

Package ‘tsfknn’

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Type Package

Title Time Series Forecasting Using Nearest Neighbors

Version 0.1.0

Description Allows to forecast time series using nearest neighbors regression Francisco Martinez, Maria P. Frias, Maria D. Perez-Godoy and Antonio J. Rivera (2017) <doi:10.1007/s10462-017-9593-z>. When the forecasting horizon multi-step ahead forecasting strategies can be used. The model built is is higher than 1, two autoregressive, that is, it is only based on the observations of the time series. The nearest neighbors used in a prediction can be consulted and plotted.

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Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

Depends R (>= 3.4.0)

Suggests knitr, rmarkdown, testthat (>= 2.0.0)

Imports ggplot2 (>= 2.2.1), graphics, stats, utils

VignetteBuilder knitr

URL <https://github.com/franciscomartinezdelrio/tsfknn>

BugReports <https://github.com/franciscomartinezdelrio/tsfknn/issues>

NeedsCompilation no

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autoplot.knnForecast *Create a ggplot object from a knnForecast object*

Description

It uses a knnForecast object to create a ggplot object that plots a time series and its forecast using KNN regression.

Usage

```
## S3 method for class 'knnForecast'
autoplot(forecast, highlight = "none",
         faceting = TRUE)
```

Arguments

forecast	The knnForecast object.
highlight	A string value indicating what elements should be highlighted. Possible values are "none", "points" and "neighbors".
faceting	Logical. This applies only if the highlight parameter is set to "neighbors". It indicates whether the different nearest neighbors should be seen in different plots (True) or in one plot.

Value

The ggplot object representing a graph with the forecast.

Examples

```
pred <- knn_forecasting(USAccDeaths, h = 12, lags = 1:12, k = 2)
library(ggplot2)
autoplot(pred)
autoplot(pred, highlight = "neighbors")
```

knn_examples	<i>Examples of the model associated with a prediction</i>
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Description

It allows to see the examples of the model associated to a knnForecast object.

Usage

```
knn_examples(forecast)
```

Arguments

forecast A knnForecast object.

Value

A matrix including the features and targets of the examples associated with the model associated with a knnForecast object.

Examples

```
pred <- knn_forecasting(ts(1:8), h = 1, lags = 1:2, k = 2)
knn_examples(pred)
```

knn_forecasting	<i>Time series forecasting using KNN regression</i>
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Description

It applies KNN regression to forecast the future values of a time series. The lags used as autoregressive variables are set with the lags parameter.

Usage

```
knn_forecasting(timeS, h, lags = NULL, k = NULL, msas = "MIMO",
  cf = "mean")
```

Arguments

timeS A numeric vector or time series of class ts.
h A positive integer. Number of values to forecast.
lags An integer vector in increasing order expressing the lags used as autoregressive variables.

k	A positive integer. The k parameter in KNN regression. A vector of k values can also be used. In that case, the forecast is the average of the forecasts produced by the different models with the different k parameters.
msas	A string indicating the Multiple Step Ahead Strategy used when more than one value is predicted. It can be "recursive" or "MIMO".
cf	A string. It indicates the combination function used to aggregate the targets associated with the nearest neighbors. It can be "mean" or "median".

Value

An object of class "knnForecast".

Examples

```
pred <- knn_forecasting(USAccDeaths, h = 12, lags = 1:12, k = 2)
pred$prediction # To see a time series with the forecasts
plot(pred) # To see a plot with the forecast
```

nearest_neighbors	<i>Nearest neighbors associated with predictions</i>
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Description

It allows to check the new instances and their nearest neighbors used in a prediction associated with a "knnForecast" object.

Usage

```
nearest_neighbors(forecast)
```

Arguments

forecast A knnForecast object.

Value

A list including the new instances used in KNN regression and their nearest neighbors.

Examples

```
pred <- knn_forecasting(UKgas, h = 4, lags = 1:4, k = 2, msas = "MIMO")
nearest_neighbors(pred)
```

tsfknn

tsfknn: A package for time series forecasting using KNN regression.

Description

The tsfknn package allows univariate time series forecasting using KNN regression.

Functions

knnForecasting It is used to forecast a time series

nearest_neighbors To see the nearest neighbors used to forecast a times series

knn_examples To see the examples used by the KNN model

autoplot To plot a prediction and the nearest neighbors used in the prediction

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