1. Consider the weather chain given in Example 1.3 (page 3) in Durrett's book.

   (a) Suppose today is sunny. What is the expected number of days to wait for the next sunny day?

   (b) In the long run, what is the fraction of days when it is rainy, but the next day is sunny?

2. Consider the transition matrix $P$ given in Durrett Exercise 1.8(e). Find $\lim_{n\to\infty} P^n(i,j)$ for all $i,j$.

   [*Comment: This chain has multiple recurrent classes and hence has infinitely many stationary distributions. So, convergence of MC theorem can not be directly applied!* ]