This book requires far more corrections than I had anticipated, and for which I am wholly responsible – and very sorry. Please make the following text corrections:

* Page 7, the second paragraph should read:
The above examples involve a single function or data set. In order to introduce another data set with the same abscissa (horizontal axis), just highlight that set, copy it to the clipboard with Ctrl + c, click on the display area of the graph, and paste the data with Ctrl + v.

* Page 11, line 4 from the bottom: the range should be $0 \leq z \leq 1$.

* Page 12, the equation in the caption of figure 1.3.3 should read:

$$z = \frac{1}{2} (1 + \cos(\sqrt{x^2 + y^2}))$$

* Page 14, the equation in the caption of figure 1.4.1 should read:

$$z = \frac{1}{2} (1 + \cos(\sqrt{x^2 + y^2})) / (100 + x^2 + y^2)$$

* Page 14, the text under point (2) should read:

(2) In cell B2 deposit the instruction for the modified Mexican hat,

$$=0.5*(1+\cos(\sqrt{($A2*$A2+B$1*B$1)}) / (100+$A2*$A2+B$1*B$1))$$

and copy this to the area B2:CX102.

* Page 15, the legend to Fig. 1.4.2 should read:

**Fig. 1.4.2:** The result of Mapper after point (3) of exercise 1.4.1, with superimposed (white) text, and with a (white) arrow from the drawing toolbar.

* Page 16, Exercise 1.5.1, point (1) should read:

(1) Open a spreadsheet, enter the number 0 in cells A1 and B1, and enter the number 10 in A2.

* Page 34, Exercise 1.12.1, point (18) should read:

(18) In cell G20 calculate the quantity $(C_aV_a-C_bV_b)/(2(V_a+V_b))$ as $=($B$16*$B$14-$B$15*E20)/(2*($B14+E20))$.

* Page 34, Exercise 1.12.1, point (22) should have: $[H^+]$ as $=10^{-F_{20}}$, and point (23): $[OH^-]$ as $=$B$13/J20

* Page 35, Exercise 1.12.1, point (26) line 5: please replace $D'$ by $\Delta'$.

* Page 35, Exercise 1.12.1, points (28) through (30) should read:

(28) We now make the transition to practical data analysis. In cell D13 deposit the label $\text{offset}=$, in cell D14 the label $\text{na}=$, and in cell P18 the heading “noise”.

(29) In cells E13 and E14 enter corresponding values ($0$ for zero offset or noise, $0.05$ for offset or noise of $0.05$ pH units, etc.), and in P20:P49 deposit Gaussian (“normal”) noise of zero mean and unit standard deviation, using **Tools ⇒ Data Analysis ⇒ Random Number Generation**, **Distribution**: Normal, **Mean** = 0, **Standard Deviation** = 1, **Output Range**: P20:P49, OK.
(30) To the instruction in cell F20 now add the terms \( +\$E$13+\$E$14*\(P_{20}\), and copy this down to F49. Now experiment with non-zero values of either offset or noise.

* Pages 38/39: the last paragraph on page 38 should start as follows:
Matrix inversion and matrix multiplication work only on data arrays, i.e.,
on rectangular blocks of cells, but not on single cells. To enter these instructions,
highlight the area where you want to place the result, type the instruction, and
enter it with Ctrl+Shift+Enter (Mac: Command+Return). In the formula box, …

* Page 47: the text in cell A23 of Fig. 1.15.1 should read eq.(1.15.1).

* Page 64, Exercise 2.6.1 under (1), the last two sentences should read:
If you bypass step 2 of the Chart Wizard, you will obtain a graph of \(x\) versus \(y\). In that case, first exchange the positions of the \(x\)- and \(y\)-columns.

* Page 74: the value of \(x_{av}\) in cell D2 of Fig. 2.10.1 should read 52.6.

* Page 76, line 3 from the bottom: \(V_d = V (P_b - P_w) / P_b\)

* Page 78, Fig. 2.11.1: the ordinate in the graph should be labeled \(V\) or \(V_d\).

* Page 85, line 3: \(= (\alpha_0/\alpha_1 - V_{av}) \times\)

* Page 85, Fig. 2.13.1: cell A13: \(V_{av} = \)
\(B13 = AVERAGE(A19:A24), C19 = A19-B13.\)

* Page 85, Fig. 2.13.1 and page 85 Fig. 2.13.2:
cell E13 should read 0.2764, and cell E14 0.00786.

* Page 105, lines 2 and 6: please replace Values by Transpose.

* Page 121, point (7): the last line should appear above Fig. 3.11.1.

* Page 123, Fig. 3.12.1: The data in columns D and E should show decimals.

* Page 129: please add to point (7): Calculate \(x_u\) with the equation shown above.

* Page 143, line 2 from the bottom: please add “see Exercise 2.12.1,”

* Page 165, line 9 from the bottom: please delete “see Fig. 3.14.1.”

