BOOK ERRATA –

Foundational and Applied Statistics for Biologists using R

2nd printing, 1st edition

updated 3/14/2024

Chapter 1

1. Page 19, Q 10. *reductio~~n~~ ad absurdum*

Chapter 2

1. Page 47, Q 31d. Given results in (b~~e~~) and (c~~d~~) ….

Chapter 3

2. Page 70, Example 3.7. Recently, ~~88~~ 120 goats were randomly sampled from the GYE…

2. Pg. 93. The mean of a geometric distribution is $(1 - \pi)/\pi$, not $1/\pi$ (Thanks to Dr. Brian Parker, New York University)

2. Pg. 98, Q. 13.
… for negative binomial dispersion parameter ~~*m*~~ *k* and mean ~~*k*~~ *m*.

3. Pg. 98, Q. 13 part e.
`Lambda.hat <-` ~~`mean(Leaf.obs)`~~ `mean(rep(Mites.per.leaf, Leaf.obs))`

Chapter 4

1. Pg. 144. Q. 8. In the table, *X* should be replaced with *x*.

2. Pg. 146. Q. 30. To the end of the paragraph describing the problem, the following statement should be added: "Assume *J* and *B* are independent."

Chapter 5

1. Pg. 193. Q. 1. To the end of the paragraph describing the problem, the following statement should be added: "Assume *J* and *B* are independent."

2. Pg. 194. Q. 7. To the end of the sentence describing the problem, the following statement should be added: "Assume random variables are independent, and that H_0 is true for (d) and (e)."

Chapter 6

1. Page 216. An error occurs in the worked example for *MSE* and *t**.
The example *currently* reads:

$$t^* = \frac{(0.114 - 0.099) - 0}{0.0171\sqrt{2/34}} = 2.4607$$

It should be changed to read:

$$t^* = \frac{(0.114 - 0.099) - 0}{0.0171\sqrt{3/34}} = 2.4607$$

2. Page 223. She wants to use $\alpha = 0.05$ and 1 - $\beta = 0.8$.
3. Page 223.
   Replace:
   $$n = \frac{(1.645 - 0.842)^2 100}{(-5 - 0)^2} = 24.7$$
   With:
   $$n = \frac{(1.645 + 0.842)^2 100}{(-5 - 0)^2} = 24.7$$

4. Page 223. Given $\alpha = 0.05$. 1 - $\beta = 0.8$,…

5. Page 234.
   In a lower tailed test, the test statistic W^* will also be ~~$W2$~~W_1.

6. Page 241, Question 4. Last sentence in the Question 4 introduction should have the following corrections.
   "With this in mind, I take a random sample of 20 female freshmen honors students and find that the mean height is 61 inches."

7. Page 243, Question 9. By typing `book.`~~`mneu`~~`menu()`

Chapter 7

1. Page 261. …area is ~~{(~~61.59, 94.34~~)}~~
2. Page 281. …~~block~~randomize what you can ~~randomize~~ block what you cannot
3. Page 291. Question 12. A sample represents a 5 km^2 area.
4. Page 291. Question 12b and 12c. Change the order of these questions.
5. Page 291. Question 12d. Replace the symbol $S_{\bar{Y}_{str}}$ with $\hat{\sigma}_{\bar{Y}_{str}}$
6. Page 291. Question 12e. Replace the symbol $S_{\hat{T}}$ with $\hat{\sigma}_{\hat{T}}$

Chapter 8

1. Page 306. Missing right parenthesis in code:

```
with(crab.weight, cor.test(gill.wt, body.wt, method = "pearson"))
```

Chapter 9

1. Page 346. Eq. 9.39. For notational consistency, replace *TSS* with *SSTO* in denominators of ratios. That is, replace:

$$R^2 = 1 - \frac{SSE}{TSS} = \frac{SSR}{TSS}$$

with

$$R^2 = 1 - \frac{SSE}{SSTO} = \frac{SSR}{SSTO}$$

2. Page 347. Eq. 9.40 is incorrect.
Replace:

$$R^2_{adj} = 1 - \frac{SSE}{SSTO} \times \frac{n-1}{n-p}$$

with

$$R^2_{adj} = 1 - \left(\left(1 - \frac{SSR}{SSTO} \right) \left(\frac{n-1}{n-p} \right) \right)$$
$$= 1 - \left(\left(1 - R^2 \right) \left(\frac{n-1}{n-p} \right) \right)$$

3. Page 358. Text above Eq. 9.54. The reciprocal of the denominator of 9.53 is the *k*th VIF. This is
4. Page 358. Text below Eq. 9.53. Note that as R^2_k increases, ~~1/(~~1 - R^2_k~~)~~ approaches 0, …
5. Page 368. Text above Example 9.21. ...then the two-tailed *P*-value is calculated as $2P(T \geq |t^*|)$…
6. Page 389. Eq. 9.86. Use of λ is for log-likelihood is confusing. Replace occurrences of λ with ℓ.
7. Page 392. Last sentence of section 9.20.5.2

The *sensitivity* (i.e. *true positive rate*) is the number of true positives divided by the number of ~~observed~~ true positives and false negatives: 14/15 = 0.93. The *specificity* (i.e., *true negative rate*) is the number of true negatives divided by the number of ~~observed~~ true negatives and false positives: 6/9 = 0.67 (also see Example 2.11).

8. Page 403. 1st sentence of section 9.22. We calculate estimates of parameters for a …
9. Page 417. Question 10.

~~b~~c. Adjust the slider widgets, or simply click *Refresh* repeatedly (> 30 times). Are *MSE* and *MSR* consistently ~~greatly~~ greater than or less than *E*(*MSE*) and *E*(*MSR*). Why?

Chapter 10

1. Page 500. Question 16a. Analyze the data correctly ~~(with block in hybrid as a random effect)~~ using

```
aov.
```

2. Page 500. Question 16c. Reanalyze the data, and repeat the hypothesis tests using `lmer`.

   Define block and hybrid as random effects.

Appendices

1. Page 549, A.4 Set Theory and Probability ~~$P(A) = 1 -$~~ $1 - P(A) = P(A')$