

Package ‘iNZightTS’

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Type Package

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Depends R (>= 2.13)

Imports grid, grDevices, graphics, stats, utils

Description

Time Series functionality for iNZight, allowing users to draw, decompose, and forecast with ease.

License GPL-2

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NeedsCompilation no

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iNZightTS-package	<i>Time Series Data Analysis</i>
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Description

The iNZightTS package provides some simple analysis tools for exploring time series data. It is used in the iNZight software.

Details

Package: iNZightTS
Type: Package
Version: 1.0
Date: 2014-02-25
License: GPL-2

Author(s)

Marco Kuper, originally developed by Simon Potter and David Banks.
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See Also

iNZight

compareplot	<i>Plot multiple time series</i>
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Description

Plot a multiple time series object to compare several series

Usage

```
compareplot(x, ...)  
  
compareplot.1(vars, xlab = "Time", ylab = "", multiplicative = FALSE,  
  t = 0)  
  
compareplot.2p(vars, xlab = "Time", ylab = "", multiplicative = FALSE,  
  t = 0)
```

Arguments

x	Multiple time series object
...	additional arguments
vars	iNZightTS object with the data and frequency information included
xlab	x axis label
ylab	y axis label
multiplicative	logical, if TRUE multiplicative series will be used
t	smoothing parameter

Functions

- `compareplot.1`: For series with frequency = 1
- `compareplot.2p`: For series with frequency > 1

Author(s)

iNZight

decompositionplot	<i>Plot a Time Series Decomposition</i>
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Description

Decomposes a time series into trend, seasonal and residual components using loess.

Usage

```
decompositionplot(obj, ylab = "", xlab = "", multiplicative = FALSE,  
  t = 0)
```

Arguments

obj	an iNZightTS object
ylab	a title for the y axis
xlab	a title for the x axis
multiplicative	logical. If TRUE, a multiplicative model is used, otherwise an additive model is used by default.
t	a control of smoothness of the trend of the time series with frequency bigger than 1 ranges from 0 to 1

Details

If the frequency is greater than 1, the components are found using the [stl](#) function with `s.window` set to TRUE (effectively replacing smoothing by taking the mean). If the frequency is 1, the trend component is found directly by using [loess](#) and the residuals are the difference between trend and actual values. The trend, seasonal and residual components are plotted on the same scale allowing for easy visual analysis.

Value

The original iNZightTS object with an item `decompVars` appended, containing results from the decomposition.

References

R. B. Cleveland, W. S. Cleveland, J.E. McRae, and I. Terpenning (1990) STL: A Seasonal-Trend Decomposition Procedure Based on Loess. Journal of Official Statistics, 6, 31V73.

See Also

[stl](#), [loess](#), [iNZightTS](#)

Examples

```
## Not run:
z <- iNZightTS(ldeaths)
y <- decompositionplot(z)

## End(Not run)
```

forecastplot	<i>Forecast plot</i>
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Description

Plot a raw time series together with it's fitted curve and add forecasts and prediction intervals to the end.

Usage

```
forecastplot(vars, xlab = "Time", ylab = "", multiplicative = FALSE,  
             show = TRUE)
```

Arguments

vars	iNZightTS object
xlab	x axis label
ylab	a title for the y axis
multiplicative	logical. If TRUE, a multiplicative model is used, otherwise an additive model is used by default.
show	logical. If TRUE, draw the plot by default.

Details

The predictions and prediction intervals are the result of models fitted by the Holt-Winters method. The amount of predicted observations is calculated by $2 * \text{freq}$, where `freq` is the frequency of the time series object.

Value

A multiple time series of the predicted values with columns `fit`, `lwr` and `upr` for the predicted values and the lower and upper bounds respectively.

References

C.C Holt (1957) Forecasting seasonals and trends by exponentially weighted moving averages, ONR Research Memorandum, Carnigie Institute 52.

P.R Winters (1960) Forecasting sales by exponentially weighted moving averages, *Management Science* **6**, 324–342.

See Also

[iNZightTS](#), [HoltWinters](#)

Examples

```
## Not run:
z <- iNZightTS(1deaths)
forecastplot(z)

## End(Not run)
```

iNZightTS

iNZightTS (Time-Series) Objects

Description

The function `iNZightTS` is used to create time-series objects used in `iNZight`.

