

Homework 9

Exercises to Turn In. Due Date: Friday, April 8.

1. Ross 4.41
2. Ross 4.50
3. Ross 5.1. You get to choose the parameterization. But you might look at how a birth and death process is parameterized to get an idea of how it might be done.
4. Ross 5.3. The definition of regular is on p. 233.
5. For the Yule process, we showed that

$$P_{1,j}(t) = e^{-\lambda t}(1 - e^{-\lambda t})^{j-1}$$

(a) Use this to argue that

$$P_{i,j}(t) = \binom{j-1}{i-1} e^{-i\lambda t} (1 - e^{-\lambda t})^{j-i}$$

(b) What is the backward equation for the Yule process?

(c) Show that

$$P_{i,j}(t) = \binom{j-1}{i-1} e^{-i\lambda t} (1 - e^{-\lambda t})^{j-i}$$

solves the backwards equation for the Yule process.