Data Mining file

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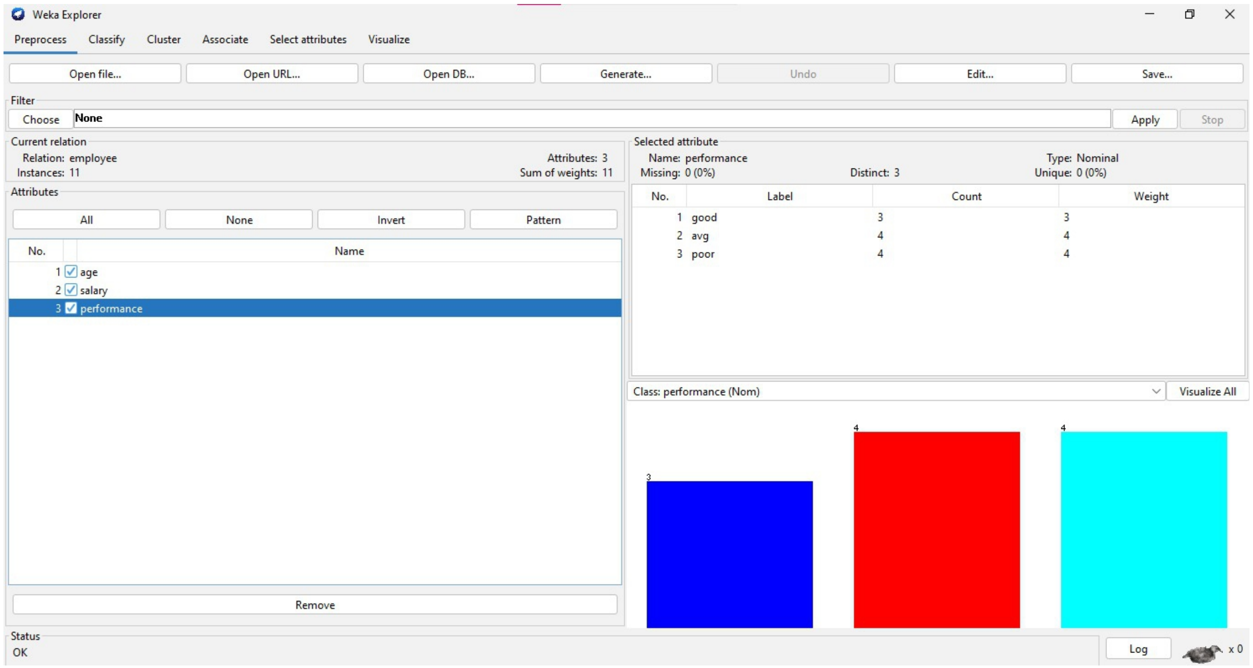
23/SCA/BSC.IT/005

1. Demonstration of preprocessing on dataset employee.arff



Filter: None

Current relation
Relation: employee
Instances: 11
Attributes: 3
Sum of weights: 11

