Package 'stlELM'

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Type Package

Title Hybrid Forecasting Model Based on STL Decomposition and ELM

Version 0.1.1

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Description Univariate time series forecasting with STL decomposition based Extreme Learning Machine hybrid model. For method details see Xiong T, Li C, Bao Y (2018). <doi:10.1016/j.neucom.2017.11.053>.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.2.1

Imports forecast, nnfor

Depends R (>= 2.10)

NeedsCompilation no

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R topics documented:

Data_potato	*Monthly Average Potato Price of Delhi Market (India)*

Description

Monthly Average Potato Price of Delhi Market from January 2010 to July 2020.

Usage

```
data("Data_potato")
```

Format

A time series data with 127 observations.

price a time series

Details

Dataset contains 127 observations of monthly average potato price of Delhi Market. It is obtained from Agmarknet Website.

Source

https://agmarknet.gov.in/

References

https://agmarknet.gov.in/

Examples

```
data(Data_potato)
```

STLELM	*STL Based ELM Forecasting Model*

Description

The STLELM function forecasts a time series using a hybrid model made of a decomposition technique called seasonal trend decomposition based on loess (STL) and a neural network based forecasting technique called extreme learning machine (ELM). The function further computes the values of different forecasting evaluation criteria.

Usage

```
STLELM(data, stepahead=10)
```

Arguments

`data`	Input univariate time series (ts) data.
`stepahead`	The forecast horizon.

Details

This function decomposes a nonlinear, nonstationary and seasonal time series into trend-cycle, seasonal and remainder component using STL (Cleveland et al., 1990). Extreme learning machine (ELM) is used to forecast these components individually (Huang et al., 2006, Xiong et al. 2018). Finally, the prediction results of all the three components are aggregated to formulate an ensemble output for the input time series.

Value

`data_test`	Testing set used to measure the out of sample performance.
`STLcomp_forecast`	
	Forecasted value of all individual components.
`FinalstlELM_forecast`	
	Final forecasted value of the stlELM model. It is obtained by combining the forecasted value of all individual components.
`MAE_stlELM`	Mean Absolute Error (MAE) for stlELM model.
`SMAPE_stlELM`	Mean Absolute Percentage Error (MAPE) for stlELM model.
`RMSE_stlELM`	Root Mean Square Error (RMSE) for stlELM model.

References

Cleveland, R.B., Cleveland, W.S., McRae, J.E., Terpenning, I. (1990). STL: A seasonal-trend decomposition procedure based on loess, Journal of Official Statistics, 6, 3–73. Huang, G., Zhu, Q., Siew, C. (2006). Extreme learning machine: theory and applications, Neurocomputing,70, 489–501. Xiong, T., Li, C., Bao, Y. (2018). Seasonal forecasting of agricultural commodity price using a hybrid STL and ELM method: Evidence from the vegetable market in China. Neurocomputing 275, 2831–2844

Examples

```
data("Data_potato")
STLELM(Data_potato)
```

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