Package ‘caschrono’

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Title S<e9>ries 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.

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

Minic method

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

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

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
armaselect(yc, nbmod = 5)
Box.test.2

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))
a1 = Box.test.2(y1, nlag = c(3, 6, 9, 12), type = "Ljung-Box", decim = 4)
champa.ts  Monthly shipments of bottles of champagne for the period 2001-2010

Description


Format

The series first is imported as a vector of numeric type with function scan and then transformed into a ts object. It 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(y, 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(csdl)

Format

This 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_Oréal, 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(csd1)
  # we create then the returns
  aa = returns(csd1, percentage = TRUE)
  aab <- aa[complete.cases(aa) == TRUE,]
  # in previous version we use package its which will not be maintained anymore
  # r.csd1 = its(aab, as.POSIXct(row.names(aab)))
  r.csd1 = zoo(aab, as.POSIXct(row.names(aab)))
}
```

---

**essil**

*Essilor stock for the period 2006-2009*

---

**Description**

Essilor close price

**Usage**

```r
data(essil)
```

**Format**

`essil` is an `its` object.

**Source**

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

**Examples**

```r
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.

c1dd (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

csdl 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
Details

We keep the same scale for the two graphs

Value

no value

Author(s)

Yves Aragon and Thibault Laurent

Examples

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

Usage

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

Arguments

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

Details

This function uses the ARMAacf and acf functions to compute theoretical and empirical ACF and PACF
**popfr**

**Value**

No values

**Author(s)**

Yves Aragon and Thibault Laurent

**Examples**

```r
set.seed(951)
ya <- arima.sim(n=200, list(ma = c(-0.3, 0.6)),
                 sd = sqrt(1.5))
plotacfthemp(ya, 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
# The executed code is :
# Not run:
bb=read.table(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=aggregate(bb$traf, list(Mois.An = mois.an), sum)
trafmensu=ts(trafmensu$x/1000,start= c(1993,1),frequency= 12)
# End(Not run)
```

### 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. Is is then converted in 1,000 of people.

**Source**

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

**Examples**

```r
# 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$traf, list(Mois.An = mois.an), sum)
trafmensu=ts(trafmens$x/1000,start= c(1993,1),frequency= 12)
## End(Not run)
```
t_stat

Arima coefficients tests

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

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)
}
**xy.acfb**

*Representation of a time series and its ACF and PACF*

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)
```
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