

Method Description

General Information

Type of Entry (<i>Academic, Practitioner, Researcher, Student</i>)	Student
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Country	India
Type of Affiliation (<i>University, Company-Organization, Individual</i>)	University
Affiliation	Indian Institute of Management Lucknow

Information about the method utilized

Name of Method	Best of 7 Combination Forecast
Type of Method (<i>Statistical, Machine Learning, Combination, Other</i>)	Combination
Short Description (up to 200 words)	I first split each time series into a training and a test set. I then generate a maximum of seven set of forecasts and estimate the MAPE of these forecasts compared with the actuals in the test set. After this step, I select a maximum of 3 top performing forecasting methods for that time series and generate required forecasts after re-training the forecasting models using these selected methods. Final forecasts are a weighted average of the forecasts generated using methods selected in the first step.

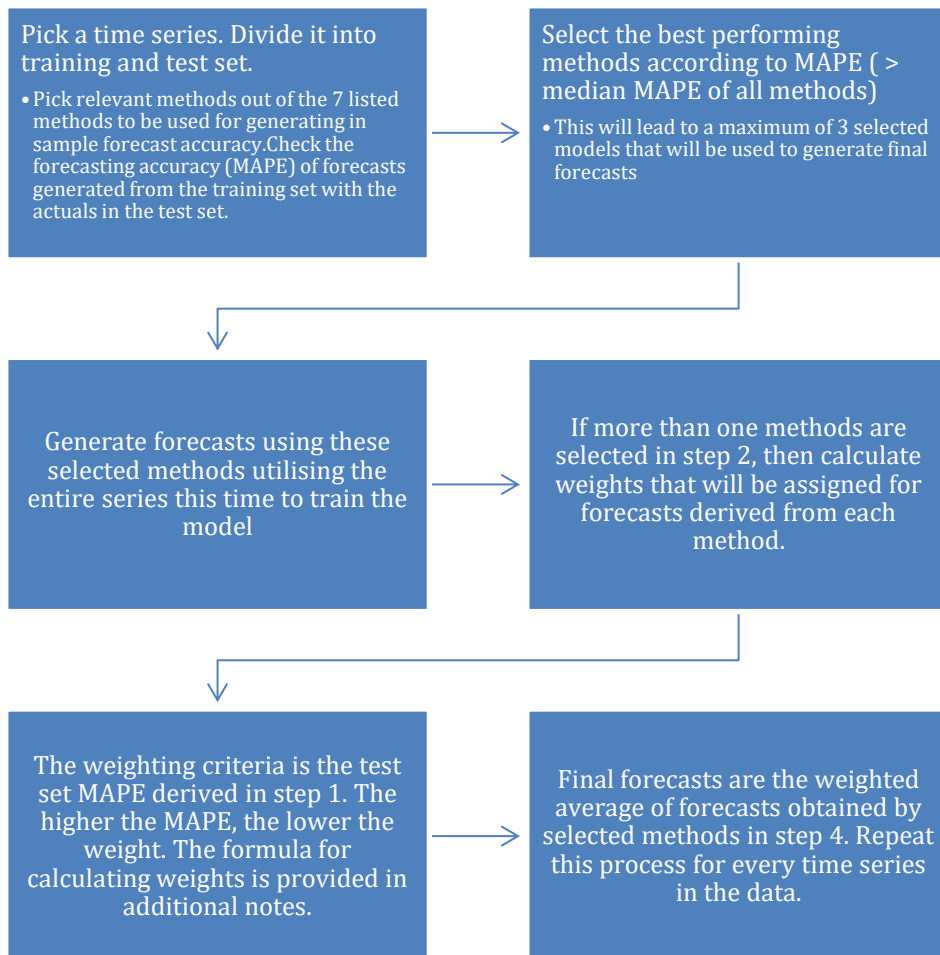
Extended Description:

Seven forecasting methods are used to generate forecasts. Final forecasts is a weighted average of the forecasts obtained using best performing methods. The forecasting methods are :

- Seasonal ets and seasonal arima (using stlm function in R forecast package)
- Feed forward neural network (nnetar in R forecast package)
- Naïve, Seasonal naïve, and random walk using the naive, snaive and rwf functions in the R forecast package

- The theta method applied by using the `thetaf` function of the forecast package.

The flow chart given below documents the forecast generation procedure step-by-step



ADDITIONAL NOTES:

- All seven methods are used to generate initial training set forecasts unless there is a situation where certain methods cannot be applied. The code file contains the details of the selection of methods.
- The fraction of data that is split into training and test set in the first step depends on the frequency of the data set. (80:20 split for yearly, quarterly and monthly and a 90:10 split for remaining frequencies)
- The weights are calculated using the following formula:
For method i , the weight is calculated as:
 1. For methods $i = 1$ to n , subtract the MAPE of that method from the sum of MAPE of all selected methods. Calculate the cube of this number. Call this value the weighted MAPE of method i .
 2. The weight for method i 's forecast is calculated by dividing weighted MAPE of method i by sum of weighted MAPE of all methods.

Weight for method i is numerically shown as:

$$\frac{(\sum_{i=1}^n MAPE_i - MAPE_i)^3}{\sum_{i=1}^n (\sum_{i=1}^n MAPE_i - MAPE_i)^3}$$

Where i denotes the ith method selected and n is the total no of methods selected (either 2 or 3)

