

EXPERIMENT NO: 1

Aim:

Create an Employee Table with the help of Data Mining Tool WEKA.

Description:

We need to create an Employee Table with training data set which includes attributes like name, id, salary, experience, gender, phone number.

Procedure:

Steps:

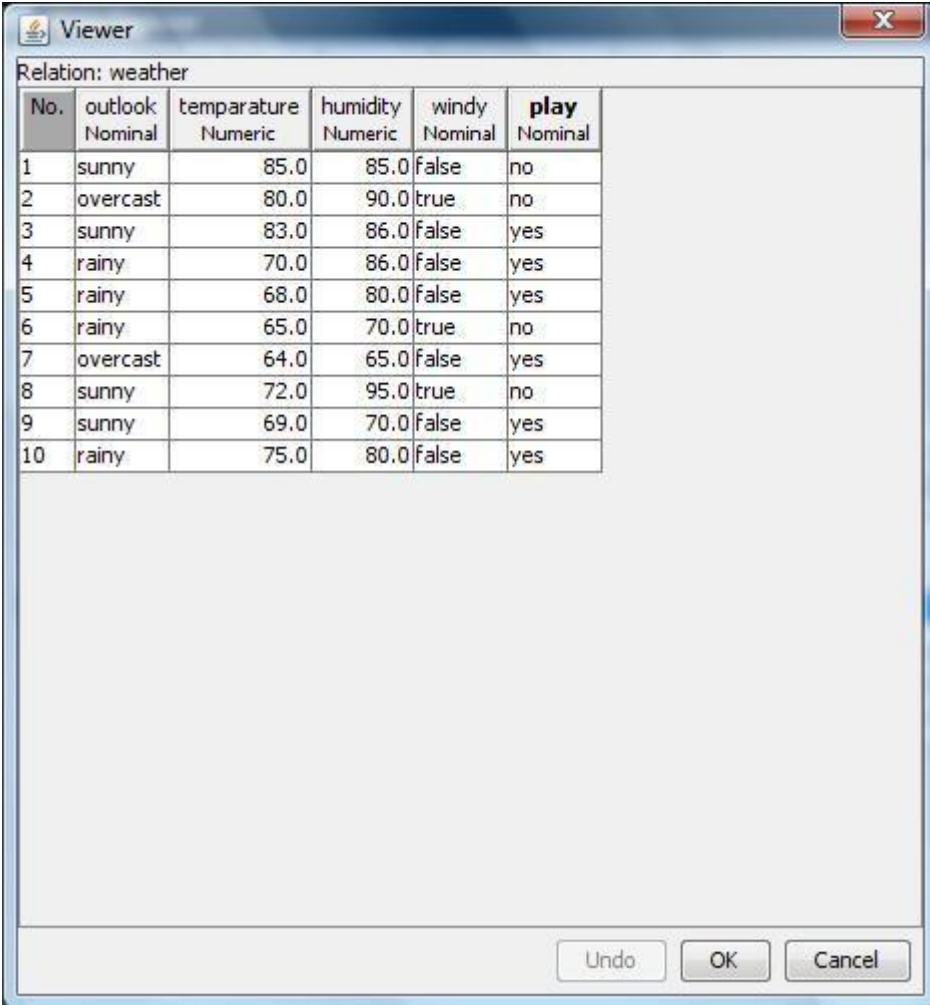
- 1) Open Start → Programs → Accessories → Notepad
- 2) Type the following training data set with the help of Notepad for Employee Table.

```
@relation employee
@attribute name
{x,y,z,a,b} @attribute id
numeric
@attribute salary
{low,medium,high} @attribute exp
numeric
@attribute gender
{male,female} @attribute phone
numeric
```

```
@data
x,101,low,2,male,250311
y,102,high,3,female,251665
z,103,medium,1,male,24023
8a,104,low,5,female,200200
b,105,high,2,male,240240
```

- 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 → Weather Table



Relation: weather

No.	outlook Nominal	temparature Numeric	humidity Numeric	windy Nominal	play Nominal
1	sunny	85.0	85.0	false	no
2	overcast	80.0	90.0	true	no
3	sunny	83.0	86.0	false	yes
4	rainy	70.0	86.0	false	yes
5	rainy	68.0	80.0	false	yes
6	rainy	65.0	70.0	true	no
7	overcast	64.0	65.0	false	yes
8	sunny	72.0	95.0	true	no
9	sunny	69.0	70.0	false	yes
10	rainy	75.0	80.0	false	yes

Undo OK Cancel

Result:

This program has been successfully executed.

EXPERIMENT NO:2

Aim:

Create a Weather Table with the help of Data Mining Tool WEKA.

Description:

We need to create a Weather table with training data set which includes attributes like outlook, temperature, humidity, windy, play.

Procedure:

Steps:

