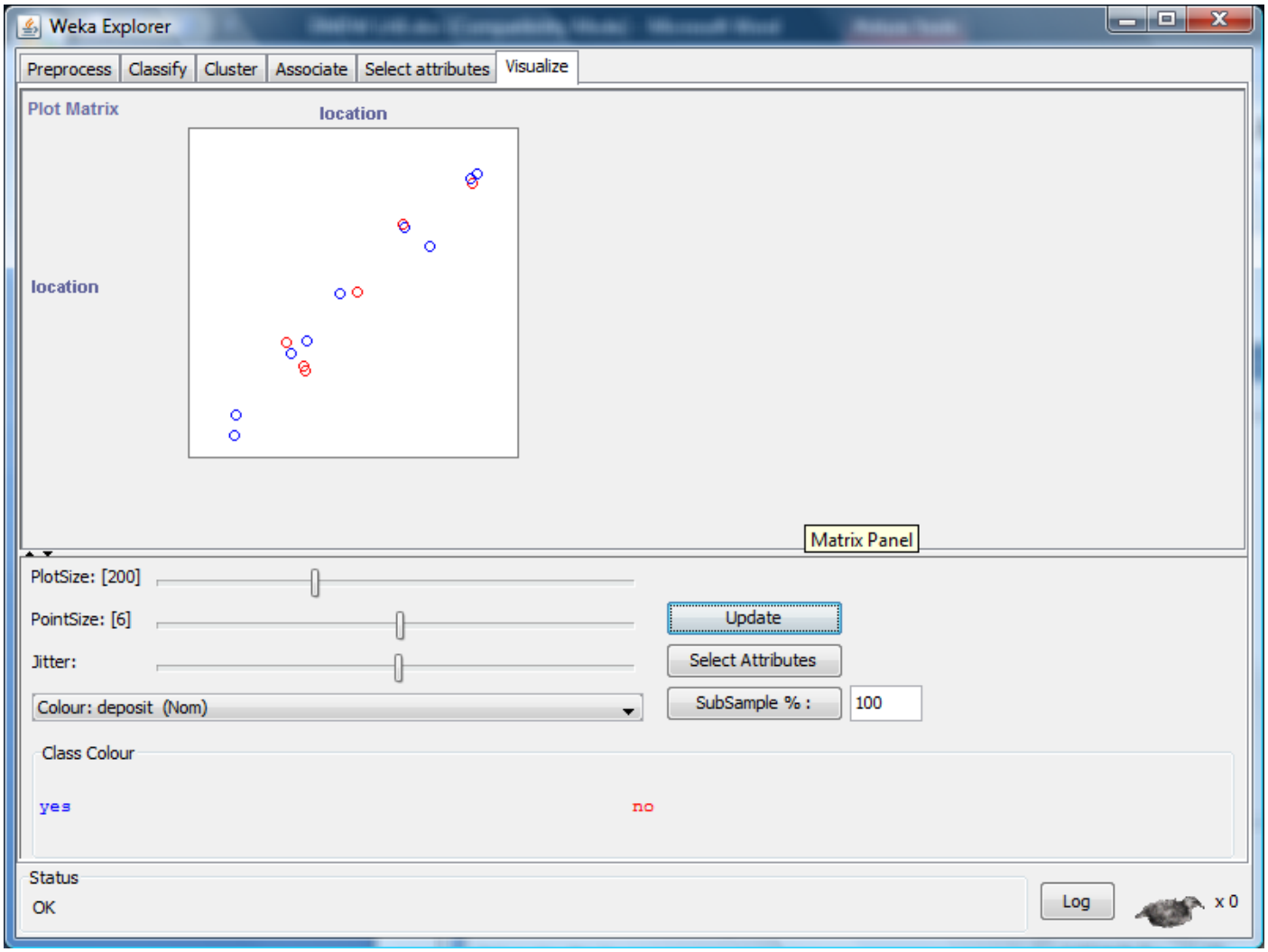
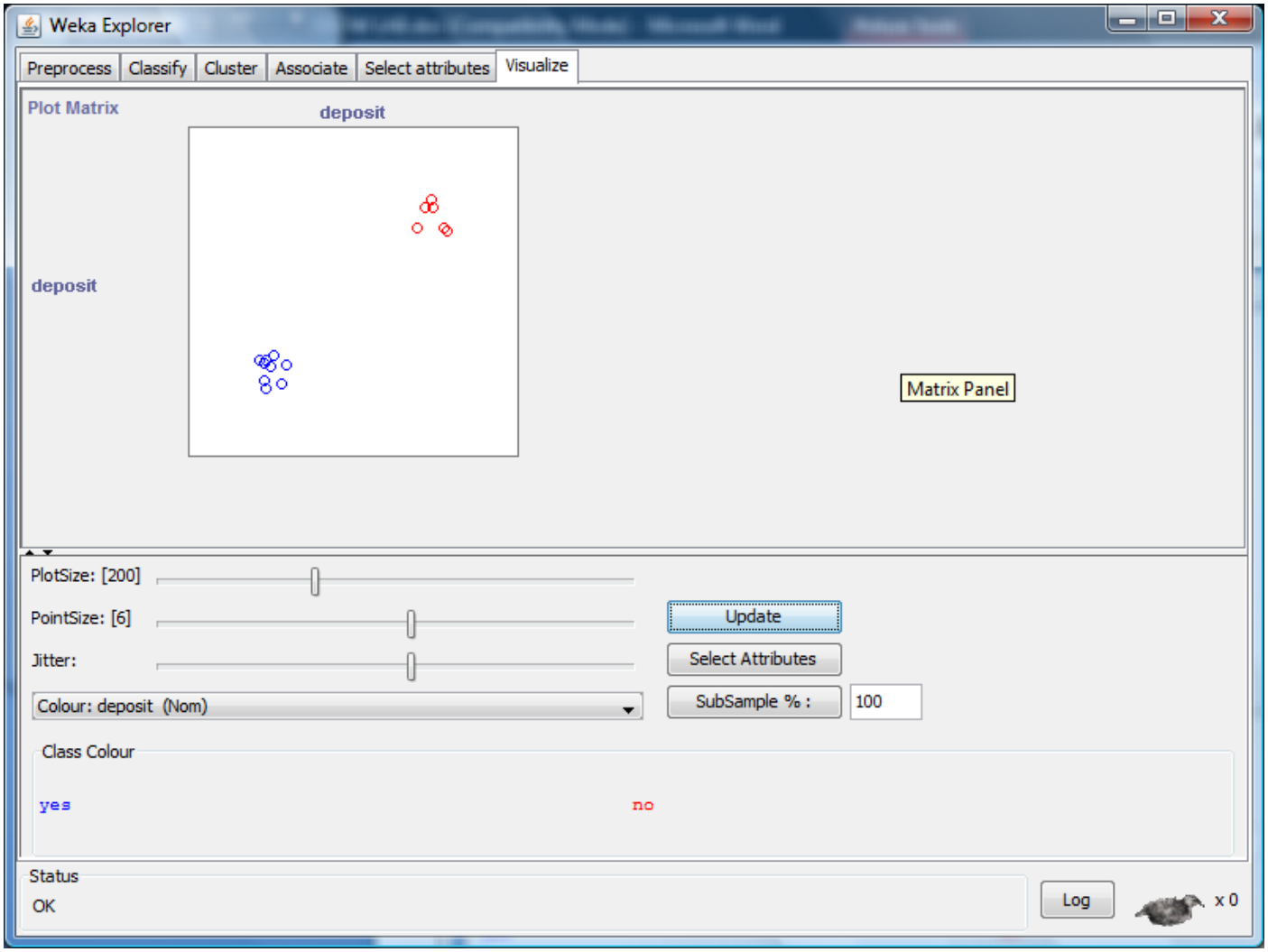
Output:



16)After that we select the **Select Attribute button**, then select **Deposit attribute** and clock OK.

