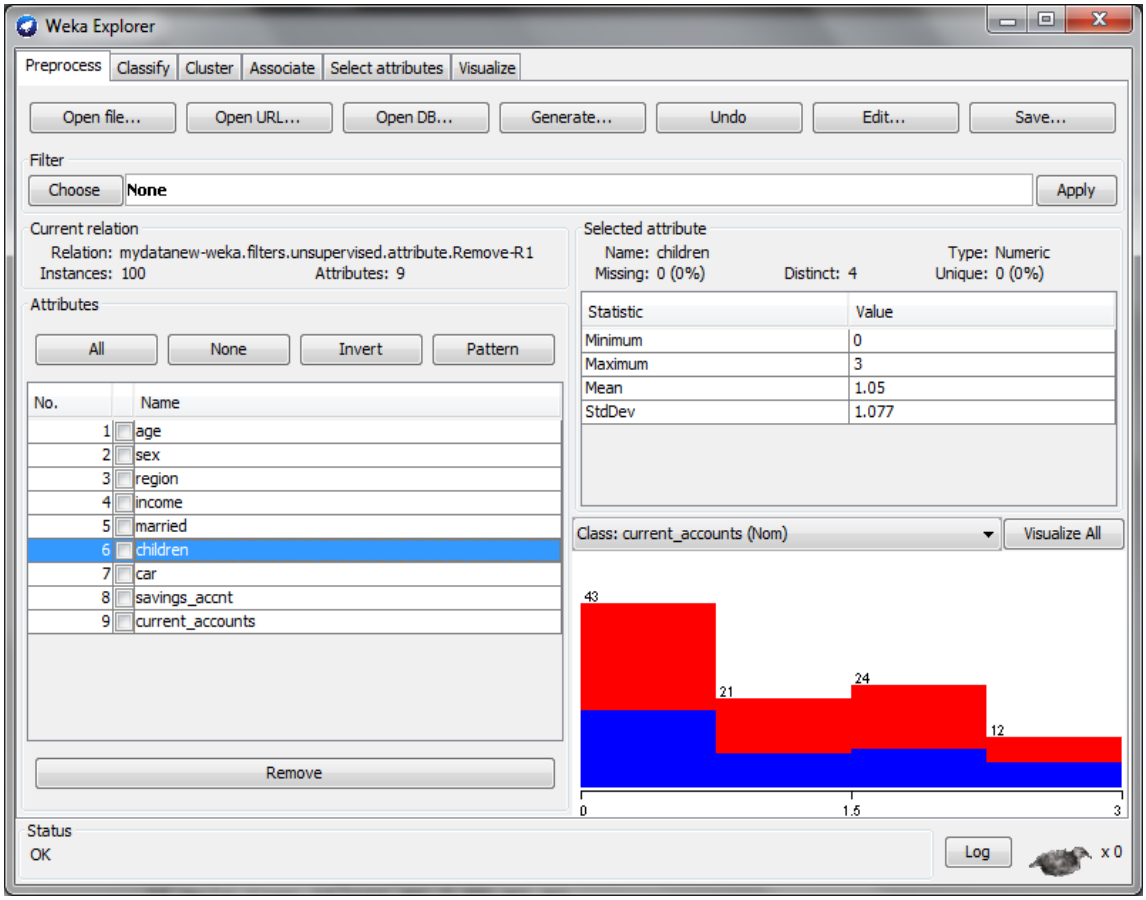


5. Go to the newly saved database file and open it with wordpad.

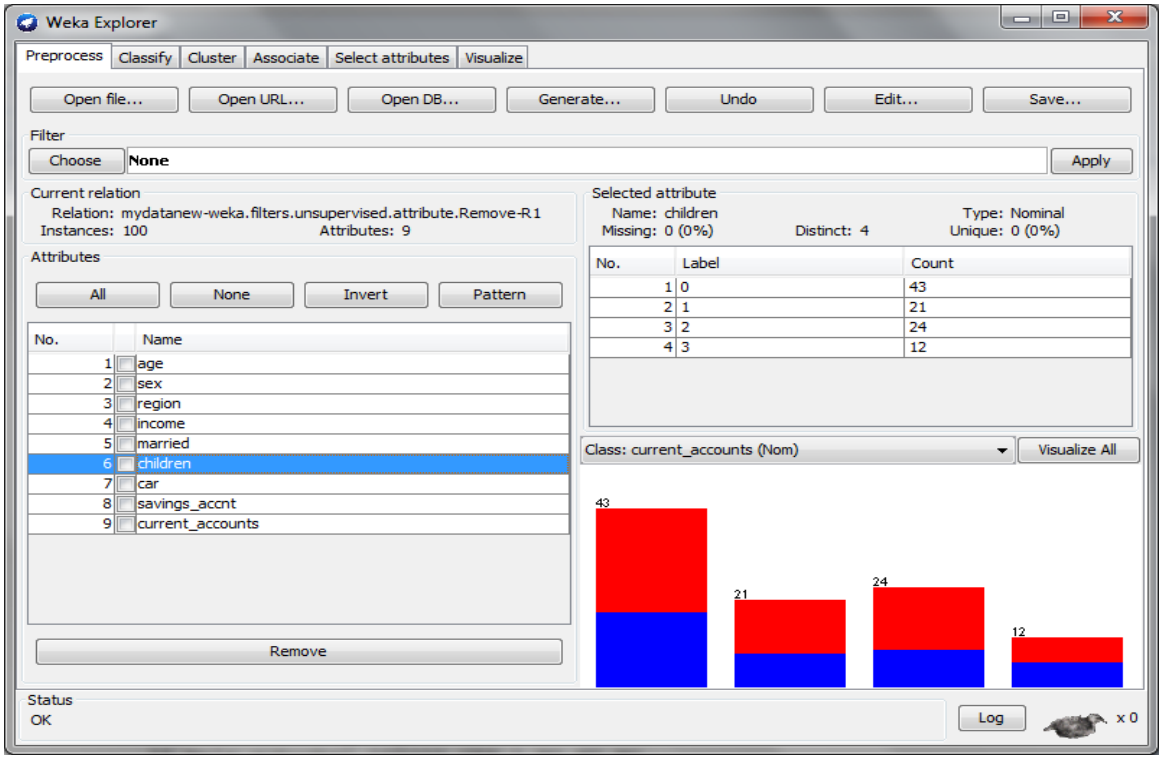


6. Change the attribute value of "children" from "numeric" to **{0,1,2,3}** and save the file.

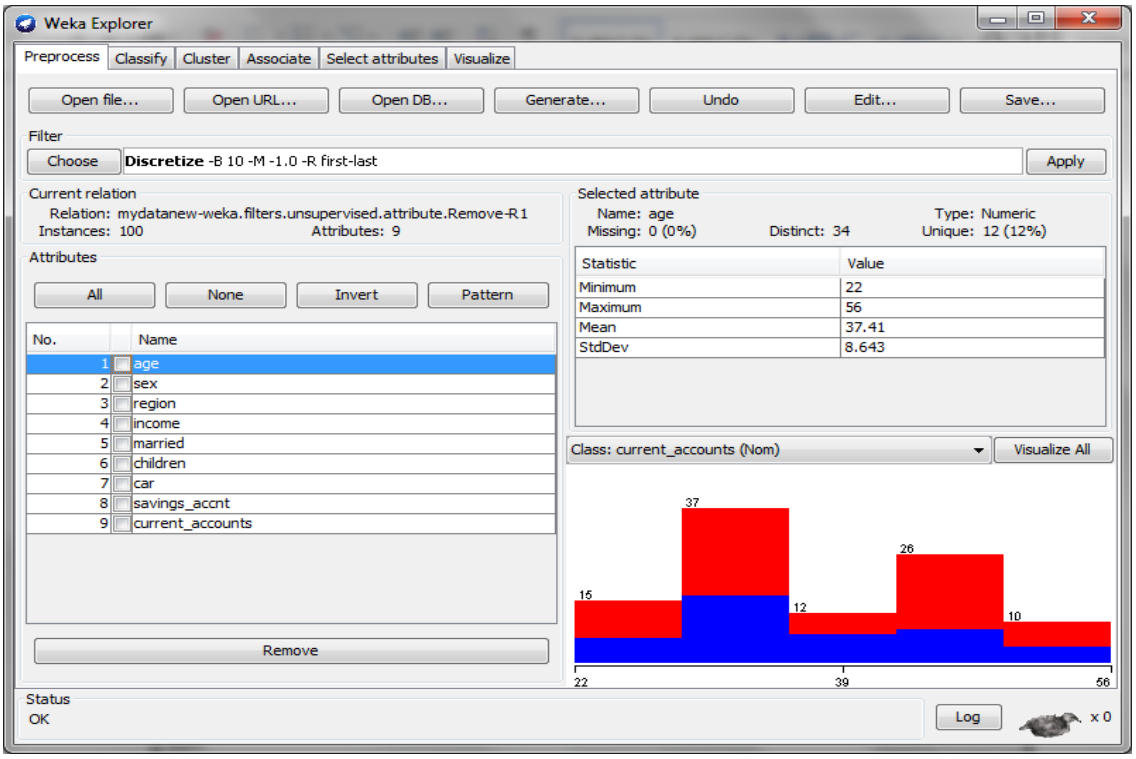




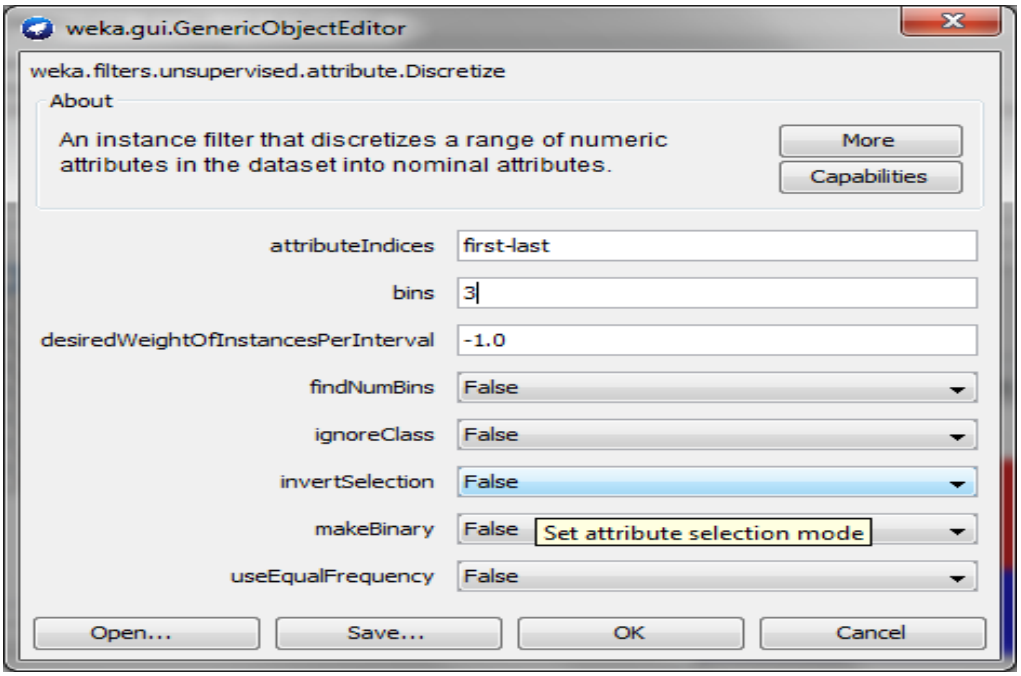
7. Open the newly saved file in WEKA. The continuous values of the attribute "children" are now discrete, as we have clustered the data in 4 discrete clusters.