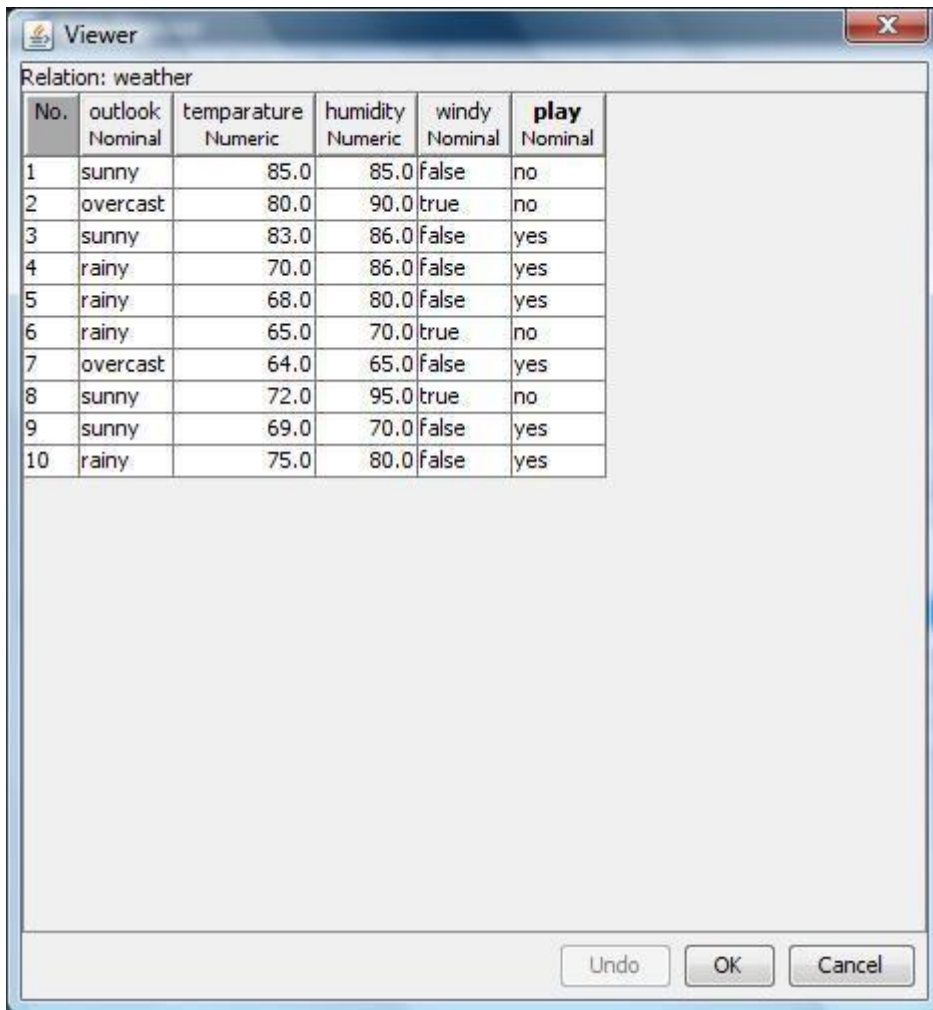
- 1) Open Start → Programs → Accessories → Notepad
- 2) Type the following training data set with the help of Notepad for Weather Table.

```
@relation weather
@attribute outlook
{ sunny,rainy,overcast } @attribute
temparature numeric @attribute humidity
numeric
@attribute windy
{ true,false } @attribute play
{ yes,no }
```

```
@data
sunny,85.0,85.0,false,no
overcast,80.0,90.0,true,no
sunny,83.0,86.0,false,yes
rainy,70.0,86.0,false,yes
rainy,68.0,80.0,false,yes
rainy,65.0,70.0,true,no
overcast,64.0,65.0,false,yes
sunny,72.0,95.0,true,no
sunny,69.0,70.0,false,yes
rainy,75.0,80.0,false,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 weather table on weka.

Training Data Set → Weather Table



Relation: weather

No.	outlook Nominal	temparature Numeric	humidity Numeric	windy Nominal	play Nominal
1	sunny	85.0	85.0	false	no
2	overcast	80.0	90.0	true	no
3	sunny	83.0	86.0	false	yes
4	rainy	70.0	86.0	false	yes
5	rainy	68.0	80.0	false	yes
6	rainy	65.0	70.0	true	no
7	overcast	64.0	65.0	false	yes
8	sunny	72.0	95.0	true	no
9	sunny	69.0	70.0	false	yes
10	rainy	75.0	80.0	false	yes

Undo OK Cancel

Result:

This program has been successfully executed.

EXPERIMENT NO:3

Aim:

Apply Pre-Processing techniques to the training data set of Weather Table

Description:

Real world databases are highly influenced to noise, missing and inconsistency due to their queue size so the data can be pre-processed to improve the quality of data and missing results and it also improves the efficiency.

There are 3 pre-processing techniques they are:

- 1) Add
- 2) Remove
- 3) Normalization

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,85.0,85.0,false,no
overcast,80.0,90.0,true,no
sunny,83.0,86.0,false,yes
rainy,70.0,86.0,false,yes
rainy,68.0,80.0,false,yes
rainy,65.0,70.0,true,no
overcast,64.0,65.0,false,yes
sunny,72.0,95.0,true,no
sunny,69.0,70.0,false,yes
rainy,75.0,80.0,false,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 weather table on weka.

Viewer

Relation: weather

No.	outlook Nominal	temperature Numeric	humidity Numeric	windy Nominal	play Nominal
1	sunny	85.0	85.0	false	no
2	overcast	80.0	90.0	true	no
3	sunny	83.0	86.0	false	yes
4	rainy	70.0	86.0	false	yes
5	rainy	68.0	80.0	false	yes
6	rainy	65.0	70.0	true	no
7	overcast	64.0	65.0	false	yes
8	sunny	72.0	95.0	true	no
9	sunny	69.0	70.0	false	yes
10	rainy	75.0	80.0	false	yes

Undo OK Cancel

Add → Pre-Processing Technique:

Procedure:

- 1) Start → Programs → Weka-3-4 → Weka-3-4
- 2) Click on **explorer**.
- 3) Click on **open file**.
- 4) Select **Weather.arff** file and click on open.
- 5) Click on **Choose button** and select the **Filters option**.
- 6) In Filters, we have **Supervised** and **Unsupervised data**.
- 7) Click on **Unsupervised data**.
- 8) Select the attribute **Add**.
- 9) A new window is opened.
- 10) In that we enter attribute index, type, data format, nominal label values for **Climate**.
- 11) Click on **OK**.
- 12) Press the **Apply button**, then a new attribute is added to the Weather Table.
- 13) **Save** the file.
- 14) Click on the **Edit button**, it shows a new Weather Table on Weka.

Weather Table after adding new attribute CLIMATE:

Viewer

Relation: weather-weka.filters.unsupervised.attribute.Add-Nclimate-LNominal-Clast

No.	outlook Nominal	temparature Numeric	humidity Numeric	windy Nominal	play Nominal	climate Nominal
1	sunny	85.0	85.0	false	no	
2	overcast	80.0	90.0	true	no	
3	sunny	83.0	86.0	false	yes	
4	rainy	70.0	86.0	false	yes	
5	rainy	68.0	80.0	false	yes	
6	rainy	65.0	70.0	true	no	
7	overcast	64.0	65.0	false	yes	
8	sunny	72.0	95.0	true	no	
9	sunny	69.0	70.0	false	yes	
10	rainy	75.0	80.0	false	yes	

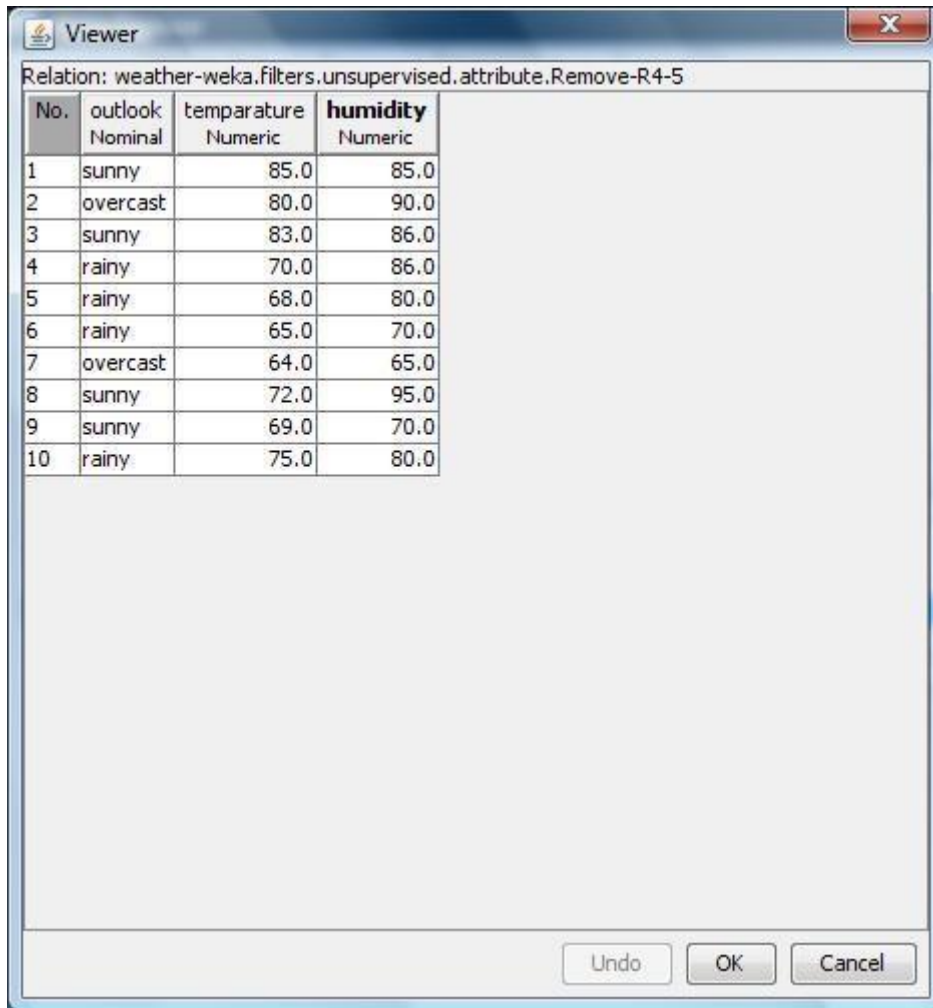
Undo OK Cancel

Remove → Pre-Processing Technique:

Procedure:

- 1) Start → Programs → Weka-3-4 → Weka-3-4
- 2) Click on **explorer**.
- 3) Click on **open file**.
- 4) Select **Weather.arff** file and click on open.
- 5) Click on **Choose button** and select the **Filters option**.
- 6) In Filters, we have **Supervised** and **Unsupervised data**.
- 7) Click on **Unsupervised data**.
- 8) Select the attribute **Remove**.
- 9) Select the attributes **windy, play** to Remove.
- 10) Click **Remove button** and then **Save**.
- 11) Click on the **Edit button**, it shows a new Weather Table on Weka.

Weather Table after removing attributes WINDY, PLAY:



Relation: weather-weka.filters.unsupervised.attribute.Remove-R4-5

No.	outlook Nominal	temparature Numeric	humidity Numeric
1	sunny	85.0	85.0
2	overcast	80.0	90.0
3	sunny	83.0	86.0
4	rainy	70.0	86.0
5	rainy	68.0	80.0
6	rainy	65.0	70.0
7	overcast	64.0	65.0
8	sunny	72.0	95.0
9	sunny	69.0	70.0
10	rainy	75.0	80.0

Buttons: Undo, OK, Cancel

Normalize → Pre-Processing Technique:

Procedure:

- 1) Start → Programs → Weka-3-4 → Weka-3-4
- 2) Click on **explorer**.
- 3) Click on **open file**.
- 4) Select **Weather.arff** file and click on open.
- 5) Click on **Choose button** and select the **Filters option**.
- 6) In Filters, we have **Supervised** and **Unsupervised data**.
- 7) Click on **Unsupervised data**.
- 8) Select the attribute **Normalize**.
- 9) Select the attributes **temparature, humidity** to Normalize.
- 10) Click on **Apply button** and then **Save**.
- 11) Click on the **Edit button**, it shows a new Weather Table with normalized values on Weka.

Weather Table after Normalizing TEMPARATURE, HUMIDITY:

Relation: weather-weka.filters.unsupervised.attribute.Normalize

No.	outlook Nominal	temparature Numeric	humidity Numeric	windy Nominal	play Nominal
1	sunny	1.0	0.6666...	false	no
2	overcast	0.7619047...	0.8333...	true	no
3	sunny	0.9047619...	0.7	false	yes
4	rainy	0.2857142...	0.7	false	yes
5	rainy	0.1904761...	0.5	false	yes
6	rainy	0.0476190...	0.1666...	true	no
7	overcast	0.0	0.0	false	yes
8	sunny	0.3809523...	1.0	true	no
9	sunny	0.2380952...	0.1666...	false	yes
10	rainy	0.5238095...	0.5	false	yes

Undo OK Cancel

Result:

This program has been successfully executed.

EXPERIMENT NO:4

Aim:

Apply Pre-Processing techniques to the training data set of Employee Table

Description:

Real world databases are highly influenced to noise, missing and inconsistency due to their queue size so the data can be pre-processed to improve the quality of data and missing results and it also improves the efficiency.

There are 3 pre-processing techniques they are:

- 1) Add
- 2) Remove
- 3) Normalization

Creation of Employee Table:

Procedure:

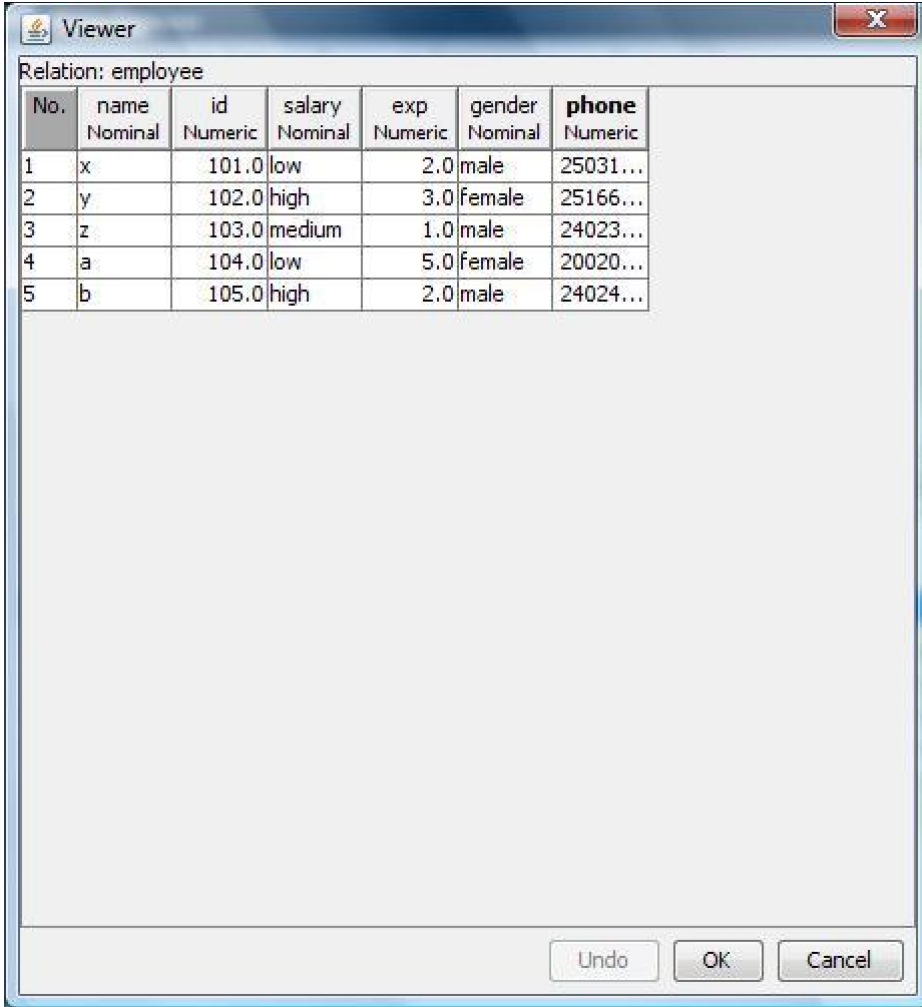
- 1) Open Start → Programs → Accessories → Notepad
- 2) Type the following training data set with the help of Notepad for Employee Table.

