Package ‘caschrono’

August 16, 2016

Title  Séries Temporelles Avec R
Description  Functions, data sets and exercises solutions for the book ‘Séries Temporelles Avec R’ (Yves Aragon, edp sciences, 2016). For all chapters, a vignette is available with some additional material and exercises solutions.
Encoding  latin1
Version  2.0
Date  2016-08-16
Author  Yves Aragon
Maintainer  Thibault Laurent <Thibault.Laurent@univ-tlse1.fr>
Depends  graphics, stats, utils, zoo
Imports  Hmisc, methods
Suggests  dse, expsmooth, fBasics, FitARMA, fGarch, forecast, polynom, timeSeries, TSA, xtable
License  GPL (>= 2)
URL  http://www.seriestemporelles.com
NeedsCompilation  no
Repository  CRAN
Date/Publication  2016-08-16 19:47:28

R topics documented:

  caschrono-package .................................................. 2
  acf2y ................................................................. 2
  armaselect ............................................................ 4
  Box.test.2 ............................................................ 5
  champa.ts ............................................................. 6
  cor arma ............................................................... 6
  csdl ................................................................. 7
  essil ................................................................. 8
  indbourse ............................................................ 9
  khct ................................................................. 9
Description

Functions, data sets and exercises solutions for the book 'Séries temporelles avec R' (Yves Aragon, edp sciences, 2016). For all chapters, a vignette is available with some additional material and exercises solutions.

Details

Package: caschrono
Type: Package
Version: 2.0
Date: 2016-08-16
License: GPL2
LazyLoad: yes

Author(s)

Yves Aragon, Maintainer: Thibault Laurent <thibault.laurent@univ-tlse1.fr>

References

Y. Aragon (2016), Séries temporelles avec R, edp sciences
acf2y

Description

Plots of the ACF and PACF at the same lags

Usage

acf2y(y, lag.max=40, numer=TRUE)

Arguments

y A time series object
lag.max An integer, the maximum lag
numer A boolean; if TRUE the ACF and PACF are printed

Details

The ACF and PACF are plotted with the same scale.

Value

if numer=TRUE, it returns the values of ACF and PACF for each lag

Author(s)

Yves Aragon, Thibault Laurent

References


See Also

xy.acfb

Examples

data("nottem")
acf2y(nottem)
Description

`armaselect` implements the MINIC (Minimum Information Criterion) identification method and returns the `nbmod` best ARMA models, with respect to the Schwarz’s Bayesian Criterion (sbc).

Usage

```r
armaselect(y, max.p = 15, max.q = 15, nbmod = 10)
```

Arguments

- `y`: a time series
- `max.p`: an integer, the maximum value for the autoregressive component, `p`
- `max.q`: an integer, the maximum value for the moving average component, `q`
- `nbmod`: an integer, the number of models that will be returned (`nbmod` may be lower than `max.p x max.q`).

Value

A matrix with `nbmod` rows and 3 columns (values of `p`, `q` and `sbc`)

Author(s)

Yves Aragon

Examples

```r
set.seed(4123)
n2 <- 210
yc <- arima.sim(n = 200, list(ar = -0.8, ma = c(-0.3, 0.6)),
    sd = sqrt(1.5))
cy <- yc - 10
armaselect(y, nbmod = 5)
```
Box.test.2

'Portemanteau' tests

Description

Box.test.2 computes at different lags, a 'Portemanteau' statistic for testing that a time series is a white noise.

Usage

Box.test.2(x, nlag, type = c("Box-Pierce", "Ljung-Box"), fitdf = 0, decim = 8)

Arguments

x a time series object
nlag a vector of integers: the lags where the statistic are computed
type test to be performed
fitdf number of degrees of freedom to be subtracted if x is a series of residuals
decim an integer, the precision of the results

Details

This function uses the Box.test.

Value

It returns a matrix of size nlag x 2 with the statistics and the p-value

Author(s)

Yves Aragon

Examples

set.seed(123)
y1 = arima.sim(n = 100, list(ar = -.7), sd = sqrt(4))
al = Box.test.2(y1, nlag = c(3, 6, 9, 12), type = "Ljung-Box", decim = 4)
Description


Format

The series first is imported as a vector of numeric type with function scan and then transformed into a ts object. Is is then converted in 1,000 of bottles.

Source

SRISE-DRAAF Champagne-Ardenne

Examples

data("champa.ts")
# The executed code is :
## Not run:
aa <- scan(system.file("/import/champagne_2001.txt", package = "caschrono"))
champa.ts <- ts(aa/1000, start = c(2001,1), frequency = 12)
## End(Not run)

---

cor.arma

Correlation matrix of the parameters for an Arima model

Description

Computes the correlation matrix for the estimated parameters of an Arima model.

Usage

cor.arma(mod)

Arguments

mod an Arima object

Value

A p x p matrix (p, the number of parameters of the ARIMA model)
Author(s)

Yves Aragon

Examples

```r
set.seed(4123)
n2 <- 210
yc <- arima.sim(n = 200, list(ar = -0.8, ma = c(-0.3, 0.6)),
    sd = sqrt(1.5))
yc <- yc - 10
if(require("forecast")){
    fit <- Arima(yc, order = c(1, 0, 2))
cor.arma(fit)
}
```

Description

French stocks (Cac40, Société générale, Danone, L’Oréal) for the period 2006 - 2009, on Euronext Paris.

