

BOOK ERRATA –

Foundational and Applied Statistics for Biologists using R

2nd printing, 1st edition

updated 4/6/2023

Chapter 1

1. Page 19, Question 10. *reductio ad absurdum*

Chapter 3

1. 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)
... 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 $\alpha = 0.05$. $1 - \beta = 0.8, \dots$

- | 5. Page 234.

| In a lower tailed test, the test statistic W^* will also be $W_2 W_1$.

- | 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.mneumenu()`

Chapter 7

1. Page 261. ...area is ~~{(61.59, 94.34)}~~
2. Page 281. ...~~blockrandomize~~ 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:

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

with

$$\begin{aligned} R_{adj}^2 &= 1 - \left(\left(1 - \frac{SSR}{SSTO} \right) \left(\frac{n-1}{n-p} \right) \right) \\ &= 1 - \left((1-R^2) \left(\frac{n-1}{n-p} \right) \right) \end{aligned}$$

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_k^2 increases, $\frac{1}{1-R_k^2}$ 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.
bc. 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 $P(A) - 1 = 1 - P(A) \equiv P(A')$