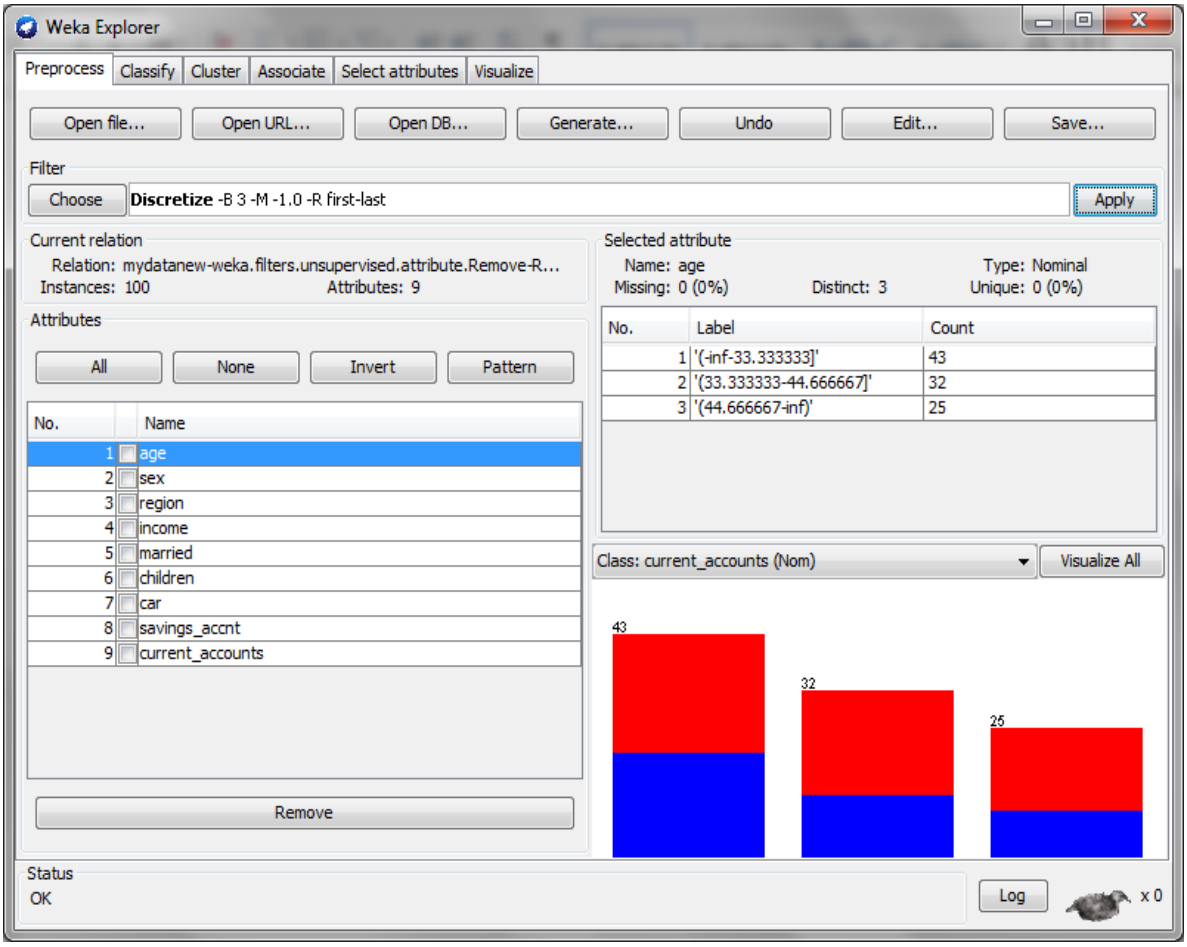


8. Select the “age” attribute, go to “Filter”-Choose-filters-unsupervised-attributes, Select Discretize.

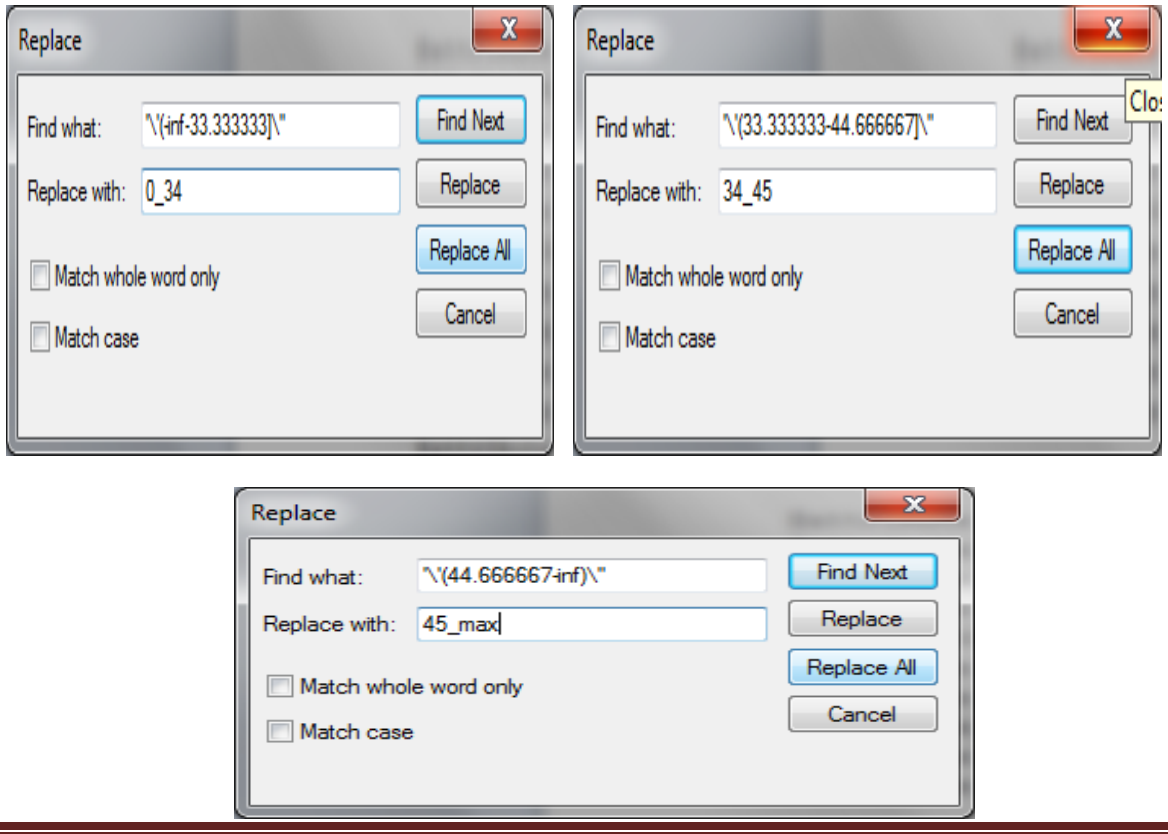


9. Click on the Discretize Text-Box. In the**GenericObjectEditor** change the bins value to **“3”**, click on OK->**Apply** Button. In the visualization 3 clusters of “age” attribute is being created.

