Statistics 104 – Homework 8

Due Friday, November 20, 2009

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

Reading:  
November 10 – November 17  Sections 8.1, 8.2, 8.4, 9.1 and 9.2  
November 19 – December 3  Sections 8.3, 9.3, and 9.4

Assignment:

1. Complete the following problems from the text: 8.1, 8.7, 8.13, 8.23, 8.47, 9.1, 9.2, 9.9, and 9.10.

2. In a CNN/Opinion Research Corporation Poll conducted between October 16th and 18th, 2009 a random sample of 1,038 adults from across the U.S. were asked the question: “Under a proposal called “cap and trade,” the federal government would limit the amount of greenhouse gases that companies could produce in their factories or power plants. If companies exceeded those limits, they would either pay a fine or pay money to other companies that produced smaller amounts of greenhouse gases. Would you favor or oppose this proposal?” 623 were in favor, 384 were opposed and 31 had no opinion.

   a) What is the population? Be specific.
   b) What is the sample? Be specific.
   c) Are the conditions met for constructing a confidence interval for the population proportion that favor “cap and trade”? Support your answer.
   d) Construct a 95% confidence interval for the population proportion that favor “cap and trade”?
   e) How would a 90% confidence interval compare to the one you constructed in d? You should comment on the centers of the intervals and the widths of the intervals. Note: You do not need to construct a 90% confidence interval to answer this question.

3. A large manufacturer that sells consumer products on-line wishes to publicize its customer satisfaction in an advertisement. Specifically, it wants to state that over 90% of the manufacturer’s customers would tell a friend to buy a product from the manufacturer. The manufacturer selects a random sample of 1,000 customers from its database of over 2 million customers, contacts them via email and asks them the question “Would you tell a friend to buy a product from us?” 922 say yes and 78 say no.

   a) What is the population?
   b) What is the sample?
   c) Verify that the conditions are satisfied.
   d) Give a null and alternative hypothesis for the proportion of all customers who would tell a friend to buy a product from the manufacturer.
   e) Compute the value of the test statistic and convert this to a P-value.
   f) Use the P-value to make a decision whether or not to reject the null hypothesis.
   g) State a conclusion, within the context of the problem, which addresses whether or not it is appropriate for the manufacturer to make the claim of over 90% satisfaction in its advertisement.