Statistics 104 – Homework 11

Due Thursday, December 5, 2013
Homework is due on the due date at the end of the lecture.

Reading:  
November 12 – November 19  Sections 8.1, 8.2, 8.4, 9.1 and 9.2  
November 21 – December 5  Sections 8.3, 9.3, and 9.4

Assignment:

1. Complete the following problems from the text: 9.1 and 9.9.  
   9.1 $H_0$ or $H_a$?

9.9 Psychic

2. 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 500 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?” 465 say yes and 35 say no. 
   a) What is the population?

   b) What is the sample?

   c) Give a null and alternative hypothesis for the proportion of all customers who would tell a friend to buy a product from the manufacturer.
d) Verify that the conditions are satisfied.

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.

3. A random sample of 400 students is selected from the 28,000 students at a large Midwestern university. The students were asked “Over the past weekend did you consume alcoholic beverages?” 154 students answered no. We wish to see if this data is consistent with the statement that 32.5% of college students report that they have not consumed alcohol recently.

a) What is the population? Be specific.

b) What is the sample? Be specific.

c) Set up a null and alternative hypothesis for the proportion of all students at the large Midwestern university who have not used alcohol recently. Hint: You should use a two-sided alternative.
d) Verify that the conditions for a hypothesis test are satisfied.

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.