1. Write a program to implement naïve Bayesian classification

OUTPUT:

=== Run information ===

Scheme: weka.classifiers.bayes.NaiveBayes

Relation: vote

Instances: 435

Attributes: 17

handicapped-infants

water-project-cost-sharing

adoption-of-the-budget-resolution

physician-fee-freeze

el-salvador-aid

religious-groups-in-schools

anti-satellite-test-ban

aid-to-nicaraguan-contras

mx-missile

immigration

synfuels-corporation-cutback

education-spending

superfund-right-to-sue

crime

duty-free-exports

export-administration-act-south-africa

Class

Test mode: evaluate on training data

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

Naive Bayes Classifier

Class

Attribute democrat republican

(0.61) (0.39)

===============================================================

handicapped-infants

n 103.0 135.0

y 157.0 32.0

[total] 260.0 167.0

water-project-cost-sharing

n 120.0 74.0

y 121.0 76.0

[total] 241.0 150.0

adoption-of-the-budget-resolution

n 30.0 143.0

y 232.0 23.0

[total] 262.0 166.0

physician-fee-freeze

n 246.0 3.0

y 15.0 164.0

[total] 261.0 167.0

el-salvador-aid

n 201.0 9.0

y 56.0 158.0

[total] 257.0 167.0

religious-groups-in-schools

n 136.0 18.0

y 124.0 150.0

[total] 260.0 168.0

anti-satellite-test-ban

n 60.0 124.0

y 201.0 40.0

[total] 261.0 164.0

aid-to-nicaraguan-contras

n 46.0 134.0

y 219.0 25.0

[total] 265.0 159.0

mx-missile

n 61.0 147.0

y 189.0 20.0

[total] 250.0 167.0

immigration

n 140.0 74.0

y 125.0 93.0

[total] 265.0 167.0

synfuels-corporation-cutback

n 127.0 139.0

y 130.0 22.0

[total] 257.0 161.0

education-spending

n 214.0 21.0

y 37.0 136.0

[total] 251.0 157.0

superfund-right-to-sue

n 180.0 23.0

y 74.0 137.0

[total] 254.0 160.0

crime

n 168.0 4.0

y 91.0 159.0

[total] 259.0 163.0

duty-free-exports

n 92.0 143.0

y 161.0 15.0

[total] 253.0 158.0

export-administration-act-south-africa

n 13.0 51.0

y 174.0 97.0

[total] 187.0 148.0

Time taken to build model: 0.01 seconds

=== Evaluation on training set ===

Time taken to test model on training data: 0.02 seconds

=== Summary ===

Correctly Classified Instances 393 90.3448 %

Incorrectly Classified Instances 42 9.6552 %

Kappa statistic 0.7999

Mean absolute error 0.0975

Root mean squared error 0.2944

Relative absolute error 20.555 %

Root relative squared error 60.469 %

Total Number of Instances 435

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class

0.891 0.077 0.948 0.891 0.919 0.802 0.974 0.984 democrat

0.923 0.109 0.842 0.923 0.881 0.802 0.974 0.960 republican

Weighted Avg. 0.903 0.089 0.907 0.903 0.904 0.802 0.974 0.975

=== Confusion Matrix ===

a b <-- classified as

238 29 | a = democrat

13 155 | b = republican