

Package ‘dcv’

February 19, 2015

Type Package

Title Conventional Cross-validation statistics for climate-growth model

Version 0.1.1

Date 2010-12-05

Author Zongshan Li with contributions from Jinlong Zhang

Maintainer Zongshan Li <zqli_st@rcees.ac.cn>

Description This package performs several conventional Cross-validation statistical methods for climate-growth model in the climate reconstruction from tree rings, including Sign Test statistic, Reduction of Error statistic, Product Mean Test, Durbin-Watson statistic etc. This package is at its primary stage, the functions have not been tested exhaustively and more functions would be added in the coming days.

Depends lmtest

License GPL-2

LazyLoad yes

Repository CRAN

Date/Publication 2010-12-06 07:48:50

NeedsCompilation no

R topics documented:

dcv-package	2
print.LM	2
test.DW	3
test.LM	4
test.PMT	5
test.RE	6
test.ST	7
val	8

Index	9
--------------	----------

dcv-package

Conventional Cross-validation statistics for climate-growth model

Description

Several conventional Cross-validation statistics for climate-growth model

Details

Package: dcv
Type: Package
Version: 0.1.1
Date: 2010-12-06
License: GPL-2
LazyLoad: yes

Author(s)

Zongshan Li <zqli_st@rcees.ac.cn> with contributions from Jinlong Zhang <jinlongzhang01@gmail.com>
Maintainer: Zongshan Li <zqli_st@rcees.ac.cn>

References

Li ZS, Shi CM, Liu YB and Zhang JL. 2010. Winter drought variations based on tree-ring data in Gaoligong Mountain, Northwestern Yunnan, China, A. D. 1795-2004. *Geochronometria*(in revision)

Examples

```
## Product Mean Test(PMT)
data(val)
test.PMT(val[,1],val[,2])
```

print.LM

Utility functions for printing.

Description

Users are not encouraged to call these internal functions directly.

Usage

```
## S3 method for class 'LM'  
## S3 method for class 'LM'  
print(x, ...)  
  
## S3 method for class 'PMT'  
## S3 method for class 'PMT'  
print(x, ...)  
  
## S3 method for class 'RE'  
## S3 method for class 'RE'  
print(x, ...)
```

Arguments

x Obeject in class "LM", "PMT" or "RE"
... further arguments to be passed to plot

Details

Internal functions for package dev.

Author(s)

Jinlong Zhang <jinlongzhang01@gmail.com>

Examples

```
data(val)  
test.RE(val[,1],val[,2])
```

test.DW

Durbin-Watson statistic

Description

Perform the Durbin-Watson statistic of actual and reconstructed climate variables over the common duration

Usage

```
test.DW(x, y)
```

Arguments

x actual climate variable
y reconstructed climate variable

Details

perform the Durbin-Watson statistic of actual and reconstructed climate variables over the common duration

Value

The value of Durbin-Watson statistic

Author(s)

Zongshan Li <zsli_st@rcees.ac.cn>

References

J. Durbin, G.S. Watson (1950), Testing for Serial Correlation in Least Squares Regression I. *Biometrika* 37, 409-428.

See Also

[lm](#)

Examples

```
data(val)
test.DW(val[,1],val[,2])
```

test.LM

Linear model

Description

Multiple R-squared and Adjusted R-squared caculated by a linear model

Usage

```
test.LM(x)
```

Arguments

x dataframe of actual and reconstructed climate variables

Details

Multiple R-squared and Adjusted R-squared caculated by a linear model for actual and reconstructed climate data

Value

result of linear model

Note

none

Author(s)

Zongshan Li <zsli_st@rcees.ac.cn>

References

Chambers, J. M. (1992) Linear models. Chapter 4 of Statistical Models in S eds J. M. Chambers and T. J. Hastie, Wadsworth & Brooks, Cole.

Wilkinson, G. N. and Rogers, C. E. (1973) Symbolic descriptions of factorial models for analysis of variance. Applied Statistics, 22, 392-9.

See Also

[summary.lm](#) for summaries and [anova.lm](#) for the ANOVA table; [aov](#) for a different interface.

Examples

```
data(val)
test.LM(val)
```

test.PMT

Product Mean Test

Description

Performs Product Mean Test(PMT) on vectors of data.

Usage

```
test.PMT(x, y)
```

Arguments

x	actual climate data
y	reconstructed climate data

Details

Performs Product Mean Test(PMT) on vectors of data.

Value

the value of the t-statistic of Performs Product Mean Test(PMT)

Author(s)

Zongshan Li <zqli_st@rcees.ac.cn>

References

Fritts HC (1976) Tree rings and climate. Academic Press, New York.

See Also

[test.ST](#)

Examples

```
data(val)
test.PMT(val[,1],val[,2])
```

test.RE

Reduction of Error statistic

Description

Performs Reduction of Error(RE) statistic on vectors of data.

Usage

```
test.RE(x, y)
```

Arguments

x a vector indicating actual climate data
y a vector indicating reconstructed climate data

Details

Performs Reduction of Error(RE) statistic on vectors of data.

Value

RE: Reduction of Error(RE) MSE: Mean squared error of validation RMSE: Root mean squared error of validation

Author(s)

Zongshan Li <zqli_st@rcees.ac.cn>

References

Cook ER ,Kairiukstis LA (1990) Methods of Dendrochronology: Applications in the Environmental Sciences. Kluwer Academic Publishers, Dordrecht, Netherlands.

See Also

[test.ST](#), [test.PMT](#)

Examples

```
data(val)
test.RE(val[,1],val[,2])
```

test.ST	<i>Sign Test statistic</i>
---------	----------------------------

Description

Performs Sign Test(ST) statistic on vectors of data.

Usage

```
test.ST(x, y)
```

Arguments

x	actual climate data
y	reconstructed climate data

Details

Performs Sign Test(ST) statistic on vectors of data.

Value

Sign Test(ST) statistic

Author(s)

Zongshan Li <zsli_st@rcees.ac.cn>

References

Fritts HC (1976) Tree rings and climate. Academic Press, New York.

See Also

[test.PMT](#),[test.RE](#),[test.DW](#)

Examples

```
data(val)
test.ST(val[,1],val[,2])
```

val

Data used in Exercise

Description

a validation data of climate-growth model in Gaoligong Mountains in Hengduan Mountains.

Usage

```
data(val)
```

Format

A data frame with 55 observations on the following 2 variables.

actual a numeric vector

recons a numeric vector

Details

A validation dataset of climate-growth model in Gaoligong Mountains in Hengduan Mountains.

References

Li ZS, Shi CM, Liu YB and Zhang JL. 2010. Winter drought variations based on tree-ring data in Gaoligong Mountain, Northwestern Yunnan, China, A. D. 1795-2004. *Geochronometria*(in revision)

Examples

```
data(val)
```


Index

*Topic **Error**

test.RE, 6

*Topic **datasets**

val, 8

*Topic **package**

dcv-package, 2

*Topic **print**

print.LM, 2

*Topic **test**

test.DW, 3

test.PMT, 5

test.ST, 7

anova.lm, 5

aov, 5

dcv (dcv-package), 2

dcv-package, 2

lm, 4

print.LM, 2

print.PMT (print.LM), 2

print.RE (print.LM), 2

summary.lm, 5

test.DW, 3

test.LM, 4

test.PMT, 5, 7

test.RE, 6

test.ST, 6, 7, 7

val, 8