

Student Name : ..... Roll No.: .....  
Experiment No.: ..... Date : .....

### 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 train 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.

↳ Check attribute type and class labels.

↳ If needed use 'discretize' filter (under 'choose' > 'supervised' > 'attribute' > 'discretize') to convert numeric attribute into categorical ones.

③ Click on 'classify' tab

④ Under 'choose', select bayes Naive Bayes

⑤ Set test option

⑥ 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

☒ Cross-validation Folds 10

☐ Percentage split % 66

More options...

(Nom) play

Start Stop

Result list (right-click for options)

12/19/27 - 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

Attribute      Class      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             0.4516
Relative absolute error             91.8631 %
Root relative squared error         99.6452 %
Total Number of Instances          14

=== Detailed Accuracy By Class ===

      TP Rate  FP Rate  Precision  Recall   F-Measure  MDC     ROC Area  FRC 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
7 2 | a = yes
4 1 | b = no
```

Status

OK

Log



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Viva - Question :-

Q1 Define the significance of the terms 'Naive' & 'Bayes' in Algorithm Name structure.

→ 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 Enlist the prominent real time applications on NB classifier.

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

② face recognition:- Classifying facial expressions or identities.

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

④ fraud detection:- Identifying fraudulent transactions in banking.