Package 'TimeSeries.OBeu'

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Type Package

Title Time Series Analysis OpenBudgets.eu

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Description Time Series Analysis for OBeu datasets

URL https://github.com/okgreece/OBeU

BugReports https://github.com/okgreece/OBeU/issues

License GPL-3

LazyData TRUE

Suggests testthat

Imports forecast, jsonlite, trend, tseries

RoxygenNote 5.0.1

R topics documented:

Athens_approved_ts — *Time series of Approved Expenditure Budget Phase of Municipality of Athens*

Description

Time series data with the Approved Budget phase expenditure amounts of Municipality of Athens from 2004-2015

- The years of the recorded approved budget phase amounts.
- The approved budget phase amounts of this time range.

Usage

```
Athens_approved_ts
```

Format

A ts object with 12 approved amounts from 2004-2015

Source

add #url#

Athens_draft_ts — *Time series of Draft Expenditure Budget Phase of Municipality of Athens*

Description

Time series data with the Draft Budget phase expenditure amounts of Municipality of Athens from 2004-2015

- The years of the recorded draft budget phase amounts.
- The draft budget phase amounts of this time range.

Usage

```
Athens_draft_ts
```

Format

A ts object with 12 draft amounts from 2004-2015

Source

add #url#

Athens_executed_ts — *Time series of Executed Expenditure Budget Phase of Municipality of Athens*

Description

Time series data with the Executed Budget phase expenditure amounts of Municipality of Athens from 2004-2015

- The years of the recorded executed budget phase amounts.
- The executed budget phase amounts of this time range.

Usage

```
Athens_executed_ts
```

Format

A ts object with 12 draft amounts from 2004-2015

Source

add #url#

Athens_reserved_ts — *Time series of Reserved Expenditure Budget Phase of Municipality of Athens*

Description

Time series data with the Reserved Budget phase expenditure amounts of Municipality of Athens from 2004-2015

- The years of the recorded reserved budget phase amounts.
- The reserved budget phase amounts of this time range.

Usage

```
Athens_reserved_ts
```

Format

A ts object with 12 reserved amounts from 2004-2015

Source

add #url#

Athens_revised_ts — *Time series of Revised Expenditure Budget Phase of Municipality of Athens*

Description

Time series data with the Revised Budget phase expenditure amounts of Municipality of Athens from 2004-2015

- The years of the recorded revised budget phase amounts.
- The revised budget phase amounts of this time range.

Usage

```
Athens_revised_ts
```

Format

A ts object with 12 revised amounts from 2004-2015

Source

add #url#

babbage.tsa.obeu — *Read and analyze time series data from Babbage API*

Description

Extract and analyze time series data from babbage api, using the tsa.obeu function.

Usage

```
babbage.tsa.obeu(json_data,time,amount,prediction_steps)
```

Arguments

json_data	The json string, URL or file from babbage api.
time	Specify the time label of the json time series data.
amount	Specify the amount label of the json time series data.
prediction_steps	The number of prediction steps.

Details

This function extracts the time series data provided by the Babbage API. A json file analyze it using the tsa.obeu function.

Value

A json string with the resulted parameters of the tsa.obeu function.

Author(s)

Kleanthis Koupidis

References

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See Also

tsa.obeu

`forecast.tsa.obeu` *Time series forecast results of OBEU Time Series*

Description

Univariate time series forecasts for short and long time series data using the appropriate model.

Usage

```
forecast.tsa.obeu(ts_model, h=1)
```

Arguments

`ts_model`	The input univariate time series data
`h`	The number of prediction steps

Details

This function is used internally in tsa.obeu and forecasts the model that fits the input data using the auto.arima function(see forecast package). The model selection depends on the results of some diagnostic tests (acf,pacf,pp adf and kpss). For short time series the selected arima model is among various orders of the AR part using 1st differences and MA(1), with the lower AIC value.

Value

A list with the parameters: ts.name a string indicating the name of the time series data ts.model a string indicating the arima orders data_year The time that time series data were sampled. data The time series values. predict_time The time that defined by the prediction_steps parameter. predict_values The predicted values that defined by the prediction_steps parameter. up80 The upper limit of the 80 low80 The lower limit of the 80 up95 The upper limit of the 95 low95 The lower limit of the 95

Author(s)

Kleanthis Koupidis

See Also

tsa.obeu, forecast(forecast package)

`stationary.test` *Stationarity testing*

Description

This functions tests the stationarity of the input time series data.

Usage

```
stationary.test(tsdata)
```

Arguments

`tsdata`	The input univariate time series data

Details

This function tests the deterministic and stohastic trend of the input time series data. This function uses ACF and PACF functions from forecast package, Phillips-Perron test, Augmented Dickeyß€“Fuller (ADF) test, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, from tseries package and Mann-Kendall test for Monotonic Trend Cox and Stuart trend test from trend package.

Phillips-Perron test tests the null hypothesis of whether a unit root is present in a time series sample, against a stationary alternative. The truncation lag parameter is set to trunc(4*(n/100)^0.25), where n the length of the in input time series data

Augmented Dickeyß€“Fuller (ADF) test, tests the null hypothesis of whether a unit root is present in a time series sample. The truncation lag parameter is set to trunc((n-1)^(1/3))), where n the lengthof the input time series data

Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, tests a null hypothesis that an observable time series is stationary around a deterministic trend (i.e. trend-stationary) against the alternative of a unit root. The truncation lag parameter is set to trunc(3*sqrt(n)/13), where n the length of the input time series data

The non-parametric Mann-Kendall test is used to detect monotonic trends. The null hypothesis, H0, is that the data come from a population with independent realizations and are identically distributed. The alternative hypothesis, HA, is that the data follow a monotonic trend.

The Cox and Stuart test is a modified sign test. The null hypothesis, H0, is that the input time series assumed to be independent against the fact that there is a time dependent trend (monotonic trend).

Value

A string indicating if the time series is stationary or non stationary for internal use in tsa.obeu.

Author(s)

Kleanthis Koupidis

References

tseries, trend

See Also

tsa.obeu, Acf and Pacf(forecast package),pp.test, adf.test and kpss.test (tseries) mk.test and cs.test (trend package)

`ts.acf.obeu` *Extract the ACF and PACF parameters of time series and their model's residuals*

Description

This function is included in tsa.obeu function and aims to extract the ACF and PACF details of the input time series data and the ACF, PACF of the residuals after fitting an Arima model.

Usage

```
ts.acf.obeu(tsdata,model_residuals,a=0.95)
```

Arguments

`tsdata`	The input univariate time series data
`model_residuals`	The model's residuals after fitting a model to the time series
`a`	The significant level (default a=0.95)

Details

This function is used internally in tsa.obeu function and the output is a list with grouped ACF and PACF parameters of the input time series data, as well as the ACF and PACF parameters of the residuals needed for the graphical purposes in OBEU.

Value

A list with the parameters:

acf.parameters acf The estimated acf values of the input time series acf.lag The lags at which the acf is estimated confidence.interval.up The upper limit of the confidence interval confidence.interval.low The lower limit of the confidence interval

pacf.parameters pacf The estimated pacf values of the input time series pacf.lag The lags at which the pacf is estimated confidence.interval.up The upper limit of the confidence interval confidence.interval.low The lower limit of the confidence interval

acf.residuals.parameters acf.res The estimated acf values of the modelß€™s residuals acf.res.lag The lags at which the acf is estimated of the modelß€™s residuals confidence.interval.up The upper limit of the confidence interval confidence.interval.low The lower limit of the confidence interval

pacf.residuals.parameters pacf.res The estimated pacf values of the modelß€™s residuals pacf.res.lag The lags at which the pacf is estimated of the modelß€™s residuals confidence.interval.up The upper limit of the confidence interval confidence.interval.low The lower limit of the confidence interval

Author(s)

Kleanthis Koupidis

See Also

tsa.obeu

`ts.non.seas.decomp` *Non seasonal decomposition*

Description

Decomposition of time series with no seasonal component

Decomposition of time series with no seasonal component

Usage

```
ts.non.seas.decomp(tsdata)
```

```
ts.non.seas.decomp(tsdata)
```

Arguments

`tsdata`	The input univariate non seasonal time series data
`tsdata`	The input univariate non seasonal time series data

Details

For non-seasonal time series there is no seasonal component. We use Local Polynomial Regression Fitting (LOESS) in order to extract the trend component and then we subtract the trend from the initial values to extract the irregular terms.