Attributes

No.	Name
1	☑ age
2	☑ salary
3	☑ performance

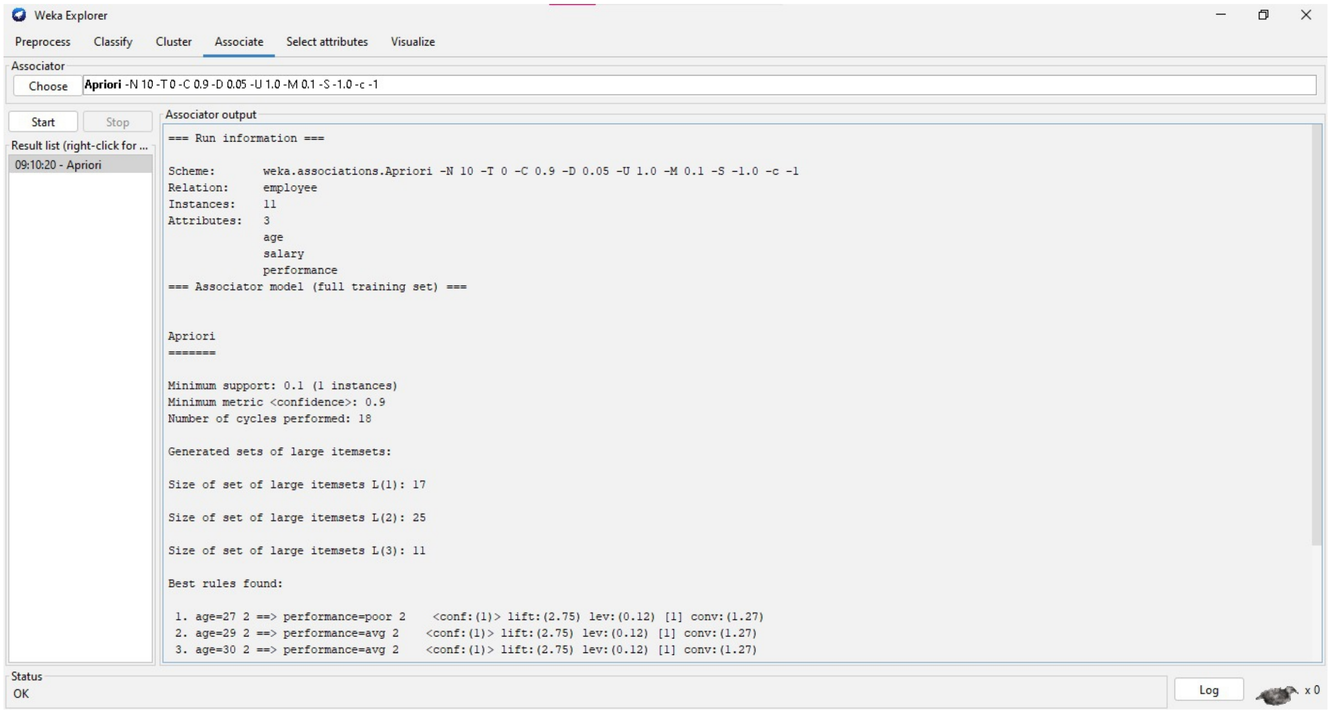
Selected attribute
Name: performance
Missing: 0 (0%)
Distinct: 3
Type: Nominal
Unique: 0 (0%)

No.	Label	Count	Weight
1	good	3	3
2	avg	4	4
3	poor	4	4

Class: performance (Nom)

