

Errata Sheet

General

- When encountering r'_k or r'_k 's throughout the book it should say r_k .

Chapter 1

- Page 15. The eleventh line from bottom (excluding footnote) should say: "The unemployment time series seen in Section 1.2 are monthly, meaning that there..."
- A typo in the original R program `ch1passengersprogram.R` that created the `ts` object for Figures 1.7-1.10 and 1.12-1.15 for the book publication produced incorrect figures. The correct Figures are displayed in Figure 1 below. Notice that although the conclusion regarding seasonality in Section 1.6.5 and 1.6.6 of the book is correct for the corresponding Figures 1.12 and 1.13 displayed in those sections, the right conclusion is the one extracted from the spaghetti plot and seasonal box plot given below: there is more traveling in the Summer months.. The typo in the R program generating those figures is a lesson on the bad consequences of entering the wrong start date in the `ts()` function when dealing with seasonal time series (which is the typo that caused the wrong graphs). The corresponding R programs posted in timeserietime.org have been updated with the correction.

Please, correct the conclusion on pages 30 and 31.

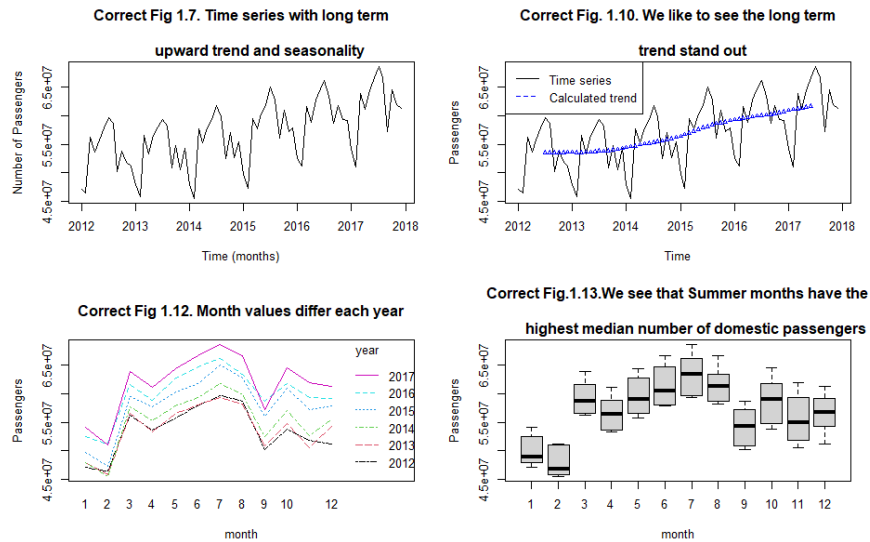


Figure 1

Chapter 2

- Table 2.3, page 78. Replace label "ma4" in column 2 with \hat{T} .
- Page 85. Footnote 3. Replace "seasonal effect" with "seasonal swing."

- Section 2.6.5, Page 97. The smoothing equations should have x_{t-1} replaced by x_t and $\gamma_{2,t-p}$ by $\widehat{\gamma}_{2,t-p}$.
- Section 2.9, Question 2.10. Remove "Select all that applies."
- Section 2.10. Line 15 from top. Should say: "This case study is conducted in Program *lakemead.myprogram.R* instead of Program *myprogram.R*."
- Section 2.10.1, second paragraph, first sentence should say "...a lot, in appearance, like the classical decomposition of a monthly time series."

Chapter 3

- Example 3.1, Page 121, third line from □. Replace "corresponds to t=0" with "corresponds to k=0."
- Section 3.5.2, Example 3.7. Replace "Exercise 3.6" with "Example 3.6."
- Section 3.5.3, page 134 third line from top: replace "lies outside 2" with "lies outside 2 standard errors."
- Section 3.4, page 128. In formula for Q , replace r_k^2 with r_i^2 .
- Example 3.7, page 133. Replace word "Exercise 3.6" with "Example 3.6."
- Page 134, second line from top. Replace "if the t-test statistic lies outside 2" with "if the $|t_{r_k}| > 2$."
- Page 146, second line from the top. Replace LNU04032300 with LNU04032183.

Chapter 4

- Section 4.1, page 162, second paragraph, line 5. Replace "has mean and variance that do not depend on time" with "has mean, variance and covariances that do not depend on time."
- Page 165, after Example 4.5. Should be "In general, differences of order d are defined as

$$\nabla^d x_t = (1 - B)^d x_t = \left[\sum_{k=0}^d \binom{d}{k} 1^k (-B)^{d-k} \right] x_t.$$

- Figure 4.4, page 185. Last sentence should say: " Notice that the colors in this plot **do not** correspond to the colors in Figure 4.5."
- Page 185. Third line from the bottom should say "The reader will notice in the R program that we used the *ymd_hms* function." The last line should say "... **year/month/day hour:minute**" format.

