

## Experiment-3.2

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**Semester: 01**

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**Subject Code: 23CSH-621**

### **Aim of the Experiment :**

Aim of the Experiment is to finding Association Rules for the Crime data using Apriori Algorithm and perform the result analysis.

### **Objective of the Experiment :**

Task to be done for this experiment is that we have to perform following tasks:

- a) Download Crime data set from kaggle and import data table in WEKA tool.
- b) Apply Apriori algorithm and perform the result analysis.

### **Algorithm/ Steps for Experiment :**

**Step 1:** Download the **Crime dataset** from the Kaggle website.

**Step 2:** Open the WEKA Tool and open the '**Explorer**' tab.

Home Crime\_data.csv

Menu Home Insert Page Layout Formulas Data Review View Tools Smart

Format Painter Paste

Calibri 11 A+ A-

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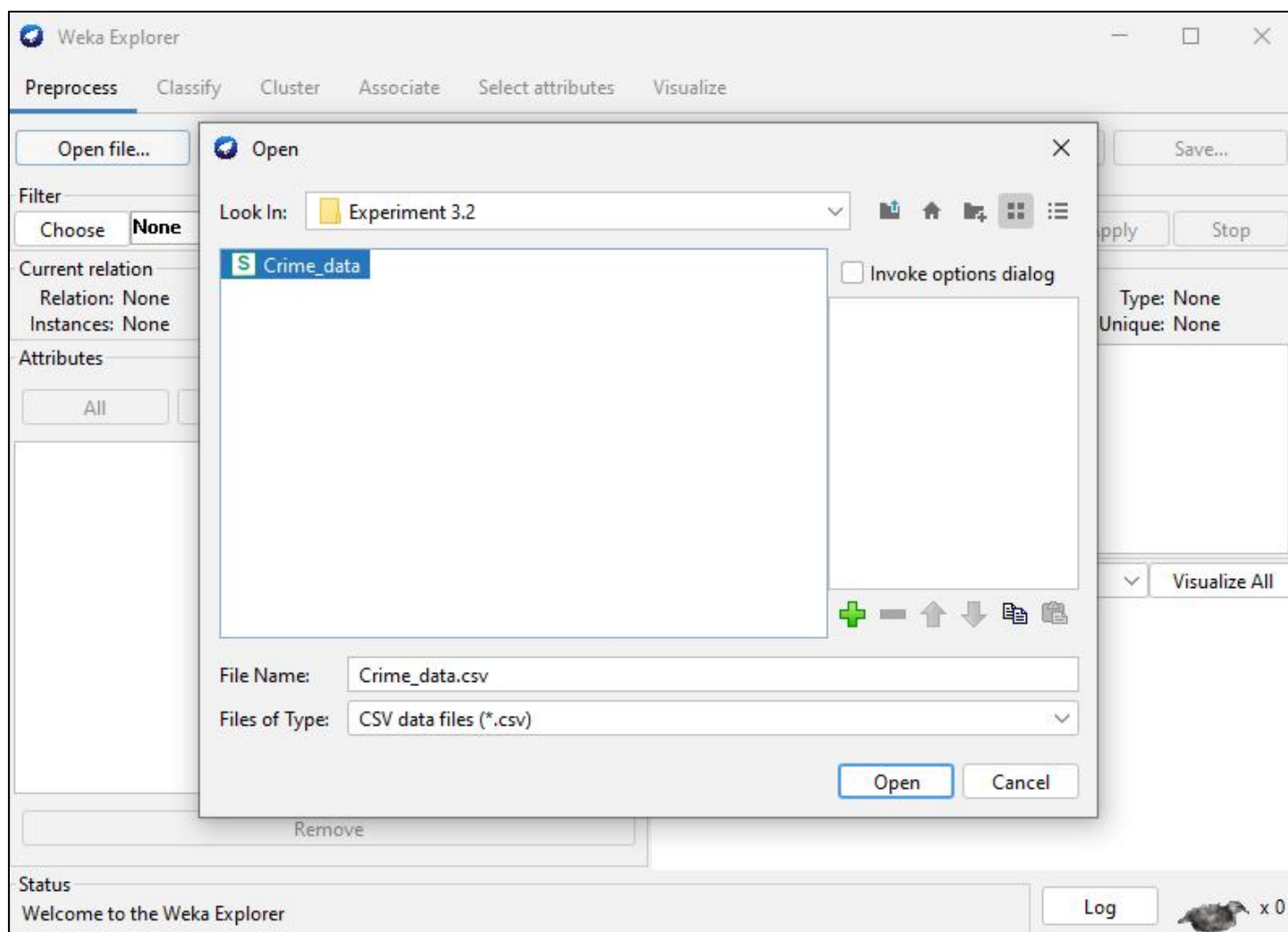
Orientation Merge and Center

