Economics 706 Prelim
August 2019

Do all questions, providing detail and discussion as appropriate.
WRITE CAREFULLY AND CLEARLY. Good luck!

Suppose that the series y_t follows a univariate I(0) third-order autoregression
with Gaussian innovations. One autoregressive root is real and the other two
are a complex conjugate pair with modulus greater than one.

1. Describe in detail how you would perform and interpret exact time-
   domain MLE using a state-space representation and the Kalman filter
   specialized to the stated data-generating process. How would your
   answer change if the process were I(1)?

2. Describe in detail how you would perform exact Bayesian posterior
   analysis using conjugate priors and a Gibbs sampler specialized to the
   stated data-generating process. How would your answer change if the
   process were I(1)?

3. Compare and contrast the mechanics and merits of the two approaches.
   How would your answer change if the process were I(1)?