

Statistics 101 – Homework 9

Due Wednesday, April 7, 2010

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

Reading: March 29 – April 2 Chapter 20
 April 5 – April 7 Chapter 21

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 20 – problems 1, 2, 3, 5, 6, 11, and 27.
 - b) Chapter 21 – problems 1, 2, 3, 4, and 13

2. In a CNN/Opinion Research Corporation poll conducted between March 19 and March 21, 2010, 402 of the 1,030 U.S. adults surveyed said they generally favor the final legislation that would make major changes in the country's health care system while 608 of those surveyed said they generally opposed the health care legislation and 20 of those surveyed were unsure. The 1,030 adults were randomly selected from all adults in the U.S. and asked the question: "As you may know, the U.S. House of Representatives and the U.S. Senate are trying to pass final legislation that would make major changes in the country's health care system. Based on what you have read or heard about that legislation, do you generally favor it or generally oppose it?"
 - a) Set up a null hypothesis that the proportion of the population that generally opposes the final health legislation is 60% against an alternative that the population proportion is less than 60%.
 - b) Check the conditions necessary for conducting a test of hypothesis for a population proportion.
 - c) Calculate the value of the test statistic and convert this to a P-value using Table Z.
 - d) Use the P-value to make a decision whether or not to reject the null hypothesis.
 - e) State a conclusion, within the context of the problem, which addresses whether a majority of U.S. adults generally oppose the final health legislation.

3. A large accounting firm recently selected 80 individuals to participate in a management-training program. Of these, 60 were males and 20 were females. The company claims that it selected the 80 individuals at random from a pool of eligible employees that consisted of 900 females and 1600 males. Does the sample agree with the company's claim or do males make up a significantly larger

proportion of those selected for the training program than the proportion of eligible males? In order to answer this question you should

- a) Indicate what the population is. Be specific and include the size of the population.
 - b) Indicate what the sample is. Be specific and include the size of the sample.
 - c) Set up a null hypothesis that the population proportion of eligible employees that are male is 64% against an alternative that the population proportion is greater than 64%.
 - d) Check the conditions necessary for conducting a test of hypothesis for a population proportion.
 - e) Calculate the value of the test statistic and convert this to a P-value using Table Z.
 - 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 the company's claim.
4. The following question was asked as part of a standardized statistics test given to over 50,000 introductory statistics students.

True or False: The P-value is the probability that the null hypothesis is true.

For a random sample of 1000 students who took the test, 463 answered true and 537 answered false. Are students guessing at the answer or not? You should support your answer by first indicating what proportion of students would answer true if the students were just guessing, i.e. picking true or false at random and then

- a) Testing an appropriate hypothesis. Be sure to include all the steps and say how the test of hypothesis supports your answer.
- b) Constructing a 95% confidence interval. Be sure to include all the steps and say how the confidence interval supports your answer.