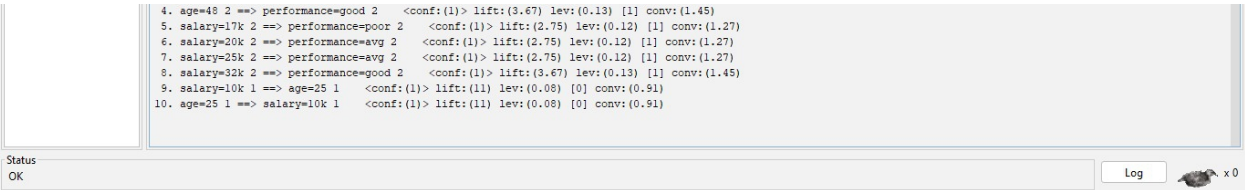
Status
OK

2.Demonstration of preprocessing on dataset employee.arff

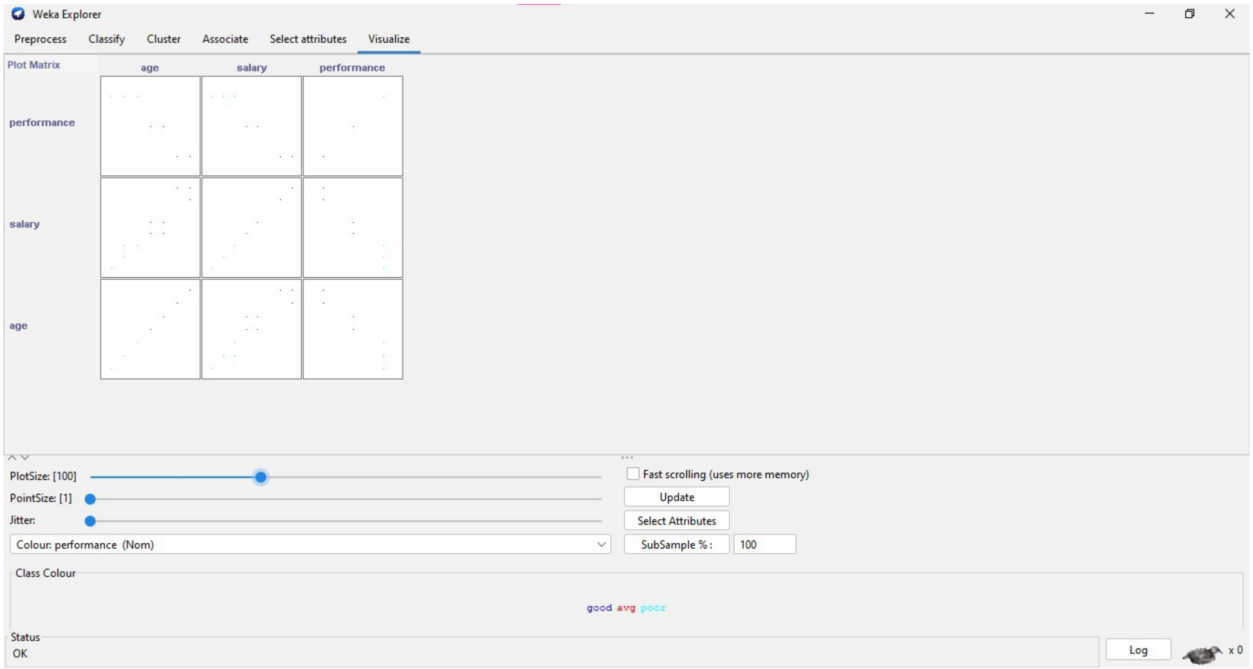


Apriori -N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1

```
=== Run information ===

Scheme:       weka.associations.Apriori -N 10 -T 0 -C 0.9 -D 0.05 -U 1.0 -M 0.1 -S -1.0 -c -1
Relation:     employee
Instances:    11
Attributes:   3
              age
              salary
              performance
=== Associator model (full training set) ===


Apriori
=======

Minimum support: 0.1 (1 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 18

Generated sets of large itemsets:

Size of set of large itemsets L(1): 17

Size of set of large itemsets L(2): 25

Size of set of large itemsets L(3): 11

Best rules found:

 1. age=27 2 ==> performance=poor 2    <conf:(1)> lift:(2.75) lev:(0.12) [1] conv:(1.27)
 2. age=29 2 ==> performance=avg 2    <conf:(1)> lift:(2.75) lev:(0.12) [1] conv:(1.27)
 3. age=30 2 ==> performance=avg 2    <conf:(1)> lift:(2.75) lev:(0.12) [1] conv:(1.27)
```

