

**Errata for “A First Look at Stochastic Processes”,
by Jeffrey S. Rosenthal, World Scientific Publishing Co., 2019.**

(Note: throughout, “line $-x$ ” means x lines from the bottom.)

- Page 15, line 5: “ $r = [4p(1 - p)]^{1/2}$ ” should be just “ $r = 4p(1 - p)$ ”.
- Page 15, line -6 : “after leaving f ” should be “after leaving 2”.
- Page 18, Problem 1.5.15, displayed equation: “ i_j ” should be “ i_r ”.
- Page 18, Definition 1.6.1: It might be better to replace “ i communicates with state j ” with “ j is accessible from state i ”, and instead use the word “communicates” to mean that *both* $i \rightarrow j$ and $j \rightarrow i$.
- Page 24, line 8: the second “ $\sum_{n=1}^{\infty} p_{12}^{(n)}$ ” should be “ $\sum_{n=1}^{\infty} p_{21}^{(n)}$ ”.
- Page 28, Problem 1.6.25(c) is a repeat of Problem 1.6.20(b), and should be omitted or replaced.
- Page 29 middle, “In general, for $1 \leq a \leq c - 1$ ” should be “In general, for $0 \leq a \leq c - 1$ ”, and then “Hence, for $1 \leq a \leq c - 1$ ” should be “Hence, for $0 \leq a \leq c$ ”.
- Page 35 line -5 : “ $\mu^{(n+1)}\mu^{(n)}$ ” should be “ $\mu^{(n+1)} = \mu^{(n)}$ ”.
- Page 47 line 11: “ $p_{ij}^{(n)} p_{kl}^{(n)}$ ” should be “ $p_{ik}^{(n)} p_{j\ell}^{(n)}$ ”.
- Page 47 middle: “ $\tau = \inf\{n \geq 0 : X_n = Y_n = i_0\}$ ” should be “ $\tau = \inf\{n \geq 1 : X_n = Y_n = i_0\}$ ”.
- Page 55, Problem 2.4.20 is a repeat of Problem 2.4.13 (except for part g); replace “10 lily pads” with “12 lily pads” (and then “10” with “12”) to make it different.
- Page 58, Problem 2.5.6(b) hint: “ $p_{ji}^{(m)}$ ” should be “ $p_{ji_0}^{(m)}$ ”, and “ $p_{ii}^{(n)}$ ” should be “ $p_{i_0i_0}^{(n)}$ ”.
- Page 59 towards bottom: “continguous” should be “contiguous”.
- Page 64 line 4: “ $i = 1, 2, 3$ ” should be “ $i = 1, 2, \dots, K$ ”.
- Page 66, line -3 : “might not be bipartite” should be “might be bipartite”.
- Page 67 line 8: “and even vertex” should be “an even vertex”.
- Page 70: Add vertical space before “What about simple random walk”.