Usage

```
iNZightTS(data, start = 1, end, freq = 1, var = 2,
  time.col = grep("time", names(data), ignore.case = TRUE)[1], ...)
```

Arguments

<code>data</code>	a <code>data.frame</code> containing time information and observation or a path to a <code>.csv</code> file with such information or a <code>ts</code> object
<code>start</code>	the time of the first observation. Either a single number or a vector of two integers, which specify a natural time unit and a (1-based) number of samples into the time unit
<code>end</code>	the time of the last observation, specified in the same way as <code>start</code>
<code>freq</code>	the number of observations per unit of time
<code>var</code>	the column number or name for the observations used from <code>data</code> in the actual time series
<code>time.col</code>	which column contains the time variable
<code>...</code>	additional information passed to <code>read.csv()</code> and used when <code>data</code> is a path
<code>ignore.case</code>	logical, ignore the case?

Details

The function `iNZightTS` is used to create time-series objects. Unlike `ts` objects, these are lists containing information about the time-series as well as the data and the time-series (`ts` object) itself.

If a `ts` object is used to create the `iNZightTS` object, all the domain information is extracted from that object.

The function recognises the following time variable formatS without case sensitive:

- "(Y)yyyy" annually data e.g. "(Y)1991"

- "(Y)yyyyMmm" monthly data e.g. "(Y)1991M01"
- "(Y)yyyyQqq" quarterly data e.g. "(Y)1991Q01"
- "(Y)yyyyWww" weekly data with yearly seasonality e.g. "(Y)1991W01"
- "(Y)yyyyDdd" daily data with yearly seasonality e.g. "(Y)1991D01"
- "WwwDdd" daily data with weekly seasonality e.g. "W01D01"
- "DddHhh" hourly data with daily seasonality e.g. "D01H01"

The length of digits of each time unit could be flexible and allowing space between the time unit

In case of data being a data.frame or path to a .csv file and start being omitted, the starting date and the freq is extracted from the column that includes the time information. This column is either named "Time" or is the first column. If end is omitted, all of the data will be used for the time-series.

See Also

[ts](#), [print.inZightTS](#), [rawplot](#)

Examples

```
## Not run:
# create from a ts object
z <- inZightTS(UKgas)
rawplot(z)

# create from a data.frame
x <- inZightTS(data.frame(Return = rnorm(100), Time = 1:100), var = "Return")

# create from a data.frame with modified time frame
y <- inZightTS(data.frame(Return = rnorm(100)), start = c(1990, 1), end =
c(1993, 5), freq = 12, var = 1)
rawplot(y)

## End(Not run)
```

Description

Draw a plot to compare 2 or more timeseries with each other. The resulting plot contains the original timeseries as well as plots showing the season effects of each timeseries, if the frequency is greater than 1.

Usage

```
multiseries(x, ...)  
  
multiseries.1(vars, multiplicative = FALSE, xlab = "Time", ylab = "",  
  t = 0, ...)  
  
multiseries.2p(vars, multiplicative = FALSE, xlab = "Time", ylab = "",  
  t = 0, ...)
```

Arguments

x	iNZightMTS object containing data
...	Further arguments to be passed onto specific methods.
vars	iNZightTS object with the data and frequency information included
multiplicative	logical, use multiply series?
xlab	x axis label
ylab	y axis label
t	smoothing parameter

Details

x is an [iNZightMTS](#) object containing some data for which timeseries objects can be created. The data columns used for the plotting are those that are used in the [iNZightMTS](#) object.

The frequency used for the plotting is also stored in x.

Functions

- multiseries.1: drawn in one window
- multiseries.2p: plot in different panels

See Also

[iNZightTS](#)

Examples

```
## Not run:  
# Frequency > 1  
y <- iNZightTS(Seatbelts)  
multiseries(y)  
  
# Frequency = 1  
# Casualties for Jan of each year  
X <- Seatbelts[12*(1:15), -8]  
X <- as.ts(X)  
z <- iNZightTS(X)  
multiseries(z)
```



```
## End(Not run)
```

newdevice	<i>importFrom iNZightTools newdevice</i>
-----------	--

Description

```
importFrom iNZightTools newdevice
```

Usage

```
newdevice(...)
```

Arguments

```
...          additional arguments to dev function
```

print.iNZightTS	<i>Print an iNZightTS object</i>
-----------------	----------------------------------

Description

Print method for iNZightTS (time series) objects.