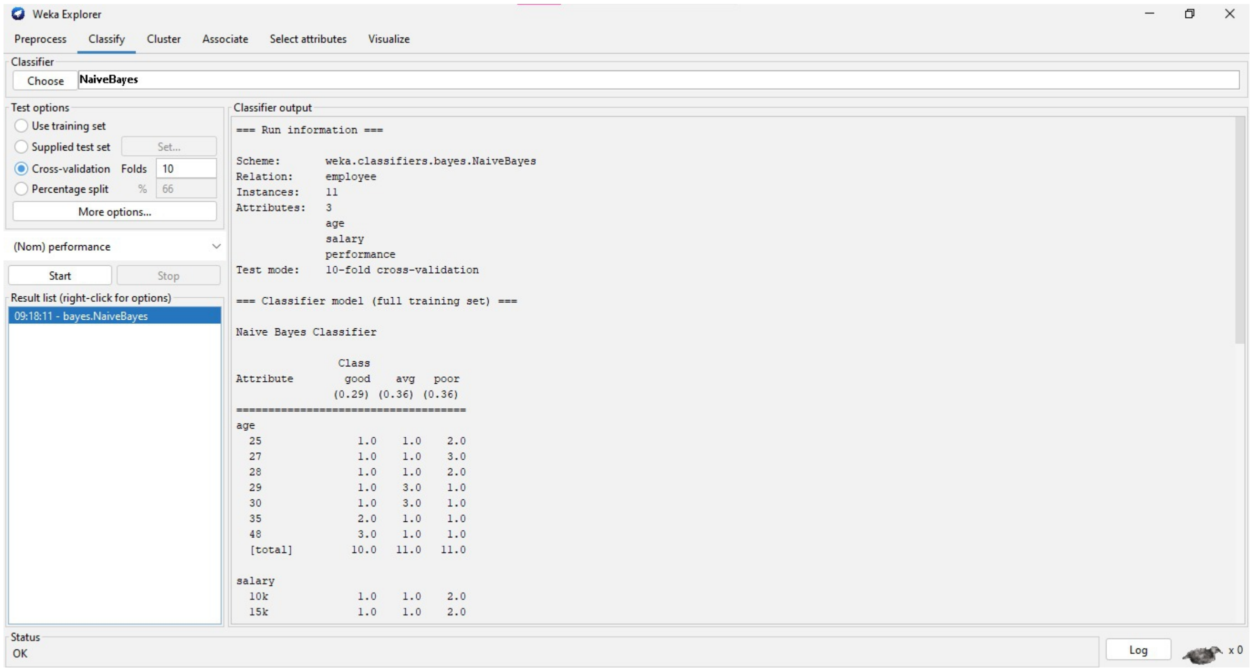


```
 4. age=48 2 ==> performance=good 2    <conf:(1)> lift:(3.67) lev:(0.13) [1] conv:(1.45)
 5. salary=17k 2 ==> performance=poor 2    <conf:(1)> lift:(2.75) lev:(0.12) [1] conv:(1.27)
 6. salary=20k 2 ==> performance=avg 2    <conf:(1)> lift:(2.75) lev:(0.12) [1] conv:(1.27)
 7. salary=25k 2 ==> performance=avg 2    <conf:(1)> lift:(2.75) lev:(0.12) [1] conv:(1.27)
 8. salary=32k 2 ==> performance=good 2    <conf:(1)> lift:(3.67) lev:(0.13) [1] conv:(1.45)
 9. salary=10k 1 ==> age=25 1    <conf:(1)> lift:(11) lev:(0.08) [0] conv:(0.91)
10. age=25 1 ==> salary=10k 1    <conf:(1)> lift:(11) lev:(0.08) [0] conv:(0.91)
```



PlotSize: [100]
PointSize: [1]
Jitter:
Colour: performance (Nom)
☐ Fast scrolling (uses more memory)
SubSample % : 100
Class Colour
good avg poor
Status
OK

3. Demonstration of classification rule process on dataset employee.arff using naïve Bayes algorithm



Classifier
NaiveBayes

Test options
○ Use training set
○ Supplied test set
● Cross-validation Folds 10
○ Percentage split % 66

