Stats 300   **Spring 2024**

Lab Assignment #10

This lab is due at 9:35 AM on Wednesday 2/28 and is worth 6 points. This may be done individually, or in a group of 2 or 3 people.

1) Think back to example 1 from the lecture, specifically the tree diagram for flipping coins. If a coin is flipped 1 time, there are 2 possible outcomes. If a coin is flipped twice, there are 4 possible outcomes. If a coin is flipped 3 times, there are 8 possible outcomes.
a) Do you see the pattern to the numbers 2, 4, 8?

b) If a coin is flipped 4 times, how many possible outcomes are there?

c) Using a tree diagram or not, make a list of all the possible outcomes that give exactly 2 heads out of 4.

d) What is the probability of flipping a coin 4 times, and getting exactly 2 heads?

e) If a coin is flipped 5 times, how many possible outcomes are there?

f) Using a tree diagram or not, make a list of all the possible outcomes that give exactly 3 heads out of 5.

g) What is the probability of flipping a coin 5 times, and getting exactly 3 heads?

h) If a coin is flipped 6 times, how many possible outcomes are there?

i) **Without** using a tree diagram, make a list of all the possible outcomes that give exactly 5 heads out of 6. (Hint: there are fewer than 10. It's not that bad.)

j) What is the probability of flipping a coin 6 times, and getting exactly 5 heads?

2)a) You are on Just Visiting in a game of Monopoly. One of your opponents has hotels on the light purple properties: St. Charles Place, States Avenue, and Virginia Avenue. You roll two dice. If the sum is 1, 3, or 4, then you will land on one of these hotels. What is the probability that you will land on one of these hotels?

b) You are still on Just Visiting. Another of your opponents has hotels on the orange properties: St. James Place, Tennessee Avenue, and New York Avenue. If the sum is 6, 8, or 9, then you will land on one of these hotels. What is the probability that you will land on one of these hotels?

c) (Extra credit) What is the probability that you will land on a light purple property on this roll, and then an orange property on your next roll?

3) Data are collected for every student at East Valley Community College. The average number of hours worked per week and number of units taken are measured for each student. See table:

Hours worked	# of units 5 or less	6 to 10	11 or more
less than 20	312	605	920
20-40	1410	2102	2011
more than 40	892	1242	685

The numbers indicate how many students fall into each category. For example, there are 312 students who take 5 units or less and work less than 20 hours per week.

A student at EVCC is chosen at random. What is the probability that the student ...
a) works more than 40 hours per week?

b) takes 11 or more units?

c) works more than 40 hours per week AND takes 11 or more units?

d) works more than 40 hours per week OR takes 11 or more units?

e) A student who takes 5 or less units is chosen at random. What is the probability that the student works more than 40 hours per week?

f) A student who works 20-40 hours per week is chosen at random. What is the probability that the student takes 11 or more units?