

## Stochastic Processes: Problems

Consider the following AR(2) process

$$x_t = \delta + \alpha_2 x_{t-2} + u_t \quad (1)$$

1. Write (1) as a MA( $\infty$ ) process.
2. Under what conditions is (1) stationary?
3. When (1) is stationary, obtain the true mean.
4. When (1) is stationary, obtain the true variance.
5. What are the conditions for the stationarity of an AR(2) process (where  $\alpha_1 \neq 0$ ).

$$x_t = \delta + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + u_t \quad (2)$$

6. True or False? All MA processes are stationary.
7. When (2) is stationary, obtain the true mean.
8. Will the true mean from (2) equal the sample mean for a given sample of observations generated by (2)?