Vector Autoregressions

A time series is a sequence of numerical data points in successive order taken on any variable that changes over time. For example, in investing, a time series is used to track the movement of the price of assets. There is no minimum or maximum amount of time that must be included allowing for a large flexibility in how the data can be gathered.

A vector autoregression (VAR) is a multivariate forecasting algorithm which is used when two or more time series influence each other.

A model is said to be autoregressive if it predicts future values based on past values. This leads to the naming of VARs, they are called autoregressive as each variable is modelled as a function of its past values; that is, the predictors are nothing but lags (time delayed value) of the series.

In autoregression models the time series is modelled as a linear combination of it’s own lags. That is, the past values of the series are used to forecast the current and future. A typical autoregression model looks like:

Here is the intercept, and the coefficients are coefficients of the lags of Y till order p. This means that up to p-lags of Y are used. The e is considered white noise.

The difference in a VAR model is that each variable is modelled as a linear combination of past values of itself and the past values of other variables in the system. Since you have multiple time series that influence each ither, it is modeled as a system of equations with one equation per variable. That is, if you have 5 time series that influence each other, we will have a system of 5 equations.

A close up of a logo

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