J19 fx

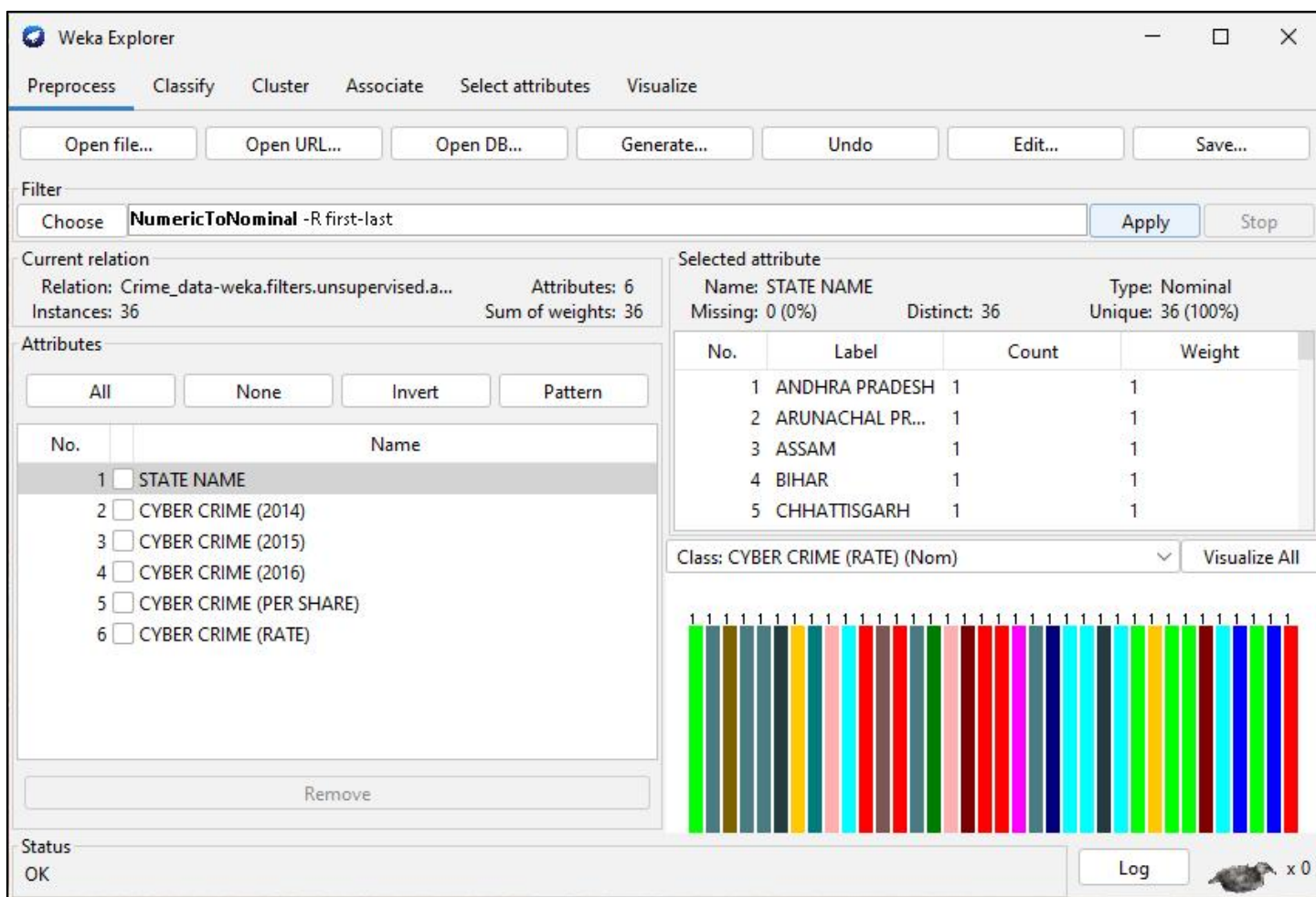
	A	B	C	D	E	F	G
1	STATE NAME	CYBER CRIME (2014)	CYBER CRIME (2015)	CYBER CRIME (2016)	CYBER CRIME (PER SHARE)	CYBER CRIME (RATE)	
2	ANDHRA PRADESH	282	536	616	5	1.2	
3	ARUNACHAL PRADESH	18	6	4	0	0.3	
4	ASSAM	379	483	696	5.7	2.1	
5	BIHAR	114	242	309	2.5	0.3	
6	CHHATTISGARH	123	103	90	0.7	0.3	
7	GOA	62	17	31	0.3	1.6	
8	GUJARAT	227	242	362	2.9	0.6	
9	HARYANA	151	224	401	3.3	1.5	
10	HIMACHAL PRADESH	38	50	31	0.3	0.4	
11	JAMMU & KASHMIR	37	34	28	0.2	0.2	
12	JHARKHAND	93	180	259	2.1	0.8	
13	KARNATAKA	1020	1447	1101	8.9	1.8	
14	KERALA	450	290	283	2.3	0.8	
15	MADHYA PRADESH	289	231	258	2.1	0.3	



