Introduction to Bayesian Computing

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Robust Regression Modeling

- How to implement regression when you have outliers
- Use t-error regresssion model
- Illustrate Bayesian paradigm
- Inference and Prediction
Modeling Church Worship Data

- Collect weekly church worship counts for a number of years
- Use negative binomial regression model
- Does the model capture the variability in the data?
Multilevel Modeling

- Hypothetical example where you are interested in learning about the waiting time for several coffee shops.
- Illustrates a varying intercept and varying slope model
- Illustrates fake data simulation – helpful in checking if our model fitting methods are working
Software

- General strategy to Bayesian computing
- Write code that defines the posterior density
- Use functions that use the code and some fitting algorithm
- Illustrate using R packages LearnBayes, rjags (interface to JAGS software) and rethinking (interface to Stan software)
Resources

Texts:

- Gelman and Hill (2006), Data Analysis Using Regression and Multilevel/Hierarchical Models
- McElreath, R. (2015), Statistical Rethinking

All R code and output for today’s examples: