

Stat 134: Section 1

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WELCOME TO STAT 134! This discussion section will complement the main lecture by providing you with helpful problems to work on and with a (hopefully) helpful hand to guide you through them (me!).

Class Activity

Introduce yourself to your neighbor (or neighbors).

Together with your neighbor(s), tear three small pieces of paper, all similar in size. Label them as R, W, and B. Fold each piece and shuffle them so that you do not know what the label on each piece is.

Pick one piece of paper, look at it and set it aside. This is **Pick 1**. Pick one of the remaining two pieces and do the same. This is **Pick 2**.

- What is the chance that Pick 1 is R?
- What is the chance that Pick 1 is R and Pick 2 is W?
- What is the chance that Pick 2 is W?

Take turns to do this; each person in the group should do this once.

Here's one way to think about this. If you repeated this experiment 600 times, how many times would you expect each event to happen?

Problem 1

Suppose a word is picked at random from this sentence. Find:

- the chance that the word has at least 4 letters;
- the chance that the word contains at least 2 vowels (a, e, i, o, u);
- the chance that the word contains at least 4 letters and at least 2 vowels.

How many words are in the sentence?
How many of them satisfy the required criteria?

Ex 1.1.2 in Pitman's Probability

*Problem 3**Sampling With and Without Replacement*

Sampling with replacement. A box contains tickets marked $1, 2, \dots, n$. A ticket is drawn at random from the box. Then **this ticket is replaced in the box** and a second ticket is drawn at random. Find the probabilities of the following events:

- a. the first ticket drawn is number 1 and the second ticket is number 2;
- b. the numbers on the two tickets are consecutive integers, meaning the first number drawn is one less than the second number drawn.
- c. the second number drawn is bigger than the first number drawn.

Sampling without replacement.

- d. Repeat a. through c. assuming instead that **the first ticket drawn is not replaced**, so the second ticket drawn must be different from the first.

How does sampling without replacement instead of with replacement change the problem? How do the probabilities change on the second ticket?

Ex 1.1.3 in Pitman's Probability