* Page 165, exercise 4.2.1, under (4): the equation should read
\(U(r) = a + 4a\{b/r\}^{12} - (b/r)^6\)

* Page 169, exercise 4.2.1, (8) should read:
(8) One can also use linear least squares to fit the data to a Lennard-Jones function,
using \(U(r) = a_0 + a_1 \times (1/r^6) + a_2 \times (1/r^{12})\). When the data are so analyzed, (with LinEst, Regression, or LS1) we obtain
\(U(r) = (1.237\pm0.016)\times10^4 - (7.16\pm0.16)\times10^4 \times (1/r^6) +
(1.028\pm0.023)\times10^{33} \times (1/r^{12})^2\), from which we find \(a = 1.237\pm0.016)\times10^4, b =
(-a_2/a_1)^{1/6} = 229.1\pm0.16, and \(r_{eq} = b^2\times2\^{1/6} = 257.2\pm0.18\) pm, in full agreement with
the results for the Lennard-Jones fit using Solver and SolverAid. (You would find
\(b = 229\pm0.12\) and \(r_{eq} = b^2\times2\^{1/6} = 257.2\pm0.14\) pm by erroneously using the standard de-
viations \(s_1\) and \(s_2\) instead of the covariance matrix in Propagation.)
Page 178, exercise 4.4.1 under (6), the instruction should read:
=\frac{A_{21}}{\sqrt{\sqrt{10}}}

Page 179, legend to Fig. 4.4.1, please add the following sentence:
Note that these g-values are not unique: other combinations, such as \( g_H \approx 384, g_K \approx 94, g_{\text{ClO}_4} \approx 384, g_H \approx 131, g_{\text{Ac}} \approx 12.5, \) and \( g_{\text{OH}} \approx 173, \) yield an equally satisfactory fit.

Page 180, at the end of section 4.4, please add:
, for several different combinations of g-values.

Page 183, exercise 4.6.1 under (5), the instruction should read:
The instruction in cell C21 of Fig. 4.6.1 might then read …

Page 184, exercise 4.6.1, under (6), the instruction in cell D21 should read:
=\exp\left(-1\times\left(\frac{A_{21}-\text{E$\$15}}{\text{F$\$15}}\right)^2\right) + \exp\left(-1\times\left(\frac{A_{21}-\text{E$\$16}}{\text{F$\$16}}\right)^2\right)

Page 184, exercise 4.6.1, under (10), the instruction should read:
=\text{SUMSQ(E21:E1020)}

Page 185, bottom line: … or 1.195, where …

Page 197, Fig. 4.10.1: the data in row 30 should be shown in italics

Page 205, the last line of the first paragraph should read: extrapolation.

Page 207, Exercise 4.16.1, under point (1): please read exercise 2.11.1, and Fig. 2.11.1. The latter also applies to point (2) on p. 208.

Page 208, Fig. 4.16.1, comment: You may again find slightly (though not significantly) different answers depending on whether you start from the data in Table 2.11 or from the \( V_d \) values shown in Fig. 4.16.1 to \pm 0.01.

Page 217, exercise 4.19.1: In (2), please replace \( \sqrt{10} \) by a factor of \( 10^{0.1} \).

Page 218, the instruction in (4) should read: \( =\text{SUM}() \) rather than \( =\text{SUMSQ}() \).

Page 219, the legend to Fig. 4.19.2 should read:
**Fig. 4.19.2:** The result after Solver has adjusted the parameter values, and SolverAid has determined the associated uncertainties. For the data shown in Fig. 4.19.1 this results in \( R_s = 0.965 \pm 0.04_6, R_p = 10.07 \pm 0.06_2, \) and \( C = 0.0981 \pm 0.0016, \) with \( SSR = 3.077 \) and a standard deviation of the fit of 0.197. Note that Solver cannot accommodate two adjacent columns for \( Y_{\text{calc}} \), so that E22:E62 must first be cut and pasted to E63:E103 before SolverAid is used. SolverAid also yields the corresponding covariance matrix and linear correlation coefficients (not shown) which, in this case, exhibits only weak mutual dependencies between the adjusted parameters.

Page 220: The second line of the legend to Fig. 4.20.1 should be moved up.

Page 221, the bottom two lines should read:
Assume that \( pK_{a1} = 6, pK_{a2} = 10, \) set \( pK_w = 14, \) and from these cal-
calculate $K_{a1} = 10^p_Ka_{a1}$ and $K_{a2} = 10^p_Ka_{a2}$. It is the $pK_a$ values

* Page 235, Exercise 5.2.1, under (4), the instruction should read:
  
  \[=E\!21+2*(E\!22*C0S(2*PI())*D\!22*G30)+E\!23*C0S(2*PI())*D\!23*G30)+...+E\!28*C0S(2*PI())*D\!28*G30)\]

  * Page 240, Exercise 5.3.1, under (1): the figure meant is Fig. 5.1.1
  
  * Page 242, line 7 from the top: more than twice per period.
  
