Typos in Probability: Theory and Examples, 4th Edition

Contributions from Nate Eldredge, J.C. Li, Carl Mueller, Sebastien Roch, Byron Schmuland, Antonio Sodre

Page numbers are those of the printed book.

Chapter 1

Page 2, proof of (ii) in Theorem 1.1.1. Two errors:
$B_n = A'_n - \cup_{m=1}^{n-1} A'_m$ (no ^{c})
Actually we are using part (ii) the definition of measure: countable additivity.

Page 3, Theorem 1.1.2. the first $\mu((a,b])$ is missing a (.

Page 6, definition of F third line: if $x_2 \geq 1$ and $0 \leq x_1 < 1$. (not $0 \leq x_1 < 1$).

Page 18. Proof of Lemma 1.4.2. φ becomes ϕ in proof. This happens a number of the times in the chapter. All the ϕ have now been changed to φ.

Chapter 2.

Page 49. Two lines after (2.1.1): $e^{-\lambda}$ should be $e^{-\lambda x}$

Page 49. Proof of 2.1.12. Middle of page 49. When we multiply by e^{-x} we integrate it as it is.

Page 49. End of proof of Theorem 2.1.12. Inside integral should be $\int_y^\infty$.

Page 58, near the end of the proof of Lemma 2.2.5. $n - j + 1 \to n - k + 1$ twice.

Page 58, last line. This equation should be marked as (*)

Page 61, middle. Improvement suggested by Carl Mueller. Let $g_n(y) = g(ny)$. Since g_n is bounded and $\to 0$ a.s., we have $(1/n)\int_0^n g(y)\,dy = \int_0^1 g_n(x)\,dx \to 0$.

Page 61, Remark after Theorem 2.2.9. “so the assumption in **Theorem 2.2.7** is not”

Page 64, Exercise 2.2.8. (5.5) should be Theorem 2.2.6.

Page 69, line 4 of Example 2.3.2. athlete (sp)

Page 74, line 1 of the proof of Lemma 2.4.4. We being $\to$ We begin

Page 75, line 2 of the proof of Theorem 2.4.5. $S_i^M \to S_n^M$

Chapter 3

Page 102, second line of proof of Theorem 3.2.4. $f(g(Y_\infty))$ is missing one). The same error appears two lines later.

Page 102, part (iv) of Theorem 3.2.5. For all **Borel** sets A

Page 104, line -2. (sp) distribution.

Page 107, line 1. (sp) charateristic

Page 139, proof of Berry Esseen theorem. [ERROR] Two people, Christophe Leurida and Lutz Mattner, have independently pointed out that in my proof Lemma 3.4.11 is applied to distributions F_L and G_L that do not have finite mean. I am told that the proof in Feller volume II, which I copied from, does not have this mistake.

Page 150. (3.6.1) No 2. Total variation distance is defined as 1/2 the L^1 norm.

Page 158. (3.7.1) i not 1 in subscript $P(X_i > x) = P(X_i < -x) = x^{-\alpha}/2$ for $x \geq 1$

Chapter 4

Page 184, proof of (4.1.1). This is not said correctly "Applying Theorem 4.1.3 to $N = T_{n-1}$, we see that conditional on $T_{n-1} < \infty$, $T(\theta^{T_{n-1}}) < \infty$ has the same probability as $T < \infty$, so

Page 188, proof of Theorem 4.1.6. $\sum_{k=m+1}^{n} P(T \geq k)$ not $P(T \geq n)$.

Page 201, Green's function constant is 1.516386059152... The one in the book ends with 137

Chapter 5

Page 225. Example 5.1.5. φ becomes ϕ in the proof.

Page 226. Theorem 5.1.2. Need to assume in (a) and (b) that $E|X|$, $E|Y| < \infty$.

