Simulating Time Series Data

- Autoregressive(AR) models
- Moving Average(MA) models
- Hierarchical models

why not linear regression for Time series

- Assumes data is iid
- In time series data points are correlated to each other

Linear regression can be used if the following condition holds:-

Assumptions with respect to the behavior of the time series

- The time series has a linear response to its predictors.
- No input variable is constant over time or perfectly correlated with another input variable. This simply extends the traditional linear regression requirement of independent variables to account for the temporal dimension of the data.

Assumptions with respect to the error

- For each point in time, the expected value of the error, given all explanatory variables for all time periods (forward and backward), is 0.
- The error at any given time period is uncorrelated with the inputs at any time period in the past or future. So a plot of the autocorrelation function of the errors will not indicate any pattern.
- Variance of the error is independent of time.
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