```
@relation employee
@attribute name
{x,y,z,a,b} @attribute id
numeric
@attribute salary
{low,medium,high} @attribute exp
numeric
@attribute gender
{male,female} @attribute phone
numeric
```

```
@data
x,101,low,2,male,250311
y,102,high,3,female,251665
z,103,medium,1,male,24023
8a,104,low,5,female,200200
b,105,high,2,male,240240
```

- 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



Relation: employee

No.	name Nominal	id Numeric	salary Nominal	exp Numeric	gender Nominal	phone Numeric
1	x	101.0	low	2.0	male	25031...
2	y	102.0	high	3.0	female	25166...
3	z	103.0	medium	1.0	male	24023...
4	a	104.0	low	5.0	female	20020...
5	b	105.0	high	2.0	male	24024...

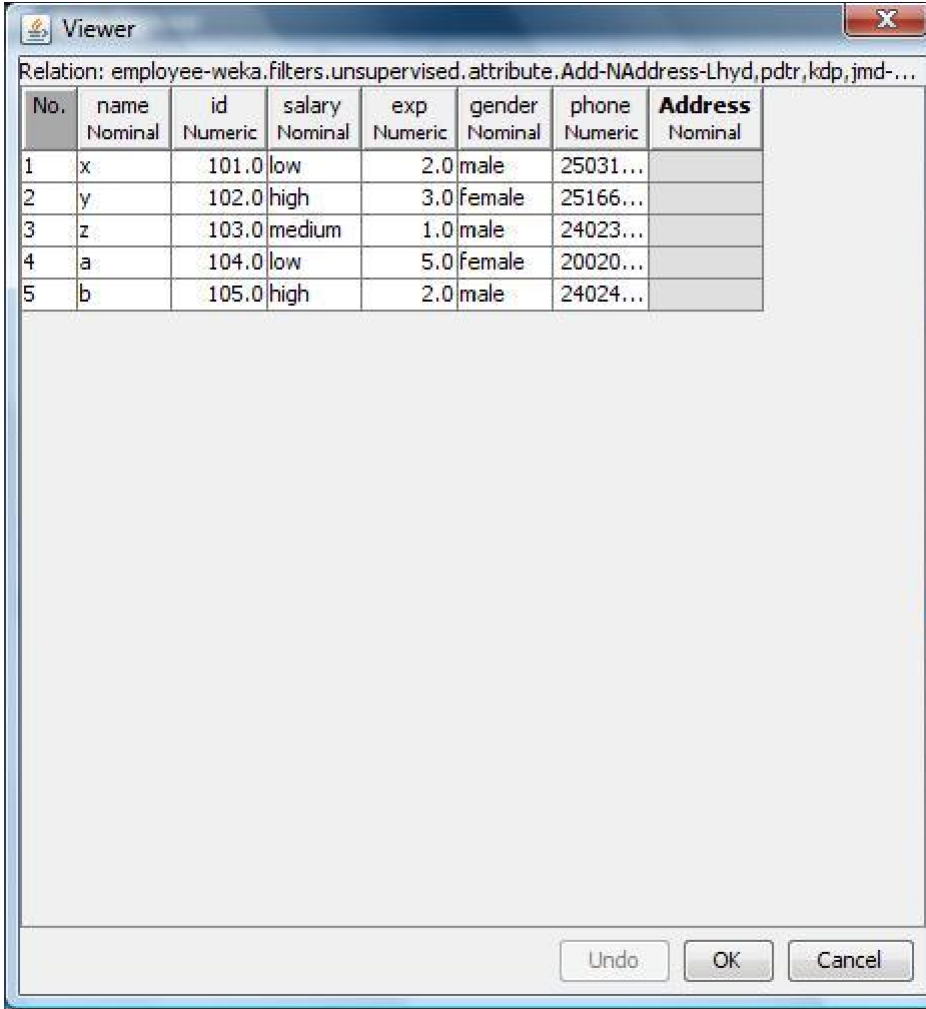
Undo OK Cancel

Add → Pre-Processing Technique:

Procedure:

- 1) Start → Programs → Weka-3-4 → Weka-3-4
- 2) Click on **explorer**.
- 3) Click on **open file**.
- 4) Select **Employee.arff** file and click on open.
- 5) Click on **Choose button** and select the **Filters option**.
- 6) In Filters, we have **Supervised** and **Unsupervised data**.
- 7) Click on **Unsupervised data**.
- 8) Select the attribute **Add**.
- 9) A new window is opened.
- 10) In that we enter attribute index, type, data format, nominal label values for **Address**.
- 11) Click on **OK**.
- 12) Press the **Apply button**, then a new attribute is added to the Employee Table.
- 13) **Save** the file.
- 14) Click on the **Edit button**, it shows a new Employee Table on Weka.

Employee Table after adding new attribute ADDRESS:



Relation: employee-weka.filters.unsupervised.attribute.Add-NAddress-Lhyd,pdtr,kdp,jmd-...

No.	name Nominal	id Numeric	salary Nominal	exp Numeric	gender Nominal	phone Numeric	Address Nominal
1	x	101.0	low	2.0	male	25031...	
2	y	102.0	high	3.0	female	25166...	
3	z	103.0	medium	1.0	male	24023...	
4	a	104.0	low	5.0	female	20020...	
5	b	105.0	high	2.0	male	24024...	

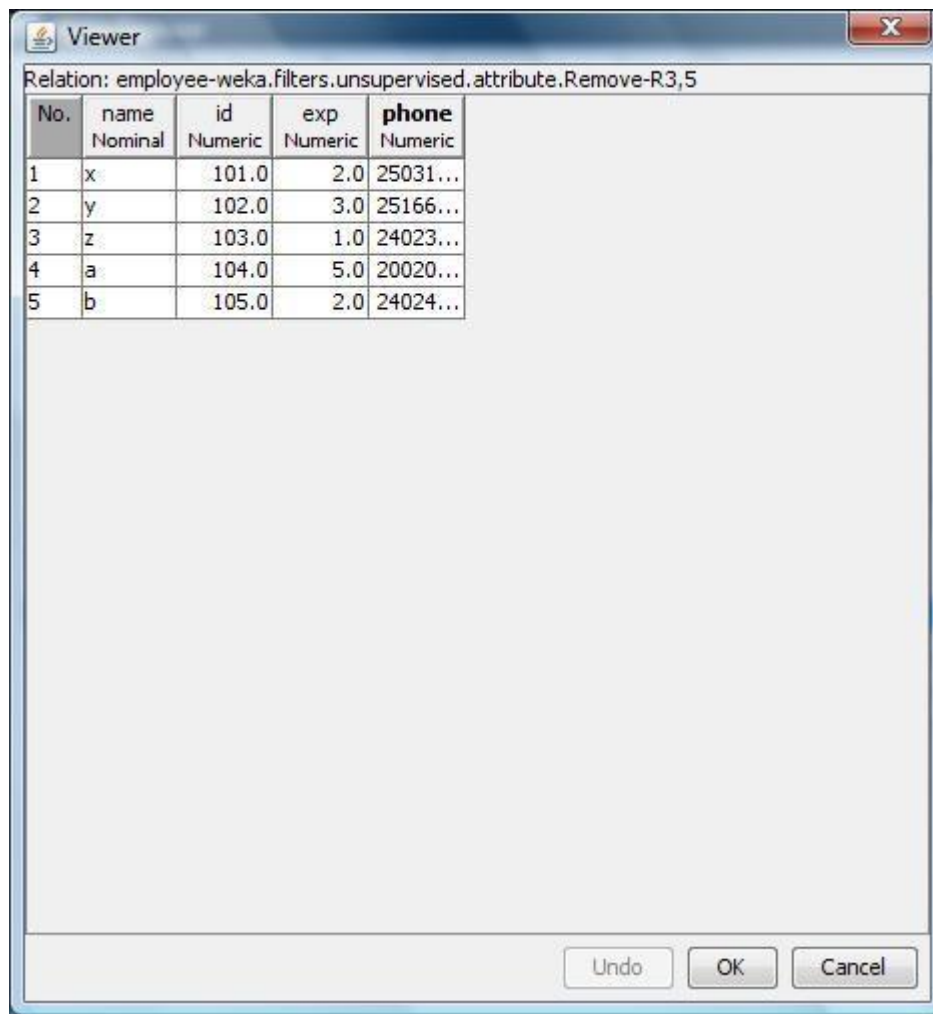
Buttons: Undo, OK, Cancel

Remove → Pre-Processing Technique:

Procedure:

- 1) Start → Programs → Weka-3-4 → Weka-3-4
- 2) Click on **explorer**.
- 3) Click on **open file**.
- 4) Select **Employee.arff** file and click on open.
- 5) Click on **Choose button** and select the **Filters option**.
- 6) In Filters, we have **Supervised** and **Unsupervised data**.
- 7) Click on **Unsupervised data**.
- 8) Select the attribute **Remove**.
- 9) Select the attributes **salary, gender** to Remove.
- 10) Click **Remove button** and then **Save**.
- 11) Click on the **Edit button**, it shows a new Employee Table on Weka.

Employee Table after removing attributes SALARY, GENDER:



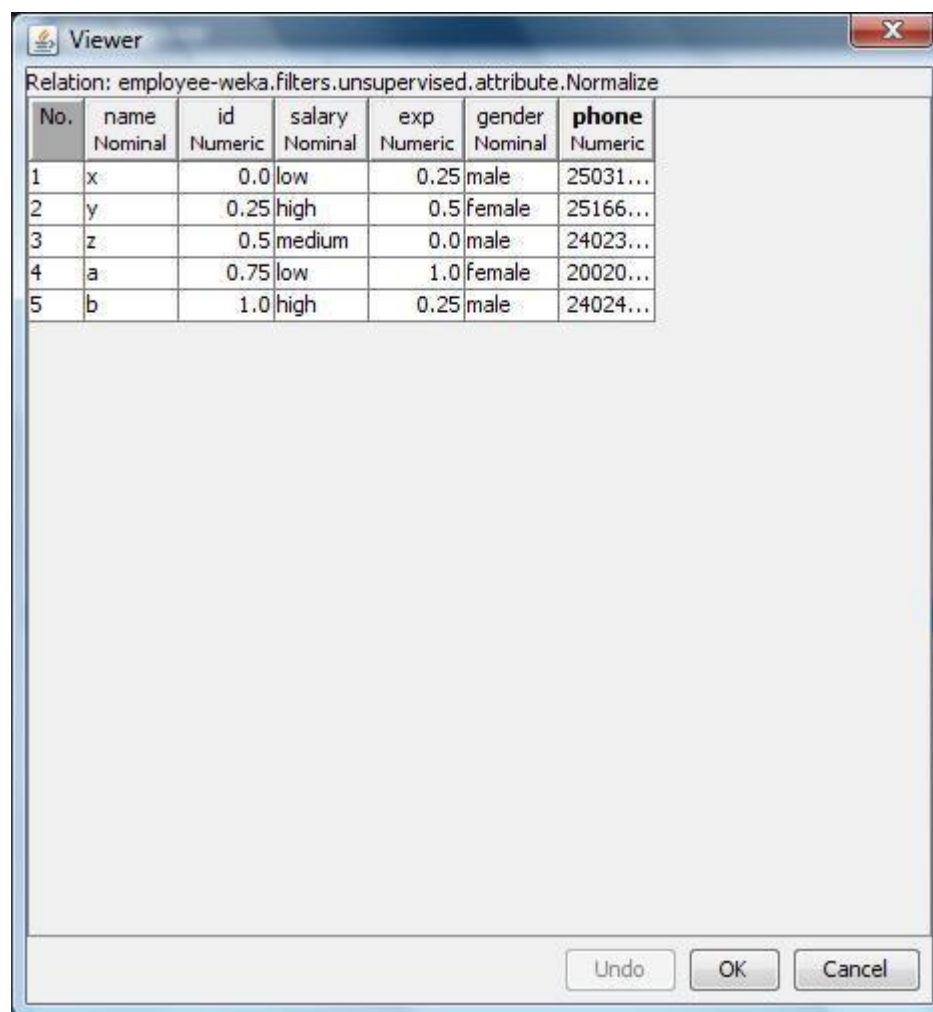
No.	name Nominal	id Numeric	exp Numeric	phone Numeric
1	x	101.0	2.0	25031...
2	y	102.0	3.0	25166...
3	z	103.0	1.0	24023...
4	a	104.0	5.0	20020...
5	b	105.0	2.0	24024...

Normalize → Pre-Processing Technique:

Procedure:

- 1) Start → Programs → Weka-3-4 → Weka-3-4
- 2) Click on **explorer**.
- 3) Click on **open file**.
- 4) Select **Employee.arff** file and click on open.
- 5) Click on **Choose button** and select the **Filters option**.
- 6) In Filters, we have **Supervised** and **Unsupervised data**.
- 7) Click on **Unsupervised data**.
- 8) Select the attribute **Normalize**.
- 9) Select the attributes **id, experience, phone** to Normalize.
- 10) Click on **Apply button** and then **Save**.
- 11) Click on the **Edit button**, it shows a new Employee Table with normalized values on Weka.

Employee Table after Normalizing ID, EXP, PHONE:



The screenshot shows a 'Viewer' window from the Weka data mining software. The title bar reads 'Viewer' with a close button. Below the title bar, the text 'Relation: employee-weka.filters.unsupervised.attribute.Normalize' is displayed. The main area contains a table with 7 columns: 'No.', 'name', 'id', 'salary', 'exp', 'gender', and 'phone'. Each column has a data type specified below its header: 'name' is Nominal, 'id' is Numeric, 'salary' is Nominal, 'exp' is Numeric, 'gender' is Nominal, and 'phone' is Numeric. The table contains 5 rows of data. At the bottom right of the window are three buttons: 'Undo', 'OK', and 'Cancel'.

No.	name Nominal	id Numeric	salary Nominal	exp Numeric	gender Nominal	phone Numeric
1	x	0.0	low	0.25	male	25031...
2	y	0.25	high	0.5	female	25166...
3	z	0.5	medium	0.0	male	24023...
4	a	0.75	low	1.0	female	20020...
5	b	1.0	high	0.25	male	24024...

Result:

This program has been successfully executed.

EXPERIMENT NO:5

Aim:

Normalize Weather Table data using Knowledge Flow.

Description:

The knowledge flow provides an alternative way to the explorer as a graphical front end to WEKA's algorithm. Knowledge flow is a working progress. So, some of the functionality from explorer is not yet available. So, on the other hand there are the things that can be done in knowledge flow, but not in explorer. Knowledge flow presents a dataflow interface to WEKA. The user can select WEKA components from a toolbar placed them on a layout canvas and connect them together in order to form a knowledge flow for processing and analyzing the data.

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.

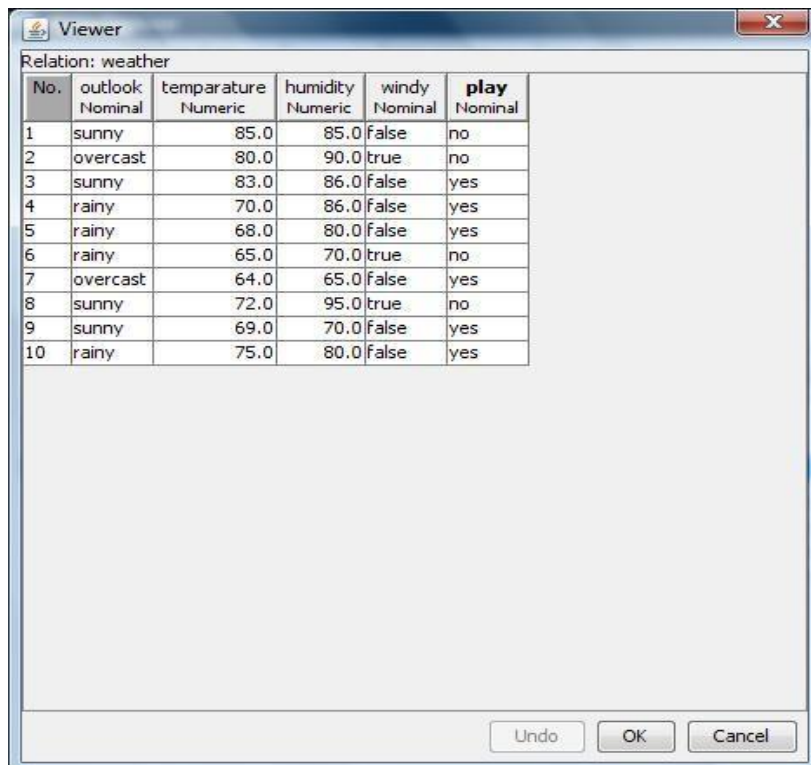
```
@relation weather
@attribute outlook
{sunny,rainy,overcast} @attribute
temperature numeric @attribute humidity
numeric
@attribute windy
{true,false} @attribute play
{yes,no}
```

