In Class - Probability Distributions

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Question 1

- We can define an event in our sampling scheme as the presence or absence of brown creepers in any given forest plot. An event is an outcome of a random experiment. Since the collection of all possible outcomes to a random experiment is called the sample space, another definition of an event is any subset of a sample space. In this example, observing brown creepers in forest plots, finding the presence of a brown creeper in one plot is an event.

Question 2

- The sample space would be 6. This represents each individual plot that you could observe for the presence or absence of the brown creeper.

Question 3

- There are 16 ways in which you can spatially distribute the two birds. We determined this by drawing out the 6 possible spaces with 2 birds in each and counted all the possible combinations that the two birds can be observed in.

Question 4

- Given that the probability of observing a brown creeper presence in a given forest plot is about 50%, it is not unusual to observe 2 birds in the sample plot. This is because on average, three birds (out of six possible in a plot) are observed. Two is not that large of a deviation from the three birds seen on average. There are 16 possible permutations of observing 2 out of 6 birds in a plot, and fewer permutations of 3 out of 6, so since there's a 50% chance that 3 out of 6 birds would be present typically, there is also a good chance that you would observe exactly 2 birds.

Question 5

Consider the scenario in which you pick up two acorns at the same time in one hand without looking.

Bur - Bur
Bur - Red
Bur - White
Red - Red
Red - White
White - White

- These would be combinations since order doesn't matter in this case as we are picking up two acorns at the same time.

Question 6

Consider the scenario in which you pick up one acorn, place it in your left pocket, walk a short distance, then pick up a second acorn and place it in your right pocket.

LBur - RBur
LBur - RRed
LBur - RWhite
LRed - RBur
LRed - RRed
LRed - RWhite
LWhite - RBur
LWhite - RRed
LWhite - RWhite

- These would be permutations because the order matters when picking up the two acorns.