

HW #6 Stat 101 Due Thursday Oct. 23

1. **Free throws.** Late in a basketball game the team that is behind often fouls someone in an attempt to get the ball back. Usually the opposing player will get to shoot foul shots “one and one”, meaning (s)he gets a shot, and then a second shot if (s)he makes the first one. Suppose the opposing player has made 70% of his/her foul shots this season. We simulated trials to estimate the average number of points the player will get in this situation.
 - a) Now calculate the actual probabilities of getting zero, one or two points. Hint: (A probability tree is a good way to do this).
 - b) Now, given these, calculate the expected value of the number of points.

2. **Car Repairs** A consumer organization estimates that over a one-year period 17% of cars will need to be repaired once, 7% twice, and 4% will require 3 or more repairs.
 - a) What is the probability that a car chosen at random will need
 1. no repairs?
 2. no more than one repair?
 3. some repairs?
 - b) If you own 2 cars, what is the probability that
 1. neither will need repair?
 2. both will need repair?

3. **M&M's** The Mars company says until the arrival of Purple, yellow candies made up 20% of their plain M&M's, red another 20%, and orange, blue, and green are each 10%. The rest were brown.
 - a) If you picked an M&M at random with these probabilities, what is the probability that
 - i. it is brown?
 - ii. it is yellow or orange?
 - iii. it is not green?
 - iv. it is turquoise?
 - b) If you picked three M&M's in a row, what is the probability that
 - i. they are all brown?
 - ii. the third one is the first one that's red?
 - iii. none are yellow?
 - iv. at least one is green?

4. **(15-10) Death Penalty.**
5. **(15-18) Shirts** Careful with this one. Are the events independent?
6. **(15-28) Politics.**

7. (15-46) Polygraphs
8. (16-10) Racehorse
9. (16-46) Bike Sale
10. (17-16) Colorblindness
11. (17-26) International Students
12. (17-34) No Shows