17) Click on the **Update button** to display the output.

Output:



Result:

This program has been successfully executed.

EXPERIMENT NO:15

Aim:

Write a procedure for cross-validation using J48 Algorithm for weather table.

Description:

Cross-validation, sometimes called **rotation estimation**, is a technique for assessing how the results of a statistical analysis will generalize to an independent data set. It is mainly used in settings where the goal is prediction, and one wants to estimate how accurately a predictive model will perform in practice. One round of cross-validation involves partitioning a sample of data into complementary subsets, performing the analysis on one subset (called the *training set*), and validating the analysis on the other subset (called the *validation set* or *testing set*).

Creation of Weather Table:

Procedure:

1) Open Start → Programs → Accessories → Notepad

2) Type the following training data set with the help of Notepad for Weather Table.

```
@relation weather
@attribute outlook {sunny, rainy, overcast}
@attribute temperature numeric
@attribute humidity numeric
@attribute windy {TRUE, FALSE}
@attribute play {yes, no}
@data
sunny,85,85,FALSE,no
sunny,80,90,TRUE,no
overcast,83,86,FALSE,yes
rainy,70,96,FALSE,yes
rainy,68,80,FALSE,yes
rainy,65,70,TRUE,no
overcast,64,65,TRUE,yes
sunny,72,95,FALSE,no
sunny,69,70,FALSE,yes
rainy,75,80,FALSE,yes
sunny,75,70,TRUE,yes
overcast,72,90,TRUE,yes
overcast,81,75,FALSE,yes
rainy,71,91,TRUE,no
```

3) After that the file is saved with **.arff** file format.

4) Minimize the arff file and then open Start → Programs → weka-3-4.

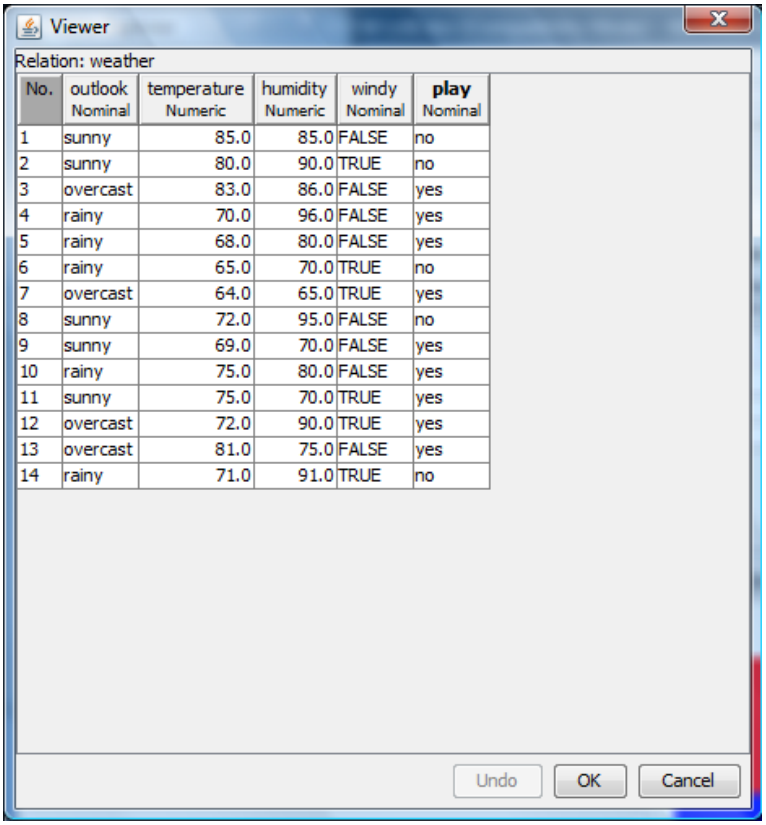
5) Click on **weka-3-4**, then Weka dialog box is displayed on the screen.

6) In that dialog box there are four modes, click on **explorer**.

7) Explorer shows many options. In that click on **'open file'** and select the arff file

8) Click on **edit button** which shows weather table on weka.

Training Data Set → Weather Table

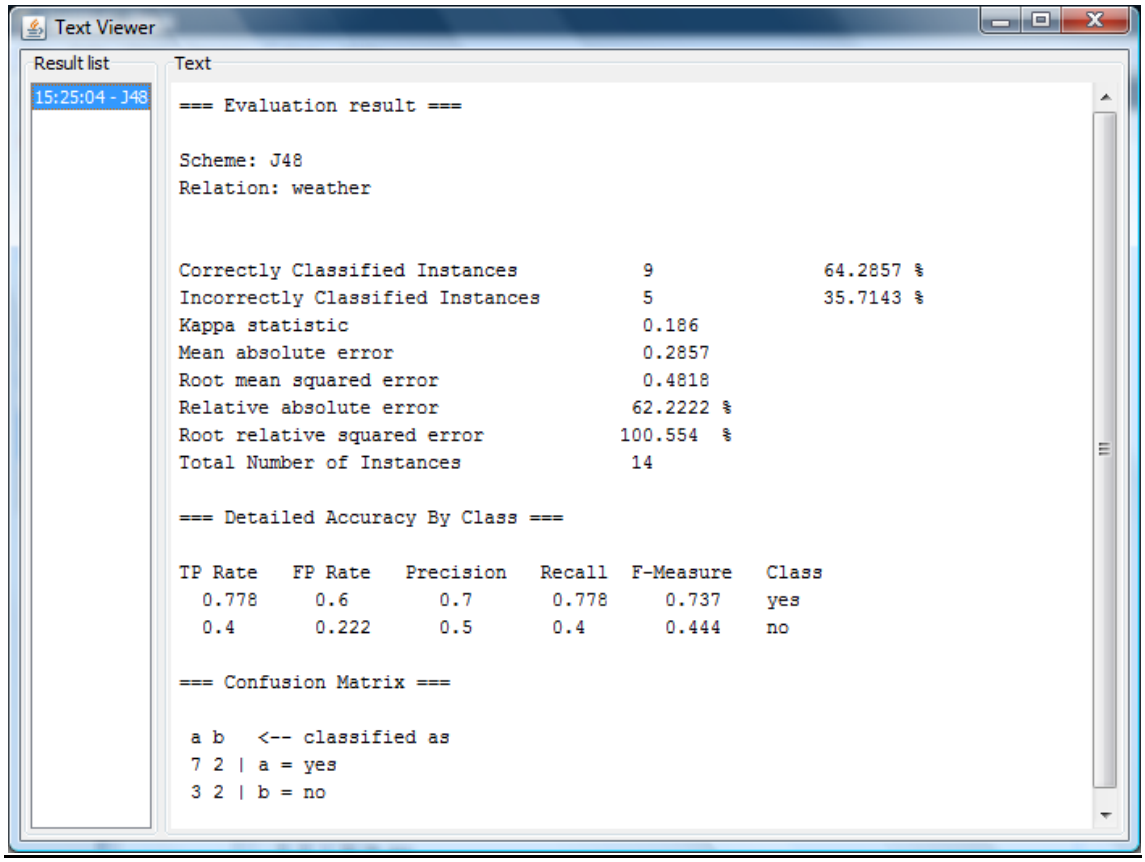


Procedure:

1) **Start** -> **Programs** -> **Weka 3.4**
2) Open **Knowledge Flow**.
3) Select **Data Source** tab & choose **Arff Loader**.
4) Place **Arff Loader** component on the **layout area** by clicking on that component.
5) Specify an Arff file to load by **right clicking on Arff Loader** icon, and then a pop-up menu will appear. In that select **Configure** & browse to the location of **weather.arff**
6) Click on the **Evaluation** tab & choose **Class Assigner** & place it on the layout.
7) Now **connect** the **Arff Loader** to the **Class Assigner** by right clicking on Arff Loader, and then select **Data Set** option, now a link will be established.
8) Right click on **Class Assigner** & choose **Configure** option, and then a new window will appear & specify a class to our data.
9) Select **Evaluation** tab & select **Cross-Validation Fold Maker** & place it on the layout.
10) Now **connect** the **Class Assigner** to the **Cross-Validation Fold Maker**.
11) Select **Classifiers** tab & select **J48** component & place it on the layout.
12) Now **connect Cross-Validation Fold Maker** to **J48 twice**; **first** choose **Training Data Set** option and **then Test Data Set** option.
13) Select **Evaluation Tab** & select **Classifier Performance Evaluator** component & place it on the layout.
14) Connect **J48** to **Classifier Performance Evaluator** component by right clicking on J48 & selecting **Batch Classifier**.
15) Select **Visualization** tab & select **Text Viewer** component & place it on the layout.
16) Connect **Text Viewer** to **Classifier Performance Evaluator** by right clicking on Text Viewer & by selecting **Text** option.
17) Start the flow of execution by selecting **Start Loading** from **Arff Loader**.

18) For viewing **result**, **right click** on **Text Viewer** & select the **Show Results**, and then the result will be displayed on the new window.

Output:



Result:

The program has been successfully executed.

EXPERIMENT NO:16

Aim: Write a procedure for Clustering Buying data using Cobweb Algorithm.

Description:

Cluster analysis or **clustering** is the task of assigning a set of objects into groups (called **clusters**) so that the objects in the same cluster are more similar (in some sense or another) to each other than to those in other clusters. Clustering is a main task of explorative data mining, and a common technique for statistical data analysis used in many fields, including machine learning, pattern recognition, image analysis, information retrieval, and bioinformatics.

Creation of Buying Table:

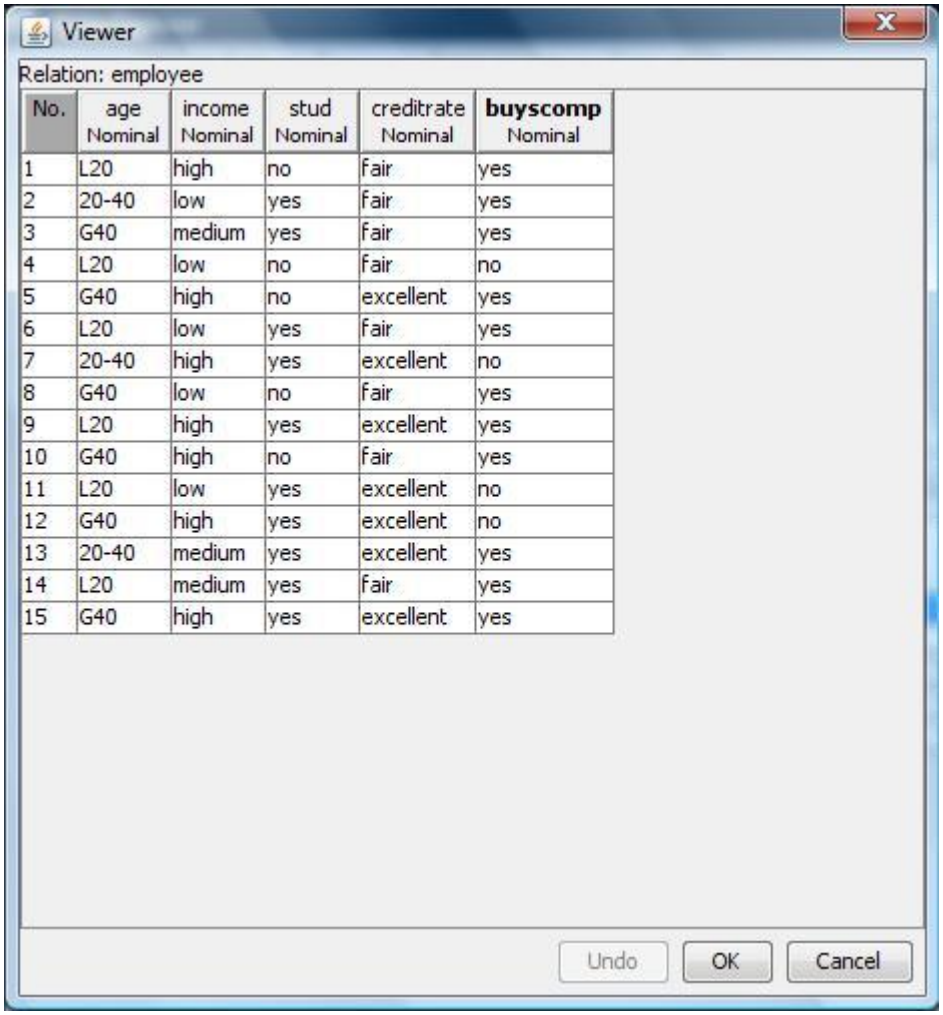
Procedure:

1) Open Start → Programs → Accessories → Notepad
2) Type the following training data set with the help of Notepad for Buying Table.

```
@relation buying
@attribute age {L20,20-40,G40}
@attribute income {high,medium,low}
@attribute stud {yes,no}
@attribute creditrate {fair,excellent}
@attribute buyscomp {yes,no}
@data
L20,high,no,fair,yes
20-40,low,yes,fair,yes
G40,medium,yes,fair,yes
L20,low,no,fair,no
G40,high,no,excellent,yes
L20,low,yes,fair,yes
20-40,high,yes,excellent,no
G40,low,no,fair,yes
L20,high,yes,excellent,yes
G40,high,no,fair,yes
L20,low,yes,excellent,no
G40,high,yes,excellent,no
20-40,medium,yes,excellent,yes
L20,medium,yes,fair,yes
G40,high,yes,excellent,yes
```

3) After that the file is saved with **.arff** file format.
4) Minimize the arff file and then open Start → Programs → weka-3-4.
5) Click on **weka-3-4**, then Weka dialog box is displayed on the screen.
6) In that dialog box there are four modes, click on **explorer**.
7) Explorer shows many options. In that click on **'open file'** and select the arff file
8) Click on **edit button** which shows buying table on weka.