**Step 3:** Click on the ‘Open file’ Option >> Select Crime dataset >> Click on **Open**.



**Step 4:** Change the dataset from Numeric to Nominal. In **‘Filter’** Section, click on **‘Choose’** >> Unsupervised >> Attribute >> **Numeric to Nominal**. Click on **‘Apply’** Option.



**Weka Explorer**

Preprocess | Classify | Cluster | Associate | Select attributes | Visualize

Open file... | Open URL... | Open DB... | Generate... | Undo | Edit... | Save...

**Filter**

Choose **NumericToNominal -R first-last** [Apply] [Stop]

**Current relation**

Relation: Crime\_data-weka.filters.unsupervised.a... Attributes: 6  
Instances: 36 Sum of weights: 36

**Attributes**

All | None | Invert | Pattern

No.	Name
1	<input checked="" type="checkbox"/> STATE NAME
2	<input type="checkbox"/> CYBER CRIME (2014)
3	<input type="checkbox"/> CYBER CRIME (2015)
4	<input type="checkbox"/> CYBER CRIME (2016)
5	<input type="checkbox"/> CYBER CRIME (PER SHARE)
6	<input type="checkbox"/> CYBER CRIME (RATE)

[Remove]

**Selected attribute**

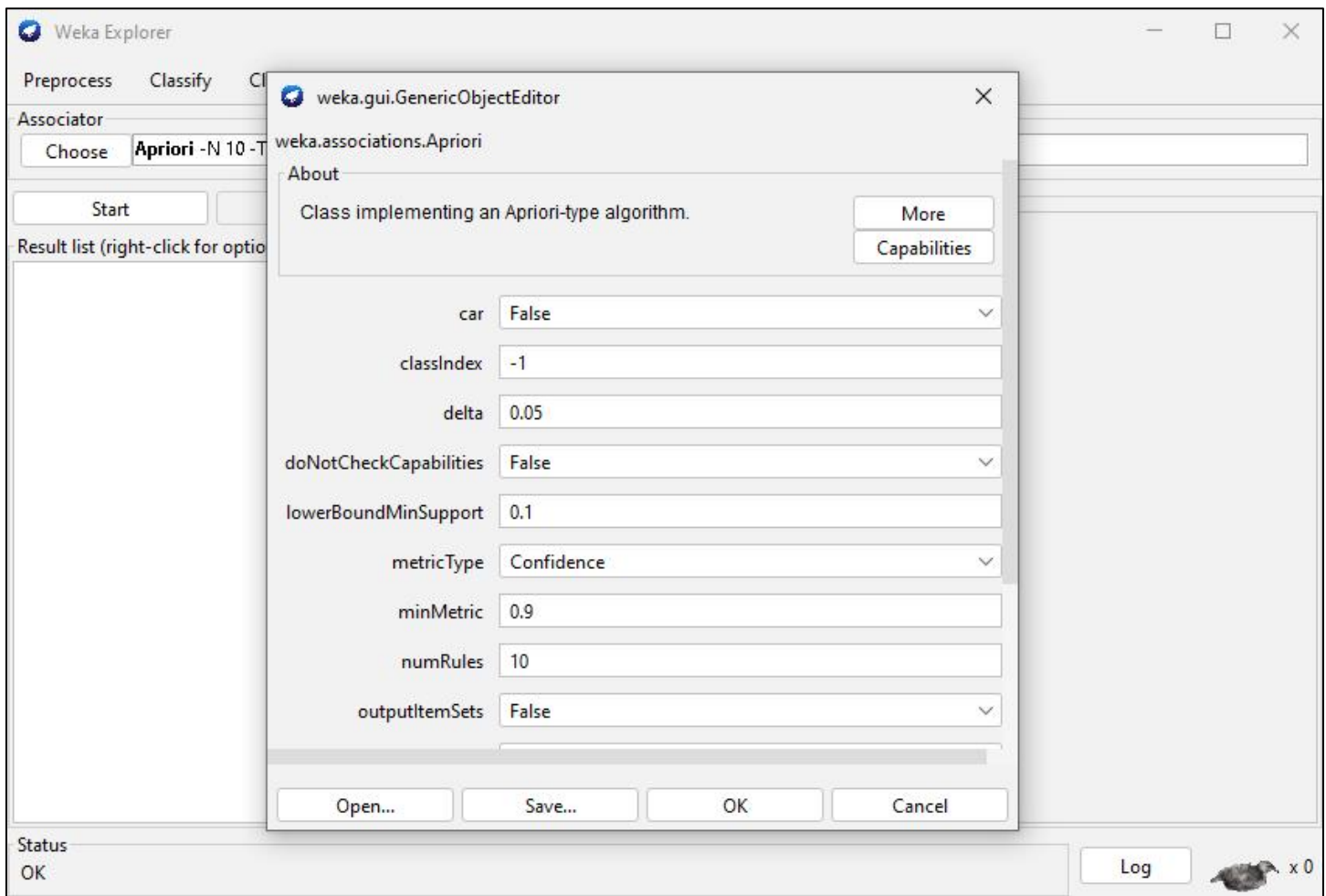
Name: STATE NAME Type: Nominal  
Missing: 0 (0%) Distinct: 36 Unique: 36 (100%)

No.	Label	Count	Weight
1	ANDHRA PRADESH	1	1
2	ARUNACHAL PR...	1	1
3	ASSAM	1	1
4	BIHAR	1	1
5	CHHATTISGARH	1	1

Class: CYBER CRIME (RATE) (Nom) [Visualize All]