- Page 72 line 5: “state space is S ” should be “state space S ”.
- Page 79, line 5: “ $P(T < \infty) = 1$ ” should be “ $\mathbf{P}(T < \infty) = 1$ ”.
- Page 113, Problem 4.2.10(b): “ $T \rightarrow \infty$ ” should be “ $S \rightarrow \infty$ ”.
- Page 85, line –4: “ $m \sum_{i=1}^{\infty} \mathbf{E}[T]$ ” should be just “ $m \mathbf{E}(T)$ ”.
- Page 87 line –1: “ $\mathbf{E}[Z_{n+1}]^2$ ” should be “ $\mathbf{E}[Z_{n+1}^2]$ ” or “ $\mathbf{E}[(Z_{n+1})^2]$ ”.
- Page 88 middle: “Then S_m is a stopping time” should be “Then S_M is a stopping time”.
- Page 89 line 9: “ $-2^{T-1} + 2^T$ ” should be “ $-2^{T-2} + 2^{T-1}$ ”.
- Page 89 middle: “ $\mathbf{E}(X_S - K) = -15$ ” should be “ $\mathbf{E}(X_S - K) = -25$ ”.
- Page 92, end of Section 3.5: The supplement www.probability.ca/martconvsupp.pdf should be added.
- Page 100 line –8: For clarity, “ $x(u - d)/(u - K)c$ ” should be “ $x[(u - d)/(u - K)]c$ ”.
- Page 115, line 6, middle: “ λ^m ” should be “ λ^k ”.
- Page 118, lines 3–7: “ $e^{\lambda h}$ ” should be “ $e^{-\lambda h}$ ” (three times), and then “ λh ” should be “ $-\lambda h$ ” in several corresponding places, and also the first “ $\lambda^2 h^2$ ” should be “ $-\lambda^2 h^2$ ”.
- Page 123, line 6 and line 16: “ $X(t)$ ” should be “ X_t ”. (For consistency, the same substitution should also be made in the first line of Problems 4.4.4, 4.4.8, 4.4.14, 4.4.15 (and in parts a,b,c), 4.4.16, and 4.4.17(a,b,c).)
- Page 124, line 11: After “ $p_{ij}^{(t)} \approx \delta_{ij} + t g_{ij}$ ”, add “(at least if G is *bounded*, i.e. $\sup_{i,j \in S} |g_{ij}| < \infty$)”.
- Page 125, statement of (4.4.6): change “generator matrix” to “bounded generator”.
- Page 125, bottom line: add “(cf. Section A.12)”.
- Page 130 middle: For clarity, “a Poisson process with” should be “an independent Poisson process with”.
- Page 132, statement of (4.4.20): change “generator” to “bounded generator”.
- Page 132, end of Section 4.4: The supplement www.probability.ca/explosivesupp.pdf should be added.
- Page 134 line –13: For clarity, after “at least one attempted departure” add “(and no

arrivals)”).

- Page 138, footnote, last line: The year “(1955)” should be added.
- Page 140 line 3: “identical” should be “identically”.
- Page 151 middle, Definition 4.7.4 line 5: “ $1 \leq i \leq d - 1$ ” should be “ $1 \leq i \leq b - 1$ ”.
- Page 155 line 5: “ $\mathbf{P}(X = i) \approx \pi_i$ for all $i \in S$ ” should be “ $\mathbf{P}(X \in A) \approx \pi(A)$ for all $A \subseteq S$ ”.
- Page 161 line 1: For completeness, there should be another “+ . . .” at the end.
- Page 162, eqn (A.3.3): “ $p^k(1 - p)$ ” should be “ $(1 - p)^k p$ ”.
- Page 162, eqn (A.3.4): “ $p^{k-1}(1 - p)$ ” should be “ $(1 - p)^{k-1} p$ ”.
- Page 163 line 1: “ $(a + b)/2$ ” should be “ $(L + R)/2$ ”.
- Page 163 equation A.3.8: “ $\frac{1}{2} - \frac{2}{3}$ ” should be “ $\frac{2}{3} - \frac{1}{2}$ ”.
- Page 165 middle: “ $O(h)$ ” should be “ $O(h^2)$ ”, and “ $o(h)$ ” should be “ $o(h^2)$ ”.
- Page 167 lines -2 to -1 : “probability $Y = y$ ” should be “probability $\mathbf{P}(Y = y)$ ”.
- Page 169 lines 1-2: “ a ” and “ b ” should be interchanged.
- Page 187, 2.4.20(e) solution: “ π_{15} ” should be “ π_{10} ”.
- Page 187, 2.4.20(f) solution: “ $\pi_j = 1/15$ ” should be “ $\pi_j = 1/10$ ”.
- Page 188, 2.8.7(d) solution, line 1: “ p_i ” should be “ π_i ”.
- Page 197: For consistency, “ $o(h)$ ” should be listed in the index as just “ $o(\cdot)$ ”.