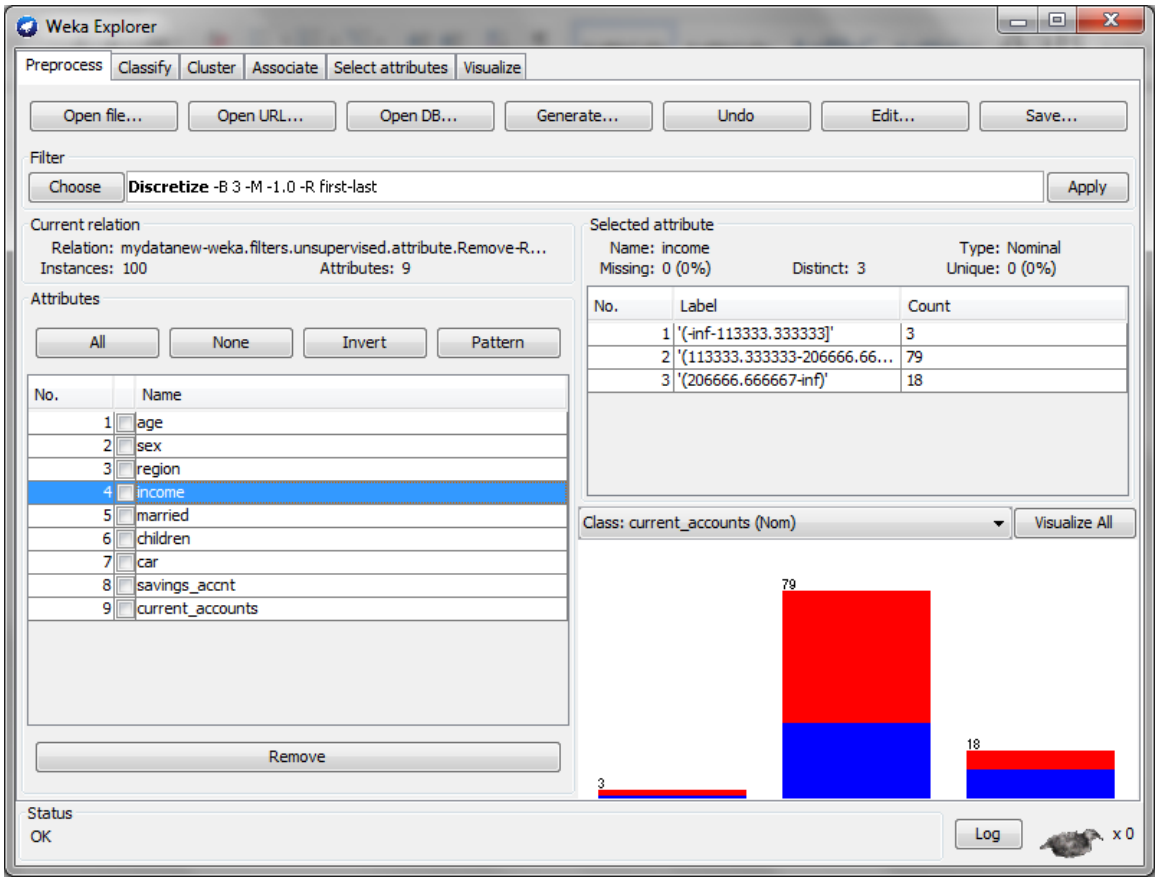


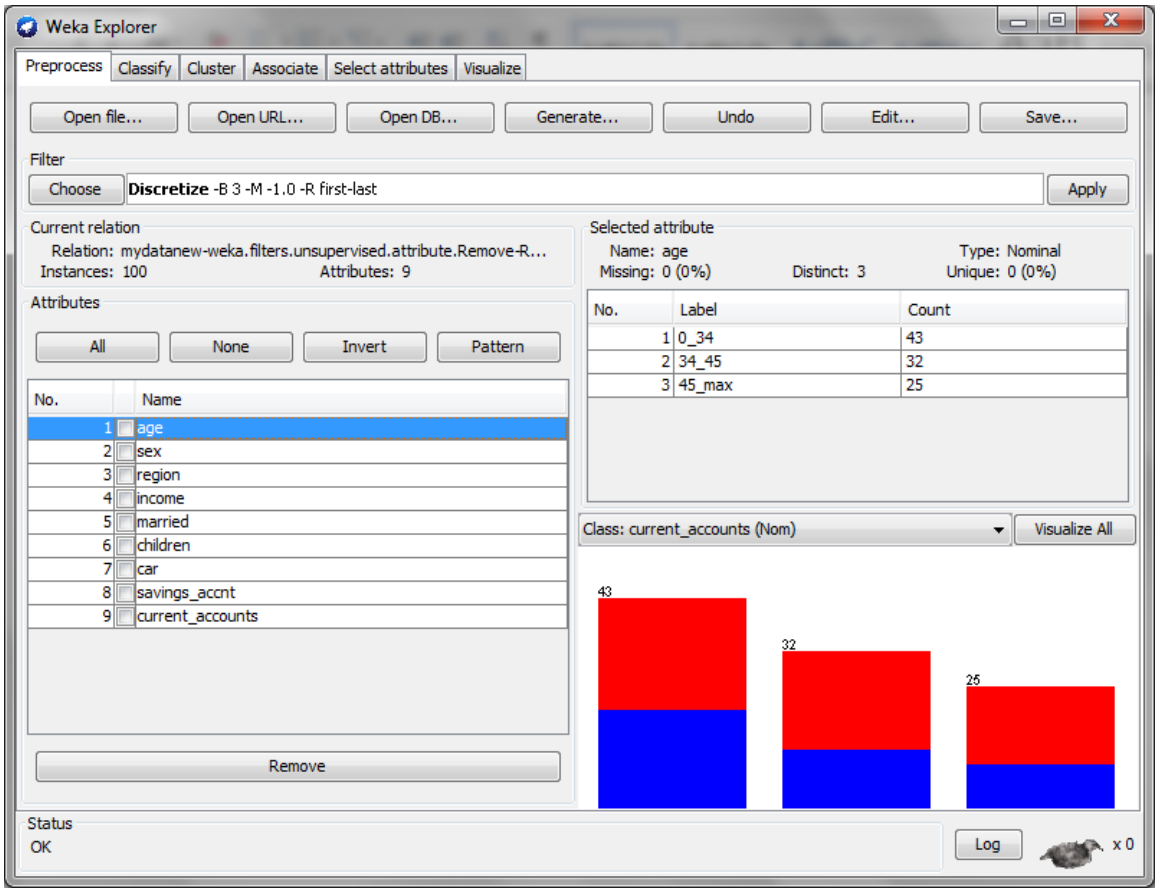


10. Open the database file with WordPad. Replace all the values of age attribute as shown in the figure below. Do the same for values of income attribute.