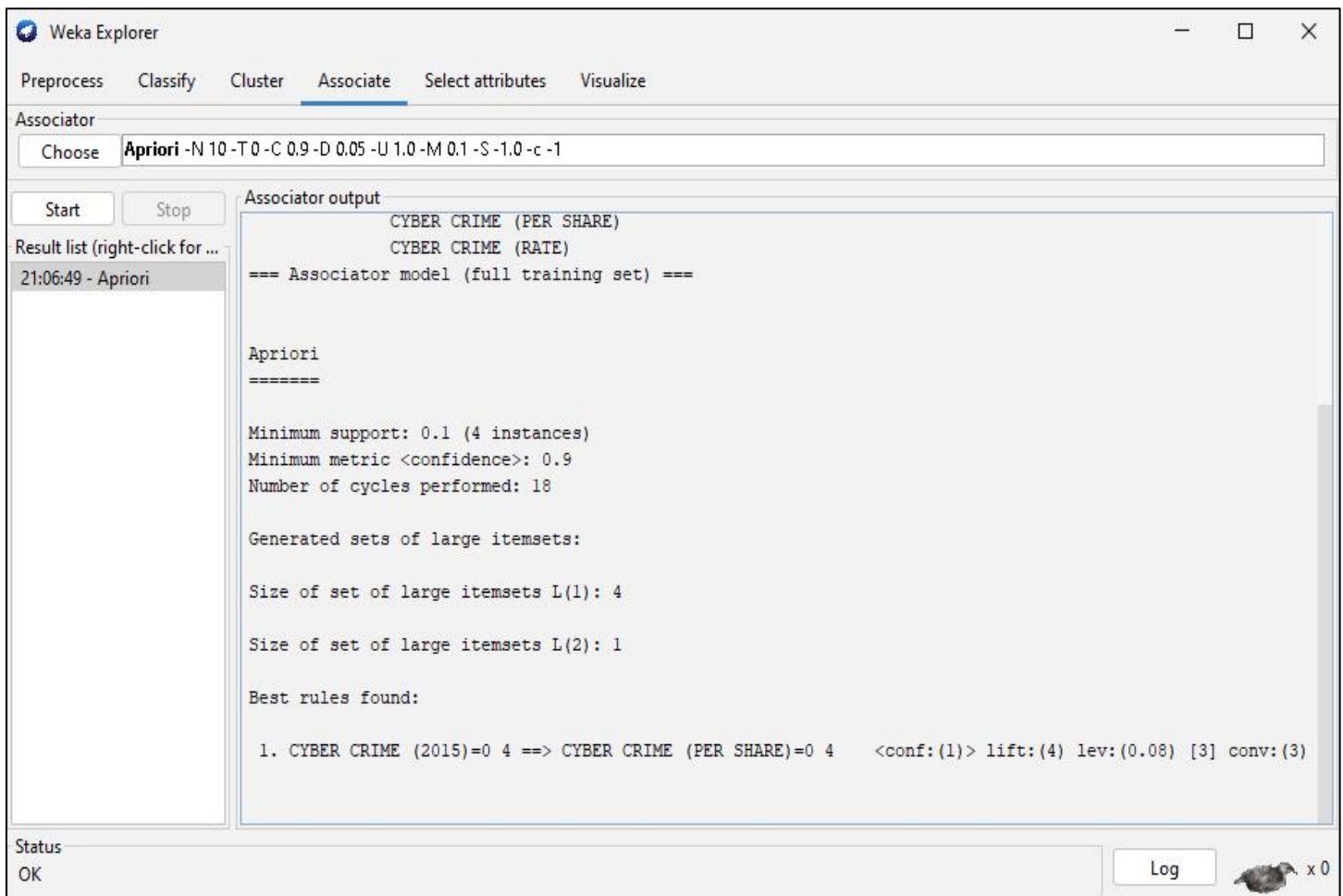
Status: OK [Log] x 0

**Step 5:** Click on the ‘Associate’ Tab >> Choose and select Apriori algorithm from ‘Associator’ Section.





**Step 6:** Click Start to build the model. Associator output shows the model evaluation parameters.



The screenshot shows the Weka Explorer application window. The 'Associate' tab is selected. The 'Associator' section shows 'Apriori' selected with parameters '-N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1'. The 'Start' button is clicked, and the 'Associator output' pane displays the following text:

