

Errata for Introduction to Applied Bayesian Statistics and Estimation for  
Social Sciences (first printing)

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1. p. 7. Table 1.1. description of  $\forall$  should read: “Used to summarily refer to all elements in a set.”
2. p. 7. Table 1.1.  $F(x)$  should read  $F(X)$ .
3. p. 13, Eq. 2.6. Middle expression should be  $F(X)$
4. p. 17, Eq. 2.10. Integration limit should be  $S$ , not  $x \in S$ .
5. p. 18., last equation.  $dx$  should be removed after the integral has been taken (right before the  $\int_0^5$  evaluation bar) .
6. p. 18, footnote 2. The footnote should refer to the *variance* and not the mean.
7. p. 22, Eq. 2.16. middle expression should be  $F(X, Y)$ .
8. p. 24. Bottom equations should either contain  $(1/28)$  in the denominator, just outside the integral, or the  $(1/28)$  in the numerators should be removed.
9. p. 33, Eq. 2.29.  $d/2$  should be replaced with  $k/2$ .
10. p. 40, Eq. 2.36.  $\frac{\sum x}{p^2}$  should be preceded by a “-” sign, as in brackets in the next equation.
11. p. 42. The partial derivative of the log-likelihood is taken with respect to  $\sigma$ , but should have been taken wrt  $\sigma^2$
12. p. 45, Exercise 3. Should read “Suppose a sample of 10 students at a major university were given an IQ test which resulted in a mean of 120...”
13. p. 51, end of next to last paragraph. Should say “ $f(data|\theta)$ ” rather than “ $p(data|\theta)$ .”
14. p. 53, first para. in section 3.3. Should say “ $f(data|parameter)$ ” rather than “ $p(data|parameter)$ .”
15. p. 55, left side of equation should be:  $f(K|\alpha = 1, \beta = 1)$ .
16. p. 63, next to last equation. Leading constant should be:  $\frac{1}{\sqrt{\tau^2(\sigma^2)^n}}$  ( $\sigma^2$  should be raised to the  $n^{th}$  power).
17. p. 64, very bottom. The updated variance parameter is 2.94, not 20. As a result, the s.d. is 1.71, not 4.47.
18. p. 66, first equation.  $b$  should replace  $\beta$  in the exponential.
19. p. 90, first equation. There should be a  $dy$  at the end of the integral.
20. p. 94., first line after the equation. The expression should read:  $(1/28)/(6q+8)$  rather than  $(1/28)(6q+8)$ .

21. p. 115. The sentences following the third footnote should be modified as follows:  
 “Thus, if  $b = 0$ ,  $m$  must be equal to .08 in order for the area under the (sampling) density to equal 1. Similarly, if  $b = 5$ ,  $m$  must be -1.92. More generally,  $b = (2 - (s^2 - r^2)m)/2(s - r)$ , (find this) and so, once  $m$  is known,  $b$  is automatically determined.”
22. p. 115. The data set used by the program has 1377 cases, but the vector,  $z$  in the second row, ends at element 1337. This should be changed to  $z[827:1377]=5$ .
23. p. 126., Figure 5.6. The figure caption should read: “Trace plot of  $\rho$  from bivariate normal model...” (figure consists of only one plot).
24. p. 129 Exercise 1. The item should ask to show that  $A^T B A = tr(AA^T B)$ .
25. p. 138, Fig. 6.3. Caption should end with: “(every 10th iteration shown in plot).”
26. p. 151, fifth line in new paragraph. The mean of  $\theta$  from each chain should be  $\theta_i$ , not  $\theta_j$ , given the subsequent notation.
27. p. 156, second line. Should say: “If we generated 10,000...” rather than 1,000.
28. p. 192, second sentence. Should say: “A requirement for using that model is that the outcome variable *conditional on  $x$*  must be continuous and normally distributed.”
29. p. 195, Equation 8.1. The left side of the equation should be:  $L(P|Y)$  and not  $L(P|y)$ .
30. p. 221, Step 4. Should read: “Sample regression coefficients from their conditional distribution:  $\beta \sim N((X'X)^{-1}(X'Y^*), (X'X)^{-1})$ .”
31. p. 224, Fig. 8.10. axis should say “Iteration (in 100s).”
32. p. 237, third line in program should read: `k=matrix(y/n,100000,4,byrow=T)`. (m should be replaced with 100000). This is correct in the zip file on my webpage.
33. p. 242, equations at top of page and next to last equation. The parameters for  $\tau^2$  and  $\sigma^2$  are a and b vs. c and d (respectively) at the top of the page, but are reversed at the bottom.
34. p. 246, last line of the program at the top of page. The filename should be as follows (as in the zip file on my webpage):

`"c:\\internet_examp.out"`

35. p. 308, program. The lines defining `s`, `cs`, `tz`, and `ctz` refer to a parameter `d` that is not defined here. This parameter should be set to 2 in defining `s` and `cs` and can be omitted altogether in defining `tz` and `ctz` (as in the zip file on my webpage).

36. p. 327 Equation A.3. should be:

$$\frac{d \int f(x) dx}{dx} = f(x)$$

37. p. 337. Equation B.1. should be:

$$\bar{x} | \mu_x, \sigma_x, n \stackrel{asy}{\sim} N \left( \mu_x, \frac{\sigma_x}{\sqrt{n}} \right)$$

( $f(\bar{x})$  is the density function, not the distribution).



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