



roniSmart Intelligence  
Machine Learning  
DataScience  
Applied Statistics  
Econometrics  
Text Analytics  
Bayesian Models  
Neural Networks

*AroniSmart Intelligence™ Tutorial*  
*Part V: Bayesian Models Module*

AroniSmartIntelligence™: Statistics, Econometrics, Machine Learning, Data Science, Bayesian Network & Text Analytics models

Welcome Handbook & Manuals Statistical Inference Regression, Econometrics & Time Series Segmentation Bayesian Models, Machine Learning, Neural Network, and BigData Analytics Text Mining and Analytics

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Welcome to AroniSmartIntelligence: Smart Tools for Applied Statistics, Econometrics, Machine Learning, Data Science, Text Analytics & Big Data

Open a File in Aroni format or check the Handbook and Manuals to explore the capabilities

Open File or Dataset with the Specified Format:

Aroni Format Text or CSV ☒ Has Header Show Data

Dataset Name: TestDataCSV.csv

Records: 180 Variables:

Simple Least-Squares and Polynomial models may use CSV format and numeric variables with at least ordinal measurement. Mixture Models, Mixed Models, Bayesian Models, Econometrics, Linear, Robust, Logistic, and Ridge Regression models require data in Aroni format. Segmentation and Classification may accept both formats (weights and initial partition must be in a text file)

Select Bayesian Models Module

Statistics Handbook, Probabilities Reference and Manuals:

or Click Bayesian Models, Neural Network & BigData Analytics

Statistics Handbook and Manuals

Descriptive Analysis and Statistic Tests:

Statistical Inference

Neural Network, Bayesian Models, Machine Learning, and BigData Analytics:

Bayesian Models, Neural Network, Machine Learning & BigData Analytics

Finite Mixture Gaussian & Generalized Mixture Models:

Segmentation & Mixture Models

Regression Analysis, Mixed Models & Econometrics:

Regression Analysis & Econometrics

Text Mining and Analytics:

Text and Sentiment Analytics

Status and Log

Ready

Stop Execution

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# AroniSmartIntelligence Bayesian Models Analysis

*Processing Text File/Unstructured dataset: choosing the directory to process*



AroniSmartIntelligence™: Statistics, Econometrics, Machine Learning, Data Science, Bayesian Network & Text Analytics -> Bayesian and Big Data

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Bayesian Models BigData Analytics Support Vector Machine Neural Networks

Choose Bayesian Model

Bayes Network

Bayesian Models Include: AODE, Naive Bayes (simple, Multinomial, Updateable), WAODE

Bayes Model Averaging... alpha: 0.5

Repeated Hill Climber Global

Global Local Fixed

Percent Split

Cross Validation

Supply Validation Data

No Validation

Test/validation Dataset: Documents

Preserve Order for Split

Seed: 1

Data Set

Name: probit\_logit\_pension

Variables: 20

Records: 194

Debug

Dependent or classification Variable:

pctstck\_dep

Select Independent/Predictor Variables:

All Deselect Invert

age

black

choice

educ

female

fine100

married

pctstck\_dep

prftshr

pyears

Model Setup

Run Model

8-Click "Ok/Continue"

Bayesian Models

Bayesian Model Options: Only relevant options are enabled. Use tooltip for more information on an option

Score Type:

Cross Validation Type: LOO-CV

Initialize as Naive

Markov Blanket

Critical Value:

Frequency Limit:

Population Size: 10

M-Estimate Weight: 1.0

Smoothing Parameter: 1.0

Descendent Pop Size: 100

Hyperparameter Range: R:0.1 - 517, 26

Hyperparameter Selection:

Hyperparameter Value: .33

Threshold: 0.5

Temperature Start: 10

maxCardinality: 2

Prior Class:

Nr of Good Operations: 5

TabuList: 5

Nr of Look Ahead Steps: 2

Seed: 1

Use Arc Reversal

Multinomial Word

Random Order

Use Mutation

Use Prob

Use Tournament Selection

Use Crossover

Normalize Data

Normalize Word Weights

Use Kernel Estimator

Use Supervised Discretization

7-Set model attributes

5-Select regressors (independent attributes)

6-Click "Model Setup"

6-Click "Model Setup"

5-Select regressors (independent attributes)

4-Select the categorical dependent variable

3-Select estimator and search algorithm

2-Select model type

1-Select Model

Outputs and Logs

Top

Clear

End

Output model Specifications

Output predictions

Output class statistics

Output Entropy Evaluation Metrics

Output Confusion Matrix

Status and Log

Loading data finished- Please Check the data and the variables

Screenshot

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# AroniSmartIntelligence Bayesian Network Model

