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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**.

Describe the sample space of your collection (i.e. enumerate the set of all possible outcomes).

Background for Q1-Q3

A sample space is a collection of all possible outcomes after an event.

Q1

The size of this sample space is 6 outcomes

Q2

3 ways to collect two of the same species

* 2 bur oak
* 2 northern red oak
* 2 white oak

Q3

3 ways to collection 2 different species

* 1 BO, 1 NRO
* 1 BO, 1 WO
* 1 NRO, 1WO

Q4

The probability of picking up a *Q. alba* acorn is 1/3, or 33.3%

Q5

The probability of picking up a *Q. macrocarpa* acorn is 1/3, or 33.3%

Q6

If the acorn in my left pocket is *Q. alba,* there is still approximately a 1/3 probability that I will place another *Q. alba* in my right pocket. This is because there are still thousands of acorns left and removing one does not significantly decrease the sampling pool.

Q7

The probability that both acorns are *Q. rubra* would be 1/9

Q8

2/9, 22.2%

Q9

1/9, or 11.1%

Q10

The sample space of a Poisson distribution is infinite.

Q11

The sample space in a Binomial distribution is = n +1, so the sample space would be 11

Q12

Both Binomial and Poisson distributions have discrete scales, meaning there is a limited set of categories. This proves to be useful in a count because there would be fewer categories to assign.

Q13

A Binomial distribution may be more useful than a Poisson distribution in the case of a coin flip because there are only two outcomes and they are not dependent on occurring at a constant rate.