

Problem 1

- (a) $c = 3.14 \times 10^3 2$
- (b) The computer code is in lab 3 material.
- (c) The distribution is Gamma(11, 3553).
- (d) The mean of Beta(α, β) is $\frac{\alpha}{\lambda}$, the standard deviation is $\frac{\alpha}{\lambda^2}$. Here the mean is 0.0031, standard deviation is 9.33×10^{-4}
- (e) The survival rate for a year and over is 0.34118
- (f) (0.17342, 0.5376)

Page 320, Problem 1

$$\begin{aligned}\xi(0.1) &= 1 - \xi(0.2) = 0.7 \\ f(x_1, \dots, x_n | \theta) &= \binom{8}{2} \theta^2 (1 - \theta)^6 \\ \xi(\theta = 0.1 | x = 2) &= \frac{\binom{8}{2} (.1)^2 (.9)^6 (.7)}{\binom{8}{2} (.1)^2 (.9)^6 (.7) + \binom{8}{2} (.2)^2 (.8)^6 (.3)} = .5418\end{aligned}$$

Problem 2

$$\begin{aligned}\xi(1.0) &= 1 - \xi(1.5) = 0.4 \\ f(x_1, \dots, x_n | \lambda) &= \frac{\lambda^3 \exp^{-\lambda}}{3!} \\ \xi(\lambda = 0.1 | x = 3) &= \frac{\frac{1.0^3 \exp^{-1.0}(0.4)}{3!}}{\frac{1.0^3 \exp^{-1.0}(0.4)}{3!} + \frac{1.5^3 \exp^{-1.5}(0.6)}{3!}} = .2457\end{aligned}$$

Problem 3

$$\begin{aligned}\frac{\alpha}{\lambda} &= 10, \frac{\alpha}{\lambda^2} = 5 \\ \Rightarrow \alpha &= 20, \lambda = 2\end{aligned}$$

Problem 5

$$\xi(\theta) = Unif(0, 1) = Beta(1, 1)$$

By DeGroot Page 321 Theroem 1,

$$\xi(\theta | X) = Beta(4, 6)$$

Problem 9

$$\begin{aligned}\xi(\theta) &= \begin{cases} \frac{1}{10}, & 10 < \theta < 20 \\ 0, & o.w \end{cases} \\ f(X|\theta) &= \begin{cases} 1, & \theta - \frac{1}{2} < x < \theta + \frac{1}{2} \\ 0, & o.w \end{cases} \\ \xi(\theta|X) &= \begin{cases} 1, & 11.5 < \theta < 12.5 \\ 0, & o.w \end{cases} \sim Unif(11.5, 12.5)\end{aligned}$$