## Using AroniSmartIntelligence™: Setting up a Bayesian Network Model

AroniSmartIntelligence™: Statistics, Econometrics, Machine Learning, Data Science, Bayesian Network & Text Analytics -> Bayesian and Big Data

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Bayes Network

Bayes Model Averaging... alpha: 0.5

Repeated Hill Climber Global

Global

Local

Fixed

CI

Bayesian Models Include: AODE, AODEsr, Bayesian Logistic Regression, Bayes Net, ComplementNaive, DMNBtext, HNB, Naive Bayes (simple, Multinomial, Updateable), WAODE

Percent Split >>

Cross Validation >>

Supply Validation Data >>

No Validation

Pct Split: 67

Folds: 2

Test/Validation Dataset: Documents

Use K2 Prior

Use ADT Tree

Tolerance: 0.0005

Preserve Order for Split

Random Seed: 1

Data Set

Name: probit\_logit\_pension

Variables: 20

Model Output

Dependent or classification Variable:

pctstck\_dep

Select Independent/Predictor Variables:

All

Deselect

Invert

age

black

choice

educ

female

finc100

finc101

finc25

finc35

finc50

finc75

irain89

Model Setup

Run Model

Status and Log

Model has finished to run. You may check the results in the output log

Screenshot

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Output viewer

Class complexity | order 0 300.386375 bits 1.579312 bits/observation

Class complexity | scheme 17.415238 bits 0.089769 bits/observation

Complexity improvement (Sf) 288.971337 bits 1.489543 bits/observation

Mean absolute error 0.036968

Root Mean squared error 0.075561

Relative absolute error 8.349631%

Root relative squared error 16.060465%

Coverage of cases (0.950000 level) 0.000000

Total Number of Observations or Entities 194.00

=== Detailed Accuracy By Class ===

TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	C-index
1.000000	0.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	32.562500

Model network

choice

age

blac

prftshr

pyears

finc25

stckin89

ck\_dep

nc50

finc100

wealth89

rain89

duc

female

finc75

finc35

finc101

Model network

irain89

finc101

choice

female

married

finc100

finc35

wealth89

finc25

black

finc50

pyears

stckin89

educ

prftshr

age

Click “Run Model” and then Click “Ok” when the model finishes to run

# AroniSmartIntelligence Bayes Network Model

## Using AroniSmartIntelligence™: Running a Bayesian Network Model

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Bayes Network Bayes Model Averaging... alpha: 0.5 Repeated Hill Climber Global

Global Local Fixed CI

Bayesian Models Include: AODE, AODEsr, Bayesian Logistic Regression, Bayes Net, ComplementNaive, DMNBtext, HNB, Naive Bayes (simple, Multinomial, Updateable), WAODE

Percent Split >> Pct Split: 67 Preserve Order for Split

Cross Validation >> Folds: 2 Random Seed: 1

Supply Validation Data >> Test/Validation Dataset: Documents

No Validation Use K2 Prior Use ADT Tree Tolerance: 0.0005

Debug

Data Set

Name: probit\_logit\_pension

Variables: 20

Records: 194

Dependent or classification Variable:

pctstck\_dep

Select Independent/Predictor Variables:

All Deselect Invert

age black choice educ female finc100 finc101 finc25 finc35 finc50 finc75 irain89 married pctstck\_dep prftshr pyears stckin89 wealth89

3-View model output (scroll as needed)

Count: 0.000000 pct: 0.000000

Kappa statistic 1.000000

K&B Relative Info Score 18293.479284

K&B Information Score 288.71337 bits 1.489543 bits/observation

Class complexity | order 0 306.1575 bits 1.579312 bits/observation

Class complexity | scheme 17.158 bits 0.089769 bits/observation

Complexity improvement (Sf) 288.71337 bits 1.489543 bits/observation

Mean absolute error 0.036968

Root Mean squared error 0.07556

Relative absolute error 8.349621%

Root relative squared error 1.07556

Coverage of cases (0.950)

Total Number of Observations

=== Detailed Accuracy By Class ===

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

choice age

black prftshr pyears

finc25 finc100

stckin89 pctstck\_dep finc50

wealth89 irain89 educ female

finc75 finc101

finc35

4-Model network

1-Click "Clear"

2-Click model Output

Output model Specifications

Output predictions

Output class statistics

Output Entropy Evaluation Metrics

Output Confusion Matrix

Model Setup Run Model

Status and Log

Model has finished to run. You may check the results in the output log

Stop Execution

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# AroniSmartIntelligence Bayesian Network Model

## Using AroniSmartIntelligence™: Viewing Results of a Bayesian Network Model