

Ethan Rutledge

ECO 602

Week 5 Reading Questions (Worked with JT)

1. What is the size of the sample space?

6

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

3

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

3

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

0.33 or 3/9

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

0.33 or 3/9

6. 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*?

0.33 or 3/9

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

0.111 or 1/9

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

0.222 or 2/9

9. 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?

0.111 or 1/9

10. Which of the following is the size of the sample space of this distribution?

Infinity

11. Which of the following is the size of the sample space of this distribution?

11 n+1

12. Which common characteristics of the Binomial and Poisson distributions make them good models for counts?

Events can't be meaningfully divided into smaller units simply by changing the scale of the measurement, they are whole integers. They allow you determine the probability that X is exactly equal to something. So as far as counts go, they will lie on a whole number starting at 0, and the probability will be between 0 and 1.

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

Binomial distributions are more useful when there is a limited number of possible samples, where as a Poisson distribution would be more appropriate when there is an infinite number of possible samples. An ecological example of this would be sampling a population that has barriers to dispersal versus a population that can migrate.