LVC 3 - Glossary of Notation

X = Random Variable

 $X_t = \text{Random Variable at time t}$

h = Lag value

∀ = Indicates "for all"

 $E(X_t)$ = Expected value of Stochastic process X_t

 μ = Mean of Stochastic process is constant value

 t_1 , $t_2 = t_1$ and t_2 are the two different timestamps

 $\Sigma = Summation$

 $R_x(t_1, t_2) = AutoCovariance$

 λ = Window size of the time series (the number of data points which we choose)

N = The total number of samples

 $\hat{\mu}$ = The summation of X values ranging from λ to N-1 divided by the subtraction of total number of samples and λ

 $\tau = t_1 - t_2$, i.e, difference between the past value and the present value

 $\widehat{R}_{X}(\tau)$ = Sample autocovariance for each λ

 $S_t =$ Seasonal Component of the time series

k = Seasonality period

 Y_{t} = Sequence of random variables

 \hat{Y}_t = Time series after applying smoothing (removing the fine-grained variation between time stamps)

 γ_h = The periodic regression coefficient of S_{t+h} in order to remove seasonality from the data

 $w_t =$ White Noise

 σ^2 = Variance

 δ_{t1-t2} = Delta, i.e., change in time

p = The number of past orders to be included in the Auto Regressive (AR) model

 a_{i} = Coefficients of the Auto Regressive model

z = Variable of the polynomial

 \boldsymbol{b}_{i} = Coefficients of the Moving Average model

q = The order of the Moving Average (MA) model

 $X_{t} - X_{t-1} = \text{First Order differencing}$

A(z) = A(z) is a matrix where each row acts as a regressor

|| || = Denotes the norm of a vector