Misprints, corrections and extensions

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- Preface, page ix, line 7
  it served as seed for the this book → it served as a seed for this book

- page 3, line 4 from bottom
  full stop after performed by the linker

- page 12, section head 1.1.2
  Arithmetric → Arithmetic

- page 13, line 6
  reminder → remainder

- page 13, line 18
  in () brackets left of a constant, variable or expression in brackets, e.g., in → in () brackets left of a constant, variable or expression, e.g., in

- page 13, line 22
  addressB will point 4 bytes ahead of addressA → addressB will point 4 bytes behind addressA

- page 15, third table
  a|b → a^b
  last paragraph: there seem to be two too large spaces (after shift and before seq)

- page 16, mathtest.c, line 9
  should read
  printf("%f %f %f %f\n", pow(M_E, 1.5), exp(1.5), log(1.0), log(M_E));
• page 17, footnote
  full stop is missing

• page 19, line 12
  counter == n_max → counter != n_max
  ( !=x should be in the same typeface as counter and n_max)

• page 23: line 9
  one could write counter + 1;
  →
  one could write counter + 1.

• page 27, line 2 from bottom
  no full stop after via

• page 32, line 8 from bottom
  prupose → purpose

• page 37, line 10
  In this case, where the function prototype is contained in a header file,
  the function prototype must be preceded by the key word, external...
  →
  In this case, where the function is not contained in the header file, the
  function prototype should be preceded by the key word external, ...

• page 44, line 12
  variable1 → number1

• page 78, exercise (4)
  via the rectangle rule → via the trapezoid rule

• page 217, in lin_eq.c
  #include <gsl/gsl_linalg.h>
  is missing

• page 231, in Def. 7.9
  $p_X(x) = \ldots (1 - p)^{(n-k)} \rightarrow p_X(x) = \ldots (1 - p)^{(n-x)}$

• page 232, below Eq. (7.27)
  $\sum i \frac{\mu_i}{\tau_i} \rightarrow \sum k \frac{\mu_k}{\tau}$

• page 234, Eq. (7.33)
  $\int_{-\infty}^{\infty} (x - E[X])^2 p_X(x) \rightarrow \int_{-\infty}^{\infty} dx (x - E[X])^2 p_X(x)$
• page 234, Def. 7.34
\[ F(x_{\text{med}}) \rightarrow F_X(x_{\text{med}}) \]

• page 234, Def. 7.15, Eq. (7.35)
should read
\[ p_X(x) = \begin{cases} 0 & x < a \\ \frac{1}{b-a} & a \leq x < b \\ 0 & x \geq b \end{cases} \]

• page 236, Def. 7.17, Eq. (7.39)
\[ p_X(x) = \frac{1}{\mu} \exp \left( -\frac{x}{\mu} \right) \rightarrow p_X(x) = \begin{cases} 0 & x < 0 \\ \frac{1}{\mu} \exp \left( -\frac{x}{\mu} \right) & x \geq 0 \end{cases} \]

• page 237, Def. 7.19
with real-valued parameters \( \lambda > 0, x_0 \)
\[ \rightarrow \text{with real-valued parameter } \lambda > 0 \]

• page 238

add after
\[ X = \lim_{n \to \infty} \max \{ X^{(1)}, X^{(2)}, \ldots, X^{(n)} \} \]
The Gumbel distribution arises by normalizing \( X \) to variance 1 and having the maximum probability at \( x = 0 \).
correspondingly, in the next sentence:
such that they have zero mean \[ \rightarrow \text{such that the maximum is at } x = 0 \]

• page 245, line 8
\[ (a = c = 11) \rightarrow (a = 25214903917, c = 11) \]

• page 245, line 3 of Sec. 7.2.2
\[ p_X(x_i) \rightarrow p_i = p_X(x_i) \]

• page 245, line 7 of Sec. 7.2.2
such that the sum \( s_j \equiv \sum_{i=1}^{j} p_X(x_i) \) of the probabilities is larger than \( u \), but \( s_{j-1} \equiv \sum_{i=1}^{j-1} p_X(x_i) < u \).
\[ \rightarrow \text{such that for the sum } s_j \equiv \sum_{i=1}^{j} p_i \text{ of the probabilities the condition } s_j - 1 < u \leq s_j \text{ holds}. \]
For example, consider a discrete random variable with \( p_1 = \frac{1}{8}, p_2 = \frac{1}{4}, p_3 = \frac{1}{2} \) and \( p_4 = \frac{1}{8} \). Using this approach, e.g., if the random number is contained in the interval \([1/8, 3/8]\), the second outcome will be selected, see Fig.