```
@data
sunny,85.0,85.0,false,no
overcast,80.0,90.0,true,no
sunny,83.0,86.0,false,yes
rainy,70.0,86.0,false,yes
rainy,68.0,80.0,false,yes
rainy,65.0,70.0,true,no
overcast,64.0,65.0,false,yes
sunny,72.0,95.0,true,no
sunny,69.0,70.0,false,yes
rainy,75.0,80.0,false,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 Weather table on weka.

Output:

Training Data Set → Weather Table



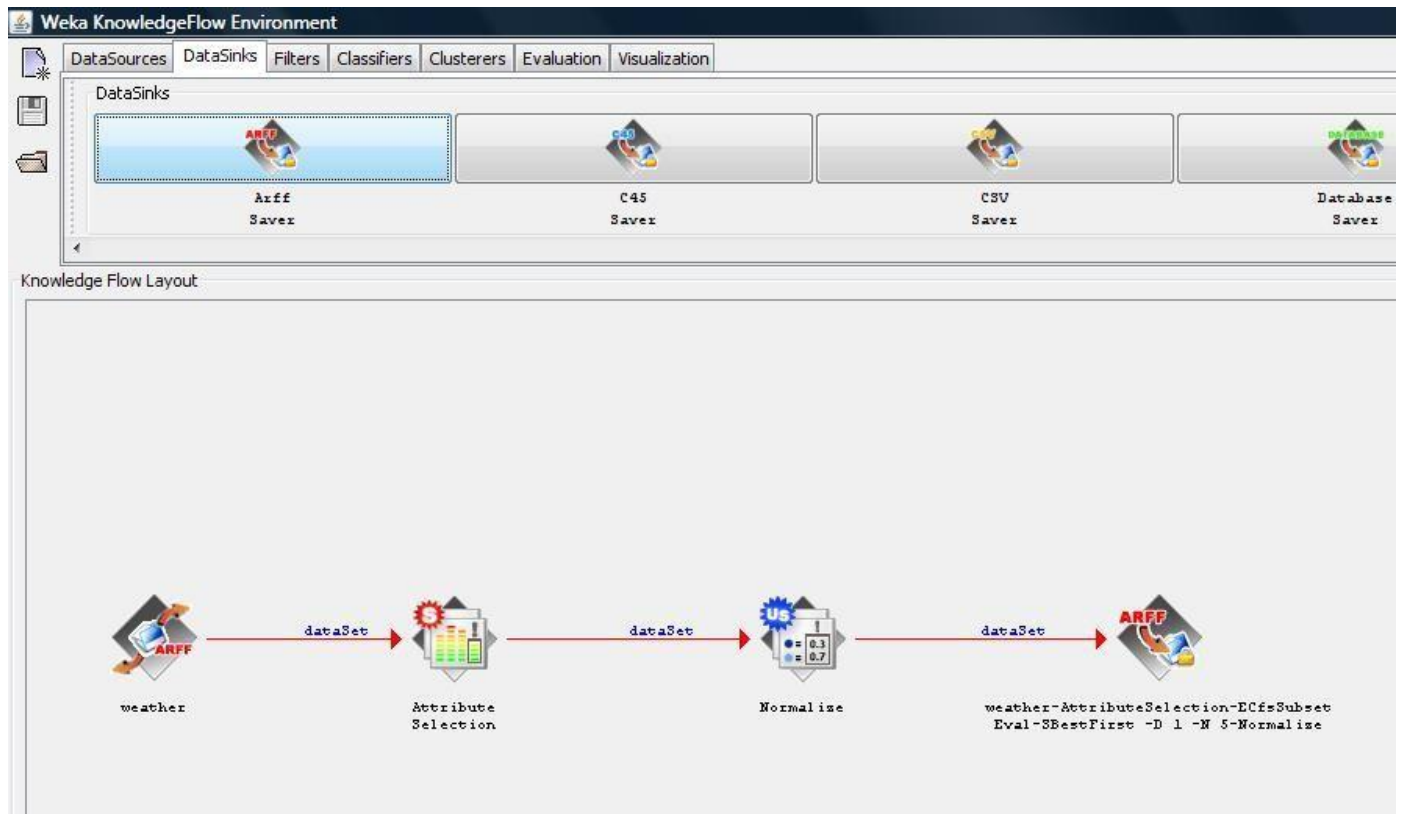
The screenshot shows a 'Viewer' window with the title 'Relation: weather'. It contains a table with 10 rows and 6 columns. The columns are: No., outlook (Nominal), temperature (Numeric), humidity (Numeric), windy (Nominal), and play (Nominal). The data is as follows:

No.	outlook Nominal	temperature Numeric	humidity Numeric	windy Nominal	play Nominal
1	sunny	85.0	85.0	false	no
2	overcast	80.0	90.0	true	no
3	sunny	83.0	86.0	false	yes
4	rainy	70.0	86.0	false	yes
5	rainy	68.0	80.0	false	yes
6	rainy	65.0	70.0	true	no
7	overcast	64.0	65.0	false	yes
8	sunny	72.0	95.0	true	no
9	sunny	69.0	70.0	false	yes
10	rainy	75.0	80.0	false	yes

At the bottom of the window are buttons for 'Undo', 'OK', and 'Cancel'.