Chapter 5

- Example 5.8, page 213. The 4th line from the top should be: $= \frac{1}{2}E[W_{t-1}^2] - E[\frac{1}{4}W_{t-2}^2]$
- Example 5.11, page 220. Sixth line from top of the example, should say " Y_{t-2} by $Y_{t-3} + W_{t-2}$ "
- Example 5.11, page 220. Replace $Var(Y_{t-k}) = (t+k)\sigma^2$ with $Var(Y_{t-k}) = (t-k)\sigma^2$ and in the formula for ρ_k , where it says $(t+k)$ replace with $(t-k)$.
- Section 5.4.2.1, page 221. In the last line of this section, replace "higher valued r_k with "higher lags."

- Page 223-224. Formula for $Var(Y_t)$ at the bottom is missing terms. Use instead:

$$\begin{aligned} Var(Y_t) &= \gamma_0 = (1 + \alpha_1^2 + \alpha_2^2 + \alpha_3^2)\sigma^2 + 2Cov(Y_{t-1}, Y_{t-2}) + 2Cov(Y_{t-1}, Y_{t-3}) + 2Cov(Y_{t-2}, Y_{t-3}) \\ &= (\alpha_1^2 + \alpha_2^2 + \alpha_3^2)\sigma^2 + 2\gamma_1 + 2\gamma_2 + 2\gamma_3 \end{aligned}$$

which implies that the two formulas at the top of page 224 are incorrect as well. Remove those two equations at the top of page 224.

- Problem 5.3, page 231. The second paragraph should say "four intervals of three numbers each"
- Page 239. Instead of model " $y_t = -0.5049y_{t-1} + w_t$ " it should be model " $y_t = -0.5049w_{t-1} + w_t$ "
- Section 5.12. The program for this case study is COVID-Italy.R.

Chapter 6

- Figure 6.1., page 251. The caption should say that the years are (1890-1978) instead of (1890-1977).
- Exercise 6.12, page 272. The second line should say "January of 1996" instead of just "1996."
- Section 6.5.1, page 278, (a). The second line should say "we use them for the forecasting" instead of "we use them for the x'_{t-k} s."
- Example 6.8, page 284, third line from the bottom, should say: "CI for α_0 " and CI for α_1 instead of referring to CI for ϵ .
- Question 6.7, page 298. The model should have a w_t term, without coefficient.
- Question 6.10, page 299, $\alpha, \hat{\alpha}$ should be $\alpha_1, \hat{\alpha}_1$.
- Question 6.14, page 300. The answer choices are missing the ARIMA(p,d,q)(P, D, Q) expression. Choose based on the forecasting equation.

Chapter 7

- Page 321, second bullet. Replace multinomial with Markov matrix. See comment in Program *ch7Poisson-HMM-estimation.R*
- Section 7.3.3, page 325. To see the correct misclassification table on top of page 325, please simulate the HMM values using the currently posted version of the R program in timeseriessite.org. Program *ch7Poisson-HMM-estimation.R*. When entering the `lambda` vector correctly in R, the results are like what would expect.

Chapter 8

- Example 8.7, page 360. It will be obvious when running the R program *chapter8var1.R* that the eigenvalues displayed in Example 8.7 are not the eigenvalues of the coefficients of the VAR(2). We make a note of that in Program. The eigenvalues shown on page 360 are those of the VAR(3) fitted to the same time series to which we fit VAR(2). *chapter8var1.R*. The eigenvalues of the VAR(2) are: 0.7417732, 0.6329784, 0.3427816, 0.1752156.
- Page 364. The coefficients of the VAR(2) model displayed do not correspond to those obtained in the R program *chapter8var2.R* for VAR(2) for the differenced data. See that program to obtain the right model coefficients and their significance. The model and narrative printed on page 364 and the narrative interpreting it can be considered another example.

- Question 8.3, page 383. The same comment as in Example 8.7.

Chapter 9

- Problem 9.6 is missing the first paragraph. It is:

If initially both the DW and the residual plot indicated autocorrelation, we would be inclined to suggest that the pattern of dependence in the residuals is AR(1). When the pattern of dependence is other than first order, the line plot of residuals against time will still be informative. However, the DW statistics may not yield useful information. The ACF will guide us better in detecting autocorrelation of the residuals.

The description of the dummy variable A_t in the model is, more precisely: 1= quarter one and quarter four (the cooler quarters); 0= quarters 2 and 3, the warmer ones.

- Page 405 Example 9.2. The equation for the model is missing the constant term.
- page 428. Runs test section. Eighth line from the bottom, should say "The deviation of 7.1" instead of "The deviation of 5.1."

Chapter 10

- Page 443, paragraph following "Diagnosing Accuracy", after the line. Replace the paragraph starting with "We will now continue the analysis....." by paragraph: "Exercise 10.3 is about using a Neural Network model for the data in Example 10.1."
- Section 10.4.1, page 444, Exercise 10.3. The exercise is incomplete. To complete it, add this sentence: "Use AutoML with the AEP data set and determine which is the top model in the leaderboard."