

Exponential Smoothing

Purpose of the Code:

The code aims to perform time series forecasting using various configurations of the Exponential Smoothing method on historical stock price data for different companies. It retrieves stock price data from Yahoo Finance, preprocesses the data, and then applies different Exponential Smoothing models to forecast future prices. The code calculates and evaluates the accuracy of these forecasts using different metrics.

Different Configurations:

Exponential Smoothing is a time series forecasting method that includes variations for different aspects of the time series data, including trend and seasonality. The code tries different configurations for trend and seasonality:

None: This configuration means that neither trend nor seasonality is considered. It's a basic approach that assumes the data is stationary and doesn't exhibit any regular patterns.

add: This configuration considers additive trend and additive seasonality. It assumes that the trend and seasonal components are linear and additive in nature.

mul: This configuration considers additive trend and multiplicative seasonality. It assumes that the trend is linear and the seasonal variations are multiplicative.

MPE, WMPE, MAPE, and WMAPE Values:

These accuracy metrics are calculated to evaluate the performance of the forecasting models. They provide insights into how well the models are able to predict the future values based on the historical data.

Mean Percentage Error (MPE):

MPE measures the average percentage difference between the actual and forecasted values. A positive MPE indicates an overall overestimation, while a negative MPE indicates an overall underestimation. MPE helps understand the overall bias in the forecasts.

Weighted Mean Percentage Error (WMPE):

WMPE accounts for the magnitudes of the errors by considering the weights of the actual values. It's a more robust version of MPE that avoids the problem of cancellations between overestimations and underestimations.

Mean Absolute Percentage Error (MAPE):

MAPE calculates the average absolute percentage difference between the actual and forecasted values. It gives an idea of the magnitude of errors in percentage terms.

Weighted Mean Absolute Percentage Error (WMAPE):

WMAPE, similar to WMPE, takes into account the magnitudes of the errors using weights. It provides a weighted average of absolute percentage differences.

These metrics provide a comprehensive view of how well the forecasting models perform and help in comparing different model configurations. By evaluating these metrics for different companies and model configurations, the code aims to identify the most suitable approach for accurate forecasting of stock prices.

In summary, the code conducts time series forecasting using Exponential Smoothing with various configurations to assess their accuracy in predicting stock prices. It then calculates MPE, WMPE, MAPE, and WMAPE values to quantitatively evaluate and compare the performance of these models.