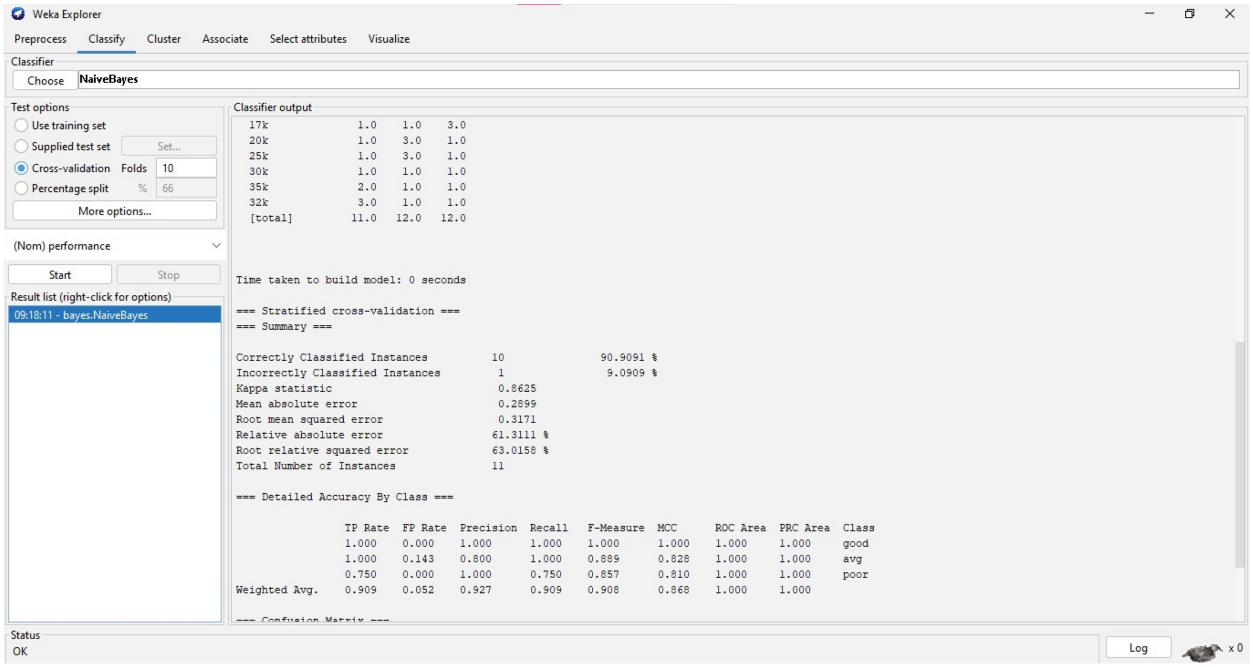
(Nom) performance

Result list (right-click for options)
09:18:11 - bayes.NaiveBayes

Classifier output

```
=== Run information ===

Scheme:       weka.classifiers.bayes.NaiveBayes
Relation:     employee
Instances:    11
Attributes:   3
              age
              salary
              performance
Test mode:    10-fold cross-validation

=== Classifier model (full training set) ===

Naive Bayes Classifier

                Class
Attribute        good    avg   poor
               (0.29) (0.36) (0.36)
====================================
age
  25              1.0    1.0    2.0
  27              1.0    1.0    3.0
  28              1.0    1.0    2.0
  29              1.0    3.0    1.0
  30              1.0    3.0    1.0
  35              2.0    1.0    1.0
  48              3.0    1.0    1.0
  [total]        10.0   11.0   11.0

salary
  10k             1.0    1.0    2.0
  15k             1.0    1.0    2.0
```

Status
OK



Classifier: NaiveBayes

Test options
- ○ Use training set
- ○ Supplied test set
- ● Cross-validation Folds 10
- ○ Percentage split % 66

