

# Statistics 101 – Homework 10

**Due Friday, April 23, 2010**

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

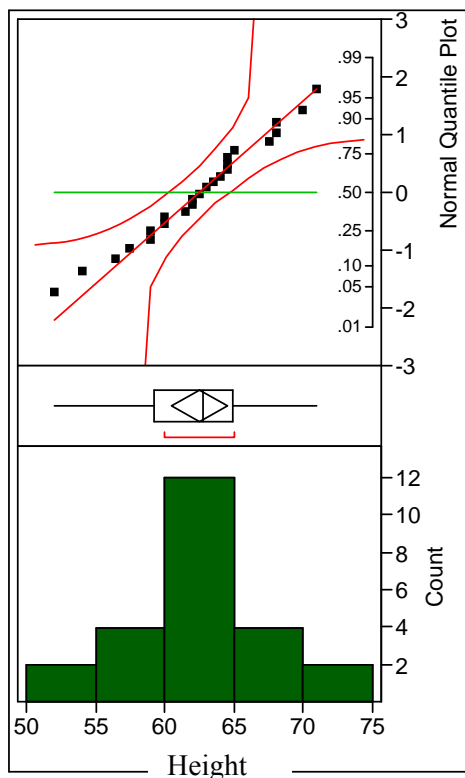
**Reading:**      April 12 – April 14                      Chapter 18 (pages 466 – 477)  
                       April 16 – April 21                      Chapter 23  
                       April 23 – April 26                      Chapter 24

**Assignment:**

1. Do the following problems from the text, *Intro Stats*, 3<sup>rd</sup> Edition. If you have an earlier edition of the text, check with someone who has the 3<sup>rd</sup> Edition to make sure you do the correct problems.
  - a) Chapter 18 – problems 29, 30, 31, and 32.
  - b) Chapter 23 – problems 1, 2, 5, 6, 15, 31, and 37.
  
2. In a study of youths in the East Boston area, several different measurements were made on girls age 5 to 17. Below are the heights (inches) of 24 randomly selected girls from East Boston.

60.0	52.0	59.0	64.0	54.0	61.5	56.5	62.5	64.5	59.0	57.5	68.0
63.0	64.5	62.0	62.0	71.0	64.5	63.5	68.0	65.0	60.0	67.5	70.0

$$n = 24, \quad \bar{y} = 62.48, \quad s = 4.74$$



- a) Verify that the nearly normal condition for statistical inference is met.
  - b) Construct a 95% confidence interval for the mean height of all girls in East Boston age 5 to 17.
  - c) Give an interpretation of this confidence interval.
  - d) Is 60 inches a plausible value for the mean height of girls age 5 to 17 in East Boston? Support your answer by referring to the confidence interval you constructed in b).
3. The high temperatures (degrees Fahrenheit) in April for a random sample of 10 locations (zip codes) in the United States are given below.

62	83	74	72	84	74	60	52	56	62
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- a) Calculate the sample mean high temperature and the sample standard deviation.
  - b) Use the summaries in a) to test the hypothesis  $H_0: \mu = 60$  against  $H_A: \mu > 60$ , where  $\mu$  is the population mean high temperature in April for locations (zip codes) in the United States. Be sure to calculate the appropriate test statistic and P-value, reach a decision and justify that decision, and state a conclusion within the context of the problem.
  - c) 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.
4. Earlier in the semester on homework #3 data on body temperature were given. A JMP file on the course web page (BodyTemp.JMP) contains data on the body temperature ( $^{\circ}\text{F}$ ) for 130 randomly selected individuals. Use JMP – Analyze – Distribution to look at the distribution of body temperatures, construct a 98% confidence interval and test the hypothesis that the population mean body temperature is  $98.6^{\circ}\text{F}$ . Turn in the JMP output with your answers to the following.
- a) Construct a 98% confidence interval for the population mean body temperature. Give an interpretation of this interval.
  - b) Test the hypothesis that the population mean body temperature is  $98.6^{\circ}\text{F}$  against the alternative that the population mean body temperatures is different from  $98.6^{\circ}\text{F}$ . Be sure to include all steps for the test of hypothesis.