

Statistics 101 L – Homework 10

Due Wednesday, April 22, 2009

Homework is due on the due date in lab.

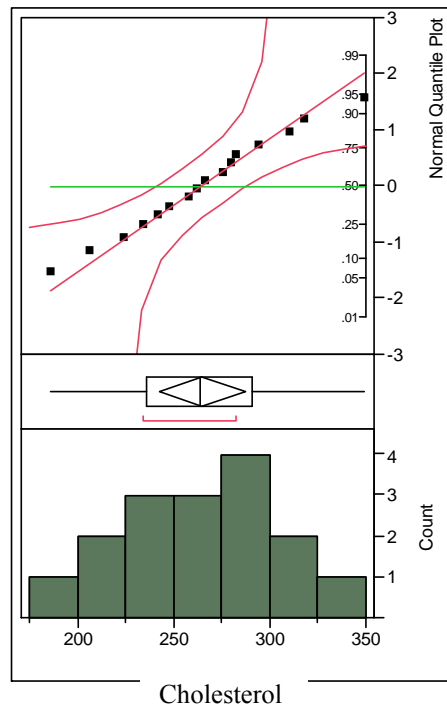
Reading: April 13 – April 15 Chapter 23
 April 17 – April 24 Chapters 24, 25

Assignment:

1. A major medical center in the Northeastern U.S. conducted a study looking at blood cholesterol levels and incidence of heart attack. Below are cholesterol levels for 16 randomly selected people who have had a heart attack.

242	318	224	310	186	294	276	280
266	282	262	248	206	234	349	258

$$n = 16, \quad \bar{y} = 264.7, \quad s = 42.12$$



- a) Verify that the conditions for statistical inference are met.
- b) Construct a 95% confidence interval for the mean cholesterol for all people who have had a heart attack.
- c) Give an interpretation of the confidence interval in b).
- d) Is 240 a plausible value for the mean cholesterol level for all people who have had a heart attack? Support your answer by referring to the confidence interval you constructed in b).
- e) Perform a test of hypothesis that the mean cholesterol level for all people who have had a heart attack is 240 against the alternative that it is greater than 240. Be sure to include the value of the test statistic, P-value, decision, reason for the decision and a conclusion.

2. The local grocery store packages different grades (based on fat content) of hamburger. Usually the leaner (less fat) grades are more expensive. A simple random sample of 12 one-pound packages of hamburger is obtained from the local store and tested for fat content. Below are the percentages of lean meat for each package.

90.7 94.1 91.7 92.3 91.6 93.2 91.4 92.4 92.1 93.4 92.9 93.0

- a) Calculate the sample mean percentage of lean meat and the sample standard deviation.
 - b) The packages are labeled 93% lean. Use the summaries in a) to test the hypothesis $H_0: \mu = 93$ against $H_A: \mu < 93$, where μ is the population mean percentage lean. Be sure to calculate the appropriate test statistic and P-value, reach a decision and justify that decision, and state a conclusion.
 - c) Based on the test in b), are the packages labeled correctly? Explain briefly.
 - d) One of the conditions for the test in b) is that the random sample could have come from a population described by a normal model (the nearly normal condition). Use the sample data to construct a box plot. Does the shape of the box plot support the nearly normal condition? Explain briefly.
3. Earlier this semester (Homework #2) we looked at the body temperature ($^{\circ}$ F) for 130 randomly selected adults. The data appear in the JMP file BodyTemp.JMP on the course web page. Use JMP to analyze the distribution of body temperatures and answer the following questions. Be sure to turn in a copy of the JMP output with your homework.
- a) Test the hypothesis that the population mean body temperature of adults is 98.6° F against the alternative that the population mean body temperature is less than 98.6° F. Be sure to include all steps for the test of hypothesis including verifying that the conditions for performing the test are met.
 - b) Construct a 90% confidence interval for the population mean body temperature of adults.