Bayesian Statistics

Statistics W640 — Spring 2016

Assignment 3

Reading:

By Friday Feb 26, read Chapters 6–7 of *Bayesian Data Analysis, third edition*; by Gelman et al.

Homework 3:

Problems 1–5 and 8 are due in class on Friday, March 4. Homework can also be submitted to the course mailbox in Room 904 SSW by 6:00pm on Monday, March 7.

1. Chapter 3 Exercise 12. See the homework addendum for tips and suggestions.

2. Chapter 4 Exercise 15.

3. Chapter 5 Exercises 1–2.

4. Fill in the missing details from the development of the hyperprior distribution for the rat tumors example of Section 5.3. In particular,
   (a) show that a uniform density for $\left(\frac{\alpha}{\alpha+\beta}, (\alpha+\beta)^{-1/2}\right)$ is equivalent to the improper density of (5.9); and
   (b) show that the hyperprior density for $\left(\log(\frac{\alpha}{\beta}), \log(\alpha+\beta)\right)$ given in (5.10) follows from the hyperprior $p(\alpha, \beta)$ in (5.9).

5. Chapter 5 Exercise 13. See the homework addendum for tips and suggestions.

6. Chapter 5 Exercise 14, not to be turned in. You might get started now if you have the chance, since this will be problem 1 on Homework 4, due after Spring Break.

7. Chapter 5 Exercise 15, also not to be turned in yet. This will be problem 2 on Homework 4, due after the break.

8. Chapter 5 Exercise 17.