Package 'TSLSTM'

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Type Package

Title Long Short Term Memory (LSTM) Model for Time Series Forecasting

Version 0.1.0

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Description The LSTM (Long Short-Term Memory) model is a Recurrent Neural Network (RNN) based architecture that is widely used for time series forecasting. Min-Max transformation has been used for data preparation. Here, we have used one LSTM layer as a simple LSTM model and a Dense layer is used as the output layer. Then, compile the model using the loss function, optimizer and metrics. This package is based on Keras and TensorFlow modules and the algorithm of Paul and Garai (2021) <doi:10.1007/s00500-021-06087-4>.

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Imports keras, tensorflow, tsutils, stats

NeedsCompilation no

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ts.lstm *Long Short Term Memory (LSTM) Model for Time Series Forecasting*

Description

The LSTM (Long Short-Term Memory) model is a Recurrent Neural Network (RNN) based archi-
tecture that is widely used for time series forecasting. Min-Max transformation has been used for
data preparation. Here, we have used one LSTM layer as a simple LSTM model and a Dense layer
is used as the output layer. Then, compile the model using the loss function, optimizer and metrics.
This package is based on Keras and TensorFlow modules.

Usage

```
ts.lstm(
  ts,
  xreg = NULL,
  tsLag,
  xregLag = 0,
  LSTMUnits,
  DropoutRate = 0,
  Epochs = 10,
  CompLoss = "mse",
  CompMetrics = "mae",
  ActivationFn = "tanh",
  SplitRatio = 0.8,
  ValidationSplit = 0.1
)
```

Arguments

ts	Time series data
xreg	Exogenous variables
tsLag	Lag of time series data
xregLag	Lag of exogenous variables
LSTMUnits	Number of unit in LSTM layer
DropoutRate	Dropout rate
Epochs	Number of epochs
CompLoss	Loss function
CompMetrics	Metrics
ActivationFn	Activation function
SplitRatio	Training and testing data split ratio
ValidationSplit	
	Validation split ration

Value

- TrainFittedValue: Fitted value of train data
- TestPredictedValue: Predicted value of test data
- AccuracyTable: RMSE and MAPE of train and test data

References

Paul, R.K. and Garai, S. (2021). Performance comparison of wavelets-based machine learning technique for forecasting agricultural commodity prices, Soft Computing, 25(20), 12857-12873

Examples

```
y<-rnorm(100,mean=100,sd=50)
x1<-rnorm(100,mean=50,sd=50)
x2<-rnorm(100, mean=50, sd=25)
x<-cbind(x1,x2)
TSLSTM<-ts.lstm(ts=y,xreg = x,tsLag=2,xregLag = 0,LSTMUnits=5, Epochs=2)
```

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