

# Corrections and Elucidations (May 13, 2008) – 2<sup>nd</sup> edn (1<sup>st</sup> printing) of Data Analysis and Graphics Using R – An Example-Based Approach

John Maindonald (email: john.maindonald@anu.edu.au) and John Braun

Webpage: <http://www.maths.anu.edu.au/~johnm/r-book.html>.

## Chapter 1

### *p.16, line -6 (ss 1.4.1)*

Replace `subset(Cars93.summary, subset=1:2)`

by

`subset(Cars93.summary, subset=c(TRUE, TRUE, FALSE, FALSE, FALSE, FALSE))`

The `subset` argument requires a logical expression indicating which rows to keep. Rows may not be identified by number.

### *p.33, line -10 (Section 1.8)*

Remove the unwanted `)` from `save.image()`

### *p.39, exercise 6(b) (Section 1.11)*

Replace

“The `log="y"` setting is automatic, after its initial use with `plot()`, for the subsequent use of `text()`.”

by

“The `log="y"` setting carries across to the subsequent `text()` commands. See Subsection 2.1.5 for an example.”

### *p.40, exercise 14 (Section 1.11)*

Replace `census1889` by `census1886`, in each of the three places where it appears.

### *p.42, exercise 20 (Section 1.11)*

Replace this exercise by:

The help page for `iris` (type `help(iris)`) gives code that converts the data in `iris3` (*datasets* package) to case-by-variable format, with column names “Sepal.Length”, “Sepal.Width”, “Petal.Length”, “Petal.Width”, and “Species”. Look up the help pages for the functions that are used, and make sure that you understand them. Then add annotation to the code that explains each step in the computation.

This should be an asterisked question.

## Chapter 2

### *p.48, code segment in final 8 lines (ss 2.1.2)*

line -2: Omit two redundant spaces; make `p` in `plot` is lower case:

```
plot(window(measles, start=1840, end=1882), ylim=c(0, 4600), yaxt="n")
```

### *p.49, footnote 4 (ss 2.1.2)*

In order not to interfere with the plotting of subsequent graphs, the code should be followed by

```
par(fig=c(0,1,0,1))
```

### *p.55, lines -15 to -14 (ss 2.1.5)*

Replace

Labeling is done on the untransformed (Number) scale, with values on the logarithmic scale given in brackets:  
by

Labeling is done on the transformed ( $\log(\text{Number})$ ) scale. The scale to the right of the graph relates  $\log(\text{Number})$  to Number.

**line -6**

Replace `c(2,3)` by `c(3,2)`.

**lines -3 to -1**

Omit `see Subsection 14.3.4. Alternatively,`

Add as the final sentence in the paragraph:

Subsection 14.3.4 describes how to label the  $x$ -axis with dates, in the format Jan95, Apr95,  
...

**p.65, fnote 11 (Section 2.2.2)**

Omit the final two lines of the footnote, i.e., omit

```
# Note that parameter settings were given both in the function call and
# in the list supplied to key. [With auto.key, this is unnecessary.]
```

**p.70, l.14 (Subsection 2.3.1)**

Replace `6.5` by `13.2`.

**p.72, line 14 (ss 2.3.4)**

Replace “use `as`” by “use `are`”.

**p.72, line 16 (Subsection 2.3.4)**

Replace `, discussed briefly in Subsection 2.2.1,`  
by `(see Subsection 2.2.1 and Section 13.2)”`

**p.76, Exercise 7 (Section 2.6)**

Replace `Download and load` by `Install and attach`.

[The package must be installed, which usually involves an initial downloading step. The action of `library()` is better described as attaching, rather than loading, the relevant package.]

**Chapter 4**

**p.105, line 16 (ss 4.1.5)**

Replace “with 3 d.f.” by “with 8 and 3 d.f.”.

**p.106, line -3 (ss 4.1.6)**

Replace `90%` by `95%`.

**p.110, Table 4.2, column “Test statistic” (ss 4.2.1)**

In line 3, omit the vertical bar that appears as the final character in the numerator.

**p.111, line -9 (ss 4.2.1)**

Replace `equal` by `unequal`.

**p.115, lines -10 to -9 ( Section 4.3)**

Replace

```
> chisq.test(table(nsw74psid3$trt, nsw74psid3$nodeg))
> # Specify correct=FALSE
. . . .
X-squared = 12, df = 1, p-value = 0.0004975
```

by

```
> # Specify correct=FALSE for easy comparison with hand calculation
> with(nsw74psid3, chisq.test(trt, nodeg, correct=FALSE))
. . . .
X-squared = 12.9666, df = 1, p-value = 0.0003171
```

**p.121, line 14 (Section 4.4)**

Replace using the `anova()` function, thus:

by

using the `aov()` function to fit the analysis of variance model, then calling the `anova()` function with the resulting `aov` object as argument, thus:

**Chapter 5****p.172 (Section 5.11)**

Exercise 12 should be asterisked.