Procedure for Knowledge Flow:

- 1) Open Start → Programs → Weka-3-4 → Weka-3-4
- 2) Open the **Knowledge Flow**.
- 3) Select the **Data Source component** and add **Arff Loader** into the **knowledge layout canvas**.
- 4) Select the **Filters component** and add **Attribute Selection** and **Normalize** into the knowledge layout canvas.
- 5) Select the **Data Sinks component** and add **Arff Saver** into the knowledge layout canvas.
- 6) Right click on **Arff Loader** and select **Configure option** then the new window will be opened and select **Weather.arff**
- 7) Right click on **Arff Loader** and select **Dataset option** then establish a link between **Arff Loader** and **Attribute Selection**.
- 8) Right click on **Attribute Selection** and select **Dataset option** then establish a link between **Attribute Selection** and **Normalize**.
- 9) Right click on **Attribute Selection** and select **Configure option** and choose the best attribute for Weather data.
- 10) Right click on **Normalize** and select **Dataset option** then establish a link between **Normalize** and **Arff Saver**.
- 11) Right click on **Arff Saver** and select **Configure option** then new window will be opened and set the path, enter **.arff** in look in dialog box to save normalize data.
- 12) Right click on **Arff Loader** and click on **Start Loading option** then everything will be executed one by one.
- 13) Check whether output is created or not by selecting the preferred path.
- 14) Rename the data name as **a.arff**
- 15) Double click on **a.arff** then automatically the output will be opened in **MS-Excel**.



Result:

This program has been successfully executed.

EXPERIMENT NO:6

Aim:

Normalize Employee Table data using Knowledge Flow.

Description:

The knowledge flow provides an alternative way to the explorer as a graphical front end to WEKA's algorithm. Knowledge flow is a working progress. So, some of the functionality from explorer is not yet available. So, on the other hand there are the things that can be done in knowledge flow, but not in explorer. Knowledge flow presents a dataflow interface to WEKA. The user can select WEKA components from a toolbar placed them on a layout canvas and connect them together in order to form a knowledge flow for processing and analyzing the data.

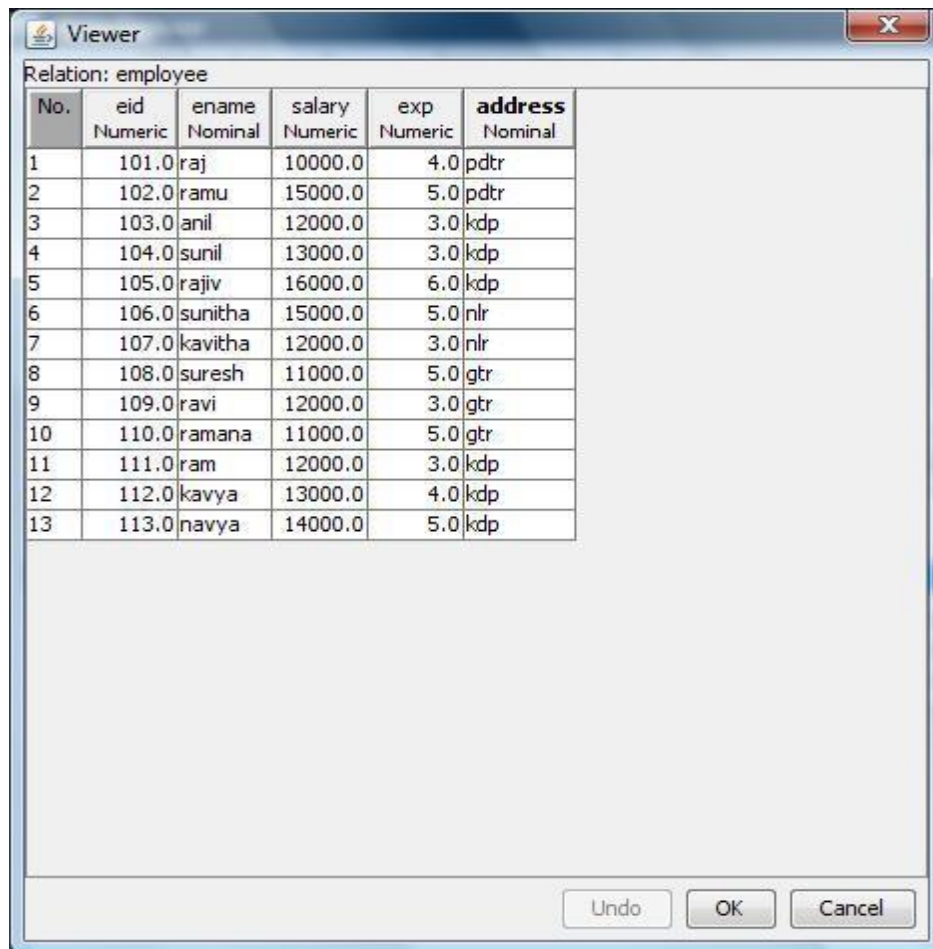
Creation of Employee Table:

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,nl
r
107,kavitha,12000,3,nl
r
108,suresh,11000,5,gtr
109,ravi,12000,3,gtr
110,ramana,11000,5,gt
r111,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.

Output:

Training Data Set → Employee Table



The screenshot shows a 'Viewer' window titled 'Relation: employee'. It displays a table with 13 rows of employee data. The columns are: No., eid (Numeric), ename (Nominal), salary (Numeric), exp (Numeric), and address (Nominal). The data is as follows:

No.	eid Numeric	ename Nominal	salary Numeric	exp Numeric	address Nominal
1	101.0	raj	10000.0	4.0	pdtr
2	102.0	ramu	15000.0	5.0	pdtr
3	103.0	anil	12000.0	3.0	kdp
4	104.0	sunil	13000.0	3.0	kdp
5	105.0	rajiv	16000.0	6.0	kdp
6	106.0	sunitha	15000.0	5.0	nlr
7	107.0	kavitha	12000.0	3.0	nlr
8	108.0	suresh	11000.0	5.0	gtr
9	109.0	ravi	12000.0	3.0	gtr
10	110.0	ramana	11000.0	5.0	gtr
11	111.0	ram	12000.0	3.0	kdp
12	112.0	kavya	13000.0	4.0	kdp
13	113.0	navya	14000.0	5.0	kdp

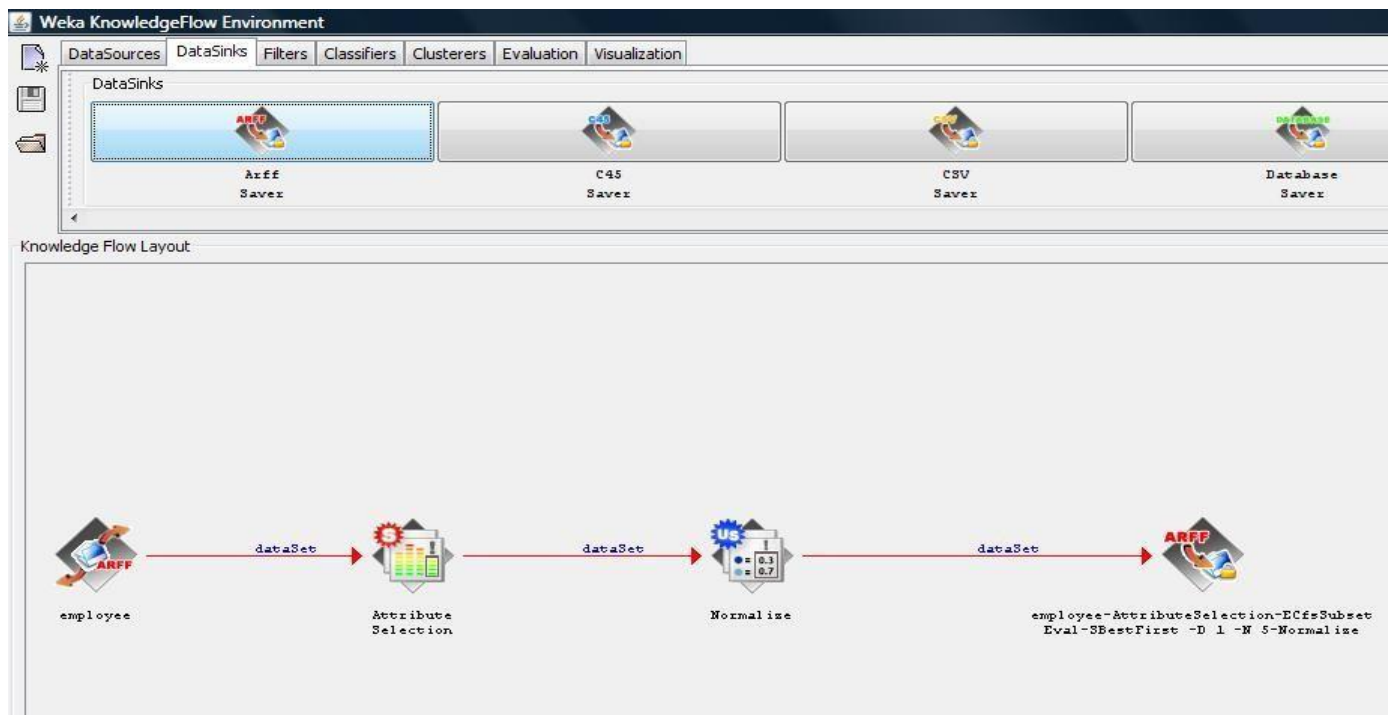
At the bottom of the window are buttons for 'Undo', 'OK', and 'Cancel'.

Procedure for Knowledge Flow:

- 1) Open Start → Programs → Weka-3-4 → Weka-3-4
- 2) Open the **Knowledge Flow**.
- 3) Select the **Data Source** component and add **Arff Loader** into the **knowledge layout canvas**.
- 4) Select the **Filters** component and add **Attribute Selection** and **Normalize** into the knowledge layout canvas.
- 5) Select the **Data Sinks** component and add **Arff Saver** into the knowledge layout canvas.
- 6) Right click on **Arff Loader** and select **Configure option** then the new window will be opened and select **Employee.arff**
- 7) Right click on **Arff Loader** and select **Dataset option** then establish a link between **Arff Loader** and **Attribute Selection**.
- 8) Right click on **Attribute Selection** and select **Dataset option** then establish a link between **Attribute Selection** and **Normalize**.
- 9) Right click on **Attribute Selection** and select **Configure option** and choose the best attribute for Employee data.
- 10) Right click on **Normalize** and select **Dataset option** then establish a link between **Normalize** and **Arff Saver**.
- 11) Right click on **Arff Saver** and select **Configure option** then new window will be opened and set the path, enter **.arff** in look in dialog box to save normalize data.
- 12) Right click on **Arff Loader** and click on **Start Loading option** then everything will be executed one by one.