11. Check the final output.

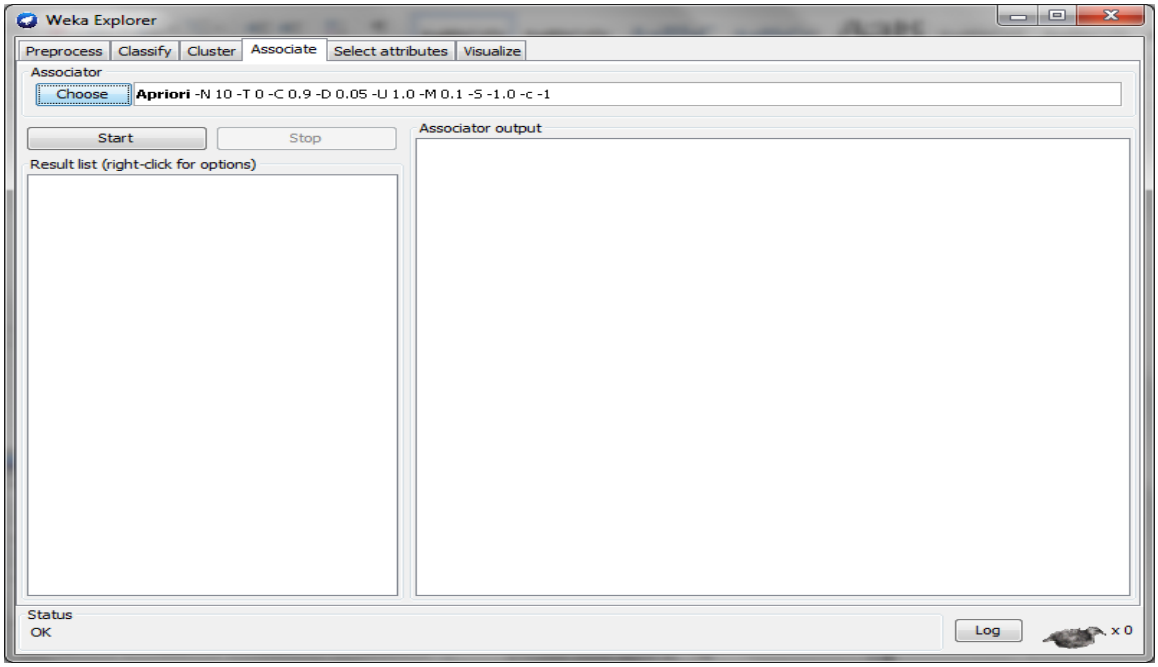




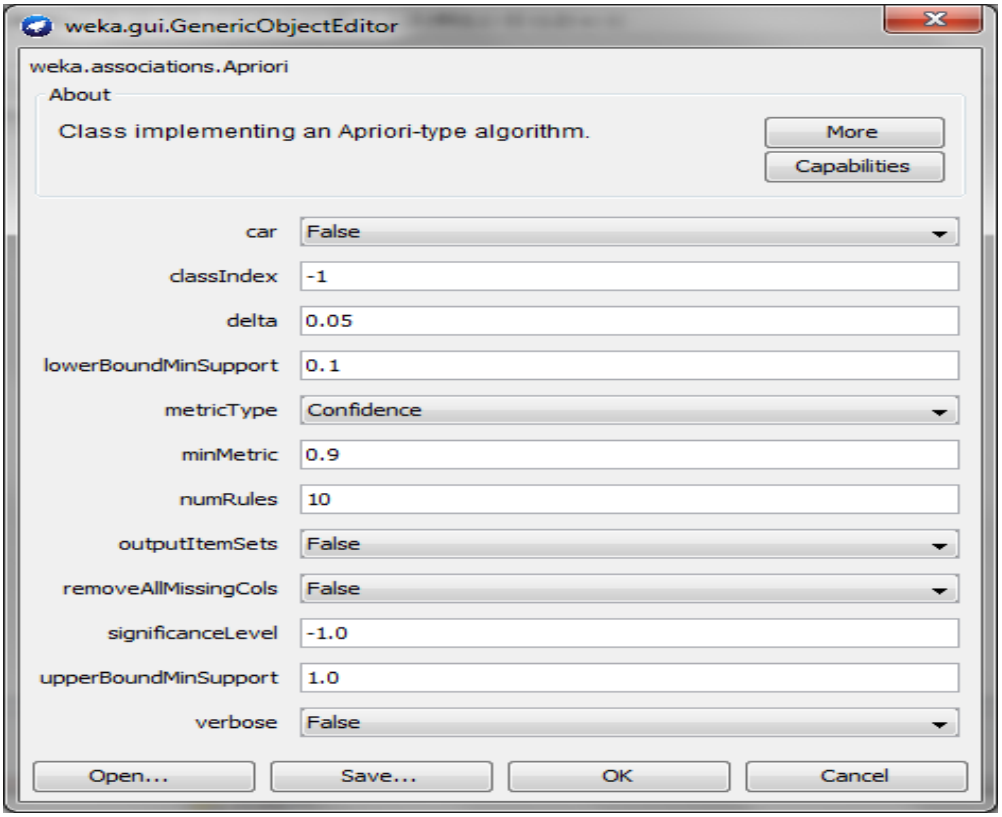
Practical No. 10

Aim : Create association rules by considering suitable parameters.

