# Stat 1040 Recitation packet 10

1. A child has 6 packets of candy remaining from Halloween:

   - 3 Snickers
   - 2 M&Ms
   - 1 Skittles

   The child decides to choose packets at random to eat each day. (Note: obviously, the child is choosing without replacement!)

   (a) What is the chance the first choice will be M&Ms?

   (b) What is the chance the first choice will be M&Ms and the second choice will also be M&Ms?

   (c) What is the chance that neither of the first two choices will be Snickers?

   (d) What is the chance that at least one of the first 2 choices will be Snickers?

   (e) What is the chance that the last remaining packet of candy (on day 6) will be a packet of skittles?

2. A fast food chain has a game in which each large burger wins a prize with probability $\frac{1}{4}$ and the chances are independent.

   (a) If I buy 4 burgers, what is the chance I get no prizes?

   (b) If I buy 4 burgers, what is the chance I get 4 prizes?

   (c) If I buy 4 burgers, what is the chance that I get at least one prize?

3. In each of the following cases, circle the correct answer.

   (a) A die will be rolled some number of times and you win \$1 if it shows "6" more than 20% of the time. Which is better for you: 60 rolls or 600 rolls?

   (b) A die will be rolled some number of times and you win \$1 if it shows "6" more than 15% of the time. Which is better for you: 60 rolls or 600 rolls?

   (c) A die will be rolled some number of times and you win \$1 if it shows "6" between 15% and 20% of the time. Which is better for you: 60 rolls or 600 rolls?

   (d) A die will be rolled some number of times and you win \$1 if it shows "6" exactly $\frac{1}{6}$ of the time. Which is better for you: 60 rolls or 600 rolls?

   (e) A die has been rolled 10 times and the last 3 rolls have all been "6"s. The chance the next roll will be a "6" is (underline the correct answer):

      i. less than $\frac{1}{6}$.
      ii. exactly $\frac{1}{6}$.
      iii. more than $\frac{1}{6}$.

4. In the 2008 election, 63% of Utah voters voted for McCain. If we take a simple random sample of 300 these Utah voters, what is the chance that fewer than 50% of our sample voted for McCain?

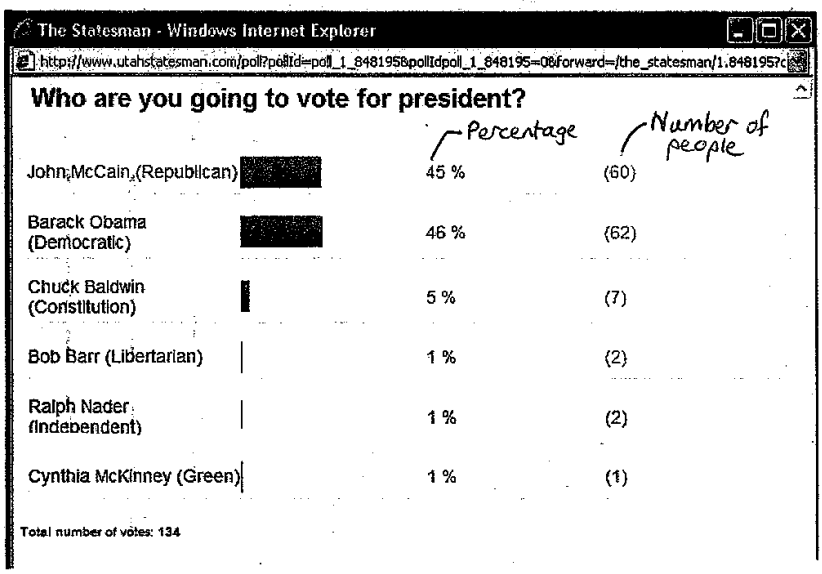
5. For each of the following answer True or False.

   (a) For confidence intervals, we do not need the tickets in the box to follow the normal curve provided we have a large enough simple random sample.

   (b) The law of averages says that if we toss a coin more and more times, the percentage of heads will tend to get closer and closer to 50%.

   (c) For a large sample, the sample itself will follow the normal curve even if the tickets in the box do not.

   (d) For a large sample, the average of the sample will follow the normal curve even if the tickets in the box do not.




   (a) Assuming these 134 people are a simple random sample of all USU students, find a 90% confidence interval for the percentage of USU students who were planning to vote for Obama at the time of the survey.

   (b) Now suppose you find out that these results came from the Statesman's online poll. Give 3 *different* reasons why your confidence interval in (a) is unreliable. Note: points will be deducted if your reasons are too vague or if they overlap too much.

7. The average GPA for graduating seniors in a large university is 3.13 with an SD of 0.7.

   (a) If I take a simple random sample of 100 graduating seniors from this university, what is the chance that the average GPA of those in my sample will be more than 3.5?

   (b) If you find out that the histogram for the GPAs does not follow the normal curve, is your answer to part (a) still valid? Why/why not?

8. For a simple random sample of 400 Cache Valley 6-year-olds, the average height is 117.25 cm with an SD of 4.2 cm. Find a 95% confidence interval for the average height of all Cache Valley 6-year-olds.

Memory Aids

Please note that these are provided for your convenience, but it is your responsibility to know how and when to use them.

For a 0-1 box,

$$\text{ave}_{\text{box}} = \text{fraction of 1's}$$

$$SD_{\text{box}} = \sqrt{\text{fraction of 0's} \times \text{fraction of 1's}}$$

$$EV_{\text{sum}} = \text{number of draws} \times \text{ave}_{\text{box}}$$

$$SE_{\text{sum}} = \sqrt{\text{number of draws}} \times SD_{\text{box}}$$

$$EV_{\text{ave}} = \text{ave}_{\text{box}}$$

$$SE_{\text{ave}} = \frac{SE_{\text{sum}}}{\text{number of draws}}$$

$$EV_{\%} = \%\text{ of 1's in the box}$$

$$SE_{\%} = \left(\frac{SE_{\text{sum}}}{\text{number of draws}}\right) \times 100\%$$