

STATS 3005 Time Series III
Assignment 4
2018

Assignment 4 is due by 5pm on Friday 5th October 2018.

Assignments are to be submitted in the hand-in box on Level 6, Ingkarni Wardli

1. For each of the following processes, where Z_t is white noise with mean zero and variance σ^2 , express the model using the backward shift operator notation B and determine whether the process is stationary and/or invertible. Express any stationary ARMA processes as a general linear process.

(a) $Y_t = Z_t - \frac{4}{3}Z_{t-1} + \frac{4}{9}Z_{t-2}$

(b) $Y_t = \frac{1}{4}Y_{t-1} + Z_t - \frac{5}{6}Z_{t-1} + \frac{1}{6}Z_{t-2}$

2. For each of the following AR(2) processes with Z_t white noise, write down the Yule-Walker equations and solve for the autocorrelation function ρ_k .

(a) $Y_t = \frac{\sqrt{3}}{2}Y_{t-1} - \frac{1}{4}Y_{t-2} + Z_t$

(b) $Y_t = \frac{8}{5}Y_{t-1} - \frac{16}{25}Y_{t-2} + Z_t$

[Assignment total: 20 marks]