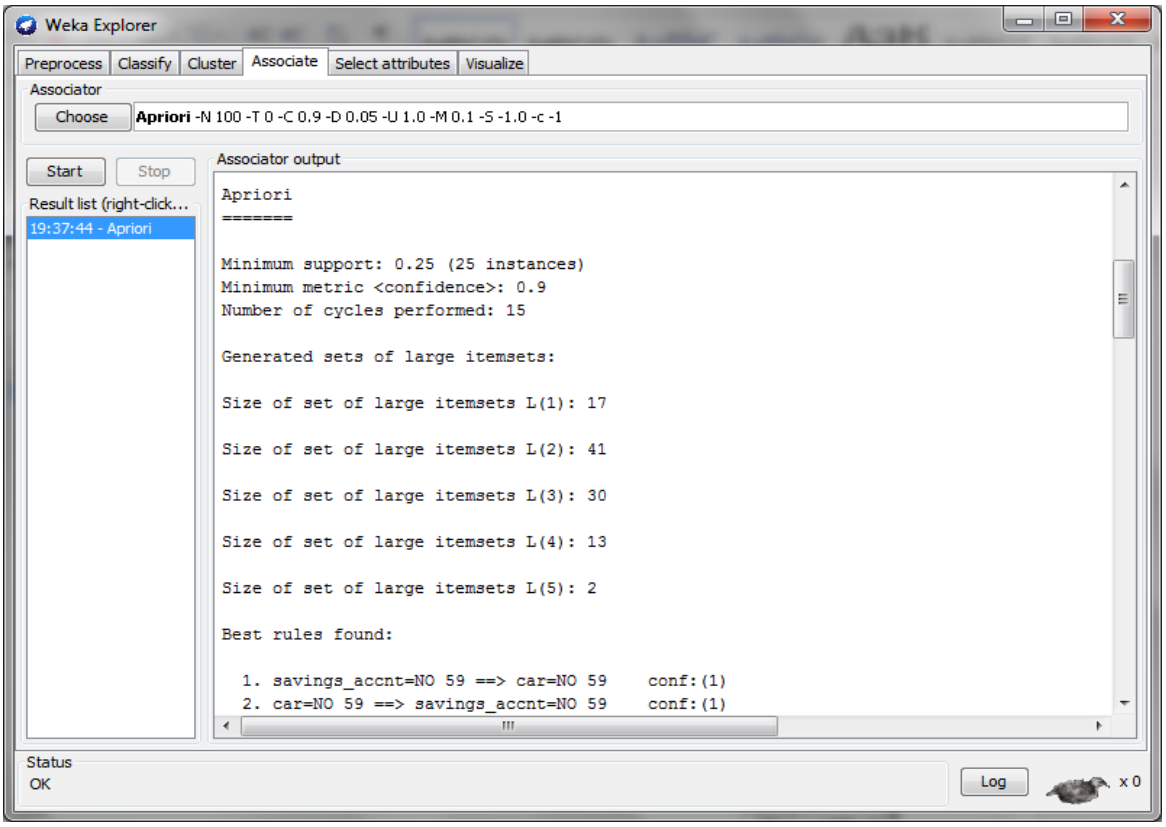
1. Open Weka Explorer->GotoAssociate tab-> Choose **Apriori**.

