Introduction to Stochastic Processes with R: Errata

Updated: April 16, 2017

1. page xiii: 5th paragraph, line 3: the URL should be:

   `www.people.carleton.edu/∼rdobrow/stochbook`

2. page 4. In Figure 1.2, the long-term probabilities in the vertex labels are incorrect. They should be: *Home*: 0.36, *a*: 0.09, *b*: 0.22, *c*: 0.12, *d*: 0.20.

3. Page 93, top line of text: Change "and eigenvectors of a square" to "and right eigenvectors of a square"

4. Page 99, 2nd math display: The last factor before the equal sign should be P^s_{ij}, not P^s_{ji}

5. page 110, top line: Change "a Markov chain" to "a finite Markov chain"

6. page 110: The **P** matrix in the penultimate display is incorrect. The correct matrix is the transpose of that matrix.

7. pages 132-133: Example 3.33 is incorrect. It will be significantly changed in the next edition.

8. page 174: for section (i), the first line should have "we are in the setting of Figure 4.2(a)", *not* Figure 4.2(b).

9. page 174, in section (i), first line under the math display, change $G'(1) = 1$, to $G'(1) \leq 1$,

10. page 183, Example 5.1. The example is incorrect as the matrix is not ergodic, and the stationary distribution is incorrect. Following is a revised Example 5.1:

    Bob's daily lunch choices at the cafeteria are described by a Markov chain with transition matrix

    $$\boldsymbol{P} = \begin{array}{l} \\ \text{Yogurt} \\ \text{Salad} \\ \text{Hamburger} \\ \text{Pizza} \end{array} \begin{array}{c} \begin{array}{cccc} \text{Yogurt} & \text{Salad} & \text{Hamburger} & \text{Pizza} \end{array} \\ \begin{pmatrix} 0 & 0 & 1/2 & 1/2 \\ 1/4 & 1/4 & 1/4 & 1/4 \\ 1/4 & 1/4 & 0 & 1/2 \\ 1/4 & 1/4 & 0 & 1/2 \end{pmatrix} \end{array}.$$

    Yogurt costs \$3.00; hamburgers cost \$7.00; and salad and pizza cost \$4.00 each. Over the long term, how much, on average, does Bob spend for lunch?

    Solution Let

    $$r(x) = \begin{cases} 3, & \text{if } x = \text{ yogurt} \\ 4, & \text{if } x = \text{ salad or pizza} \\ 7, & \text{if } x = \text{ hamburger.} \end{cases}$$

    The lunch chain is ergodic with stationary distribution

Yogurt	**Salad**	**Hamburger**	**Pizza**
1/5	1/5	3/20	9/20

With probability 1, Bob's average lunch cost converges to

$$\sum_x r(x)\pi_x = 3\left(\frac{1}{5}\right) + 4\left(\frac{1}{5} + \frac{9}{20}\right) + 7\left(\frac{3}{20}\right) = \$4.25 \text{ per day.}$$

11. page 243, 3rd and 4th lines above Section 6.5 should be

    Taylor series approximation. A numerical software package finds $E(K) = 24.617$. The integral in (6.4) can be used to find the second moment $E(T^2)$, and then the variance of T. An application of the law of total variance gives $Var(K) = 148.619$, with standard deviation 12.19.

12. page 248. The 3rd and 4th equations from the bottom are each missing a factor of $e^{-\lambda t}$.

13. page 312, first mathematical display: The numerator of the fraction should be

$$\frac{e^{-\lambda(1.5)}(\lambda(1.5))^k}{k!}$$