

Statistics 101 – Homework 9

Due Wednesday, November 11, 2009

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

Reading:	November 2 – November 6	Chapter 20
	November 9 – November 11	Chapter 21
	November 16	Chapter 18 (pages 466 – 477)
	November 18 – November 20	Chapter 23

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. An airline claims that they rarely lose a passenger's checked luggage. In addition, if checked luggage is lost, 90% of the luggage is recovered and returned to the owner within 24 hours. A consumer group surveyed a large random sample of the airline's customers and found that 103 of 122 people who had lost luggage were reunited with the missing items within 24 hours. Does this sample data cast doubt on the airline's claim of 90% recovered and returned within 24 hours? To answer this question you should
 - a) Set up a null hypothesis that the population proportion of lost luggage returned within 24 hours is 90% against an alternative that the population proportion is less than 90%.
 - 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 the airline's claim.
3. A large accounting firm recently selected 75 individuals to participate in a management-training program. Of these, 50 were males and 25 were females. The company claims that it selected the 75 individuals at random from a pool of eligible employees that consisted of 800 females and 1200 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? To answer this question you should

- a) What is the population?
 - b) What is the sample?
 - c) Set up a null hypothesis that the population proportion of eligible employees that are male is 60% against an alternative that the population proportion is greater than 60%.
 - 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.