

Assignment 6

Problem 1:

Are the following processes stationary?

1. $y_t = -1.9y_{t-1} - 0.88y_{t-2} + u_t$
2. $y_t = u_t + 0.9u_{t-1} + 0.1u_{t-2}$
3. $y_t = 0.7y_{t-1} - 0.1y_{t-2} + u_t$

Problem 2:

Transform the following ARMA process in its AR and in its MA representation. Which conditions have to be fulfilled that this is possible?

$$y_t - 0.2y_{t-1} = u_t + 0.8u_{t-1}$$

and

$$u_t \sim WN(0, \sigma^2)$$

Problem 3:

Use the dataset RANDOM to do the following exercises:

1. Plot the series and the autocorrelation and partial autocorrelations. Is this an AR or an MA process? Which order does this process has?
2. Estimate the parameter of the in point 1 identified process and write down the underlying model for this series.
3. Estimate additionally an MA(10) and an AR(1) process.
4. Calculate the AIC, BIC, MAE and MAPE for the three regression models. Which of these models would you prefer?