

Lab Assignment #11

This lab is due at 9:35 AM on Monday, 3/4 and is worth 6 points. This may be done individually, or in a group of 2 or 3 people.

Write each probability answer as a fraction, or a decimal to at least 3 significant digits, or a percent to at least 3 significant digits. Show work.

- 1) Suppose that every time you drive a car, there is a 1 in 10,000 chance that you will be in a really bad crash.
 - a) Should you wear a seatbelt one ten-thousandth of the time?
 - b) What percent of the time should you wear a seatbelt?
 - c) Why?

2) A baseball hat is flipped 3 times. Assume it lands up 17% of the time, and down 83% of the time. What is the probability that...

a) the first two flips are up and then the third is down?

b) two flips are up and one flip is down, in any order?

3) Four cards are taken from a deck of cards, without replacement. What is the probability that the four cards are four different suits?

4) a) You need math tutoring this weekend. You have four potential tutors. Each has a 13% chance of being available. What is the probability that at least one tutor is available?

b) What is the probability that all four are busy?

5) a) You roll a six-sided die 7 times and get the following sequence of rolls: 1, then 5, then 5, then 2, then 6, then 2, then 4. Based on this observation, you then ask this question: what is the probability of rolling a six-sided die 7 times and getting the following sequence of rolls: 1, then 5, then 5, then 2, then 6, then 2, then 4. Write the probability here.

b) Is this number really close to zero?

c) Fill in the blanks in this story...

Your friend says, "Wow, a really unlikely thing just happened here. Maybe this is evidence that there's something strange going on with this six-sided die." You reply: "Actually, it doesn't do anyone any good to ask a question about the probability of an event _____ the event happens. That's cheating, because we saw the event first, so we knew which of the 279,936 possible questions that we might have asked. In fact, _____ possible sequence of 7 rolls is equally unlikely. No matter what happens, the probability would be a ridiculously small number, but something always has to happen, so no big deal. If you predict a sequence of 7 rolls _____ they actually happen, then I'll be impressed."

d) Explain where the number 279,936 comes from.

6)a) What is the probability that 5 randomly chosen people were born in 5 different months? Assume that there is a 1 in 12 chance that a person is born in any particular month.

b) What is the probability that 12 randomly chosen people were born in 12 different months?