Package: stlTDNN (via r-universe)

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Type Package

Title STL Decomposition and TDNN Hybrid Time Series Forecasting

Version 0.1.0

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Description Implementation of hybrid STL decomposition based time delay neural network model for univariate time series forecasting. For method details see Jha G K, Sinha, K (2014). <doi:10.1007/s00521-012-1264-z>, Xiong T, Li C, Bao Y (2018). <doi:10.1016/j.neucom.2017.11.053>.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Imports forecast, nnfor

Depends R (>= 2.10)

NeedsCompilation no

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Repository CRAN

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Data_potato *Normalized Monthly Average Potato Price of India*

Description

Normalized Monthly Average Potato Price of India 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 normalized monthly average potato price of India. It is obtained from World Bank "Pink sheet".

Source

Department of Consumer Affairs, Govt. of India

References

https://consumeraffairs.nic.in/

Examples

```
data(Data_potato)
```

STLTDNN *STL Based TDNN Hybrid Forecast*

Description

The STLTDNN function forecasts univariate 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 time delay neural network (TDNN). The function further computes the values of different forecasting evaluation criteria.

Usage

```
STLTDNN(data, stepahead=12)
```

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). Time delay neural network is used to forecast these components individually (Jha and Sinha, 2014). 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.
FinalstlTDNN_forecast	Final forecasted value of the stlTDNN model. It is obtained by combining the forecasted value of all individual components.
MAE_stlTDNN	Mean Absolute Error (MAE) for stlTDNN model.
SMAPE_stlTDNN	Mean Absolute Percentage Error (MAPE) for stlTDNN model.
RMSE_stlTDNN	Root Mean Square Error (RMSE) for stlTDNN 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.

Jha, G.K., Sinha, K. (2014). Time-delay neural networks for time series prediction: An application to the monthly wholesale price of oilseeds in India. Neural Computing and Application, 24, 563–571

Examples

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

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