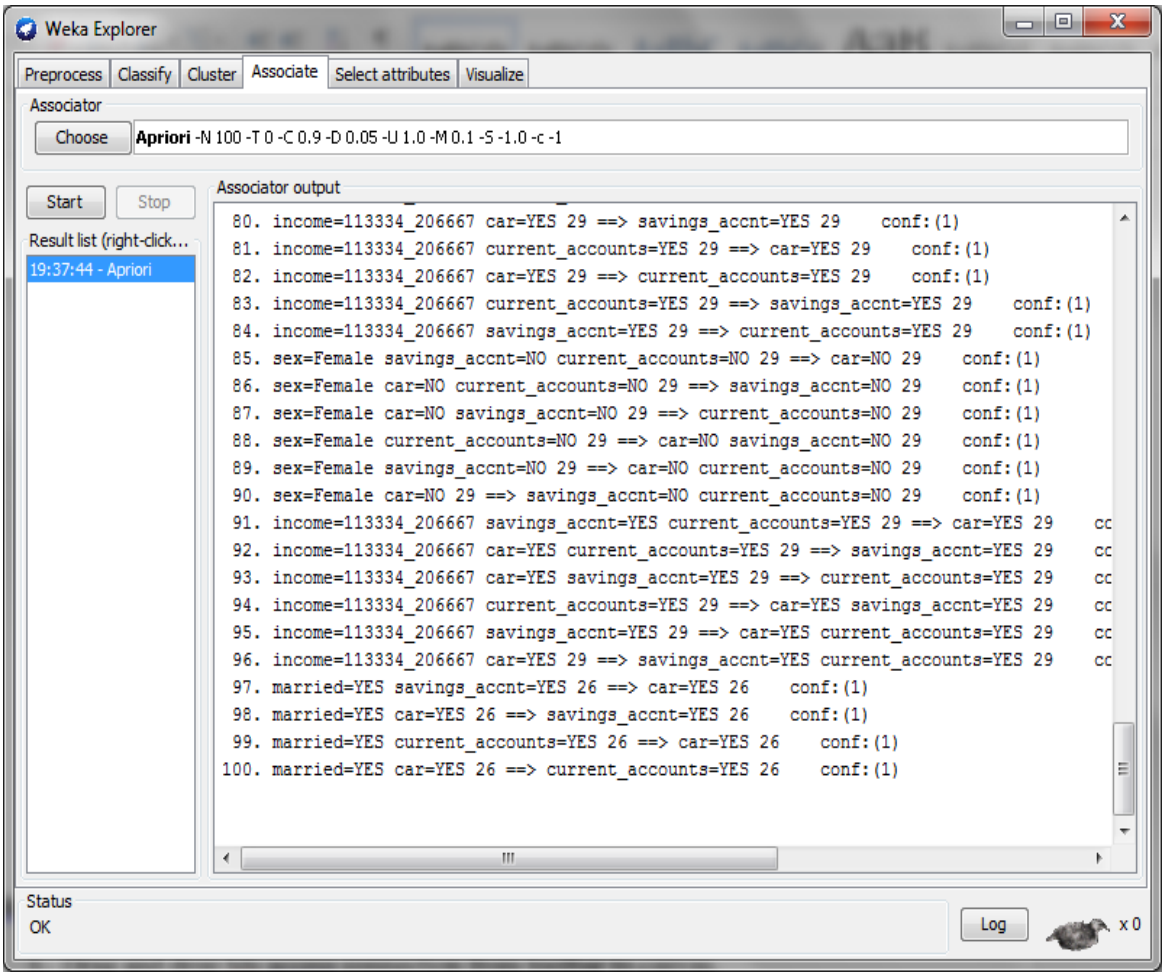


2. In the Generic-Object-Editor change the **numRules** value from **10 to 100**.Click on **Ok** ->Click **Start**.

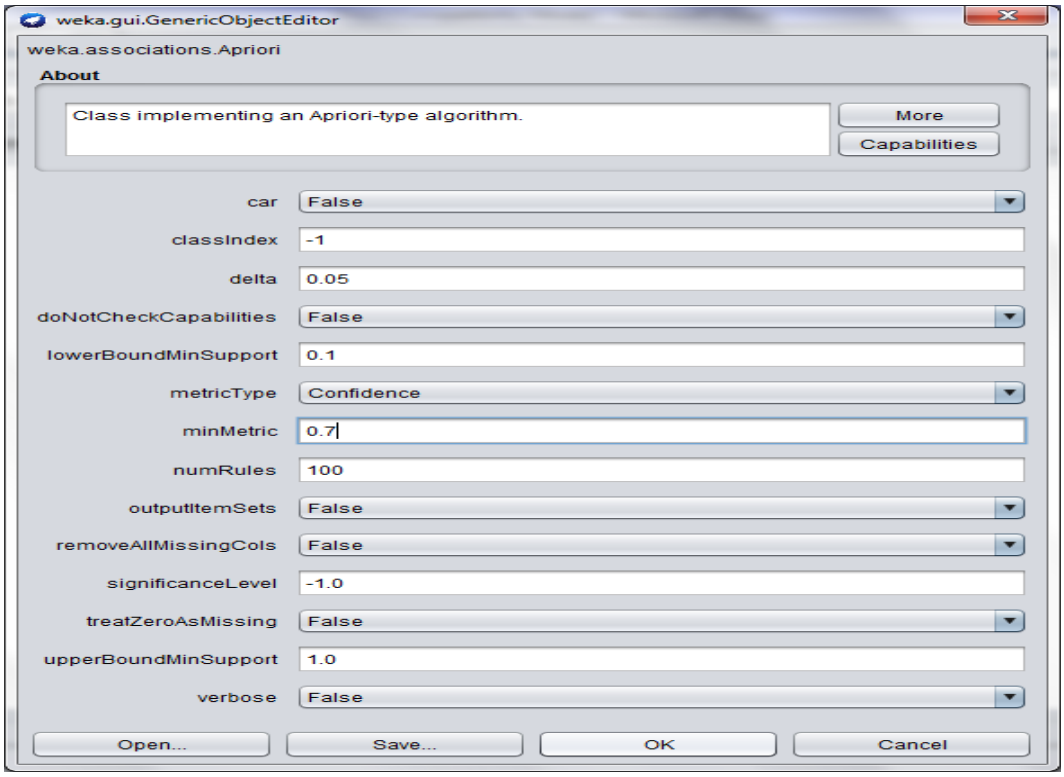


3. Output of rules generated with respect to Confidence.

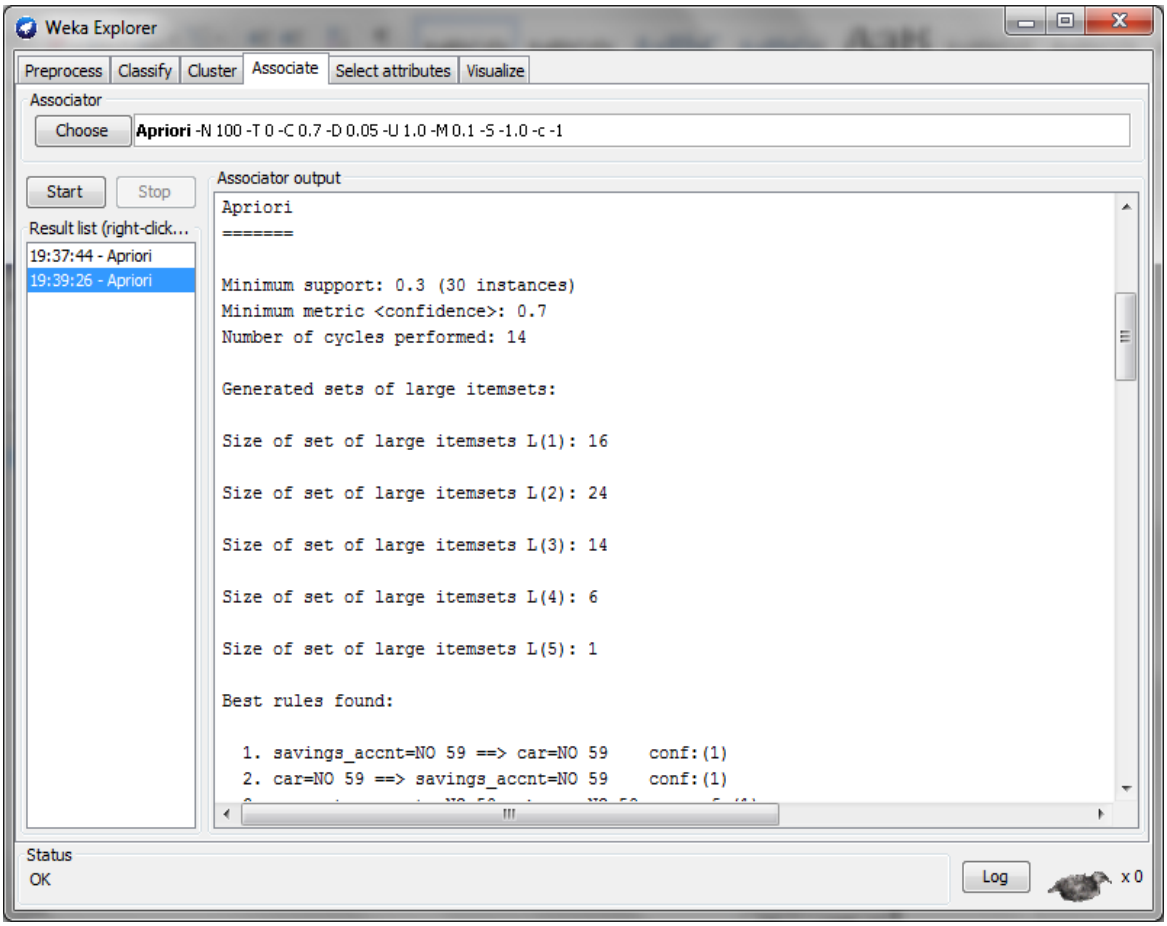


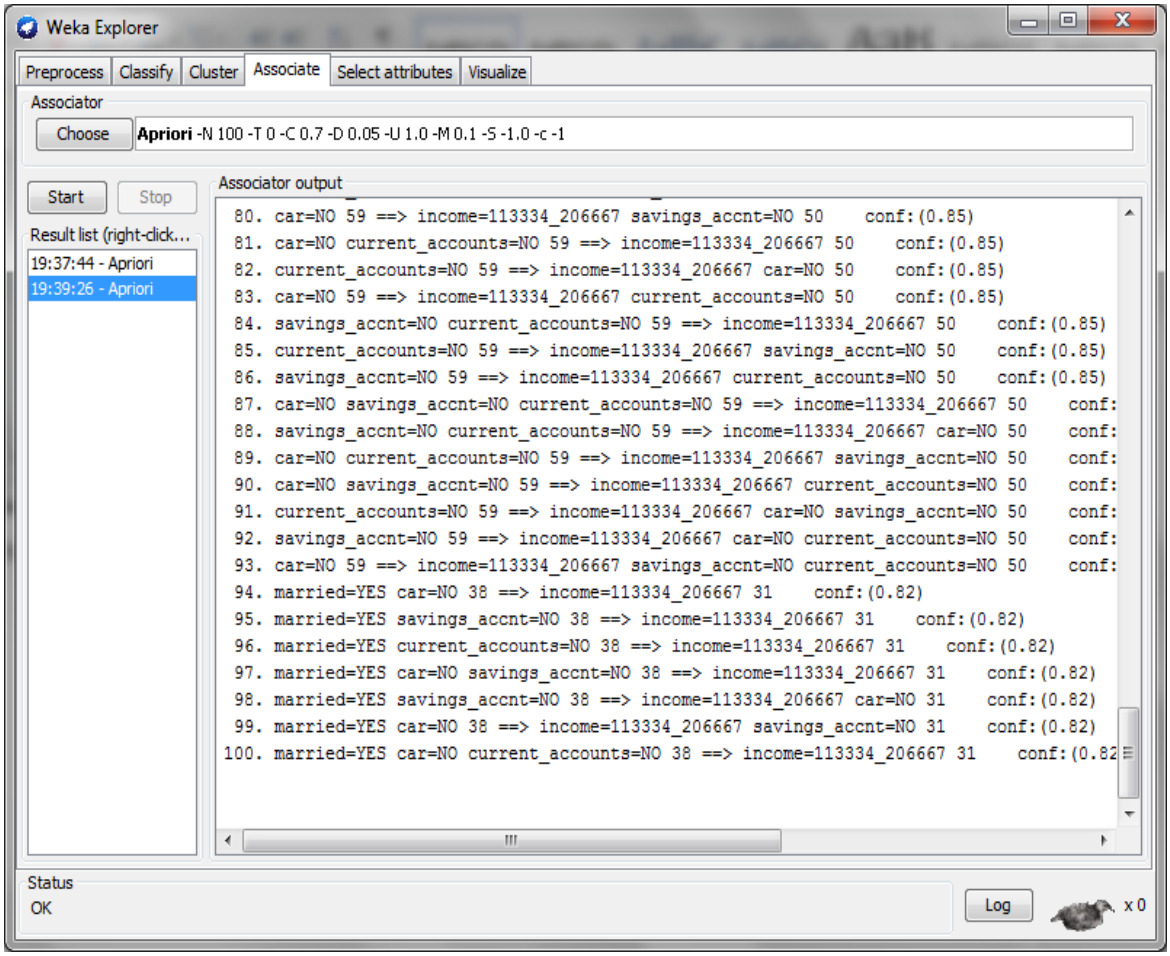


4. Changing **minMetric** value from **0.9 to 0.7**.

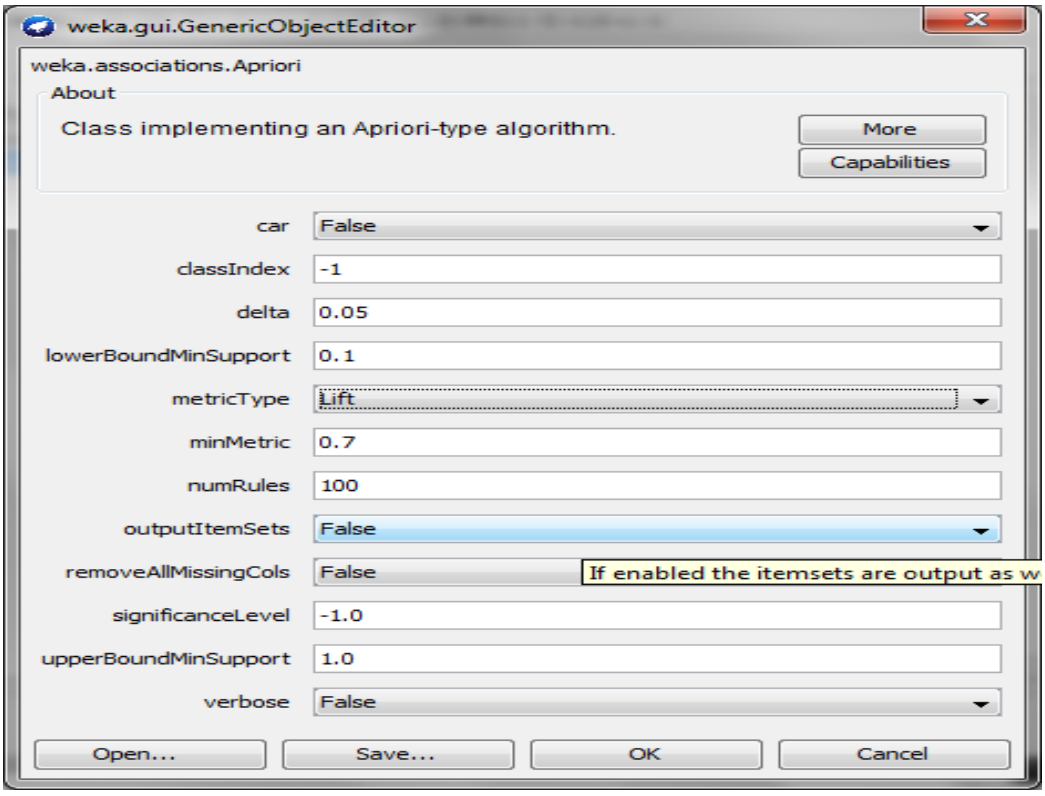


5. Output of rules generated with respect to **Confidence**.

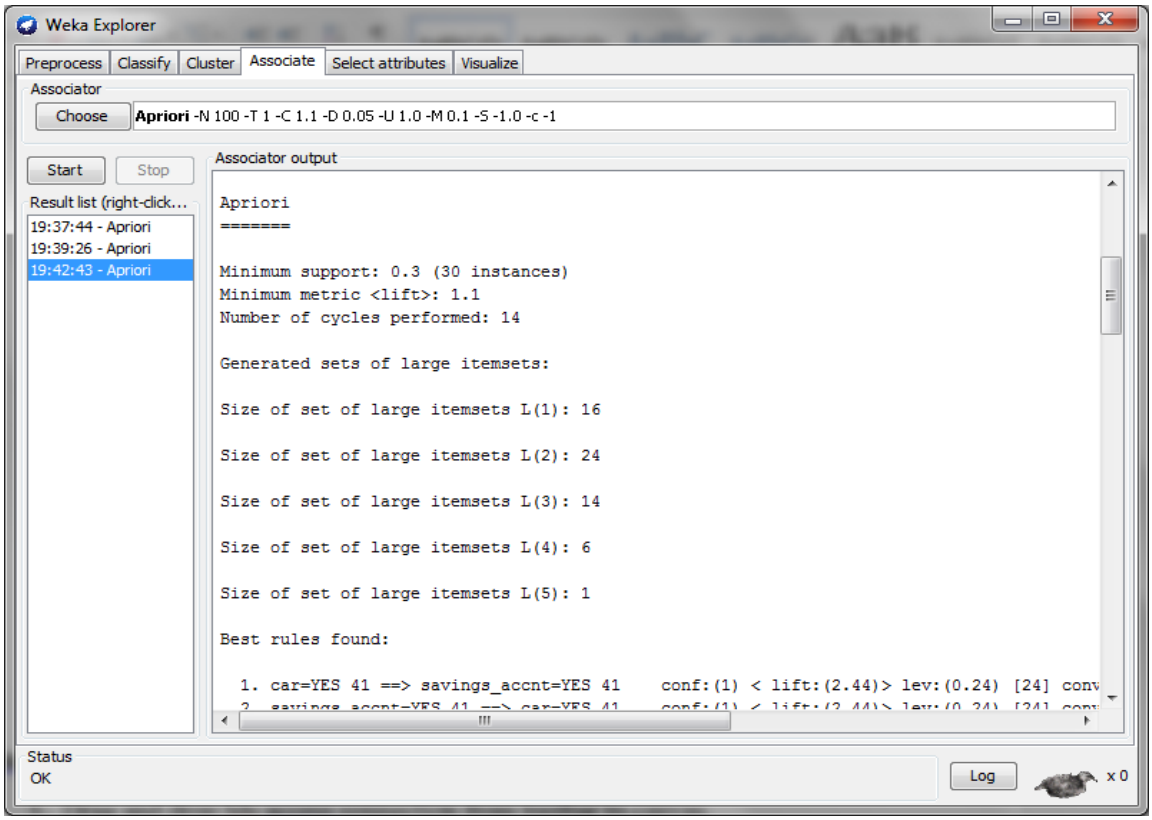


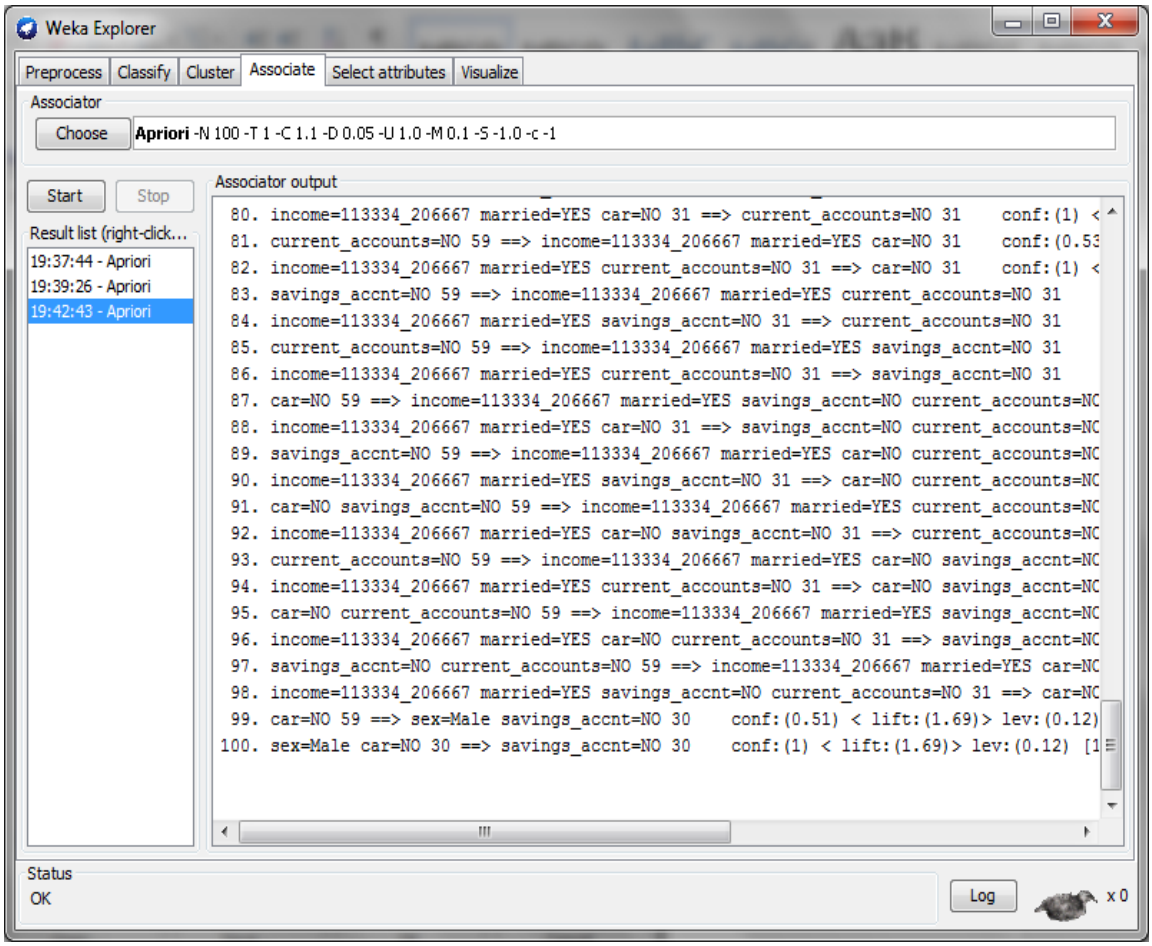


6. Change the metricType to "**Lift**".



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




Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Associator
Choose
Apriori -N 100 -T 1 -C 1.1 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1
Start
Stop
Result list (right-click...
19:37:44 - Apriori
19:39:26 - Apriori
