Package ‘GMDH’

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Type Package

Title Short Term Forecasting via GMDH-Type Neural Network Algorithms

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Depends R (>= 3.2.5)

Imports MASS, stats, utils

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Description Group method of data handling (GMDH) - type neural network algorithm is the heuristic self-organization method for modelling the complex systems. In this package, GMDH-type neural network algorithms are applied to make short term forecasting for a univariate time series.

License GPL (>= 2)

NeedsCompilation no

Repository CRAN

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Short Term Forecasting via GMDH-Type Neural Network Algorithms

Description

Package GMDH includes a function for short term forecasting of a univariate time series by using GMDH-type neural network algorithms, and a dataset for implementation.

Details

Package: GMDH
Type: Package
Version: 1.6
Date: 2016-09-20
License: GPL (>=2)

Cancer Data

Description

Yearly cancer death rate (per 100,000 population) of Pennsylvania between 1930 and 2000.

Usage

data(cancer)

Format

A time series with 71 observations on the following variable.
cancer a time series for yearly cancer death rate

References


Examples

data(cancer)
plot(cancer)
out = fcast(cancer, f.number = 2)
out$mean
A Function to Make Short Term Forecasting via GMDH-Type Neural Network Algorithms

Description

fcast forecasts time series via GMDH-type neural network algorithms.

Usage

fcast(data, method = "GMDH", input = 4, layer = 3, f.number = 5, level = 95, tf = "all", weight = 0.7, lambda = c(0, 0.01, 0.02, 0.04, 0.08, 0.16, 0.32, 0.64, 1.28, 2.56, 5.12, 10.24))

Arguments

data is a univariate time series of class ts
method expects a character string to choose the desired method to forecast time series. To utilize GMDH-type neural network in forecasting, method is set to "GMDH". One should set method to "RGMDH" for forecasting via Revised GMDH-type neural network. Default is set to "GMDH"
input is the number of inputs. Defaults input = 4
layer is the number of layers. Default is set to layer = 3
f.number is the number of observations to be forecasted. Defaults f.number = 5
level confidence level for prediction interval. Default is set to 95
tf expects a character string to choose the desired transfer function to be used in forecasting. To use polynomial function, tf should be set to "polynomial". Similarly, tf should be set to "sigmoid", "RBF", "tangent" to utilize sigmoid function, radial basis function and tangent function, respectively. To use all functions simultaneously, default is set to "all"
weight is the percent of the data set to be utilized as learning set to estimate regularization parameter via validation. Default is set to weight = 0.70
lambda is a vector which includes the sequence of feasible regularization parameters. Defaults lambda=c(0,0.01,0.02,0.04,0.08,0.16,0.32,0.64,1.28,2.56,5.12,10.24)

Value

Returns a list containing following elements:

method the forecasting method as a character string
mean point forecasts as a time series
lower lower limits for prediction interval
upper upper limits for prediction interval
level confidence level for prediction interval
x the original time series
fitted the fitted values
residuals the residuals of the model. The residuals are x minus the fitted values

Author(s)
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References


Examples
```r
data = ts(rnorm(100, 10, 1))
out = fcast(data)
out

data = ts(rnorm(100, 10, 1))
out = fcast(data, input = 6, layer = 2, f.number = 1)
out$mean
out$fitted
out$residuals
plot(out$residuals)
hist(out$residuals)
```
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