Training Data Set → Buying Table

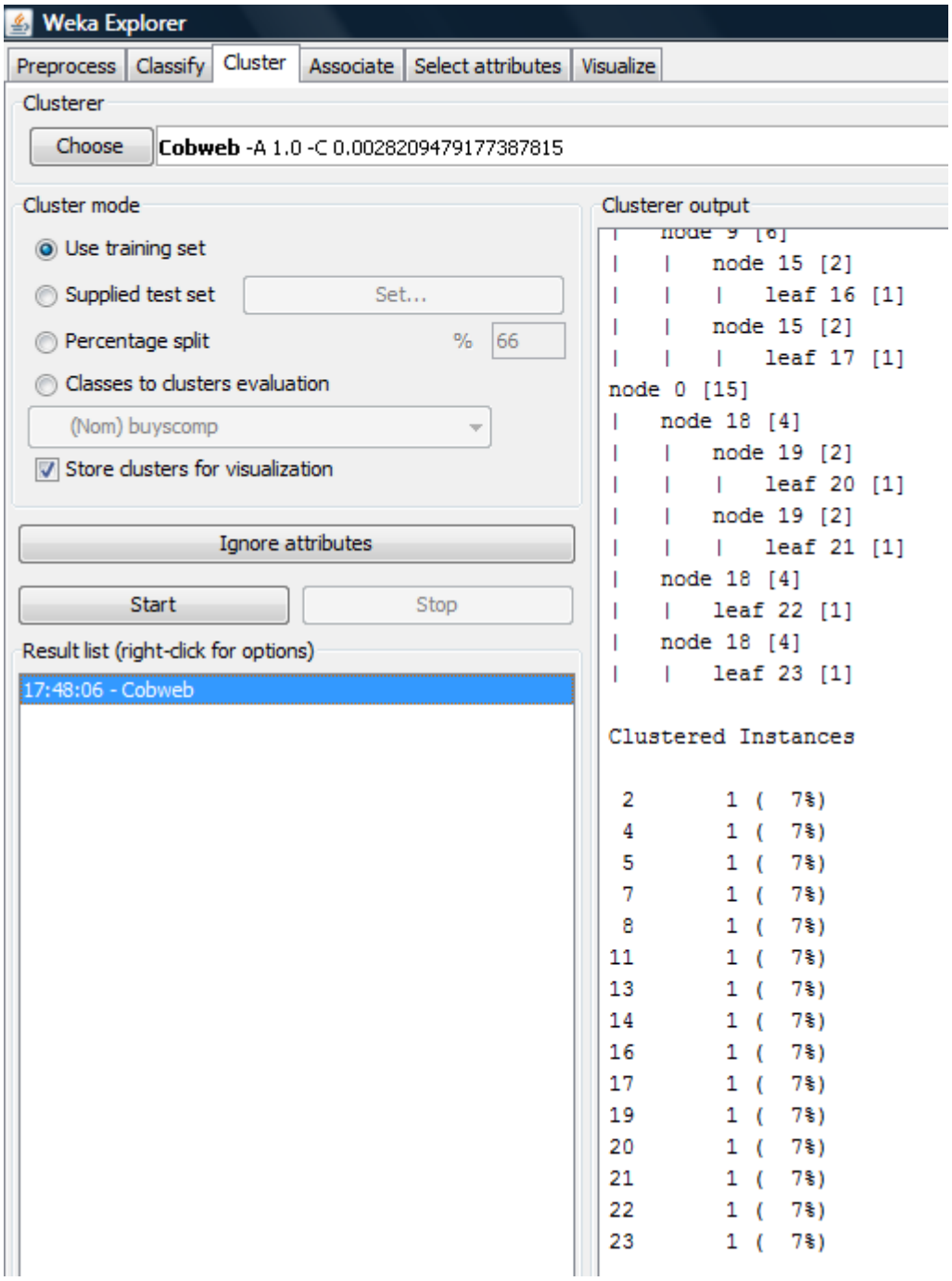


No.	age Nominal	income Nominal	stud Nominal	creditrate Nominal	**buyscomp** Nominal
1	L20	high	no	fair	yes
2	20-40	low	yes	fair	yes
3	G40	medium	yes	fair	yes
4	L20	low	no	fair	no
5	G40	high	no	excellent	yes
6	L20	low	yes	fair	yes
7	20-40	high	yes	excellent	no
8	G40	low	no	fair	yes
9	L20	high	yes	excellent	yes
10	G40	high	no	fair	yes
11	L20	low	yes	excellent	no
12	G40	high	yes	excellent	no
13	20-40	medium	yes	excellent	yes
14	L20	medium	yes	fair	yes
15	G40	high	yes	excellent	yes

Procedure:

1) Click **Start** -> **Programs** -> **Weka 3.4**
2) Click on **Explorer**.
3) Click on **open file** & then select **Buying.arff** file.
4) Click on **Cluster menu**. In this there are different algorithms are there.
5) Click on **Choose button** and then select **cobweb** algorithm.
6) Click on **Start button** and then **output** will be displayed on the screen.

Output:



Result:

The program has been successfully executed.

EXPERIMENT NO:17

Aim: Write a procedure for Clustering Weather data using EM Algorithm.

Description:

Cluster analysis or **clustering** is the task of assigning a set of objects into groups (called **clusters**) so that the objects in the same cluster are more similar (in some sense or another) to each other than to those in other clusters. Clustering is a main task of explorative data mining, and a common technique for statistical data analysis used in many fields, including machine learning, pattern recognition, image analysis, information retrieval, and bioinformatics.

Creation of Weather Table:

Procedure:

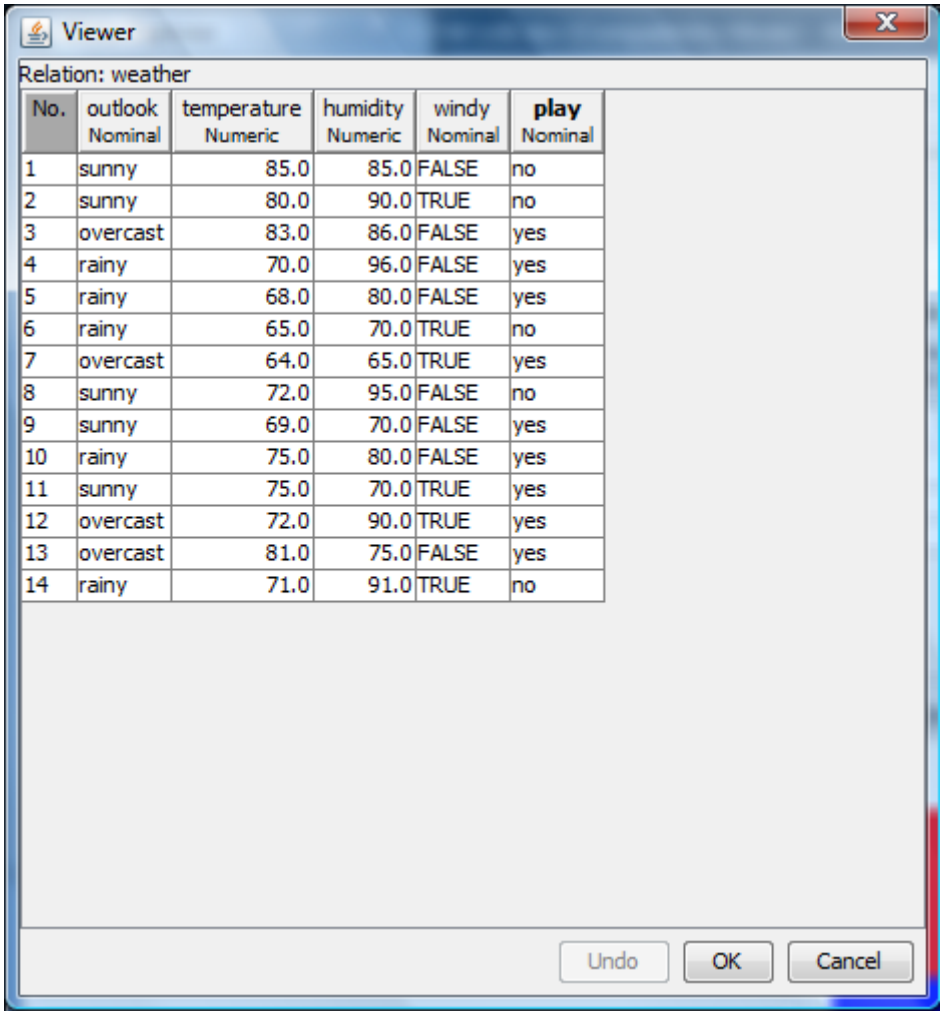
1) Open Start → Programs → Accessories → Notepad
2) Type the following training data set with the help of Notepad for Weather Table.

```
@relation weather
@attribute outlook {sunny, rainy, overcast}
@attribute temperature numeric
@attribute humidity numeric
@attribute windy {TRUE, FALSE}
@attribute play {yes, no}

@data
sunny,85,85,FALSE,no
sunny,80,90,TRUE,no
overcast,83,86,FALSE,yes
rainy,70,96,FALSE,yes
rainy,68,80,FALSE,yes
rainy,65,70,TRUE,no
overcast,64,65,TRUE,yes
sunny,72,95,FALSE,no
sunny,69,70,FALSE,yes
rainy,75,80,FALSE,yes
sunny,75,70,TRUE,yes
overcast,72,90,TRUE,yes
overcast,81,75,FALSE,yes
rainy,71,91,TRUE,no
```

3) After that the file is saved with **.arff** file format.
4) Minimize the arff file and then open Start → Programs → weka-3-4.
5) Click on **weka-3-4**, then Weka dialog box is displayed on the screen.
6) In that dialog box there are four modes, click on **explorer**.
7) Explorer shows many options. In that click on **'open file'** and select the arff file
8) Click on **edit button** which shows weather table on weka.