Page 228. Proof of Theorem 5.1.5. Missing) in $\int_A E(X|\mathcal{G})\, dP$

Page 247. Theorem 5.3.9. ϕ should be φ

Page 266. α is the number of votes for A and β the number of votes for B. We should assume $\alpha > \beta$ or write $(\alpha - \beta)^+$.

Page 271. *Simpler proof due to Nate Eldredge.* $X_{N\wedge n}$ is a supermartingale so by Fatou's lemma

$$EX_0 \geq \liminf_{n\to\infty} EX_{N\wedge n} \geq EX_N$$

Page 271. Theorem 5.7.7. Another case where $\phi = \varphi$.

Page 273, problem 5.7.6. (LaTeX) $P(S_T \leq a)$ not $P(S_T leqa)$. A much worse problem is that to make this exercise work one needs to assume that the ξ_i are bounded below so $Y_n = X_{n\wedge T}$ is bounded.

Page 273, Problem 5.7.7. $E\xi_i > 0$ not $EX_i > 0$. However there is the much worse problem that the result you are asked to prove is incorrect. Replace the last sentence by: Let $S_n = S_0 + \xi_1 + \cdots + \xi_n$ and $T_0 = \inf\{m : S_m = 0\}$. Use the martingale $X_n = \exp(\theta_o S_n)$ to conclude that if $S_0 = k$ then $P(T_0 < \infty) = \exp(-\theta_o k)$.

Chapter 6

Page 275. (sp) Komogorov's extension theorem

Page 291. Seven State Example. Two errors:
$\rho_{34} > 0$ and $\rho_{43} = 0$ so 3 is transient.
To make the graph correct we need $p(6, 4) > 0$.

Chapter 7

Page 335, Exercise 7.2.3. Use **Theorem** 7.2.3 and ... proof of Theorem **7.2.1** to

Page 343, Example 7.4.2. Theorem 7.4.2, not (6.1)

Page 343, Example 7.4.3. $Y_1, Y_2, Y_3, \ldots$, let $L_{m,n} =$ (was not a sentence)

Page 352, Exercise 7.5.4. The water starts at $(0, 0)$.

Chapter 8

Page 356, right after Theorem 8.1.1. Kolmogorov's extension theorem is Theorem A.3.1, not (7.1) in the Appendix

Page 377, first line of proof of Theorem 8.5.4. $B_t^2 = (B_s + B_t - B_s)^2$. Second subscript was 2.

Page 378, Theorem 8.5.7. $E_0 \exp(-\lambda T_a)$ (a should be subscript).

Page 378, Exercise 8.5.3. In part (ii), T should be σ.

Page 379, proof of Theorem 8.5.9: (i) There are some calculation errors in the computation of the partial derivatives of p_t. (ii) All that is shown is that $t \to E_x u(t, B_t)$ is constant. A little more work is needed to conclude that $E(u(t, B_t)|\mathcal{F}_s) = u(s, B_s)$. One can do this by noting that $v(r, x) = u(s+r, x)$ satisfies the heat equation and then use the Markov property.

Page 380, Exercise 8.5.6. The conclusion should be ≤ 1 not $\leq 1/\sqrt{2}$.

Page 388, Example 8.6.5. The trouble starts in the second formula which should be

$$|x^k - y^k| \leq \int_x^y k|z|^{k-1}\, dz \leq \epsilon k M^{k-1}$$

In the definition of $G_n(M)$ we should now insist $\max_{m \leq n} |X_m| \leq M^{-k}\sqrt{n}$ to get $\leq k/M$ on the right-hand side of the next equation.

Appendix.

Page 405. End of proof of Lemma A.1.6. $\mu^*(F \cap A^c)$.

Page 407, proof of part (ii). LaTeX error. Should be $B = \cup_{i=1}^n$ not $\cup i = 1^n$

Page 406. Line 2 of proof of (iii) of Theorem A.2.1. $C \supset E$ not $B \supset E$

Index. Law of the iterated logarithm is on page 396