

Statistics 101 – Homework 7

Due Wednesday, October 28, 2009

Homework is due on the due date at the end of the lecture.

Reading: October 21 – October 23 Chapter 18 (p. 458 – 466)
 October 26 – October 30 Chapter 19

Assignment:

1. Do the following problems from the text, *Intro Stats*, 3rd Edition. If you have an earlier edition of the text, check with someone who has the 3rd Edition to make sure you do the correct problems.
 - a) Chapter 14 – problems 31 and 32.
 - b) Chapter 18 – problems 3, 4, 11, 13 and 14.
2. The maker of M&M's says on its website that 16% of Dark Chocolate M&M's are orange. Suppose that M&M's are packaged at random. We wish to examine the sample proportion of orange Dark Chocolate M&M's, \hat{p} , in various sized bags.
 - a) For each of the different sized bags, give the mean and standard deviation of the sampling distribution of \hat{p} . Also comment on whether or not the success/failure condition is met for the sampling distribution to be approximately normal.
 - i) Fun size bags containing 25 Dark Chocolate M&M's.
 - ii) Small bags containing 64 Dark Chocolate M&M's.
 - iii) Medium bags containing 100 Dark Chocolate M&M's.
 - iv) Extra large bags containing 400 Dark Chocolate M&M's
 - b) For the extra large bags containing 400 Dark Chocolate M&M's, use the 68-95-99.7 Rule to describe how the sample proportion of orange Dark Chocolate M&M's might vary from bag to bag.
 - c) In an extra large bag of 400 Dark Chocolate M&M's there are 80 orange. Is this an unusually large number of orange? Explain.
3. It is believed that 44% of all college students in the United States engage in binge drinking (5 or more drinks at a sitting for men, 4 or more for women). Consider a random sample of 100 college students. Verify that the success/failure condition is met. Use the 68-95-99.7 Rule to describe the sampling distribution model for the sample proportion of students who engage in binge drinking.
4. In 2004, 20.9% of all adults (18 years old or older) in the United States were current smokers. There were approximately 220,000,000 adults in the United States in 2004. For a random sample of 1000 U.S. adults is the 10% condition met? Explain briefly. Is the success/failure condition met? Explain briefly. Use the 68-95-99.7 Rule to describe the sampling distribution model for the proportion current smokers in a random sample of 1000 adults in the United States in 2004.
5. A company who packages microwave popcorn claims that only 5% of the popcorn in each package fails to pop. A package of popcorn contains 200 randomly selected kernels of popcorn. What is the chance that a package will have 16 or more kernels that fail to pop? Verify that the appropriate conditions for computing this probability are met?