```

      CYBER CRIME (PER SHARE)
      CYBER CRIME (RATE)
=== Associator model (full training set) ===

Apriori
=====

Minimum support: 0.1 (4 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 18

Generated sets of large itemsets:

Size of set of large itemsets L(1): 4

Size of set of large itemsets L(2): 1

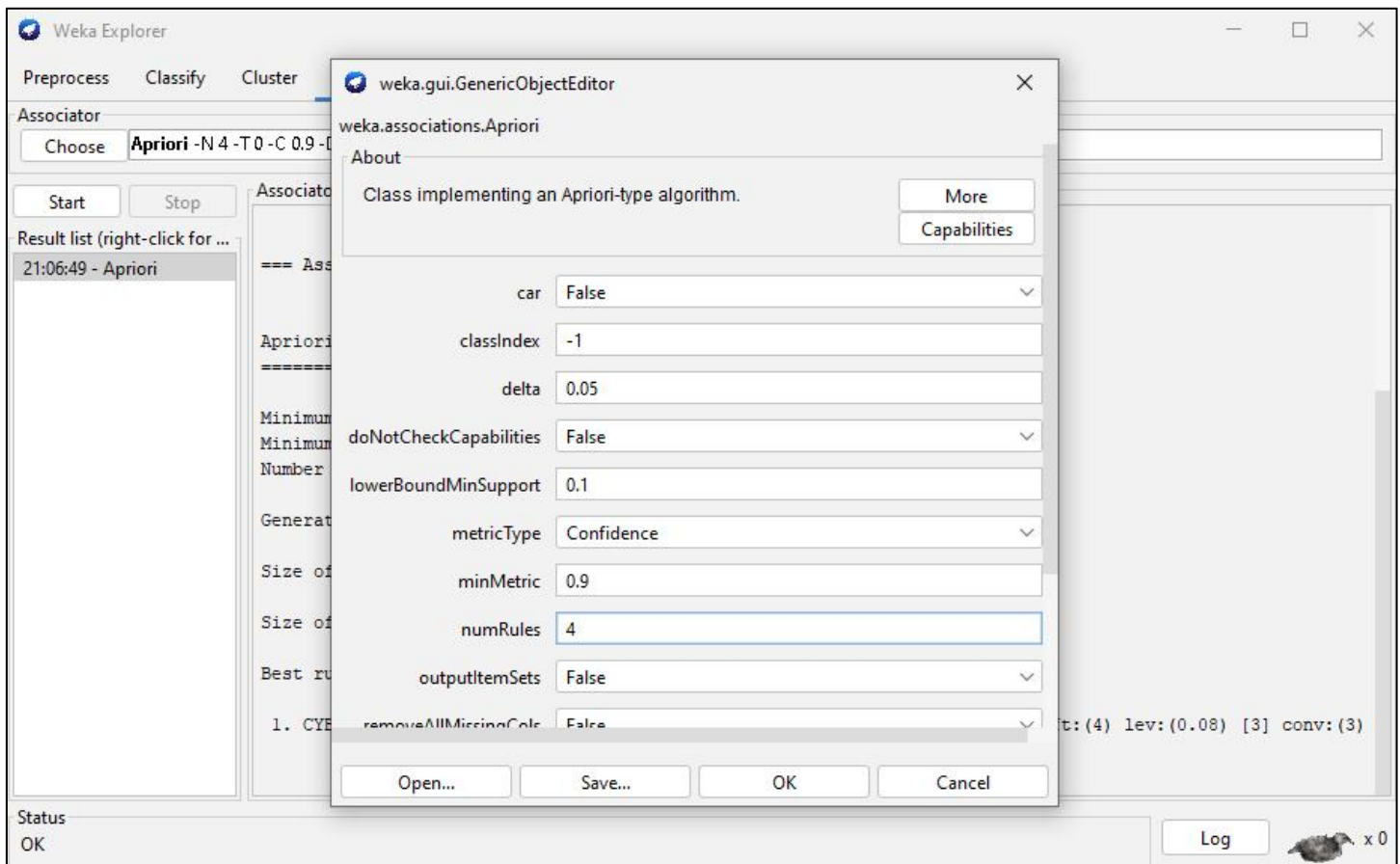
Best rules found:

1. CYBER CRIME (2015)=0 4 ==> CYBER CRIME (PER SHARE)=0 4    <conf:(1)> lift:(4) lev:(0.08) [3] conv:(3)

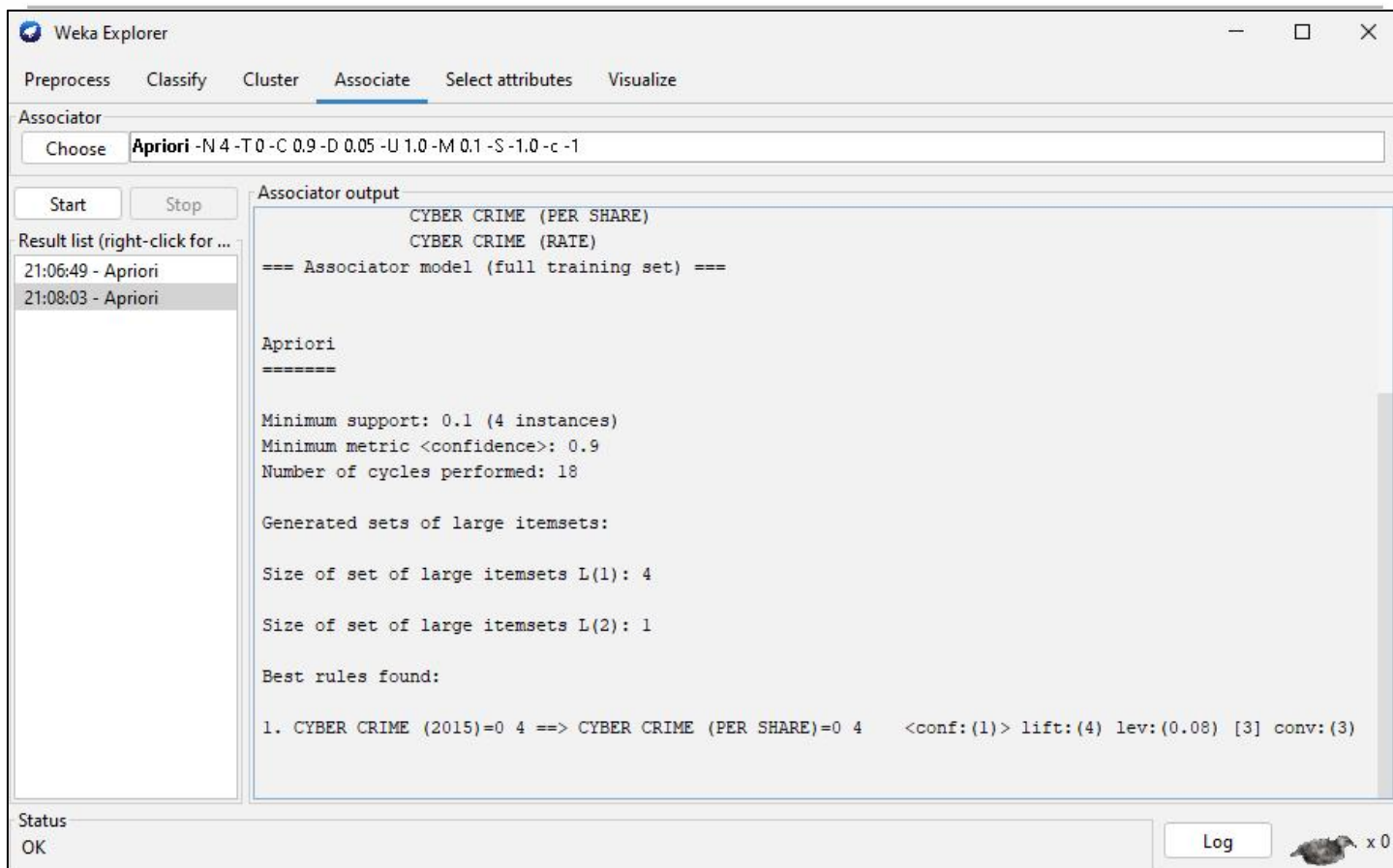
```

The 'Result list' on the left shows '21:06:49 - Apriori'. The 'Status' bar at the bottom indicates 'OK'.

**Step 7:** Click on the Apriori algorithm and change numrules from 10 to 4.



**Step 8:** Click Start to build the model. Associator output shows the model evaluation parameters.



## Learning outcomes (What I have learnt):

1. I learnt about the WEKA Tool and its applications.
2. I learnt about how to use Explorer Tab in WEKA Tool.
3. I learnt about how to change attributes from Numeric to Nominal.
4. I learnt about how to perform Apriori algorithm on the dataset.
5. I learnt about how to change numrules in Apriori algorithm.