

Statistics 101 – Homework 7

Due Friday, March 26, 2010

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

Reading: March 10 and March 22 Chapter 18 (p. 458 – 466)
 March 22 – March 26 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 24% of Milk Chocolate M&M's are blue. Suppose that M&M's are packaged at random. We wish to examine the sample proportion of blue 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 30 M&M's
 - ii) Small bags containing 60 M&M's
 - iii) Medium bags containing 100 M&M's
 - iv) Extra large bags containing 455 M&M's
 - b) For the extra large bags containing 455 M&M's, use the 68-95-99.7 Rule to describe how the sample proportion of blue M&M's might vary from bag to bag.
 - c) In an extra large bag of 455 M&M's there are 140 blue M&M's. Is this an unusually large number of blue M&M's? Explain briefly.
3. It is believed that 51% of the 18- to 20-year-old age group who currently drink engage in binge drinking (5 or more drinks at a sitting for men, 4 or more for women). Consider a random sample of 200 18- to 20-year-olds who currently drink. 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 18- to 20 year-olds who currently drink who engage in binge drinking.
4. In 2006, 21.5% of all adults (18 years old or older) in the Iowa were current smokers. There were approximately 2.2 million adults in Iowa in 2006. For a simple random sample of 1,950 adult Iowans 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 1,950 adult in Iowa in 2006.
5. It is believed that 3% of children have a gene that may be linked to a juvenile disease. Researchers hoping to track 20 or more of these children for several years test 800 newborns for the presence of this gene. What is the chance that the researchers find enough subjects for their prospective observational study?