Training Data Set → Weather Table



No.	outlook Nominal	temperature Numeric	humidity Numeric	windy Nominal	play Nominal
1	sunny	85.0	85.0	FALSE	no
2	sunny	80.0	90.0	TRUE	no
3	overcast	83.0	86.0	FALSE	yes
4	rainy	70.0	96.0	FALSE	yes
5	rainy	68.0	80.0	FALSE	yes
6	rainy	65.0	70.0	TRUE	no
7	overcast	64.0	65.0	TRUE	yes
8	sunny	72.0	95.0	FALSE	no
9	sunny	69.0	70.0	FALSE	yes
10	rainy	75.0	80.0	FALSE	yes
11	sunny	75.0	70.0	TRUE	yes
12	overcast	72.0	90.0	TRUE	yes
13	overcast	81.0	75.0	FALSE	yes
14	rainy	71.0	91.0	TRUE	no

Procedure:

9) Click **Start** -> **Programs** -> **Weka 3.4**

10) Click on **Explorer**.

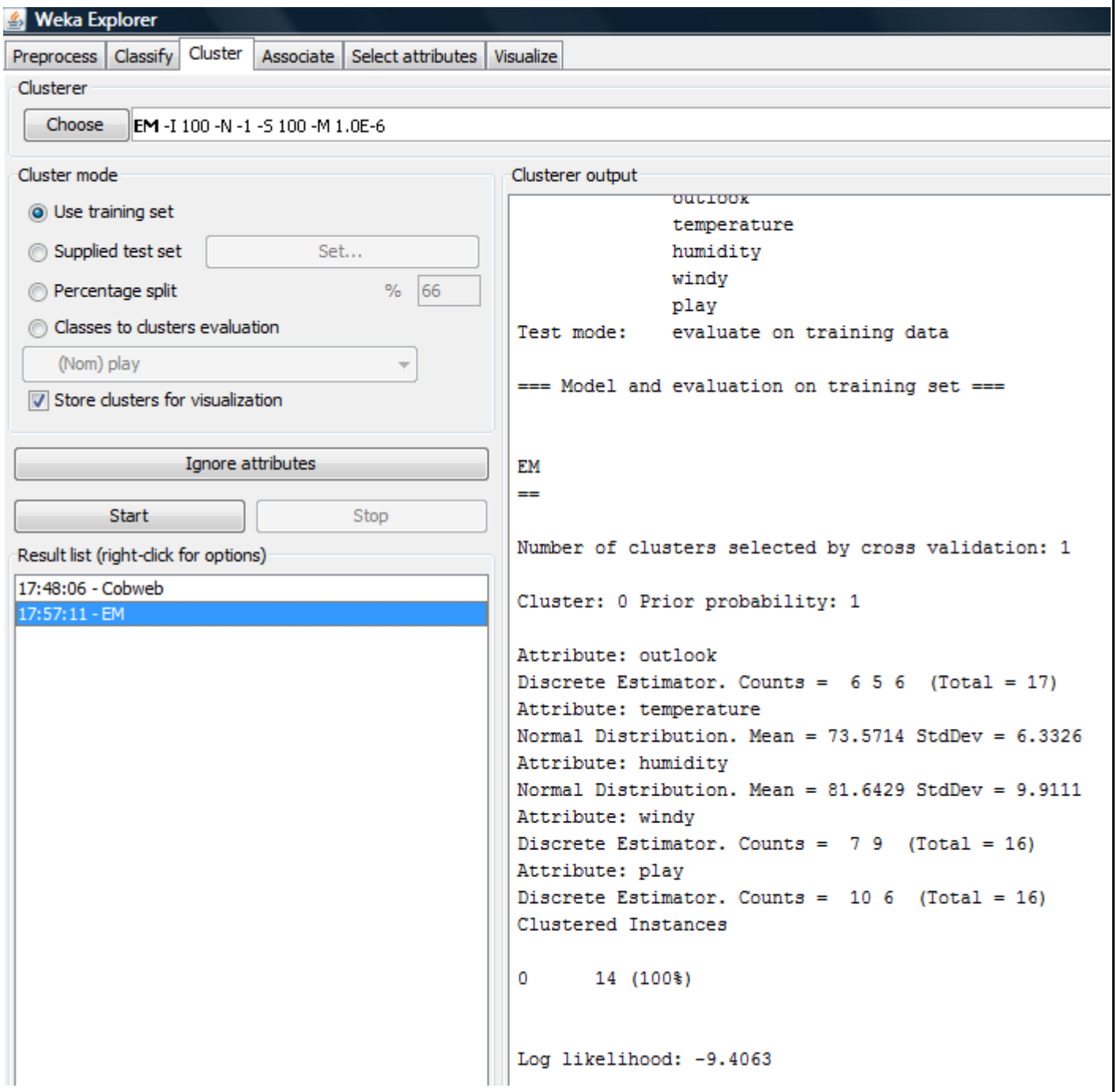
11) Click on **open file** & then select **Weather.arff** file.

12) Click on **Cluster menu**. In this there are different algorithms are there.

13) Click on **Choose button** and then select **EM** algorithm.

14) Click on **Start button** and then **output** will be displayed on the screen.

Output:



Result:

The program has been successfully executed.

EXPERIMENT NO:18

Aim: Write a procedure for Banking data using Farthest First Algorithm.

Description:

Cluster analysis or **clustering** is the task of assigning a set of objects into groups (called **clusters**) so that the objects in the same cluster are more similar (in some sense or another) to each other than to those in other clusters. Clustering is a main task of explorative data mining, and a common technique for statistical data analysis used in many fields, including machine learning, pattern recognition, image analysis, information retrieval, and bioinformatics.

Creation of Banking Table:

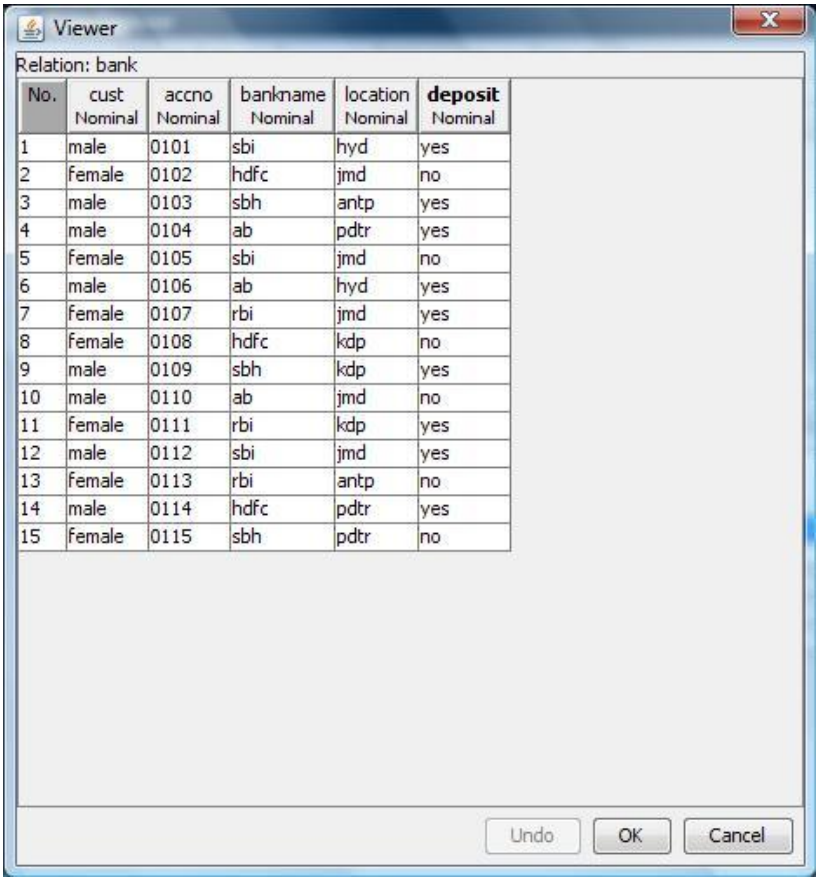
Procedure:

1) Open Start → Programs → Accessories → Notepad
2) Type the following training data set with the help of Notepad for Banking Table.

```
@relation bank
@attribute cust {male,female}
@attribute accno
{0101,0102,0103,0104,0105,0106,0107,0108,0109,0110,0111,0112,0113,0114,0115}
@attribute bankname {sbi,hdfc,sbh,ab,rbi}
@attribute location {hyd,jmd,antp,pdtr,kdp}
@attribute deposit {yes,no}
@data
male,0101,sbi,hyd,yes
female,0102,hdfc,jmd,no
male,0103,sbh,antp,yes
male,0104,ab,pdtr,yes
female,0105,sbi,jmd,no
male,0106,ab,hyd,yes
female,0107,rbi,jmd,yes
female,0108,hdfc,kdp,no
male,0109,sbh,kdp,yes
male,0110,ab,jmd,no
female,0111,rbi,kdp,yes
male,0112,sbi,jmd,yes
female,0113,rbi,antp,no
male,0114,hdfc,pdtr,yes
female,0115,sbh,pdtr,no
```

3) After that the file is saved with **.arff** file format.
4) Minimize the arff file and then open Start → Programs → weka-3-4.
5) Click on **weka-3-4**, then Weka dialog box is displayed on the screen.
6) In that dialog box there are four modes, click on **explorer**.
7) Explorer shows many options. In that click on **'open file'** and select the arff file
8) Click on **edit button** which shows banking table on weka.

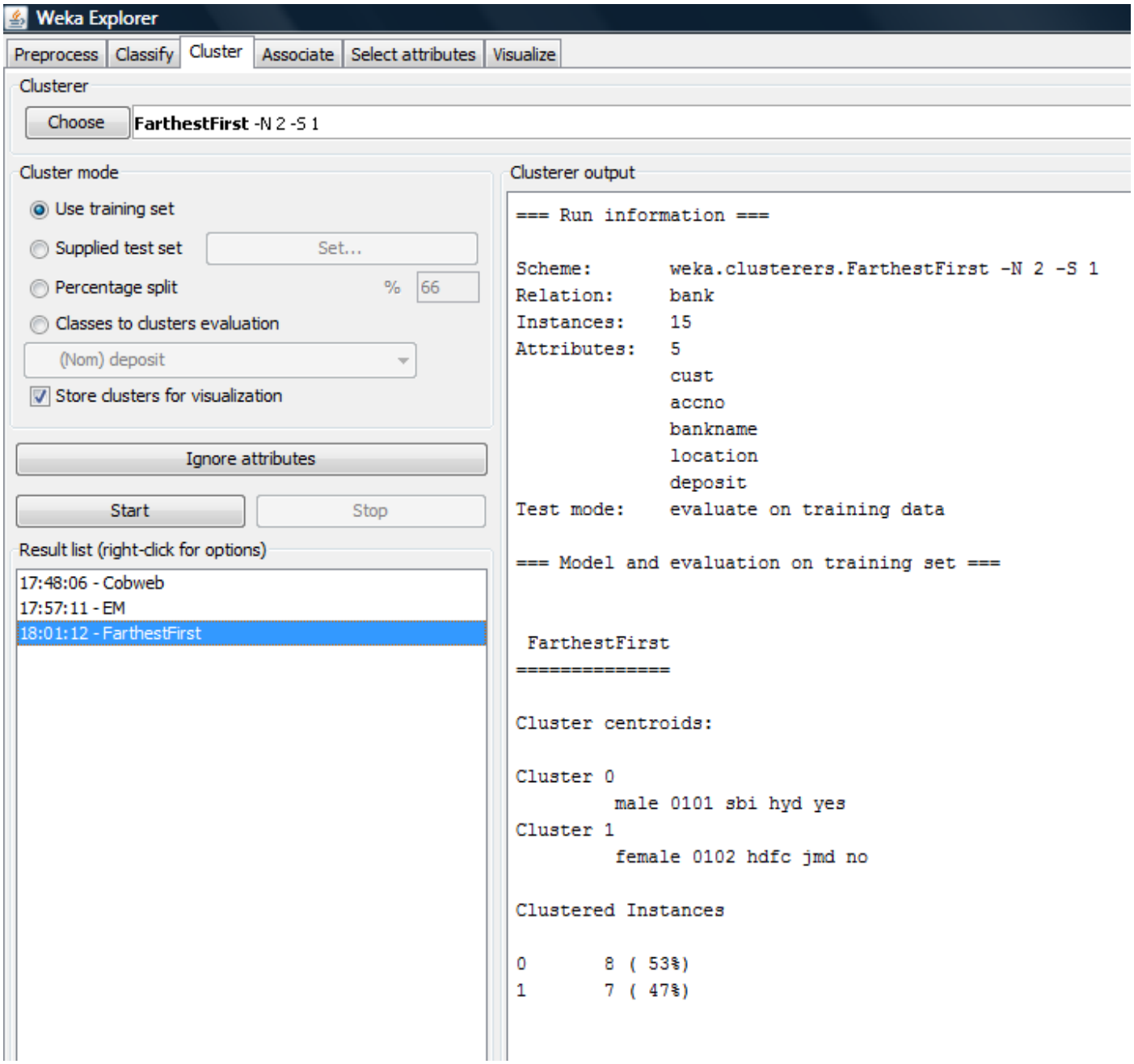
Training Data Set → Banking Table



Procedure:

1) Click **Start** -> **Programs** -> **Weka 3.4**
2) Click on **Explorer**.
3) Click on **open file** & then select **Banking.arff** file.
4) Click on **Cluster menu**. In this there are different algorithms are there.
5) Click on **Choose button** and then select **FarthestFirst** algorithm.
6) Click on **Start button** and then **output** will be displayed on the screen.

Output:



Result:

The program has been successfully executed.

EXPERIMENT NO:19

Aim: Write a procedure for Employee data using Make Density Based Cluster Algorithm.

Description:

Cluster analysis or **clustering** is the task of assigning a set of objects into groups (called **clusters**) so that the objects in the same cluster are more similar (in some sense or another) to each other than to those in other clusters. Clustering is a main task of explorative data mining, and a common technique for statistical data analysis used in many fields, including machine learning, pattern recognition, image analysis, information retrieval, and bioinformatics.

