1. (10) Suppose you roll two normal six sided dice. Here are three events:
   - \( A \) : Both dice are odd
   - \( B \) : Both dice are even
   - \( C \) : The dice match (doubles)

   Which pair(s) of these events are disjoint, if any?

   Which pair(s) of these events are independent, if any?

   What is \( P(A|C) \)?

2. (10) Pick a number from 1 to 100 with all numbers equally likely. Pick another, and multiply those two numbers together. What is the probability that the product is less than 1000? Explain how you got your answer.
The data set `attenu` is built in to R. It has data on 23 California earthquakes, each reported by multiple stations.

(a) How many variables and how many observations are in the `attenu` data set?

(b) What was the maximum magnitude (mag) of any earthquake?

(c) `station 117` appears more than any other. How many times does it appear? Write your R code with your answer.

A power spike hits a computer with four memory chips. When this happens, each chip is destroyed with probability 0.2. The four chips are independent of each other.

(a) What is the probability that chip #1 survives?

(b) What is the probability that all four blow out?

(c) What is the probability that none of them blow out?
5. This question uses the data Nightingale from the HistData library. This data shows the deaths by Disease, Wounds, and Other reasons during the Crimean war.

(a) How many total deaths by Disease were there for the entire war?

(b) How many total deaths by all three reasons were there for the entire war?

(c) Make a plot with the Date on the x-axis and the Disease.rate on the y-axis. You do not need to draw it here. Describe how the disease rate changed over time.