Homework Assignment 7

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Problem 3.2. For those processes in Problem 3.1 that are causal.

Solution. From problem 3.1, the following processes are causal:

a. $X_t + 0.2X_{t-1} - 0.48X_{t-2} = Z_t$

b. $X_t + 0.6X_{t-1} = Z_t + 1.2Z_{t-1}$

c. $X_t + 1.8X_{t-1} + 0.81X_{t-2} = Z_t$.

□

Problem 3.4. Compute the ACF and PACF of the AR(2) process

$$X_t = 0.8X_{t-2} + Z_t, \quad \{Z_t\} \sim \mathrm{WN}(0, \sigma^2)$$

Solution. □

Problem 3.6. Show that the two MA(1) processes

$$\begin{aligned} X_t &= Z_t + \theta Z_{t-1}, \quad \{Z_t\} \sim \mathrm{WN}(0, \sigma^2) \\ Y_t &= \widetilde{Z}_t + \theta \widetilde{Z}_{t-1}, \quad \{\widetilde{Z}_t\} \sim \mathrm{WN}(0, \sigma^2) \end{aligned}$$

where $0 \leq |\theta| < 1$, have the same autocovariance functions.

Solution. □

Problem 3.10.

Solution. □