Week2

Friday, October 9, 2020 7:57 PM

Week 2

R library (astsa)

1. The library contains the required data

Stationarity

1. In a (weak) stationary time series, there is no
    a. systematic change in mean (no trend)
    b. systematic change in variance
    c. periodic variations

Autocovariance function

$$\gamma(s,t) = Cov(X_s, X_t) = E[(X\_s - \mu_s)(X_t - \mu_t)]$$

$$\gamma(t,t) = E[(X_t - \mu_t)^2] = Var(X_t) = \sigma_t^2$$

Autocovariance coefficients

$$s_{xy} = \frac{\sum_{t=1}^{N}(x_t - \bar{x})(y_t - \bar{y})}{N-1}$$

Random Walk

$$E[X_t] = E\left[\sum_{i=1}^{t} Z_i\right] = \sum_{i=1}^{t} E[Z_i] = \mu t$$

$$Var[X_t] = Var\left[\sum_{i=1}^{t} Z_i\right] = \sum_{i=1}^{t} Var[Z_i] = \sigma^2 t$$

Simulating MA(2) process

1. How to simulate MA processes in R
2. That ACF of MA(q) cuts off at lag q