- 13) Check whether output is created or not by selecting the preferred path.
- 14) Rename the data name as **a.arff**
- 15) Double click on **a.arff** then automatically the output will be opened in **MS-Excel**.

	A	B	C	D	E	F	G	H	I	J
1	@relation \'employee-weka.filters.supervised.attribute.AttributeSelection-Eweka.attributeSelection.Cf									
2										
3	@attribute eid numeric									
4	@attribute ename {raj,ramu,anil,sunil,rajiv,sunitha,kavitha,suresh,ravi,ramana,ram,kavya,navya}									
5	@attribute address {pdtr,kdp,nlr,gtr}									
6										
7	@data									
8	0,raj,pdtr									
9	0.083333,ramu,pdtr									
10	0.166667,anil,kdp									
11	0.25,sunil,kdp									
12	0.333333,rajiv,kdp									
13	0.416667,sunitha,nlr									
14	0.5,kavitha,nlr									
15	0.583333,suresh,gtr									
16	0.666667,ravi,gtr									
17	0.75,ramana,gtr									
18	0.833333,ram,kdp									
19	0.916667,kavya,kdp									
20	1,navya,kdp									
21										



Result:

This program has been successfully executed.

EXPERIMENT NO:7

Aim: Finding Association Rules for Buying data.

Description:

In data mining, **association rule learning** is a popular and well researched method for discovering interesting relations between variables in large databases. It can be described as analyzing and presenting strong rules discovered in databases using different measures of interestingness. In market basket analysis association rules are used and they are also employed in many application areas including Web usage mining, intrusion detection and bioinformatics.

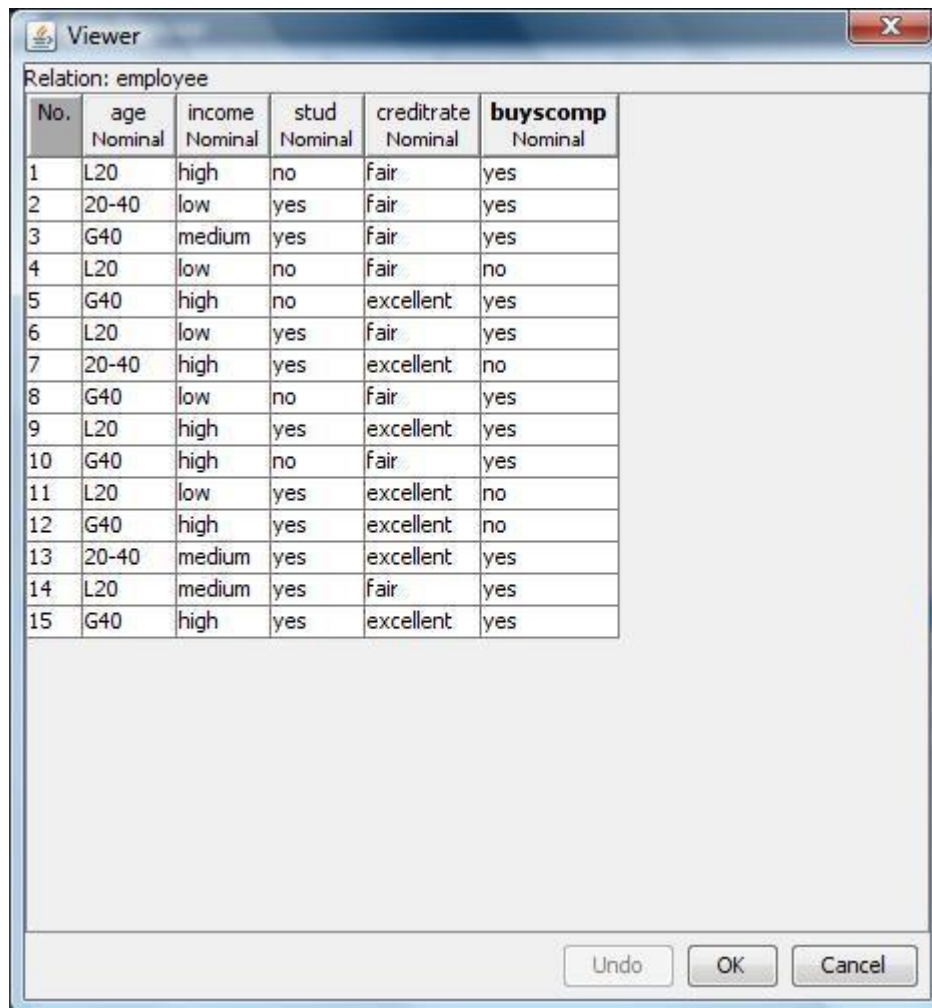
Creation of Buying Table:

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 student {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.

Output:

Training Data Set → Buying Table



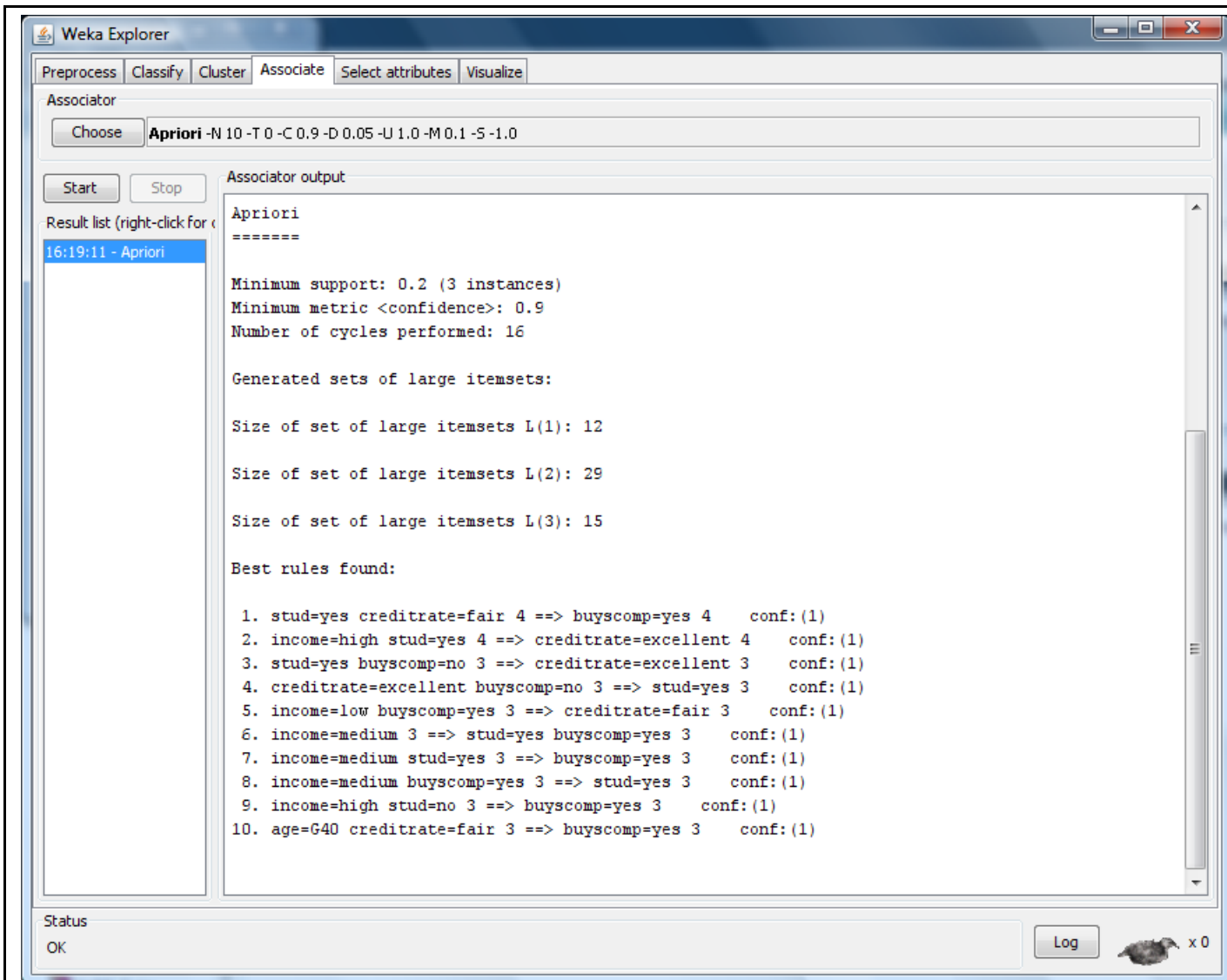
Relation: employee

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

Undo OK Cancel

Procedure for Association Rules:

- 1) Open Start → Programs → Weka-3-4 → Weka-3-4
- 2) Open **explorer**.
- 3) Click on **open file** and select **buying.arff**
- 4) Select **Associate option** on the top of the Menu bar.
- 5) Select **Choose button** and then click on **Apriori Algorithm**.
- 6) Click on **Start button** and output will be displayed on the **right side** of the window.



Result:

This program has been successfully executed.

EXPERIMENT NO:8

Aim: Finding Association Rules for Banking data.