**Fig. X:** A discrete distribution with four outcomes with probabilities \( p_1 = \frac{1}{8}, p_2 = \frac{1}{4}, p_3 = \frac{1}{2} \) and \( p_4 = \frac{1}{8} \). The probabilities are represented in the interval \([0, 1]\) by sub-intervals which have lengths equal to the probabilities, respectively. This allows to draw random numbers according to the distribution.

- page 255, in Def. 7.23
  \[ u = u_\alpha(x_0, x_1, \ldots, x_{n-1}) \rightarrow u_\alpha = u_\alpha(x_0, x_1, \ldots, x_{n-1}) \]

- page 257, line 4 (in calculation \( 1 - \alpha \))
  \[ P(-\bar{X} - z\sigma_X \leq -\mu \leq -\bar{X} + z\sigma_X) \]
  \[ \rightarrow \]
  \[ P(-\bar{X} - z\sigma_X \leq -\mu \leq -\bar{X} + z\sigma_X) \]

- page 258, last paragraph of 7.3.2
  \[ y_i = (x_i - \bar{x}) \rightarrow y_i = (x_i - \bar{x})^2 \]

- page 262, second item
  over some some distance \rightarrow over some distance

- page 264, Eq. (7.66)
  should read
  \[ F_{H^*}(h_n) = F_{H^*}(h_i) = 1 - \frac{\alpha}{2}. \] (1)

- page 265, line 7
  After the sentence ending in \( \alpha = 0.32 \) uncertainty add
  The quantity corresponding to the standard error bar is \( \sqrt{\text{Var}[H]} \).

- page 267, line 11
  knwoledge \rightarrow knowledge
whether or

In case the two sample sizes are different, e.g., \( n \) and \( \hat{n} \), respectively, Eq. (7.69) must be changed to [1]

\[
\chi^2 = \frac{1}{n\hat{n}} \sum_k (\hat{n}_k - n\hat{h}_k)^2 \frac{1}{h_k + \hat{h}_k}
\]

for example

The “error bars” are calculated incorrectly in case the data points come with error bars and these are included in the fit, e.g., when doing

\( \text{fit f(x) } "\text{sg_e0_L.dat}" \text{ using 1:2:3 via e,a,b} \). In this case one has to divide the given Asymptotic Standard Error by the \((\text{stdfit})\) value.

Instead of using the given C program, one can calculate \( Q \) directly inside \text{gnuplot}:

\[
\text{ndf} = \text{FIT_NDF} \\
\text{chisq} = \text{FIT_STDFIT}^2 \times \text{ndf} \\
Q = 1 - \text{igamma}(0.5 \times \text{ndf}, 0.5 \times \text{chisq})
\]

(also in the corresponding boxes for \text{init_poisson()}, \text{rand_fisher_tippett()}, \text{variance()} and \text{bootstrap_ci()} on pages 316–318)

/** PARAMETERS: (*)= return-parameter **/

/** PARAMETERS: (*)= return-parameter **/

/** p(k)=mu^k*exp(-mu)/k! **/

/** p(k)=mu^-k*exp(-mu)/x! **/

/** p(k)=mu^-k*exp(-mu)/k! **/
• page 318, end of exercise (3), line below formula for $s^2$
  rounding errors → rounding errors

• page 319, 1st line
  cc -o bt bootstrap_test.c bootstrap_ci.c mean.c -lm -DSOLUTION
  →
  cc -o bt bootstrap_test.c bootstrap_ci.c mean.c variance.c -lm -DSOLUTION

• page 320, exercise (6), 1st line after function prototype
  Hints: Use the function → Hints: Use the function

References