19:42:43 - Apriori
Associator output
80. income=113334_206667 married=YES car=NO 31 ==> current_accounts=NO 31 conf:(1) <
81. current_accounts=NO 59 ==> income=113334_206667 married=YES car=NO 31 conf:(0.53
82. income=113334_206667 married=YES current_accounts=NO 31 ==> car=NO 31 conf:(1) <
83. savings_accnt=NO 59 ==> income=113334_206667 married=YES current_accounts=NO 31
84. income=113334_206667 married=YES savings_accnt=NO 31 ==> current_accounts=NO 31
85. current_accounts=NO 59 ==> income=113334_206667 married=YES savings_accnt=NO 31
86. income=113334_206667 married=YES current_accounts=NO 31 ==> savings_accnt=NO 31
87. car=NO 59 ==> income=113334_206667 married=YES savings_accnt=NO current_accounts=NC
88. income=113334_206667 married=YES car=NO 31 ==> savings_accnt=NO current_accounts=NC
89. savings_accnt=NO 59 ==> income=113334_206667 married=YES car=NO current_accounts=NC
90. income=113334_206667 married=YES savings_accnt=NO 31 ==> car=NO current_accounts=NC
91. car=NO savings_accnt=NO 59 ==> income=113334_206667 married=YES current_accounts=NC
92. income=113334_206667 married=YES car=NO savings_accnt=NO 31 ==> current_accounts=NC
93. current_accounts=NO 59 ==> income=113334_206667 married=YES car=NO savings_accnt=NC
94. income=113334_206667 married=YES current_accounts=NO 31 ==> car=NO savings_accnt=NC
95. car=NO current_accounts=NO 59 ==> income=113334_206667 married=YES savings_accnt=NC
96. income=113334_206667 married=YES car=NO current_accounts=NO 31 ==> savings_accnt=NC
97. savings_accnt=NO current_accounts=NO 59 ==> income=113334_206667 married=YES car=NC
98. income=113334_206667 married=YES savings_accnt=NO current_accounts=NO 31 ==> car=NC
99. car=NO 59 ==> sex=Male savings_accnt=NO 30 conf:(0.51) < lift:(1.69)> lev:(0.12)
100. sex=Male car=NO 30 ==> savings_accnt=NO 30 conf:(1) < lift:(1.69)> lev:(0.12) [1
Status
OK
Log
x 0