A BASIC COURSE IN PROBABILITY THEORY, 2nd Edition: ERRATA

The red describes the change and location, while the black typeset is the correct content.

TECHNICAL CORRECTIONS

1. p.31, Remark 2.1: Replace Chapter IV by Chapter VIII   Chapter VIII

2. p.46, 18-20 lines down : There is a gap in the argument in Example 9. Replace by the following.   Let $S = \{S_n\}_{n=0}^{\infty}$, $\varphi^-(x) = P_x(S \text{ hits abefore b})$ and $\varphi^+(x) = P_x(S \text{ hits b before a})$ for $a < x < b$. Fix arbitrary $a < x < b$ and condition on S_1^x: $\varphi^{\pm}(x) = \varphi^{\pm}(x)\frac{1}{2} + \varphi^{\pm}(x)\frac{1}{2}$, $\varphi^-(a) = 1, \varphi^-(b) = 0$, and $\varphi^+(a) = 0, \varphi^+(b) = 1$. The linear solutions (3.28) follow from the algebraically equivalent equations $\varphi^{\pm}(x) - \varphi^{\pm}(x-1) = \varphi^{\pm}(x+1) - \varphi^{\pm}(x), a < x < b$, by summing over $x \in [a+1, b-1]$. Apply boundary values to determine $c^{\pm}$. Let $a \to -\infty$. By (3.28) and continuity properties of countably additive measures: $P_x(S \text{ reaches b}) = 1$. Let $b \to \infty$. Then $P_x(S \text{ reaches a}) = 1$. In particular, from $x+1$ it is sure to reach x and from $x-1$ it is sure to reach x. Thus S started at any $x \in \mathbb{Z}$ is certain to eventually return to x.

3. p. 57, 7 lines up: Replace "integrability" by inequality.   ... where the inequality follows from ...

4. p. 57, 5 lines up: Open a parenthesis (and delete the factor 'y' from first equation of display (3.12) $(\int_{[1,\max\{1,M_n\}]} \frac{1}{y} dy) dP$

5. p. 93, 14 lines up: Replace *Involution* by *Idempotent*   (ii) (Idempotent)

6. p. 97, 7 & 8 lines down: Replace τ by h^* as indicated $Q_-(dy) = \varphi(h^*)^{-1} e^{h^* y} Q_-(dy)$

7. p. 97, 9 lines down: Replace h^* by h as indicated $\psi(h) = \mathbb{E}e^{h\tilde{Y}_j} =$

8. p. 97, 12 lines down: Replace '=' by $\geq$ $\int_{\{(y_1,\dots,y_n):\sum_{j=1}^n y_j \geq 0\}}$

9. p. 97, 13 lines down: Replace '=' by $\geq$ $\int_{\{(y_1,\dots,y_n):\sum_{j=1}^n y_j \geq 0\}}$

10. p. 97, 14 lines down: Raise $\sigma\sqrt{n}x$ to be part of exponent $\int_{[0,\infty)} e^{-h^*\sigma\sqrt{n}x} F_n(dx)$

11. p. 97, 3 lines up: Replace τ by h^* $|R_n| = \varphi^n(h^*)\epsilon_n$

12. p. 97, last line: Replace X_1 by $\tilde{Y}_1$ $\frac{\mathbb{E}|\tilde{Y}_1|^3}{\sigma^3\sqrt{n}}$

13. p.98, 8 lines up: Replace e^{aY} by e^{ha} on right side of inequality $e^{hY} \leq \frac{b-Y}{b-a} e^{ha} + \frac{Y-a}{b-a} e^{hb}$

14. p. 127, 6 lines up: Replace $= m$ by $\leq m$ $|\Phi'(x)| \leq m < 2/5$

15. p. 127, display (6.62): Replace σn by $\sigma\sqrt{n}$ in argument for φ^n $\varphi^n(\frac{\xi}{\sigma\sqrt{n}})$

16. p. 128, last line of (6.64): Replace 1 by ρ as indicated $\frac{\rho}{6\sigma^3 n^{\frac{3}{2}}}$

17. p. 128, last display in the proof of Theorem 6.17: Replace $\frac{98}{99}$ by 9.6 and divide expression in brackets by T on right side of inequality $\leq [\frac{8}{9}\sqrt{\pi} + 9.6]/T$.

18. p.128, last line in the proof of Theorem 6.17:
Replace 4π by the indicated bound ... smaller than $3\pi\rho/(\sigma^3\sqrt{n})$.

19. p. 134, Exercise 25(i): Insert superscript n for φ^n in displayed equation. $\int_{[-\pi,\pi)^k} \varphi^n(\xi)d\xi$

20. p. 136, 6 lines down: Delete 'given by' and insert for $Z_k = S_k - S_{k-1}$, ... $k = 0, 1, \ldots, n$, for $Z_k = S_k - S_{k-1}$,

21. p. 136, 8 lines down: Replace Y_{k+1} by Z_{k+1} in displayed equation and insert period at end of display. $\sqrt{n}Z_{k+1}(t - \frac{k}{n})+$ ...

22. p.149, 10 lines down: Replace $|\mathbb{E}$ by $<$ $Q_n(\{\omega \in C[0,1] : |\omega_0| > B\}) < \eta, \quad n = 1, 2, \ldots$

23. p.149, 12 lines down: Replace $|\mathbb{E}\epsilon$ by $\geq \epsilon$ and replace $|\mathbb{E}\eta$ by $< \eta$ $Q_n(\{\omega \in C[0,1] : \nu_\omega(\delta) \geq \epsilon\}) < \eta, \quad n \geq 1$

24. p. 151, 2 lines down: Replace 'p' by 'M' in exponent of 2 belong to $\{0, 1, 2, \ldots, 2^{M+1}\}$.

25. p.151, 2 lines down: Replace L_n by L_M $u^*, v^* \in L_M$

26. p. 151, 2 lines down: Replace $-n-1$ by $-M-1$ in the exponent $|u - u^*| \leq 2^{-M-1}$

27. p. 155, 6 lines down: Replace $\Rightarrow$ by comma. Suppose that $d_{BL}(Q_m, Q) \to 0$

28. p. 172, 21 lines down: Delete 'is product space' following 'the product space' ... i.e., the product space, $X_t(\omega) = x_t$

29. p.238, line before Lemma 1: Replace 'Alexandrov's theorem 7.1' by 'Proposition 1.6' Proposition 1.6

30. p. 242, Theorem 1.3, 3rd line: Replace S by $C(S)$ then $\mathcal{H}$ is dense in $C(S)$, i.e., $\overline{\mathcal{H}} = C(S)$.