MATH 427- Homework-7-Spring 2023

1 Exercise text book, Shumway and Stoffer

Problem #2.6,

2 Additional Exercises

2.1 Exercise 1 Use R

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(a) Detrend the series Airline Passengers (airpass) from the package "itsmr" by fitting a linear regression of the series on time t. Is there a significant trend in the series? comment.

(b) Plot a sample **acf** of the residuals from part (a) and compare it a sample **acf** of the original series.

(c) Use "*diff(airpass)*" to compute the first difference of the original series. Examine its sample **acf** plot and compare it with the **acf** plot of the residuals in part (b)

2.2 Exercise 2

Show your work in order to earn credit.

Consider the model $x_t = w_t - .3w_{t-1}$

(a) Find its ACVF(Autocovariance function).

(b) Find its ACF (Auto correlation function).

2.3 Exercise 3

Identify the following models as ARMA(p, q) models.

(a) $x_t = 0.5x_{t-1} - 0.7x_{t-2} + w_t - .3w_{t-1}$

(b) $x_t + 0.6x_{t-1} - 0.2x_{t-2} = w_t$

(c) $x_t = w_t + 0.2w_{t-1}$