Revised explanation of the auto and cross correlation plots for the economic example:

On the diagonal, we have the auto-correlation plots for the two time series. Off-diagonal we have the cross-correlation plots. The auto-correlation plots indicate that neither of the two time series is stationary since the auto-correlation decreases slowly with the increase in the lag. The cross-correlation plots are different; recall that in the previous lesson, I mentioned that the lead-lag correlation between any pair of time series is not symmetric; that is it depends on which time series in the pair is the lead and which one is the lag TS. In these plots, the first time series in the title of the sample cross-correlation plots is the lag time series. For example, in the cross-correlation plot in the lower left panel, the interest rate is the lead and the unemployment is the lag time series, that is, this plot presents the estimate cross-correlation for interest rate at time t-k and the unemployment at time t. Note that the lags are provided in reverse order. The last bar in this plot corresponds to the contemporaneous correlation that is correlation of interest rate and unemployment rate both at the same time t. The next to the last bar corresponds to the correlation between interest rate at time t-1 and unemployment at time t and so on. How can we interpret the lead-lag correlation from this plot. The contemporaneous correlation is very small but there is a lead-lag relationship, as the cross-correlation values are large, in fact very slowly increasing as the lag increases, which is an indication that unemployment indeed lags interest rate but over a long period of time. In contrast, if we look at the estimate cross-correlation where the unemployment is the lead time series, we see that the cross-correlation is small, suggesting that the unemployment rate does not lead the interest rate, which is counter the argument of the economic theory of setting interest rate based on the level of unemployment.

Revised explanation of the auto and cross correlation plots for the White Noise Simulation Example:

As expected the auto-correlation plots indicate that the two TS are WN. For the cross-correlation plots, only the one for which the first TS e2 is the lead and the second TS e1 is the lag time series shows one large correlation value at lag 3. This means that there is a large correlation between e1 at t and e2 and t-3; from our simulation, the t-3 e2 is exactly the e1 and hence the large correlation at lag 3. In contrast, the other cross-correlation plot has not large correlations. This is because e1 and e2 are WN processes.

Revised explanation of the auto and cross correlation plots for the Multivariate AR process:

The cross-correlation plots show that X leads Y but Y does not lead X as we see that the cross-correlation for lags 1 to 3 are outside of the confidence band. Indeed, from our simulation model, X lags Y with 2 lags since Y is a function of X\_t-1 and X\_t-2.