Usage

data(csd1)

Format

This its object contains the following firms close prices:

- Cac40, ^FCHI (name of the quote symbol), common used French stock market index
- Soegen, GLE.PA (name of the quote symbol), Société générale
- Danone, BN.PA (name of the quote symbol), Danone
- L_Oreal, OR.PA (name of the quote symbol), L’Oréal

from 2006-01-02 to 2009-06-30.

Source

http://fr.finance.yahoo.com/
Examples

```r
if(require("timeSeries")){
data(csdl)
  # we create then the returns
  aa = returns(csdl, percentage = TRUE)
  aab <- aa[complete.cases(aa) == TRUE,]
  # in previous version we use package its which will not be maintained anymore
  # r.csdl = its(aab, as.POSIXct(row.names(aab)))
  r.csdl = zoo(aab, as.POSIXct(row.names(aab)))
}
```

essil  
---

Essilor stock for the period 2006-2009

Description

Essilor close price

Usage

data(essil)

Format

essil is an its object.

Source

http://fr.finance.yahoo.com/

Examples

data("essil")
  # In 2011, code obtained like that
  # require("its")
  # deb = "2006-01-01"; fin = "2009-12-31"
  # essil= priceIts(instrument="EI.PA",start=deb ,end=fin, quote="Close")
  # colnames(essil) = "essilor"
  # In 2016
  # require("tseries")
  # essil <- get.hist.quote(instrument = "EI.PA", start=deb ,end=fin, quote="Close")
indbourse

Stock price indices for the period 2006-2010

Description

indbourse contains stock price indices for the period 2006-2010: Nikkei (name of the quote symbol: N225), ESTX50 EURP (STOXX50E), Dow Jones (DJI), Nasdaq (IXIC), CAC40 (^FCHI) and PARIS IND SBF120 (SBF120).

Format

indbourse is an its object.

Source

Yahoo finance

Examples

data(indbourse)

khct

Monthly electricity consumption for the period 1970-1984

Description

Monthly electricity consumption, heating degree days and cooling degree days in some region for the period 1970-1984.

Usage

data(csd1)

Details

htdd (heating degree days) is minus the sum over the month of the daily difference between the average daily temperature, if it is lower than 65 F. degrees, and 65 F. degrees, the equilibrium temperature above which a house does not need to be heated.

cldd (cooling degree days) is the sum over the month of the daily difference between the average daily temperature, if it is greater than 65 F. degrees, and 65, the equilibrium temperature above which air conditioning is switched on.

The dataset is from the book by Pankratz (1981).
Value

csd1 is a multivariate ts object which contains:

kwh  electricity consumption in kilo-watt-hours
htdd  heating degree days, in Fahrenheit degrees
cldd  cooling degree days, in Fahrenheit degrees

Source


Examples

data(khct)
  # The executed code is :
  ## Not run:
  khct = read.csv2(file=system.file("/import/conselec.csv",package="caschrono"))
  attach(khct)
  khc = ts(cbind(kwh, htdd,cldd), frequency = 12, start=c(1970,1))
  kwh = khc[,1]
  htdd = khc[,2]
  cldd = khc[,3]
  temps = time(kwh)
  ## End(Not run)

lait  Milk collection in France

Description

lait is the monthly milk collection in France, January 1980 - January 2010

Format

lait is a ts object

Details

Data are expressed in thousands of tons

Source

Enquête laitière mensuelle - Service de la Statistique et de la Prospective (SSP) - Ministère de l’Alimentation, de l’Agriculture et de la Pêche.

Examples

data(lait)
Fatalities in car accidents in France for the period 1973-2006

Description

m30 is the series of monthly fatalities in car accidents in France for the period 1973-2006.

Usage

data(m30)

Format

Time series data

Details

The data from July 1973 to December 2004 have been multiplied by 1.069 to take into account the change of the definition of a fatal accident. Until 2004, an accident is fatal if death occurs within 6 days whereas from 2006 the deadline moves to 30 days.

Source

http://www.securite-routiere.org/Fiches/statistiques/statmensuelles.htm

Examples

data(m30)

plot2acf

ACF plots of two series

Description

Plots the ACF of two series at the same lags

Usage

plot2acf(y1, y2, lag.max=40, main=c("",""))

Arguments

y1 A time series object
y2 A time series object
lag.max An integer, the value of the maximum lag
main A vector of character, the title of the plot
We keep the same scale for the two graphs

no value

Yves Aragon and Thibault Laurent

data(nottem)
set.seed(2561)
inov1 = rnorm(290, sd=4.18)
y = arima.sim(list(order = c(12,0,1), ma=-.7, ar=rep(0,11), .9)),
inov =innov1, n.start=50, n = 240) + 50
plot2acf(nottem, y, main=c("ACF nottem","ACF SAR"))

plotacfthemp

Plots the ACF and PACF of a theoretical ARMA model and the empirical ACF and PACF of an observed series

plotacfthemp plots the ACF and PACF of a theoretical ARMA model and the empirical ACF and PACF of an observed series.