Creation of Employee Table:

Procedure:

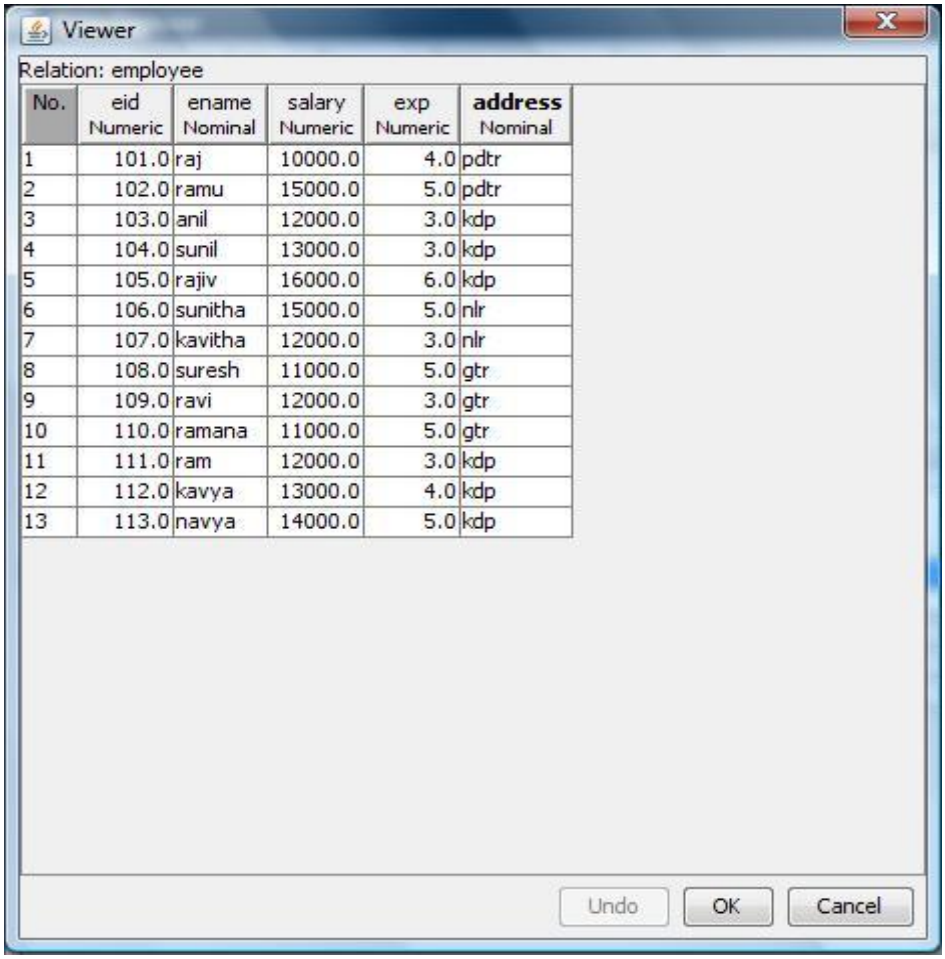
1) Open Start → Programs → Accessories → Notepad
2) Type the following training data set with the help of Notepad for Employee Table.

```
@relation employee
@attribute eid numeric
@attribute ename {raj,ramu,anil,sunil,rajiv,sunitha,kavitha,suresh,ravi,ramana,ram,kavya,navya}
@attribute salary numeric
@attribute exp numeric
@attribute address {pdtr,kdp,nlr,gtr}

@data
101,raj,10000,4,pdtr
102,ramu,15000,5,pdtr
103,anil,12000,3,kdp
104,sunil,13000,3,kdp
105,rajiv,16000,6,kdp
106,sunitha,15000,5,nlr
107,kavitha,12000,3,nlr
108,suresh,11000,5,gtr
109,ravi,12000,3,gtr
110,ramana,11000,5,gtr
111,ram,12000,3,kdp
112,kavya,13000,4,kdp
113,navya,14000,5,kdp
```

3) After that the file is saved with **.arff** file format.
4) Minimize the arff file and then open Start → Programs → weka-3-4.
5) Click on **weka-3-4**, then Weka dialog box is displayed on the screen.
6) In that dialog box there are four modes, click on **explorer**.
7) Explorer shows many options. In that click on **'open file'** and select the arff file
8) Click on **edit button** which shows employee table on weka.

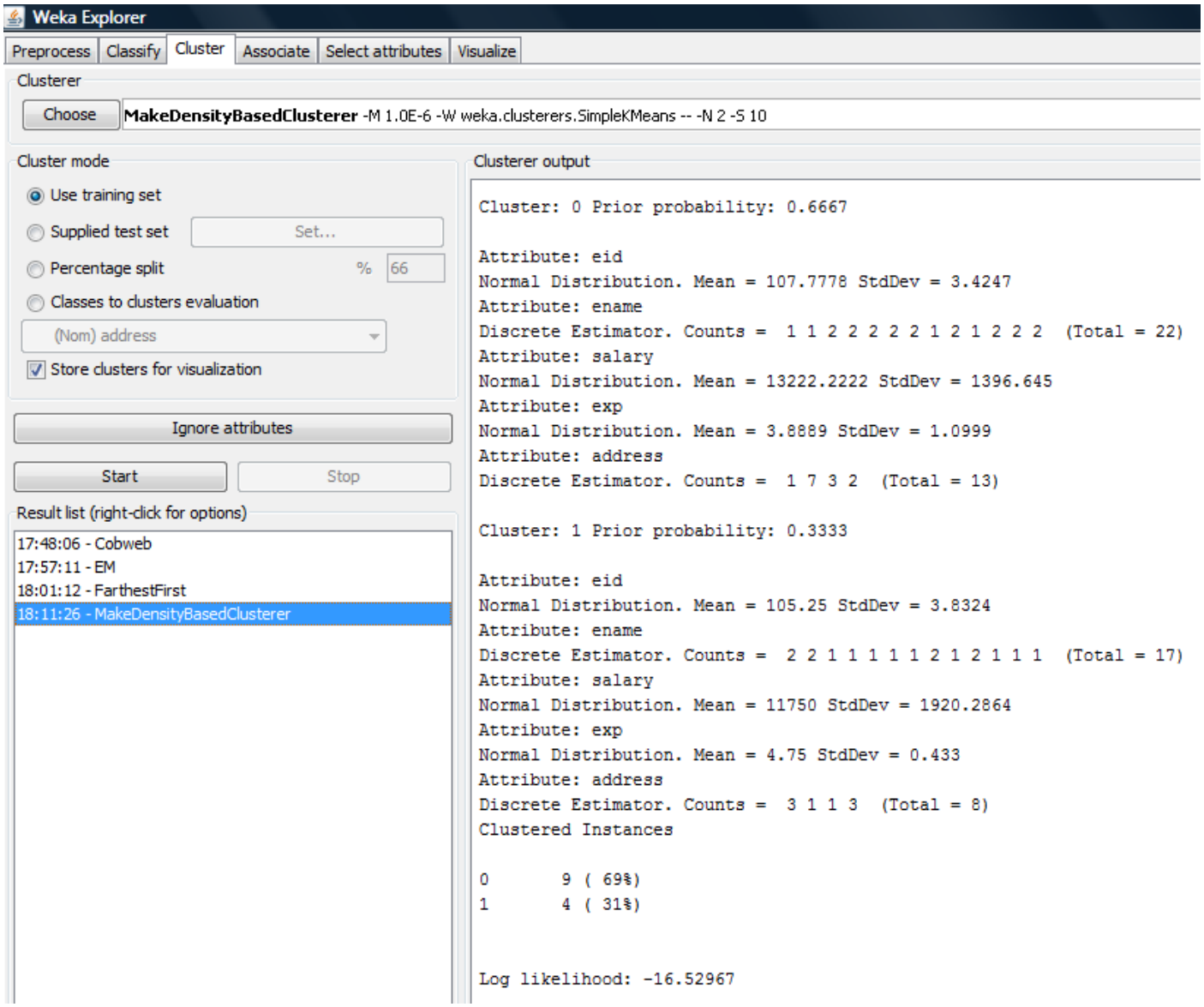
Training Data Set → Employee Table



Procedure:

1) Click **Start** -> **Programs** -> **Weka 3.4**
2) Click on **Explorer**.
3) Click on **open file** & then select **Employee.arff** file.
4) Click on **Cluster menu**. In this there are different algorithms are there.
5) Click on **Choose button** and then select **MakeDensityBasedClusterer** algorithm.
6) Click on **Start button** and then **output** will be displayed on the screen.

Output:



Result:

The program has been successfully executed.

EXPERIMENT NO:20

Aim: Write a procedure for Clustering Customer data using Simple KMeans Algorithm.

