Package ‘caschrono’

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Title Séries temporelles avec R - Méthodes et cas

Description Functions, data sets and exercises solutions for the book ‘Séries temporelles avec R - Méthodes et cas’ (Yves Aragon, Springer, 2011). For all chapters, a vignette is available with some additional material and exercises solutions.

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R topics documented:

caschrono-package ........................................ 2
acf2y ...................................................... 2
armaselect .................................................. 4
Box.test.2 .................................................. 5
champa.ts .................................................. 6
cor arma ..................................................... 6
csd1 ......................................................... 7
essil .......................................................... 8
indbourse ................................................... 8
khct .......................................................... 9
lait ........................................................... 10
Description

Functions, data sets and exercises solutions for the book 'Séries temporelles avec R - Méthodes et cas' (Yves Aragon, Springer, 2011). For all chapters, a vignette is available with some additional material and exercises solutions.

Details

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Author(s)

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References

Y. Aragon (2011), Séries temporelles avec R - Méthodes et cas, Springer

Plots of the ACF and PACF of a time series

acf2y
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)
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)
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. Is is then converted in 1,000 of bottles.

Source
SRISE-DRAAF Champagne-Ardenne

Examples
```r
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
fit <- Arima(yc,order=c(1,0,2))
cor.arma(fit)
```

---

csd1 French stock and returns

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
- Socgen, 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
data(csd1)
# we create then the returns
aa = returns(csd1, percentage = TRUE)
aab <- aa[complete.cases(aa) == TRUE,]
r.csd1 = its(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)
# code obtained like that
# deb = "2006-01-01"; fin = "2009-12-31"
# essil= priceIts(instrument="EI.PA",start=deb,end=fin, quote="Close")
# colnames(essil) = "essilor"

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)
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,clldd), frequency = 12, start=(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**

```r
data(lait)
```

---

m30  

*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**

```r
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.
**plot2acf**

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

**Examples**
```
data(n30)
```

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

**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"))
```
plotacftthemp  

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

Description

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

Usage

plotacftthemp(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.

Value

No values

Author(s)

Yves Aragon and Thibault Laurent

Examples

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

*French population for the period 1846-1951*

**Description**

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

**Usage**

`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**

`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="", 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**

```r
t_stat(modarima, decim=6)
```

**Arguments**

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

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

```
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

```
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

data(nottem)
xy.acfb(nottem)
Index

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

*Topic ts
acf2y, 2
armaselect, 4
Box.test, 2, 5
caschrono-package, 2
cor arma, 6
plot2acf, 11
plotacftfemp, 12
t_stat, 14
Tel_extract, 13
trafmensu, 14
xy.acfb, 3, 15

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, 8
khct, 9
lait, 10