plotacfthemp(y, ar = numeric(0), ma = numeric(0), lag.max = 20, titre="")

y time series, a ts object
ar numeric vector of AR coefficients
ma numeric vector of MA coefficients
lag.max integer, Maximum lag required.
titre a string of characters for the title

This function uses the armaacf and acf functions to compute theoretical and empirical ACF and PACF
Value

No values

Author(s)

Yves Aragon and Thibault Laurent

Examples

```r
set.seed(951)
y <- arima.sim(n=200, list(ma = c(-0.3, 0.6)),
sd = sqrt(1.5))
plotacf(y, ma=c(-0.3,0.6), titre="MA(2)"
```

### Description

`popfr` is the French population average for the period 1846-1951.

### Usage

```r
data(popfr)
```

### Format

Time series data

### Details

One unit: 1,000 inhabitants. Two missing values in 1916 and 1941

### Source

http://www.insee.fr/fr/themes/tableau.asp?ref_id=NATnon02145

### Examples

```r
data(popfr)
```
**Tel_extrait**  
*Telephone consumption in a firm*

**Description**

The file "Tel_extrait.csv" has been created by an automatic telephone exchange system in a firm; the date includes the day, the month and the year ordered like this: D, M, Y.

**Format**

The series is first imported as a *data.frame* object and then transformed into a *ts* object.

**Examples**

```r
don.mois1=read.csv2(file=system.file("/import/Tel_extrait.csv",package="caschrono"),
col.names=c("Date.app","Heur.deb.app","Code Dest","Dest Det","Dur app sec.",
"Mont app EU"), skip=0, stringsAsFactors=FALSE)
```

---

**trafmensu**  
*Monthly Air traffic at Toulouse Blagnac Airport for the period 1993-2007*

**Description**

The file "/import/trafquoti.txt" contains daily Air traffic at Toulouse Blagnac Airport for the period 1993-2007.

**Format**

The series is imported first as a *data.frame* with function `read.table`, aggregated by month and then transformed into a *ts* object. It is then converted in 1,000 of people.

**Source**

Chambre de Commerce et d’Industrie de Toulouse (CCIT)

**Examples**

```r
data(trafmensu)
# The executed code is:
## Not run:
bb=read.table(file= system.file("/import/trafquoti.txt",package="caschrono"),
header=FALSE,quote='', sep="", colClasses=c('numeric','character'),
col.names =c('trafic','date'))
mois.an= as.numeric(paste(substr(bb$date,1,4), substr(bb$date,6,7), sep=""))
trafmens=aggregate(bb$traf, list(Mois.An = mois.an), sum)
trafmensu=ts(trafmens$s/1000,start= c(1993,1),frequency= 12)
## End(Not run)
```
Description

It computes the t-statistics tests for the coefficients of an Arima model.

Usage

`t_stat(modarima, decim=6)`

Arguments

- `modarima`: an Arima object
- `decim`: an integer, the precision of the results

Details

`modarima` may be created with the function `Arima` (package `forecast`) or `arimax` (package `TSA`).

Value

It returns a matrix 2 x (number of free coefficients) of the t-statistics and the p-values.

Author(s)

Yves Aragon

Examples

```r
if(require("forecast")){
  set.seed(123)
  y1 = arima.sim(n=100, list(ar=-.7), sd=sqrt(4))
  my1 = Arima(y1, order=c(1,0,0), include.mean = FALSE)
  t_stat(my1)
}
```
Description

`xy.acfb` plots a time series and its ACF and PACF at the same lags.

Usage

```r
xy.acfb(y, lag.max=40, numer=TRUE)
```

Arguments

- `y` A time series object
- `lag.max` An integer, the value of the maximum lag
- `numer` A boolean, `TRUE` for printing the value of ACF and PACF by lag

Details

We keep the same scale for the ACF and the PACF

Value

If `numer=TRUE`, it prints the values of ACF and PACF for each lag

Author(s)

Yves Aragon and Thibault Laurent

References


See Also

`acf2y`

Examples

```r
data(nottem)
xy.acfb(nottem)
```
Index

*Topic datasets
  champa.ts, 6
cSDL, 7
essil, 8
indbourse, 9
khct, 9
lait, 10
m30, 11
popfr, 13
Tel_extrait, 14
trafmensu, 14

*Topic ts
  acf2y, 2
armaselect, 4
Box.test, 2, 5
caschrono-package, 2
cor arma, 6
plot2acf, 11
plotacftemp, 12
t_stat, 15
xy.acfb, 16

acf2y, 2, 16
armaselect, 4

Box.test, 2, 5

caschrono (caschrono-package), 2
caschrono-package, 2
champa.ts, 6
cor arma, 6
cSDL, 7
essil, 8
indbourse, 9
khct, 9
lait, 10
m30, 11
plot2acf, 11
plotacftemp, 12
popfr, 13
t_stat, 15
Tel_extrait, 14
trafmensu, 14
xy.acfb, 3, 16