

Quiz 1

ECON312 Time Series Analysis

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Student _____
first name last name

Grade _____ / 10

Instructions

- The quiz is closed-book.
- No electronic devices are allowed.
- Write your answers in a clear and unambiguous way.

Good luck!

Question 1 (10 pts.)

Consider the following AR(1) model

$$y_t = \phi y_{t-1} + e_t \tag{1}$$

where the error terms are themselves AR(1) processes

$$e_t = \rho e_{t-1} + u_t \qquad u_t \sim IID(0, \sigma^2).$$

with $|\phi| < 1$ and $|\rho| < 1$.

1. Can Eq. (1) be estimated by OLS? Why yes or why not? Explain your answer.
2. If your answer is yes, will the estimators be unbiased and/or consistent? If the answer is no, can you suggest a transformation to make the model estimable? Will the estimators be unbiased and/or consistent in that case?