Time Series Analysis Notes

# Models

## ETS

Exponential Smoothing State Space Model. Captures level, trend, and seasonality components.

## Theta

Combines simple exponential smoothing and linear regression. Effective for forecasting.

## AR model

Autoregressive model. Uses past values to predict future values.

## MA model

Moving Average model. Uses past forecast errors in a regression-like model.

## ARIMA

Autoregressive Integrated Moving Average. Combines AR and MA with differencing to make data stationary.

## SeasonalNaive

Forecasts by repeating the last observed value from the same season.

## WeightedEnsemble

Combines multiple models using weighted average to improve accuracy.

## SARIMA Model

Seasonal ARIMA. Extends ARIMA to support seasonal differencing and seasonal components.

# Metrics

## MAPE

Mean Absolute Percentage Error. Measures prediction accuracy as a percentage.

## SMAPE

Symmetric Mean Absolute Percentage Error. Adjusts MAPE to be symmetric.

## MAE

Mean Absolute Error. Measures average magnitude of errors in predictions.

## RSquared

Coefficient of Determination. Indicates goodness of fit of the model.