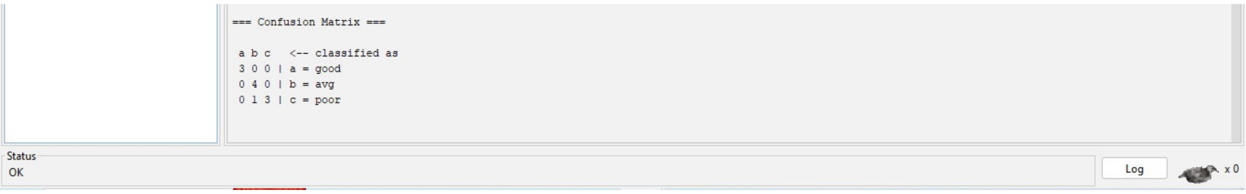
(Nom) performance

Result list (right-click for options)
09:18:11 - bayes.NaiveBayes

Classifier output

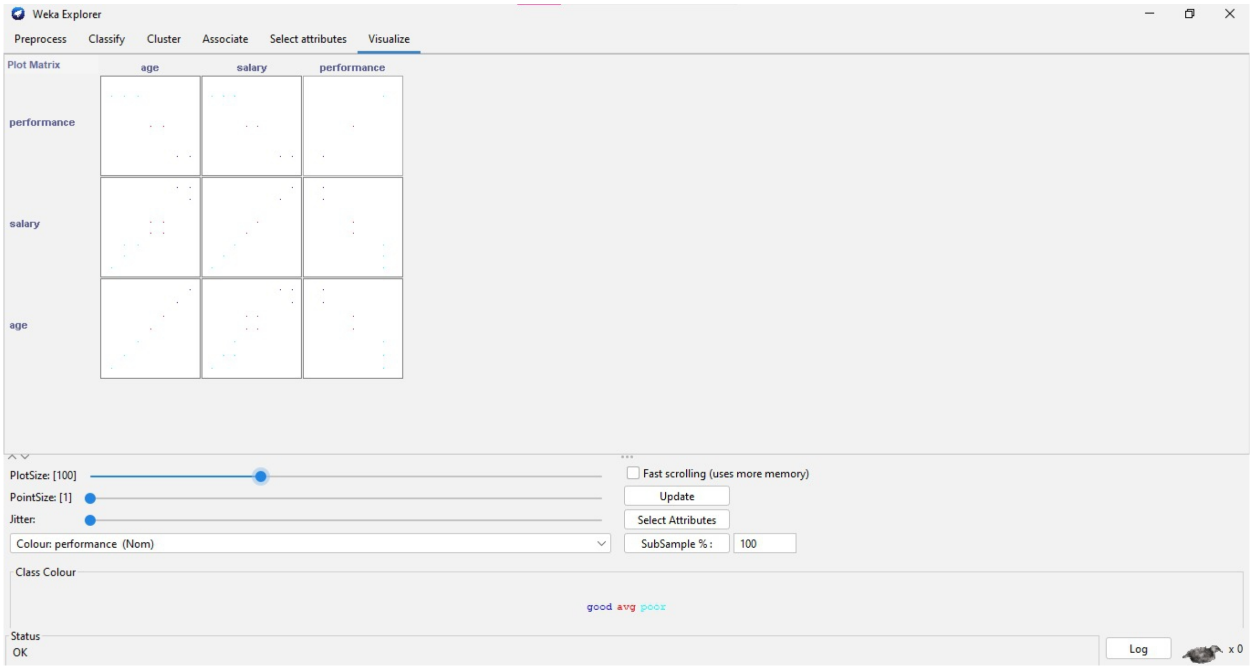
```
  17k              1.0    1.0    3.0
  20k              1.0    3.0    1.0
  25k              1.0    3.0    1.0
  30k              1.0    1.0    1.0
  35k              2.0    1.0    1.0
  32k              3.0    1.0    1.0
  [total]         11.0   12.0   12.0



Time taken to build model: 0 seconds

=== Stratified cross-validation ===
=== Summary ===

Correctly Classified Instances          10               90.9091 %
Incorrectly Classified Instances         1                9.0909 %
Kappa statistic                          0.8625
Mean absolute error                      0.2899
Root mean squared error                  0.3171
Relative absolute error                 61.3111 %
Root relative squared error             63.0158 %
Total Number of Instances               11

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 1.000    0.000    1.000      1.000    1.000      1.000    1.000     1.000     good
                 1.000    0.143    0.800      1.000    0.889      0.828    1.000     1.000     avg
                 0.750    0.000    1.000      0.750    0.857      0.810    1.000     1.000     poor
Weighted Avg.    0.909    0.052    0.927      0.909    0.908      0.868    1.000     1.000
```

Status
OK



```
=== Confusion Matrix ===

 a b c   <-- classified as
 3 0 0 | a = good
 0 4 0 | b = avg
 0 1 3 | c = poor
```

Status
OK



PlotSize: [100]

PointSize: [1]

Jitter:

Colour: performance (Nom)

□ Fast scrolling (uses more memory)

