

# Assignment 2

## Reading:

By Mon Sep 15 read Sections 4.1--4.2 and Chapters 5--6 of Bayesian Data Analysis, third edition; by Gelman et al.

Do Chapter 3 Exercise 3 of Gelman et al, but don't turn it in. You can check your solution against the one given on the book's web page, [www.stat.columbia.edu/~gelman/book/](http://www.stat.columbia.edu/~gelman/book/)

## Homework 2: 微信ri sepaper

The following problems from Gelman et al are due in class on Mon October 2. Homework can also be submitted to the course mailbox in Room 904 SSW by 5:00pm on Friday, October 6.

1. Chapter 3 Exercise 4ab. In part (b) you should display a histogram of 1000 random draws from the posterior distribution of the odds ratio, and give an approximate 95% posterior interval.
2. Chapter 3 Exercise 7. In the second model you should assume that  $t = b + v$  is  $\text{Poisson}(\theta_t)$ , and that  $b$  given  $t$  is  $\text{Binomial}(t, p)$ . Demonstrate that the models are equivalent, and show how the parameters are related.
3. Chapter 3 Exercise 11. For part (a) you should display a contour plot of the posterior distribution, a scatterplot of 1000 random draws from the posterior, and a histogram of draws from the posterior of the LD50; and give an approximate 95% posterior interval for the LD50.
4. Chapter 3 Exercise 12(c-h). Set  $t = \text{year} - 1975$ , and use the prior  $p(\alpha, \beta) \propto 1$  for  $\alpha > 0, \beta > -\frac{\alpha}{12}$
5. Chapter 4 Exercise 1, but use the data and model from Exercise 2.11:  $\theta \sim \text{uniform}[0, 100]$  and  $y = (43, 44, 45, 46.5, 47.5)$ .
6. Chapter 4 Exercise 15

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