Week 5 Reading Questions

Suppose it is a beautiful fall day and you are sitting underneath three oak trees: Bur oak (Quercus. macrocarpa), Northern Red Oak (Q. rubra), and white oak (Q. alba). They’ve just started to drop their acorns.

Without looking, you reach down and pick up **two** acorns at the **same time**.

1. What is the size of the sample space?

The size of the sample space is 6. (BN) (BW) (BB) (WN) (WW) (NN)

1. Given the scenario description, how many ways are to there to collect two acorns of the same species?

There are 3 ways to collect two acorns of the same species. (BB)(NN)(WW)

1. Given the scenario description, how many ways can you collect two acorns of different species?

There are 3 ways to collect two acorns of different species. (BN) (BW)(WN)

Suppose it is a beautiful fall day and you are sitting underneath three oak trees: Bur oak (Quercus. macrocarpa), Northern Red Oak (Q. rubra), and white oak (Q. alba). They’ve dropped most of their acorns. It was a productive year so there seem to be thousands of acorns from each species!

* There are approximately the same number of acorns from each species on the ground, and they seem to be evenly spread around.

You collect an acorn, place it in your left pocket, walk a short distance and collect a second acorn placing it in your right pocket.

1. What is the probability that the acorn in your *left pocket* is *Q. alba*?

There is a 33 percent chance that the acorn in the left pocket is *Q. alba.*

1. What is the probability that the acorn in your right pocket is Q. macrocarpa?

There is a percent 33 chance that the acorn in the left pocket is *Q. macrocarpa.*

1. If you already know that the acorn in your left pocket is Q. alba, what is the probability that the acorn in your right pocket is also Q. alba?

The probability of *Q. alba* being in both pockets is 33.

1. What is the probability that both acorns are Q rubra?

The probability of both being *Q. rubra* is 11 percent.

1. What is the probability that you collected exactly one each of Q. alba and Q. rubra?

There is two possible ways this can happen (QaQr)(QrQa). So, you would get a probability of 2/9.

1. What is the probability that the acorn in your left pocket is Q. alba and you have an acorn of Q. rubra in your right pocket?

There is only one possible way to get this specific order so the probability would be 1/9.

1. If a Poisson distribution had a lambda of 6 then the sample space of the distribution is infinite.
2. If a Binomial distribution has n = 10 and p = 0.6 then the size of the sample space of the distribution is *n* + 1. So, in this example, the sample size would equal 10   
   + 1= 11.
3. Which common characteristics of the Binomial and Poisson distributions make them good models for counts?

They both can be used to do surveys or if you have a large population size. They also have a fixed variance.

1. Describe a scenario in which a Binomial distribution may be a better count model than a Poisson distribution.

A Binomial distribution would be better than a Poisson distribution if you needed to conduct trials that are not unlimited and fixed. They are useful with presence and absence. The binomial distribution will help you calculate success. If you wanted to conduct trials to see how many Brown creepers are in a sample area.