Bent E. Sørensen

ECONOMICS 7344 – MACROECONOMIC THEORY II, Spring 2008

Homework 6. Wednesday February 20. Due Wednesday February 27.

1. Let

$$x_t \ = \alpha_0 \ + \ u_t \ + \ 0.5 * u_{t-1} + u_{t-2} \ ,$$

where u_t is white noise.
Find the auto-covariances for x_t in terms of σ_u^2 (the variance of u_t).

2. (10% of final 2005) Assume that income follows the AR(2) process

$$y_t = 3 + 1.5y_{t-1} + 0.5y_{t-2} + e_t \ \ (*)$$

where e_t is white noise.

What is $E_1 y_3$ if $y_1 = 4$ and $y_0 = 2$? (Note, the time indices are 0, 1, and 3).

3. Given the AR(2) process

$$x_t \ = \ 3 \ + \ \frac{5}{6} * x_{t-1} \ - \ \frac{1}{6} * x_{t-2} \ + \ u_t$$

where $Eu_t^2 = 2$. Is this process stable?
a) Assuming that the process is stationary, find the variance of x_t and the first-order auto-covariance.

b) Now assume that you know $x_0 = 2$ and $x_1 = 0$. Find the expected value of x_2, x_3, and x_4 conditional on x_0 and x_1. Also find the variance of x_2, x_3, and x_4 conditional on x_0 and x_1.