Forecasting methods cheat sheet

Exponential Smoothing

This is the basic forecast modelling technique where trend and seasonality are taken into account. Depending on the data if it has trend or seasonality three different types of exponential smoothing can be performed: Single exponential smoothing, Double exponential smoothing, and holts winter method. The flow chart to identify the right model is below.
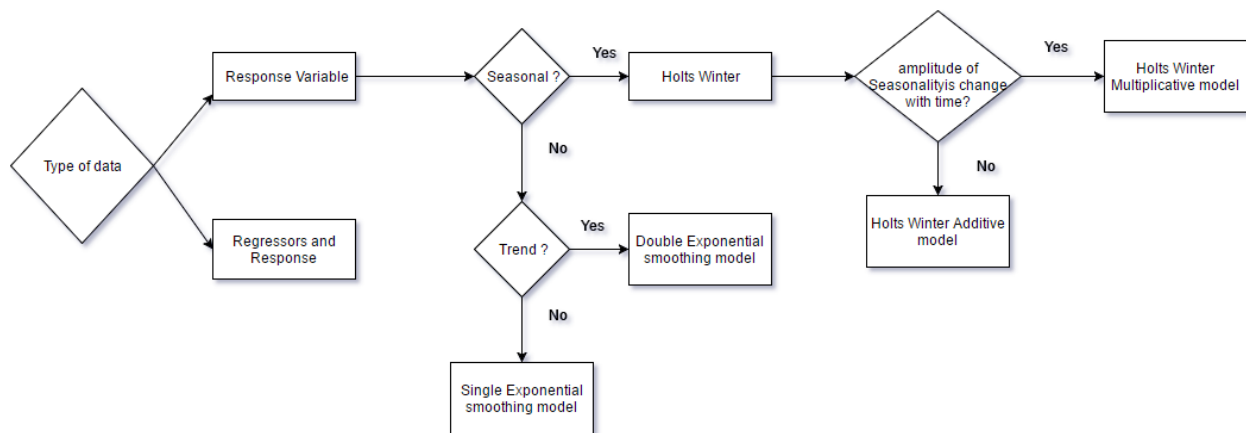

Figure 1 Exponential smoothing

ARIMA

ARIMA models are used when there is correlation in the series. ARIMA models are created by identifying auto-regressive and moving average parts of the series by analyzing its ACF and PACF plot. The flow chart to identify the right parameters below.
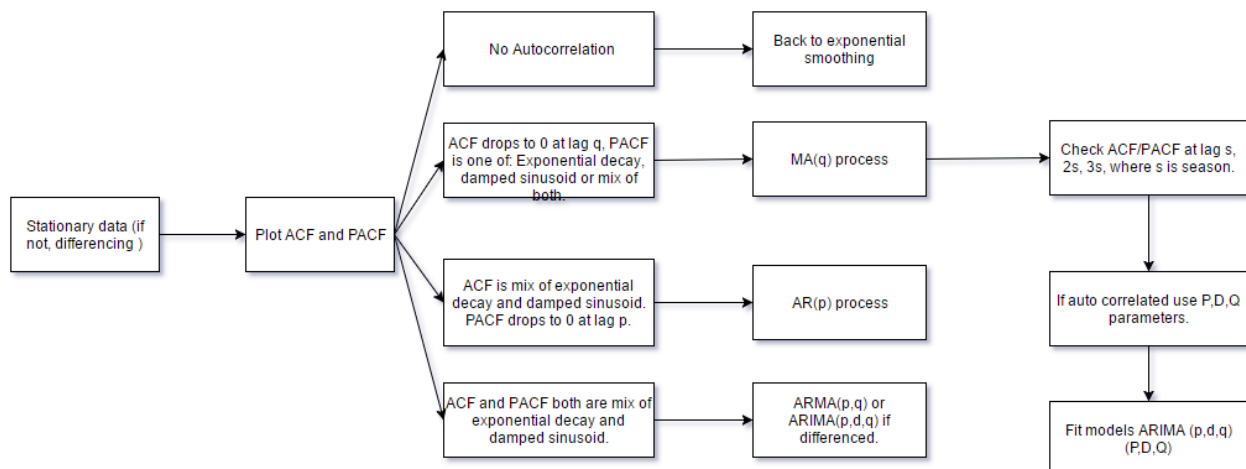

