Bayes, HW 6, Due March 21

Rob McCulloch

March 21, 2017

1. AR2 for the Lake Data

Get a Bayesian inference for the model

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \epsilon_t, \;\; \epsilon_t \sim N(0, \sigma^2), \text{ iid}$$

Use the conditionally conjugate multivariate normal prior for $\beta = (\beta_0, \beta_1, \beta_2)'$ with $\sigma^2 \sim \frac{\nu\lambda}{\chi^2_\nu}$ independently.

Do we need the AR2 model or is the simple AR1 sufficient?

2. Prediction

Using inference from the previous question get draws from the predictive distibution of the next lake level:

$$p(Y_{T+1}|y_1, y_2, \ldots, y_T).$$

Graphically present your draws.