Errata for Durrett's *Essentials of Stochastic Processes*

This list is in two parts. The first part lists errors found in the 7th printing by Nate Eldredge and others. The second part is Rick Durrett's own errata list and apparently includes errors found prior to the 7th printing. Unfortunately since they are from separate sources I cannot collate them.

You can identify which printing you have: near the bottom of the copyright page you should see a decreasing sequence of numbers: 9 8 7 .... The *last* number in this sequence indicates which printing you have. So 9 8 7 is the 7th printing, 9 8 7 6 5 4 3 is the 3rd.

- Page 8, line 10 (Exercise 1.27): $S_5 \cap S_7$ should be $S_5 \cup S_7$.
- Page 25, line 1: Z should be X
- Page 97, exercise 9.44: The knight can move from (i, j) to $(i + 2, j + 1)$ and so on, not $(i + 2, i + 1)$.
- Page 115, line 11 (Exercise 4.1): Should refer to Example 6.4 instead of 6.5.
- Page 115, line 17 (Example 4.2): Reference to (3.10) should be (3.6).
- Page 116, example 4.3 "Why is this true?" Wald's' has extra apostrophe
- Page 124, exercise 5.19: Reference to (3.8) should be (3.6)
- Page 140, line 10: "Example 3.1.," has extra period
- Page 141, example 3.4: should be numbered 4.1
- Page 251, line 16: the probabilities for $P(T_a < T_b)$ and $P(T_b < T_a)$ are reversed. It should read

$$P(T_a < T_b) = \frac{b}{b-a} \quad \text{and} \quad P(T_b < T_a) = \frac{-a}{b-a}$$

- Page 265, exercise 6.4 (c): Should say $E(Y_s Y_t)$, not $E(Y_s, Y_t)$.
- Page 266, line 3 (exercise 6.11): the equation has a sign error and should read

$$B((2m+1)/2^{n+1}) = \frac{\{B((m+1)/2^n) + B(m/2^n)\} + 2^{-n/2} Y_{n,m+1}}{2}$$

- Page 270, exercise 6.40: the given formula is wrong and should read

$$E[e^{-rT}(K - X_T)^+] = E[e^{-rT}(X_T - K)^+] - X_0 + e^{-rT}K.$$

- Page 274: the solution to 9.9 (a) should say D, H, S are transient and J, T, M are recurrent.
- Page 275: Answer to 9.45 (a) should be $(21 + 2k)/1456$.
- Page 276: In answer for 7.29, standard deviation should be 46.6K.
- Page 277: Answer to 8.21 (b) should be 0.0965 ($\pi(4)$ improved by 0.0193 and customers are arriving at rate 5).

Typos in "Essentials of Stochastic Processes" by R. Durrett

(Page numbers are on the left; the arrows $A \to B$ means that B should replace A.)

vi Family Update: out → our
vii 3. Poisson Process: Compund → Compound
16 Solution to Ex 2.11 : "we must have $V \leq 1$, so that $U \geq x - 1$". Also, the lower limit on the integral is $x - 1$ instead of $1 - x$.
24 $Z \to X$ in the last display.
41, line 2: properly → property
44 Not all the arrows in the diagram are correct.
45 Line 13. (3.3) → (3.4).
45 proof of theorem: $x \to y, y \not\to x$
47 proof of Lemma 3.9: $\rho_{xy}^{k-1} \to \rho_{yy}^{k-1}$
48 Here N_y is used for $N(y)$.
50, Exercise 4.1: $i, j \to i + j$.
50, line 6. $i \to x$.
52 225→ 210
53, line 3. $I_x \to I_y$.
53 Ex 4.6: go to the left from 1 → go to the left from 0
53 definition of stationary dist: add in the fact that it sums to 1. Also, n means different things in $p^n(x, y)$ and in $1 \times n$ matrix.
55 very top: 4.4 → 4.5
58 very top: always start with day → always start every day
58, line after the first matrix: states 2,3,4 should be 1,2,3.
59 $I_n = 2$ and $D_n = 3$ in line 4 are not defined here. Actually, $I_n = X_n$ is the chain (I stands for inventory) and D was defined on page 32 (D stands for demand).
60 Example 5.2: For a new of example → For a new example
60 Exercise 5.1: even → odd
61 top: lim should be in Roman
62, diagram: the probabilities are not right.
63, (5.5): $c \to \pi(l)$.
64 Example 5.5: Denominator of $\pi(3)$ should be 116, not 176
66 Ex 6.1: win with \$1 → win \$1 with
67 Solution to Ex 6.2: 6.2 → 6.1
67 Middle: (6.1) → (*)
68 Statement of Ex 6.3: 20/18 → 20/38. Also, .005127 → .005128.
71 top and 86 middle: Do not need aperiodicity here.
72 Back to TT: it take longer → it takes longer

73 end of Ex 6.8: are TH... are TT → are TT... are TH
73 Third line of Example 7.1. $p \to 1-p$.
73 Bottom line: $i+1 \to i$ in one place.
74 I. When $p < 1/2$: One the other hand → On the other hand
77 Ex 7.2: there were are → there we are
79 Proof: 7.8 → 7.6
85 Theorem 4.7: remove comma after S, or add one before S.
86 Theorem 7.2: remove "then"
90 Ex. 9.9 spelling: "likley"
91 9.12b: stationary distribution of p or p^2? (One might as well compute both.)
95 Exercise 34. "if we each time" should be fixed. Also $n \to N$.
97 Problem 9.41. The " after $\frac{2}{3}$ is misplaced.
97 Problem 9.42. Example 6.2 → Example 6.3.
98 Problem 9.49. The probabilities do not add up to 1.
98 Problem 9.51. Assume infinitely many p_i's are > 0. Also, there is a typo in "probability".
130, top display: Some n's should be $n+1$'s, etc.
130, Definition: of → be
130, diagram: $S \to s$
130 3 lines from the bottom: $s < T_{n-1} \to s < T_{n+1}$
132 line 6: fourth → fifth
135, middle: (i) is a very strong assumption...
153 7.13: The problem has an (a) but no (b).
153 7.16(b): Unclear wording.
154 7.21: $\frac{2}{3}$ of a vehicle... Also passes in an hour?
163, top line: $P_1(T_\infty < \infty) = 1$.
167, line 3: $t - s \to t + s$.
168 display 2.9. The binomial coefficient should be $\binom{j-1}{j-i}$. In the proof, $n_k \geq 0$ should be $n_k \geq 1$.
200 bottom line: $p_{i,j}(t) \to p_t(i,j)$ Same comment about the answer on page 276.
201 8.5: .... sales may reduce the inventory to 0....
273 1.25: Ans. $= 2/n$ (By the way this page is unnumbered)
273 2.17: $m \to n-2$; also reverse the roles of p and $1-p$.
274 9.7: 5 is not recurrent
274 9.9a: J, T, and H → J, T, and M
275 9.33b: 13.7 → 14.7
275 7.15(b): There is a missing $\frac{1}{8}$.