Usage

```
## S3 method for class 'iNZightTS'
print(x, full = FALSE, ...)
```

Arguments

x	the iNZightTS object to be printed
full	whether to print all the underlying data
...	Unused arguments. Only here for consistency with the base S3 method.

Details

The full argument controls whether to print all the data from which the iNZightTS object has been created. The default is set to FALSE and only the head() of the data will be printed.

See Also

[print](#), [iNZightTS](#)

Examples

```
## Not run:
print(inZightTS(UKgas))

## End(Not run)
```

rawplot	<i>Draw a simple time series plot</i>
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Description

Draws a plot of a given inZightTS object with the trend superimposed.

Usage

```
rawplot(obj, multiplicative = FALSE, ylab = "", xlab = "",
        animate = FALSE, t = 0, e = NULL)
```

Arguments

obj	an inZightTS object
multiplicative	logical. If TRUE, a multiplicative model is used, otherwise an additive model is used by default.
ylab	a title for the y axis
xlab	a title for the x axis
animate	animate the plotting process?
t	smoothing parameter
e	NULL by default to support animation stop

Details

If animate is set to TRUE, a scatterplot of all points in the time series will appear followed by slowly drawn lines connecting the points, simulating the drawing of a time series by hand.

recompose	<i>Recompose a decomposed time series</i>
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Description

Recompose a time series object, with optional animation.

Usage

```
recompose(vars.decomp, animate = TRUE, e = NULL)
```

Arguments

vars.decomp	a decomposed time series object
animate	logical, if TRUE the plot will be animated
e	environment to use (for controlling animation timings)

Value

the recomposed series

Author(s)

iNZight

seaice	<i>Sea Ice</i>
--------	----------------

Description

A dataset containing sea ice measurements from 1990 to 2011.

Usage

```
seaice
```

Format

A data frame with 265 rows and 3 variables:

Time The time variable

Arctic Sea ice measurement for the Arctic

Antarctica Sea ice measurement for Antarctica

seasonplot

Plot Seasonal Subseries from a Time Series

Description

This function plots the seasonal components of a time series together with the estimated seasonal effects of that series.

Usage

```
seasonplot(obj, ...)
```

Arguments

obj an iNZightTS object
 ... Further arguments to be passed onto specific methods.

Details

The resulting window will contain two plots. On the left, every seasonal subseries of the time series is plotted. On the right will be the average seasonal effect of the series.

See Also

[iNZightTS](#)

Examples

```
## Not run:
x <- iNZightTS(UKgas)
seasonplot(x)

## End(Not run)
```

visitorsA2

Visitors (annual)

Description

A dataset containing annual visitor numbers for several countries.

Usage

```
visitorsA2
```

Format

A data frame with 13 rows and 5 variables:

Time The time variable (year)

Australia Visitor counts for Australia

China..People.s.Republic.of Visitor counts for China

Japan Visitor counts for Japan

United.Kingdom Visitor counts for the UK

visitorsM2	<i>Visitors (monthly)</i>
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Description

A dataset containing monthly visitor numbers for several countries.

Usage

```
visitorsM2
```

Format

A data frame with 164 rows and 5 variables:

Time The time variable (year/month)

Australia Visitor counts for Australia

China..People.s.Republic.of Visitor counts for China

Japan Visitor counts for Japan

United.Kingdom Visitor counts for the UK

visitorsQ	<i>Visitors (quarterly)</i>
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Description

A dataset containing quarterly visitor numbers for several countries.

Usage

```
visitorsQ
```

Format

A data frame with 54 rows and 5 variables:

Date The time variable (year/quarter)

Australia Visitor counts for Australia

China..People.s.Republic.of Visitor counts for China

Japan Visitor counts for Japan

United.Kingdom Visitor counts for the UK

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