ECOM90024
Forecasting in Economics and Business
Tutorial 5

1.) Is the following MA(2) process covariance-stationary?

$$Y_t = (1 + 2.4L + 0.8L^2)\varepsilon_t$$

$$\varepsilon_t \sim_{iid} (0,1)$$

If so, calculate its autocovariances and autocorrelations.

2.) Is the following AR(2) process covariance-stationary?

$$(1 - 1.1L + 0.18L^2)Y_t = \varepsilon_t$$

$$\varepsilon_t \sim_{iid} (0,1)$$

If so, calculate its autocovariances and autocorrelations.

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3.) Given the following AR(2) process,

$$Y_t = 0.6Y_{t-1} - 0.08Y_{t-2} + \varepsilon_t$$

$$\varepsilon_t \sim_{iid} (0,1)$$

Compute the roots of the corresponding lag polynomial and verify that it is indeed a covariance stationary process.

4.) The data file ar2.csv contains 2000 observations that have been simulated from an AR(2) process whose coefficients you do not know.

a.) Using ***R***, compute and plot the sample autocorrelations and partial autocorrelations. Do they accord with the dependence structure of an AR(2) process?

b.) Using your knowledge of the Yule-Walker equations, compute estimates of the AR(2) coefficients.

c.) Using ***R***, verify your computation in part b.) by computing OLS estimates of the AR(2) coefficients.