ERRATA

An Introduction to Stochastic Processes
with Applications to Biology
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Chapter 2:

Exercise 22 (b) Show that $p_{ii}^{(n)} = p_{ii}^n$ and $\lim_{n\to\infty} p_{ii}^{(n)} = 0$.

page 89: $p(0) = (0,1,0,0,0,0)^T$, $P^2p(0)$ and $P^3p(0)$

Chapter 4:

page 163, Example 4.11: $\text{Prob}\{Y_j = 0\} = 1 - \exp(-\gamma x)(1-p_0)$

Chapter 6:

Table 6.1: $\sigma^2(t)$

Exercise 9 (b) $M(\theta,t) = [1 + (e^\theta - 1)e^{-\mu t}]^N \exp\left(\frac{\nu}{\mu}[e^\theta - 1][1 - e^{-\mu t}]\right)$

Chapter 8:

Section 8.5:

$$\begin{aligned} p(y,s;x,t-\Delta t) &- p(y,s;x,t) \\ &= \int_{-\infty}^{\infty} p(z,t;x,t-\Delta t)\left[(z-x)\frac{\partial p(y,s;x,t)}{\partial x}\right. \\ &\quad \left. + \frac{(z-x)^2}{2}\frac{\partial^2 p(y,s;x,t)}{\partial x^2} + \frac{(z-x)^3}{6}\frac{\partial^3 p(y,s;\xi,t)}{\partial x^2}\right] dz \\ &= \frac{\partial p(y,s;x,t)}{\partial x}\int_{-\infty}^{\infty} p(z,t;x,t-\Delta t)(z-x)\,dz \\ &\quad + \frac{1}{2}\frac{\partial^2 p(y,s;x,t)}{\partial x^2}\int_{-\infty}^{\infty} p(z,t;x,t-\Delta t)(z-x)^2\,dz \\ &\quad + \frac{\partial^3 p(y,s;\xi,t)}{\partial x^3}\int_{-\infty}^{\infty} p(z,t;x,t-\Delta t)\frac{(z-x)^3}{6}\,dz, \end{aligned}$$

Exercise 8: $dX(t) = r(X(t)-E)dt + c(X(t)-E)dW(t), \quad p(x,0) = \delta(x-x_0)$

Exercise 10: $dX(t) = adt + \sqrt{b}dW(t), \quad p(x,0) = \delta(x-x_0)$

Exercise 14: $dX = [b(X) - d(X)]dt + \sqrt{b(X)+d(X)}\,dW$