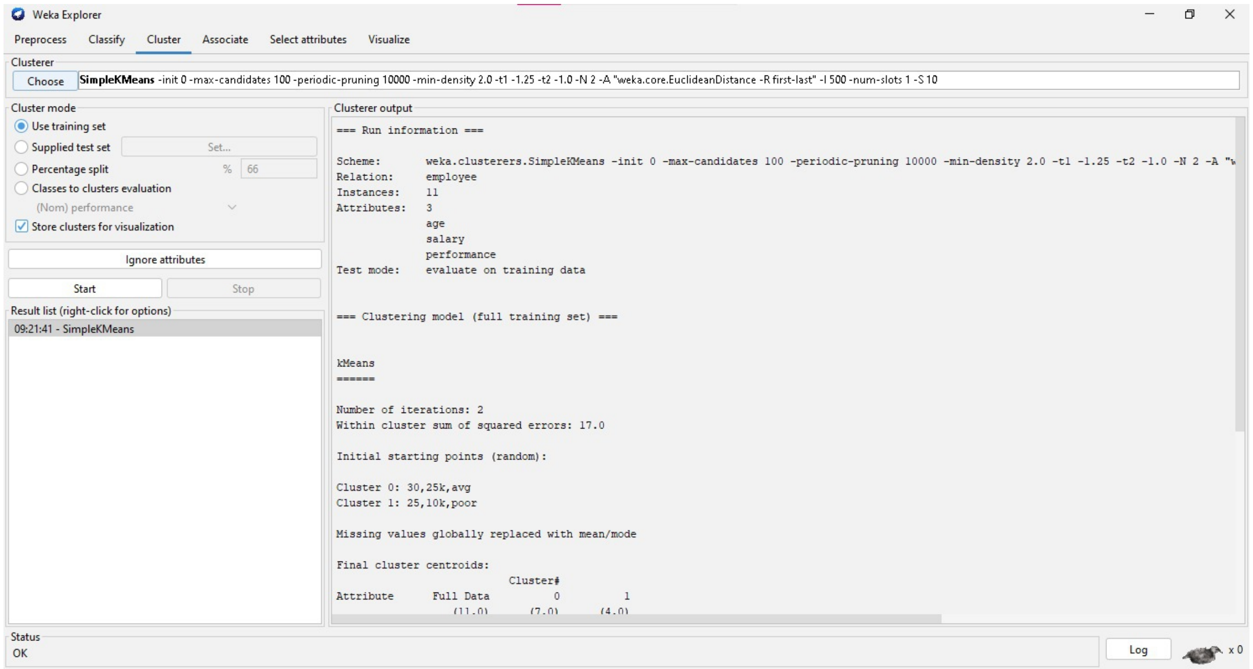
SubSample % : 100

Class Colour

good avg poor

Status
OK

4. Demonstration of clustering rule process
   on dataset Employee.arff using simple k- means



Clusterer: **SimpleKMeans** -init 0 -max-candidates 100 -periodic-pruning 10000 -min-density 2.0 -t1 -1.25 -t2 -1.0 -N 2 -A "weka.core.EuclideanDistance -R first-last" -I 500 -num-slots 1 -S 10

Cluster mode

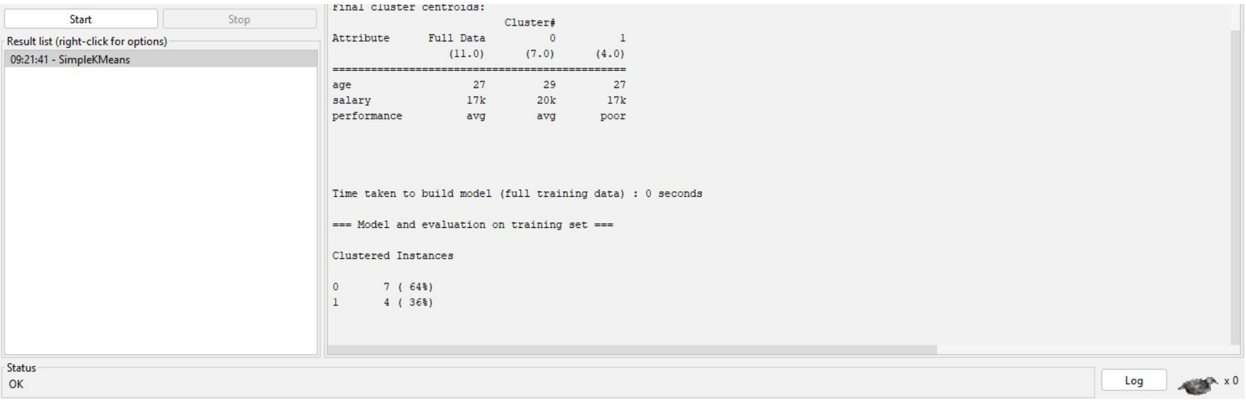
● Use training set
○ Supplied test set
○ Percentage split % 66
○ Classes to clusters evaluation
(Nom) performance
☑ Store clusters for visualization