**Chapter 6****p.189 (ss 6.3.3), line 3**

This should read

“ Figure 6.9B does seem marginally more consistent than Figure 6.9A with the assumption of a linear relationship between predictors. ”

(i.e., interchange A with B)

**p.196, Section 6.5, 2<sup>nd</sup> paragraph**

This should be abbreviated to:

“ The way that data are sampled can likewise affect the coefficients. This section will examine data, sampled in a deliberately biased way, on the effect of book dimensions (thickness, height and width) on book weight. ”

[One dataset only is discussed.]

**p.207 (ss 6.8.1), line 3**

In line 3 of Subsection 6.8.1, replace Such error, ...

with

Discussion will be limited to a relatively simple ‘classical “errors in  $x$ ” model. For this model the error in  $x$ , ...

**p.209 (ss 6.8.1), final paragraph**

Replace Variables that are measured inaccurately ... interpreting results.

with

Again, attention will be limited to the classical “errors in  $x$ ” model. Where one only of several variables is measured inaccurately, its coefficient may on that account not appear statistically significant, or be severely attenuated. For remaining variables (measured without error) possible scenarios include: the coefficient suggests a relationship when there is none, or the coefficient is reversed in sign. Where several variables are measured with error, there is even more room for

misleading and counter-intuitive coefficient values.

*p.211 (ss 6.8.3), Table 6.3, final line*

Replace “14 = 28.5 - 16.5”

by

with

“12 = 28.5 - 16.5”

*p.218 (Section 6.11)*

In “Additional Notes”, there is a further exercise (exercise 12) that illustrates how measurement error in one variable may lead to a spurious effect for a variable that is measured without error.

## Chapter 7

*p.222 (ss 7.1.1), lines -4 to -3*

There are 8 degrees of freedom (not 66) for the residual standard error. These lines should read.

```
> qtuke(p=.95, nmeans=4, df=8) * sem
[1] 20.26
```

*p.236 (ss 7.5.1)*

line 2: “... the first with two knots, and the second with three knots.”

line 10: Replace “Figure 7.7 A” by “Figure 7.7B”.

fnote 4, line 2: Replace

“# panel A: nspline, df=4” by “# panel A: ns(juice,3).”

The line then reads:

```
fruit.lmb4 <- lm(ohms ~ ns(juice,4)) # panel A: ns(juice,3)
```

*p.237 (ss 7.5.1)*

Figure 7.7, caption: Add: The degrees of freedom (‘df’ or ‘degree’) shown are those supplied to ns() or poly(). These must in each case be increased by one to allow for the intercept.

Figure 7.8, caption: Replace “Figure 7.7 A” by “Figure 7.7B”.

*p.237 (ss 7.5.1)*

Figure 7.7, caption: Add: The degrees of freedom (‘df’ or ‘degree’) shown are those supplied to ns() or poly(). These must in each case be increased by one to allow for the intercept.

Figure 7.8, caption: Replace

“Figure 7.7 A” by “Figure 7.7B”.

*p.238, Figure 7.9, caption (ss 7.5.1)*

Replace “B-spline (one knot) fitted in Figure 7.7 A” by “N-spline (three knots) fitted in Figure 7.7B”

## Chapter 8

*p.266 (ss 8.4.2), line3 -3 and -2*

Replace exp(-1.282) by exp(-1.283)

Replace Bank by Lowerside. Omit the final sentence; it adds nothing to what has gone be-

fore.

**p.268 (ss 8.4.2), lines 11-12**

Omit these lines (they repeat lines 9-10), i.e., omit

```
> ANW.glm <- glm(A ~ habitatNW + log(meters), family = quasipoisson,
+               data=moths)
```

**p.282 (ss 8.7.5), line 5**

Omit (or from  $\beta = 0$ ). (The parenthetical comment is superfluous).

**Chapter 10**

**p.302, line 2**

Replace `nline` by `nlme`.

**p.308 (ss 10.1.3)**

In line 13 (“lower” of the ...”), replace `0` by `1`. In line 14, replace `1` by `2`.

**p.309 (ss 10.1.3), line 5:**

Following “In”, insert [hierarchical](#)  
i.e., “In [hierarchical](#) multi-level ...”

**pp. 310, 314 & 343 – output from `mcmcSamp()`:**

Changes to the structure of objects created by `mcmcSamp()` affect code on pages 310 (lower half-page), 314 (lines -16 to -10) and 343 (line 2). The code on page 310 starts with the two lines:

```
> set.seed(41)           # Use to reproduce results below
> ant111b.samp <- mcmcSamp(ant111b.lmer, n=1000)
```

The code in subsequent lines is no longer valid. Instead, attach the `coda` package and use the function `HPDinterval()` to extract Bayesian credible intervals.

```
library(coda)           # Needed with lme4_0.99875-9; this may change
HPDinterval(ant111b.samp, prob=0.95)
```

**p.311 (ss 10.1.3)**

**line 5:** Replace `0` by `3`, `1` by `2`, and `2` by `1`. Thus the sentence becomes:  
“We now have three levels of variation: level `3` is house, level `2` is suburb, and level `1` is city.”