Figure 2 ARIMA flowchart

Dynamic Regression

Most of the time, external variables affect the time series. In these cases dynamic regression can be used. ARIMA has a provision to include external variables as regressors. Flow chart to identify the right model below.
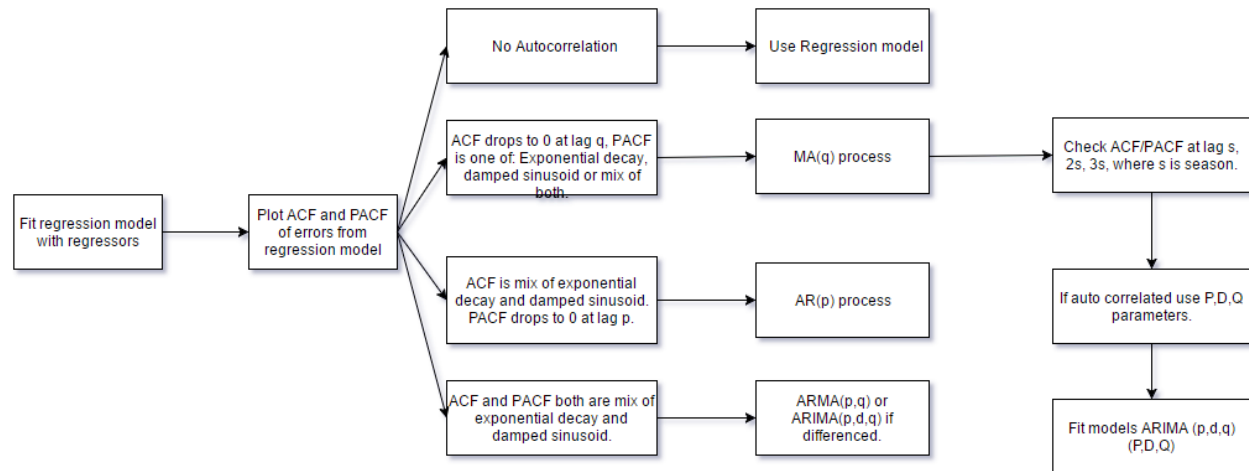

Figure 3 Dynamic Regression flow chart

Neural Nets

Neural networks are blackbox type models. These models can be created with adjusting many parameters. These models are created for any type of data. Flow chart to identify the right model below.
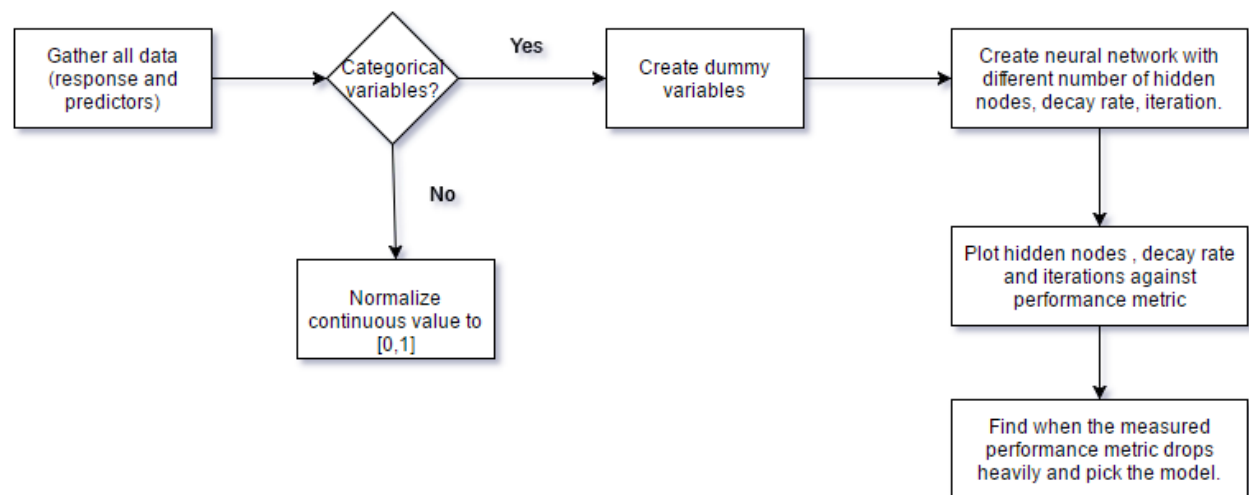

Figure 4 Neural Network flow chart

ARCH/GARCH

ARCH/GARCH models are useful when there is high volatility in the series i.e. variance changes over time. This model is used when dealing with stock market data. Flow chart to identify the right model below.
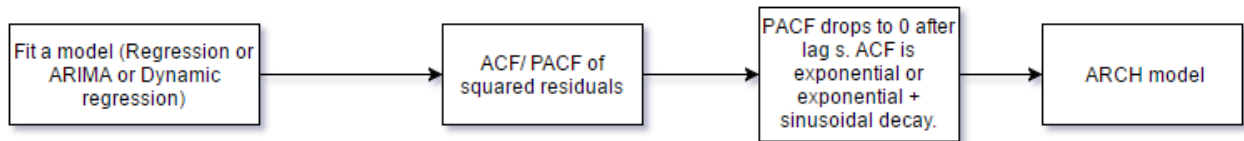

| Fit a model (Regression or ARIMA or Dynamic regression) | → | ACF/ PACF of squared residuals | → | PACF drops to 0 after lag s. ACF is exponential or exponential + sinusoidal decay. | → | ARCH model |

Figure 5 ARCH model