For non-seasonal time series there is no seasonal component. We use Local Polynomial Regression Fitting (LOESS) in order to extract the trend component and then we subtract the trend from the initial values to extract the irregular terms.

Value

A list with the following components timeseries The time series data season There is no seasonality, this parameter is set NULL loess.trend trend The trend values conf.interval.up The upper limit of the trend confidence interval conf.interval.low The lower limit of the trend confidence interval loess.comparison number.observation The time series length loess.residuals The loess residuals loess.enp loess.s loess.onedelta loess.twodelta loess.tracehat loess.divisor loess.robust loess.weights

A list with the following components timeseries The time series data season There is no seasonality, this parameter is set NULL loess.trend trend The trend values conf.interval.up The upper limit of the trend confidence interval conf.interval.low The lower limit of the trend confidence interval loess.comparison number.observation The time series length loess.residuals The loess residuals loess.enp loess.s loess.onedelta loess.twodelta loess.tracehat loess.divisor loess.robust loess.weights

Author(s)

Kleanthis Koupidis

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References

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See Also

tsa.obeu, loess, predict.loess (stats package)

tsa.obeu, loess, predict.loess (stats package)

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ts.seasonal.obeu *Decomposition of seasonal time series*

Description

Decomposition of seasonal time series data using stlm from forecast package. This function is used internally in tsa.obeu.

Usage

```
ts.seasonal.obeu(tsdata)
```

Arguments

tsdata	The input univariate seasonal time series data

Details

Decomposition of seasonal time series data is based on stlm from forecast package and returns a list with useful parameters for OBEU.

Value

ts_model Summary of the arima model stl.general trend The estimated trend component seasonal The estimated seasonal component remainder The estimated remainder component weights The final robust weights (if robust=F all weights are one) window A vector with the spans used for the "s", "t", and "l" smoothers stl.degree A vector with the polynomial degrees for these smoothers lambda Box-Cox transformation parameter tsdata.stl$x tsdata.stl$m fitted The model's fitted values ts_model arima.order The Arima order arima.coef A vector of AR, MA and regression coefficients arima.coef.se The standard error of the coefficients residuals The residuals of the model (fitted innovations) residuals.other resid.variance The MLE of the innovations variance covariance.coef The matrix of the estimated variance of the coefficients used.notused.observations not.used.obs The number of not used observations for the fitting used.obs the number of used observations for the fitting comparison loglik The maximized log-likelihood (of the differenced data), or the approximation to it used aic The AIC value corresponding to the log-likelihood bic The BIC value corresponding to the log-likelihood aicc The second-order Akaike Information Criterion corresponding to the log-likelihood data The time series data

Author(s)

Kleanthis Koupidis

References

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See Also

tsa.obeu, stlm (forecast package)

`tsa.obeu` *Time series analysis results for OBEU Time series*

Description

Univariate time series analysis for short and long time series data using the appropriate model.

Usage

```
tsa.obeu(tsdata, h)
```

Arguments

`tsdata`	The input univariate time series data
`h`	The number of prediction steps

Details

This function automatically tests for stationarity of the input time series data in order to select the appropriate arima model that fits the input data using the auto.arima function(see forecast package). For short time series the selected arima model is among various orders of the AR part using 1st differences and MA(1), with the lower AIC. This function also decomposes both seasonal and non seasonal time series and forecasts h steps ahead the user selected(default h=1).

Value

A json string with the parameters (Missing some): ts_name param forecasts

Author(s)

Kleanthis Koupidis

References

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See Also

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