Description:

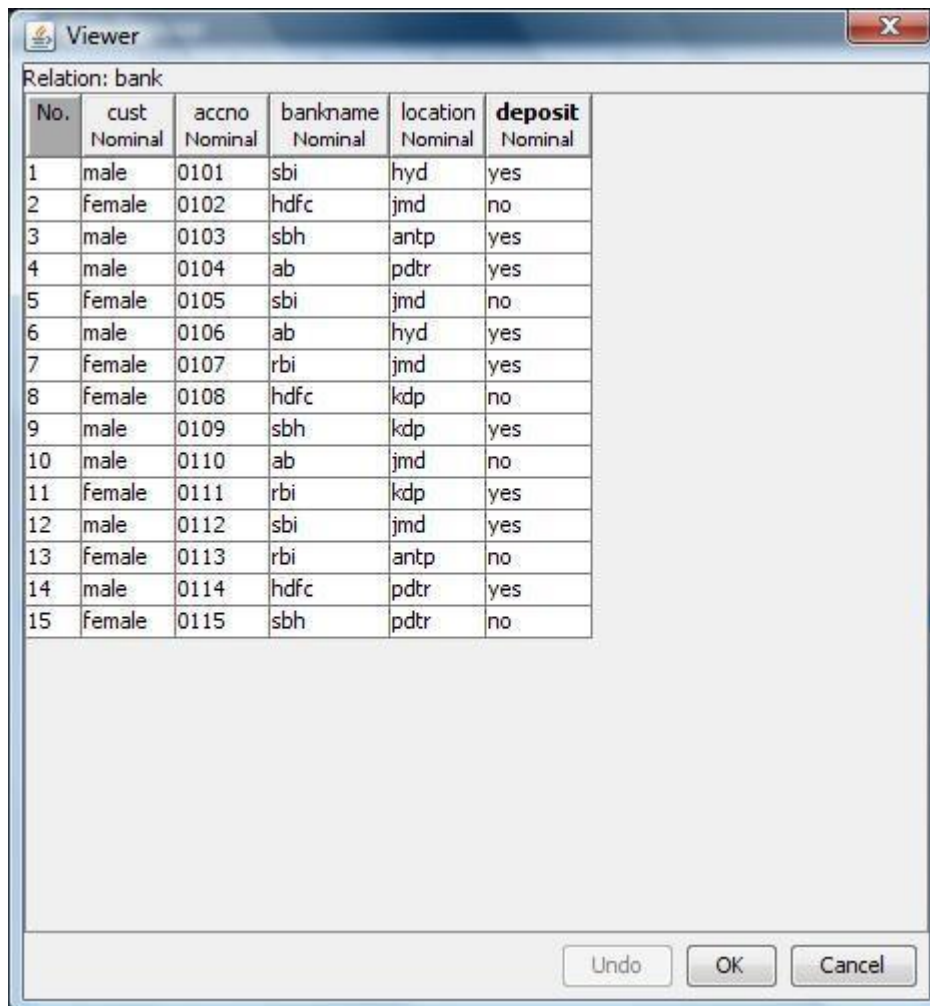
In data mining, **association rule learning** is a popular and well researched method for discovering interesting relations between variables in large databases. It can be described as analyzing and presenting strong rules discovered in databases using different measures of interestingness. In market basket analysis association rules are used and they are also employed in many application areas including Web usage mining, intrusion detection 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,n
omale,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,n
omale,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



Relation: bank

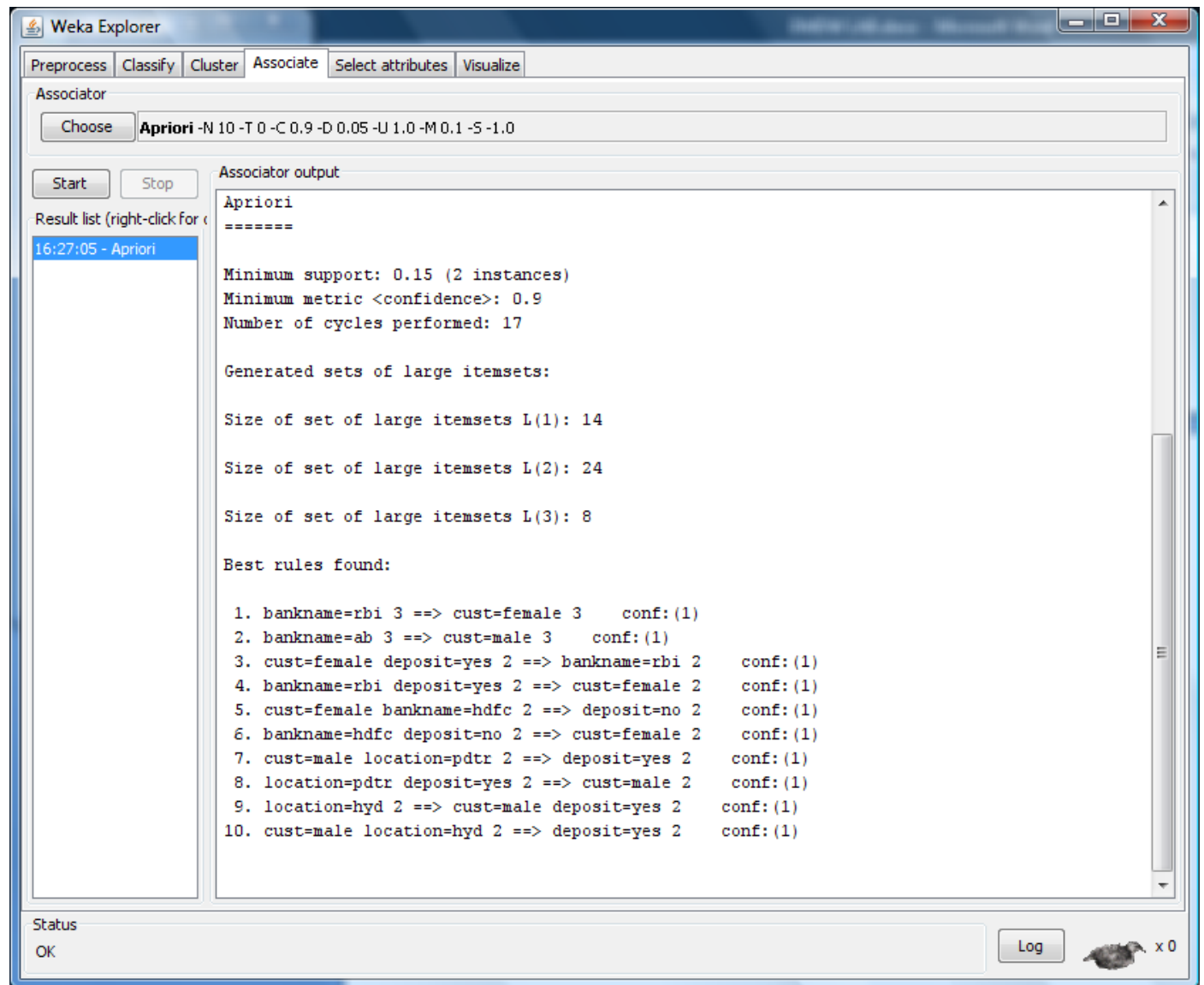
No.	cust Nominal	accno Nominal	bankname Nominal	location Nominal	deposit Nominal
1	male	0101	sbi	hyd	yes
2	female	0102	hdfc	jmd	no
3	male	0103	sbh	antp	yes
4	male	0104	ab	pdtr	yes
5	female	0105	sbi	jmd	no
6	male	0106	ab	hyd	yes
7	female	0107	rbi	jmd	yes
8	female	0108	hdfc	kdp	no
9	male	0109	sbh	kdp	yes
10	male	0110	ab	jmd	no
11	female	0111	rbi	kdp	yes
12	male	0112	sbi	jmd	yes
13	female	0113	rbi	antp	no
14	male	0114	hdfc	pdtr	yes
15	female	0115	sbh	pdtr	no

Undo OK Cancel

Procedure for Association Rules:

- 1) Open Start → Programs → Weka-3-4 → Weka-3-4
- 2) Open **explorer**.
- 3) Click on **open file** and select **bank.arff**
- 4) Select **Associate option** on the top of the Menu bar.
- 5) Select **Choose button** and then click on **Apriori Algorithm**.
- 6) Click on **Start button** and output will be displayed on the **right side** of the window.

Output:



Result:

This program has been successfully executed.

EXPERIMENT NO:9

Aim: Finding Association Rules for Employee data.

Description:

In data mining, **association rule learning** is a popular and well researched method for discovering interesting relations between variables in large databases. It can be described as analyzing and presenting strong rules discovered in databases using different measures of interestingness. In market basket analysis association rules are used and they are also employed in many application areas including Web usage mining, intrusion detection and bioinformatics.

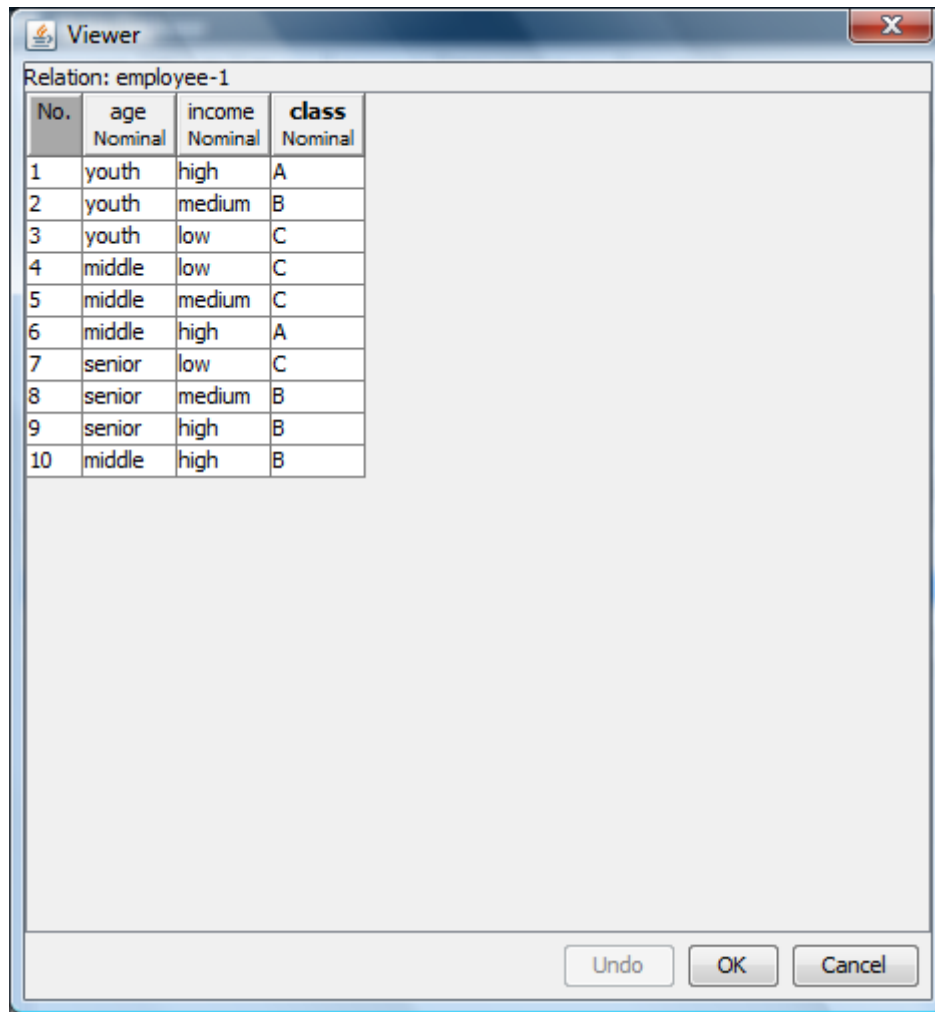
Creation of Banking Table:

Procedure:

- 1) Open Start → Programs → Accessories → Notepad
- 2) Type the following training data set with the help of Notepad for Employee Table.
@relation employee-1
@attribute age {youth, middle, senior}
@attribute income {high, medium, low}
@attribute class {A, B, C}

@data
youth, high, A
youth, medium, B
youth, low, C
middle, low, C
middle, medium, C
middle, high, A
senior, low, C
senior, medium, B
senior, high, B
middle, high, B
- 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



Relation: employee-1

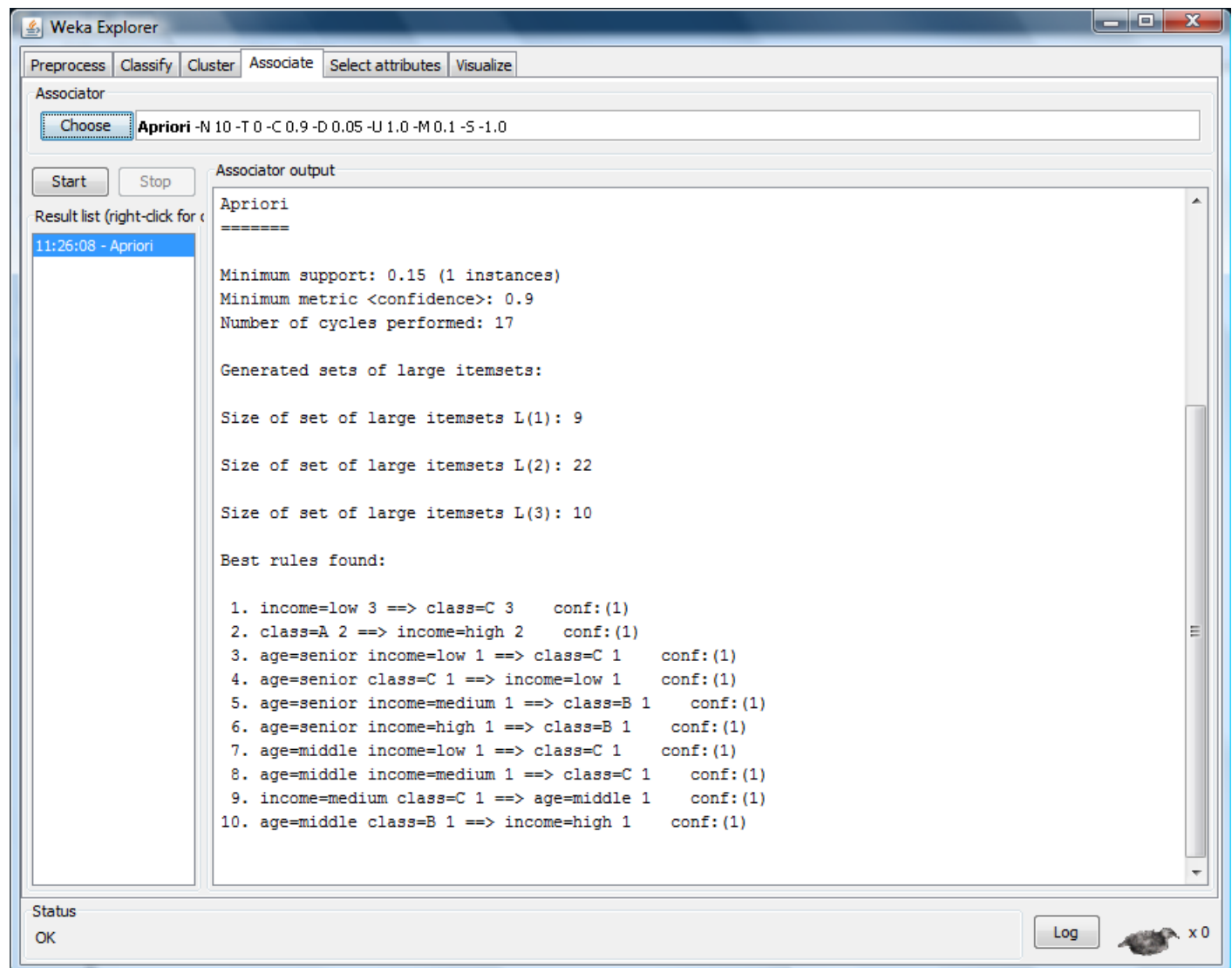
No.	age Nominal	income Nominal	class Nominal
1	youth	high	A
2	youth	medium	B
3	youth	low	C
4	middle	low	C
5	middle	medium	C
6	middle	high	A
7	senior	low	C
8	senior	medium	B
9	senior	high	B
10	middle	high	B

Undo OK Cancel

Procedure for Association Rules:

- 1) Open Start → Programs → Weka-3-4 → Weka-3-4
- 2) Open **explorer**.
- 3) Click on **open file** and select **employee-1.arff**
- 4) Select **Associate option** on the top of the Menu bar.
- 5) Select **Choose button** and then click on **Apriori Algorithm**.
- 6) Click on **Start button** and output will be displayed on the **right side** of the window.

Output:



Result:

This program has been successfully executed.

EXPERIMENT NO:10

Aim:

To Construct Decision Tree for Weather data and classify it.

Description:

Classification & Prediction:

Classification is the process for finding a model that describes the data values and concepts for the purpose of Prediction.

Decision Tree:

A decision Tree is a classification scheme to generate a tree consisting of root node, internal nodes and external nodes.

Root nodes representing the attributes. Internal nodes are also the attributes. External nodes are the classes and each branch represents the values of the attributes

Decision Tree also contains set of rules for a given data set; there are two subsets in Decision Tree. One is a Training data set and second one is a Testing data set. Training data set is previously classified data. Testing data set is newly generated data.

Creation of Weather Table:

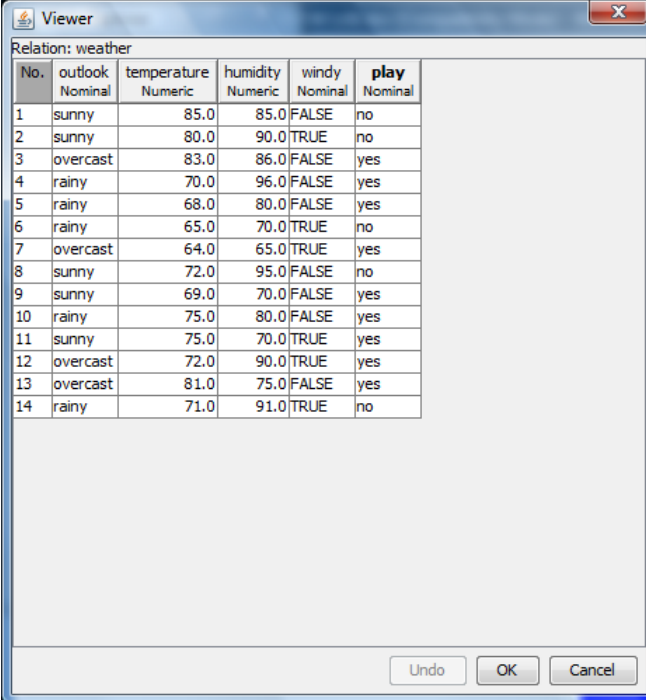
Procedure:

- 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



The screenshot shows the 'Viewer' window in Weka. The title bar says 'Viewer'. Below the title bar, it says 'Relation: weather'. The main area contains a table with 6 columns: 'No.', 'outlook', 'temperature', 'humidity', 'windy', and 'play'. The 'outlook' column is labeled 'Nominal', 'temperature' is 'Numeric', 'humidity' is 'Numeric', 'windy' is 'Nominal', and 'play' is 'Nominal'. The table contains 14 rows of data.

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

At the bottom of the window, there are three buttons: 'Undo', 'OK', and 'Cancel'.

Procedure for Decision Trees:

- 1) Open Start → Programs → Weka-3-4 → Weka-3-4
- 2) Open **explorer**.
- 3) Click on **open file** and select **weather.arff**
- 4) Select **Classifier option** on the top of the Menu bar.
- 5) Select **Choose button** and click on **Tree option**.
- 6) Click on **J48**.
- 7) Click on **Start button** and output will be displayed on the **right side** of the window.
- 8) Select the **result list** and **right click** on result list and select **Visualize Tree option**.
- 9) Then **Decision Tree** will be displayed on **new window**.

Output:

The Weka Explorer window displays the results of a J48 classifier. The 'Classifier' tab is selected, and the classifier is 'J48 -C 0.25 -M 2'. The 'Test options' section shows 'Cross-validation' with 'Folds' set to 10. The 'Classifier output' section contains a summary of performance metrics and a detailed accuracy by class table.

Classifier output

=== Summary ===

Metric	Value	Percentage
Correctly Classified Instances	9	64.2857 %
Incorrectly Classified Instances	5	35.7143 %
Kappa statistic	0.186	
Mean absolute error	0.2857	
Root mean squared error	0.4818	
Relative absolute error	60	%
Root relative squared error	97.6586	%
Total Number of Instances	14	

=== Detailed Accuracy By Class ===

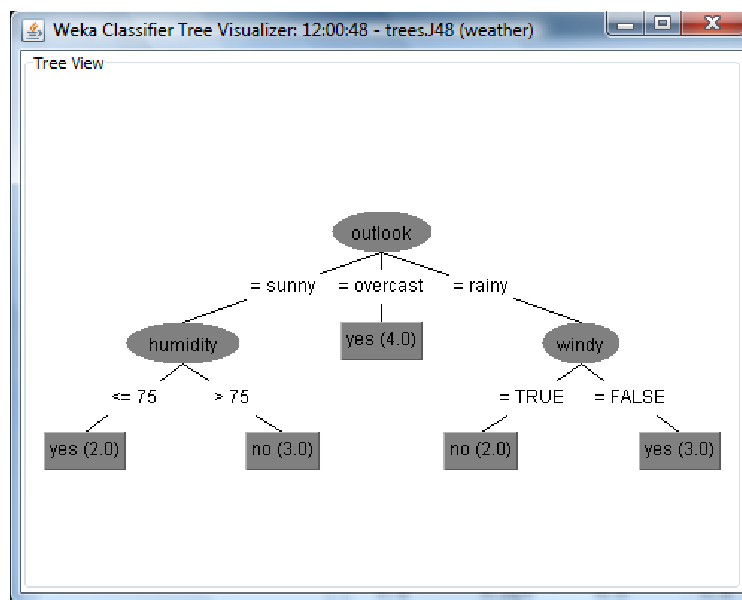
TP Rate	FP Rate	Precision	Recall	F-Measure	Class
0.778	0.6	0.7	0.778	0.737	yes
0.4	0.222	0.5	0.4	0.444	no

=== Confusion Matrix ===

a b <-- classified as

a \ b	a = yes	a = no
b = yes	7	2
b = no	3	2

Decision Tree:



Result: This program has been successfully executed.

