

Experiment - 7

- Objective :- Implementation of Naive Bayes algorithm on Categorical dataset using weka explorer.
- Key Conditions :- Create dataset CSV file & import it apply NB algo to draw the model. Then supply test data to make prediction for new I/P & check accuracy.
- Steps :-
 - ① Load the data (in explorer).
 - ② Preprocess the data.
 - ③ Check attribute type and class labels.
 - ④ If needed use 'discritize' filter (under 'choose' > 'supervised'.
 > 'attribute' > 'discritize') to convert numeric attribute into categorical ones.
 - ⑤ Click on 'classify' tab
 - ⑥ Under 'choose', select bayes Naive Bayes
 - ⑦ Set test option
 - ⑧ Click start button.
- Result :- Naive bayes classifier in weka provides accuracy score & precision recall matrices successfully implemented Naive Bayes algo.

EXPERIMENT 7

Weka Explorer

Preprocess Classify Cluster Associate Select attributes Visualize

Classifier Choose **NaiveBayes**

Test options

Use training set Supplied test set Set...

Cross-validation Folds: 10 Percentage split % 66

More options...

(Nom) play

Start Stop

Result list (right-click for options)

12:1927 - bayes.NaiveBayes

Classifier output

```
*** Run information ***
Scheme: weka.classifiers.bayes.NaiveBayes
Relation: weather.symbolic
Instances: 14
Attributes: 5
outlook
temperature
humidity
windy
play
Test mode: 10-fold cross-validation
*** Classifier model (full training set) ***
Naive Bayes Classifier

      Class
Attribute   yes    no
          (0.63) (0.38)
=====
outlook
  sunny     3.0    4.0
  overcast  5.0    1.0
  rainy     4.0    3.0
  [total]   12.0   8.0

  temperature
  hot       3.0    3.0
  mild      5.0    3.0
  cool      4.0    2.0
  [total]   12.0   8.0

  humidity
  high      4.0    5.0
  normal    7.0    2.0
  [total]   11.0   7.0

  windy
  TRUE     4.0    4.0
  FALSE    7.0    3.0
  [total]   11.0   7.0

Time taken to build model: 0 seconds
*** Stratified cross-validation ***
*** Summary ***
Correctly Classified Instances      8      57.1429 %
Incorrectly Classified Instances    6      42.8571 %
Kappa statistic                   -0.0244
Mean absolute error               0.4374
Root mean squared error           0.4916
Relative absolute error            51.8631 %
Root relative squared error      59.6492 %
Total Number of Instances         14

*** Detailed Accuracy By Class ***
      TP Rate FP Rate Precision Recall  F-Measure MCC ROC Area PRC Area Class
  0.778  0.800  0.636  0.778  0.700  -0.026  0.578  0.697  yes
  0.200  0.222  0.333  0.200  0.250  -0.026  0.578  0.557  no
Weighted Avg.  0.571  0.594  0.528  0.571  0.539  -0.026  0.578  0.647

*** Confusion Matrix ***
a b  <-- classified as
1 2 | a = yes
4 1 | b = no
```

Status OK

Log x0

Student Name: Roll No.

Experiment No. Date:

* Viva - Question :-

(Q1) Q1 Explain the significance of the terms 'Naive' & 'Bayes' in Algorithm Naive Bayes.

→ Naive in Naive Bayes refers to assumption that features are independent, simplifying computation. Bayes' comes from Bayes' theorem which calculates probability of an event based on prior knowledge.

(Q2) Q2 Enlist the prominent real time application on NB classifier.

→ ① spam filtering → detecting spam emails based on word probabilities.

② face recognition - Classifying facial expression on identities.

③ Sentiment analysis - Classifying text as +ve, -ve or neutral.

④ fraud detection - Identifying fraudulent transaction in banking.