Result list (right-click for options)
09:21:41 - SimpleKMeans

Status
OK

Clusterer output

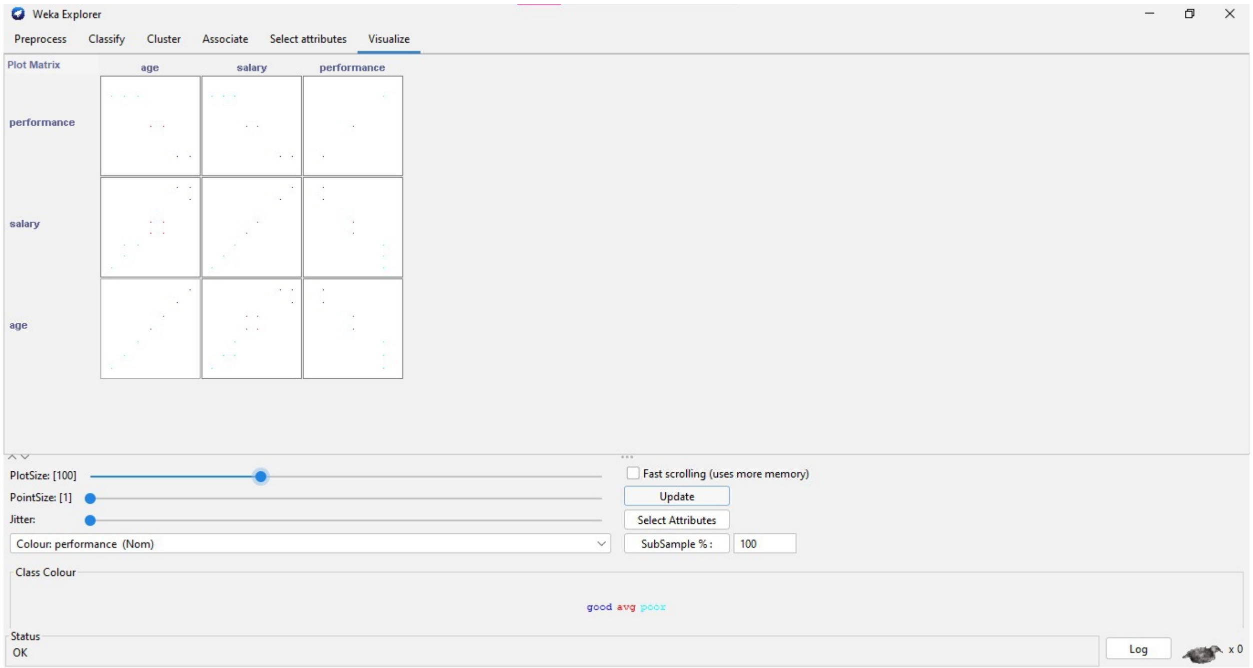
```
=== Run information ===

Scheme:       weka.clusterers.SimpleKMeans -init 0 -max-candidates 100 -periodic-pruning 10000 -min-density 2.0 -t1 -1.25 -t2 -1.0 -N 2 -A "w
Relation:     employee
Instances:    11
Attributes:   3
              age
              salary
              performance
Test mode:    evaluate on training data


=== Clustering model (full training set) ===


kMeans
======

Number of iterations: 2
Within cluster sum of squared errors: 17.0

Initial starting points (random):

Cluster 0: 30,25k,avg
Cluster 1: 25,10k,poor

Missing values globally replaced with mean/mode

Final cluster centroids:
                           Cluster#
Attribute      Full Data          0           1
                  (11.0)      (7.0)       (4.0)
```



Result list (right-click for options)
09:21:41 - SimpleKMeans

Status
OK

```
Final cluster centroids:
                           Cluster#
Attribute      Full Data          0           1
                  (11.0)      (7.0)       (4.0)
===============================================
age                   27         29          27
salary               17k        20k         17k
performance          avg        avg        poor




Time taken to build model (full training data) : 0 seconds

=== Model and evaluation on training set ===

Clustered Instances

0       7 ( 64%)
1       4 ( 36%)
```



PlotSize: [100]

PointSize: [1]

Jitter:

Colour: performance (Nom)

☐ Fast scrolling (uses more memory)

SubSample % : 100

Class Colour

good avg poor

Status

OK