Description:

Cluster analysis or **clustering** is the task of assigning a set of objects into groups (called **clusters**) so that the objects in the same cluster are more similar (in some sense or another) to each other than to those in other clusters. Clustering is a main task of explorative data mining, and a common technique for statistical data analysis used in many fields, including machine learning, pattern recognition, image analysis, information retrieval, and bioinformatics.

Creation of Customer Table:

Procedure:

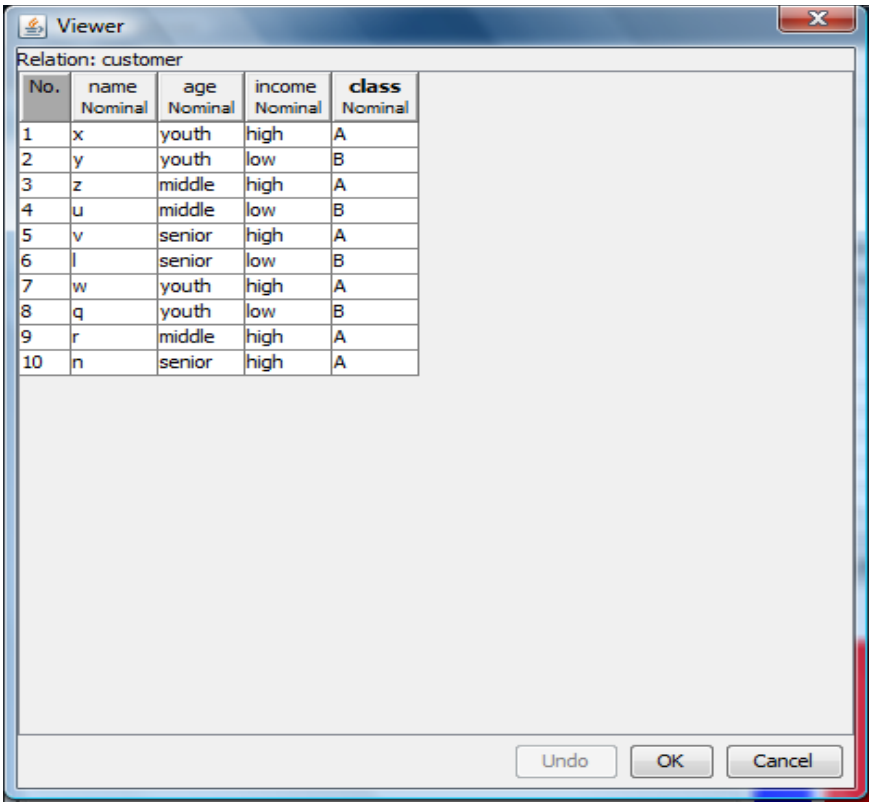
1) Open Start → Programs → Accessories → Notepad
2) Type the following training data set with the help of Notepad for Buying Table.

```
@relation customer
@attribute name {x,y,z,u,v,l,w,q,r,n}
@attribute age {youth,middle,senior}
@attribute income {high,medium,low}
@attribute class {A,B}

@data
x,youth,high,A
y,youth,low,B
z,middle,high,A
u,middle,low,B
v,senior,high,A
l,senior,low,B
w,youth,high,A
q,youth,low,B
r,middle,high,A
n,senior,high,A
```

3) After that the file is saved with **.arff** file format.
4) Minimize the arff file and then open Start → Programs → weka-3-4.
5) Click on **weka-3-4**, then Weka dialog box is displayed on the screen.
6) In that dialog box there are four modes, click on **explorer**.
7) Explorer shows many options. In that click on **'open file'** and select the arff file
8) Click on **edit button** which shows buying table on weka.

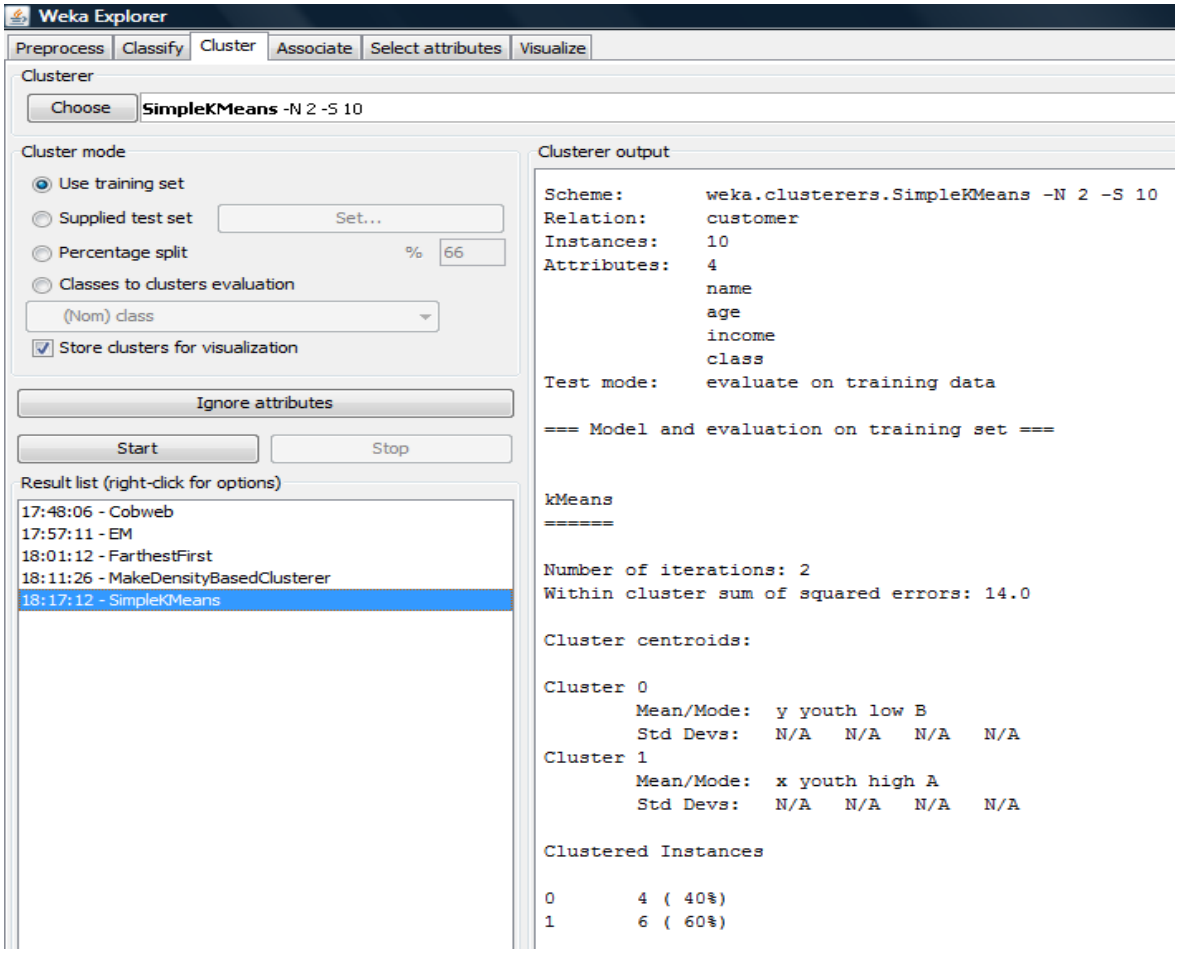
Training Data Set → Customer Table



Procedure:

1) Click **Start** -> **Programs** -> **Weka 3.4**
2) Click on **Explorer**.
3) Click on **open file** & then select **Customer.arff** file.
4) Click on **Cluster menu**. In this there are different algorithms are there.
5) Click on **Choose button** and then select **SimpleKMeans** algorithm.
6) Click on **Start button** and then **output** will be displayed on the screen.

Output:



Result:

The program has been successfully executed.