  * Page 242, line 4 from the bottom: Leakage often occurs when ...
  
  * Page 250, legend to Fig. 5.6.3: $a = -117, -92, -22, 23,$ and 108 respectively.
  
  * Page 262, Exercise 5.8.1, point (3) line 1: ... i.e., 32 times as long.

  * Page 262, the two bottom paragraphs should read:

    By using least squares, say from $t = -0.6875$ to $-0.125$, to fit the top ten interpolated data to a parabola $y = a_0 + a_1x + a_2x^2$, and then computing the maximum as $x_{\text{max}} = -a_1/(2a_2)$, we find $x_{\text{max}} = -0.3998 \pm 0.0001$ and $y_{\text{max}} = 0.69991 \pm 0.00001$, quite close to the correct values of $x_{\text{max}} = -0.4$ and $y_{\text{max}} = 0.7$.

    However, when the function is asymmetric, the above method can lead to systematic distortion. For the function $y = 1/\{\text{exp}[-0.5(x+0.1)]\text{exp}[4(x+0.1)]\}$ we find $x_{\text{max}} = -0.843 \pm 0.001$ and $y_{\text{max}} = 0.6346 \pm 0.0002$, whereas the correct values are $x_{\text{max}} = -0.5621$ and $y_{\text{max}} = 0.70551$, see Figs. 5.8.3 and 5.8.4. The interpolated function does go through the data points, but doesn’t fit the function. Note that, in this case, the differences in $x_{\text{max}}$ and $y_{\text{max}}$ far exceed their standard deviations, illustrating the danger of interpreting the standard deviation as a measure of accuracy.

  * Page 263, exercise 5.8.1, point (6) line 2: $y = 1/\{\text{exp}[-0.5(x+0.1)]\text{exp}[4(x+0.1)]\}$

    Please also use that same expression for $y$ in the legends for Figs. 5.8.3 and 5.8.4 on page 264.

  * Page 286, exercise 6.2.1, point (7): ... and its convolution D17:D216 vs. A17:A216.
  
  * Page 289, exercise 6.2.3, point (1) lines 3 and 4: ... in cells F2: F16. Also place ...
  
  * Page 292, line 1: ... in cell J17, place the instruction ...
  
  * Page 292, point (7) should read:

    (7) The expression for deconvolution is slightly different from that for convolution. In cell K37 (to take a place equivalent to that of cell D37 in exercise 6.1.1) deposit the instruction


    and in cell L37 place $=K37*$K$13$. Copy these instructions all the way down to row 137.

  * Page 292, point (8) should read: (8) Plot L17:L137 vs. H17:H137. You have now unfiltered the original signal, as illustrated in Fig. 6.1.1.

  * Page 343, line 3 should read:
so that the instruction in, e.g., cell B8 might read \(=B1*EXP(-D1*A8)\).

* Page 343, Exercise 7.1.1, point (7): the instruction should read \(=B8+G1*N8\)

* Page 344, point (11) line 2 should read: … adjustable parameters in K1:K3 with …

* Page 347, line 12 should read: … in (7.1.6) through (7.1.8) …

* Page 348, Exercise 7.2.1, point (3) should read:
  The improvement in Fig. 7.2.1 over the results shown in Fig. 7.1.4 is immediate and dramatic: for the same step size \((\Delta t = 0.1)\) the errors are now more than an order of magnitude lower.

* Page 350, Exercise 7.3.1, point (1) should read: … corresponding values in B1:B3.

* Page 362, Exercise 7.6.1, point (2) should read: Name the cells containing these parameters…

* Page 366, line 4 from the bottom should read: … with (7.6.4) and (7.6.5), so that ...

* Page 383, in Sub Root3(), line 3 should read:
  \[\text{Dim Array3 As Variant}\]

* Page 384, in Sub Root3() line 11: please place brackets around 1/3
  so that it will read \(\text{Array3}(r, c) = \text{Array3}(r, c) ^ {1/3}\)

* Page 392, line 6 from bottom should read: … and only one real root in the …

* Page 393, in Sub RootFinder, the statements involving Xres, SpareFormulaArray, and SpareValueArray should be deleted, as in the SampleMacros.

* Page 394, line 2 from bottom: please change optical into optimal

* Page 406: in the code section under ' Specify a graph title in the middle of the page, add a line so that the first three lines will read
  \[\text{ch.Chart.HasTitle = True}\]
  \[\text{With ch.Chart.ChartTitle}\]
  \[\text{.Caption = "Sample Chart #1"}\]

Thanks to all readers who kindly informed me of typos and inaccuracies in this first edition, especially to Prof. Panos Nikitas for finding so many of them.

If you find additional errors, please contact me at rdelevie@bowdoin.edu so that they can be shared in this file and, if they affect the MacroBundle, can be corrected there. Use that same e-mail address also for your questions and comments.