**line 8:** Replace `reflected` by `identified`.

**p.325 (final 2 lines) & p.326 (first 2 lines), ss 10.3.5**

(First paragraph under *Plots of residuals*)

Replace these first 4 lines, i.e.

```
Recall that by default, fitted values adjust for all except random variation between individual vines, i.e., they account for treatment, block and plot effects. For this, set level=2 when calculating fitted values, or the equivalent residuals. Other choices are to calculate fitted values as treatment plus block (level=1) or as treatment effects only ...
```

by

In this hierarchical model there are three levels of variation: level 1 is between blocks, level 2 is between plots, and level 3 is between vines. The function `fitted()` adjusts for all levels of random variation except between individual vines, i.e. fitted values are at level 2.

Because the older `lme()` function (`nlme`) was designed for use with hierarchical models, the `fitted` method for `lme` model objects does accept the parameter `level`, here with a choice of 0, 1 or 2. ...

Thus, the paragraph reads

“In this hierarchical model there are three levels of variation: level 1 is between blocks, level 2 is between plots, and level 3 is between vines. The function `fitted()` adjusts for all levels of random variation except between individual vines, i.e. fitted values are at level 2.

Because the older `lme()` function (*nlme*) was designed for use with hierarchical models, the `fitted` method for `lme` model objects does accept the parameter `level`, here with a choice of 0, 1 or 2. The block *effects* are differences between fitted values at level 1 and fitted values at level 0, while the plot effects are differences between fitted values at level 2 and fitted values at level 1.”

**p.348 (Section 10.10), exercise 1**

Replace the final four lines of code, starting `vcov <- show(VarCorr(kiwishade.lmer))`, with

```
vcov <- VarCorr(kiwishade.lmer)
vars <- c("(block:plot)^2"=as.vector(vcov[["block:plot"]]),
         "sigma^2"=as.vector(attributes(vcov, "sigmaREML")$sc^2))
print(vars)
```

**Chapter 11**

**p.365, line 9 (ss 11.5.1)**

Replace “(=0.832+0.054)” by “(=0.832+0.045)”

**Chapter 12**

**Figure 12.1 (p.377) & Figure 12.3 (p.380), figure legends**

In these figures, females are in gray, and males in black.

**Chapter 14**

**p.426, line -11 (Section 14.2)**

Following “The command”, insert `datafile("bostonc")`

**p.433, lines 7 & 11 (ss 14.3.4)**

Replace “1Jan1990” by “1Jan1995”.

**p.462, Figure 14.2 (ss 14.11.3)**

In the legend in the top left of the plotting area, replace  $y = -1.112x^{2.274}$  by  $y = 0.384 x^{2.274}$ .

**p.463, line -8 (Section 14.12)**

Replace `trellis.settings` by `par.settings`.

**p.464, line 9 (ss 14.3.4)**

Replace `levels (groups)` provides the legends by `the levels of the groups` argument supply the text strings.

**Index of R symbols and functions, pp.485-490**

On page 487, remove “189” from the entries against “identify”.

On page 488, add the index entry

[par.settings](#), 57, 58, 463

On page 489, under `trellis.par.set`, replace 462, 464 by 463.

### ***Index of Terms, pp.491-500***

#### ***p.494***

Replace the heading at the top of column 1, i.e.

distribution (*cont.*)

by

[examples, analyses & analysis issues](#) (*cont.*)

### ***Index of Authors, pp.501-502***

References to pages 43 to 75 (Chapter 2) are mostly, in each case, too large by 1. Thus Aldrich, 64 should be Aldrich, 63.

Add [Box & Jenkins](#), 299; [Chatfield](#), 97; [Hyndman et al](#), 299; [McCullagh & Nelder](#), 283; [Nightingale](#), 76; [Ord et al](#), 299; [Snijders & Bosker](#), 347; [Tukey](#), 43.

### ***Redundant spaces***

Omit redundant spaces as follows:

p.48: `log10(c(1,5000*1000))` (line -7)

[NB also in line -2, omit two redundant spaces & `plot` (not `Plot`)]

p.196 final line: `oddbooks` (not `odd books`)

p.310 midpage: `names(ant111b.samp)`

p.463 : `trellis.par.set()` (line -13); `xyplot` (line -7), following `list` (lines -6, -5 and -4)

p.464 : `help(xyplot)` (line 19), `simpleKey()` (lines 11-12 and 17)

[NB also: “help” should be in typewriter font.]

[The inclusion of a space between a function name and the ( that precedes the argument is contrary to established practice. It does no harm, however.]

### ***Acknowledgement***

We are indebted to Raymond Balise (Stanford University) for a number of these corrections.