Stat 296 Fall 2007
Assignment #1

This assignment is due at the beginning of class on Thursday, September 20, 2007. You must submit all problems that are marked with an asterix (*). Your assignment must be stapled and problem numbers clearly labelled. You must integrate your computer printouts into the body of your text in an organized and meaningful way. Do not crowd your work and do not write in multiple columns!

1. * If you have not already done so, send me an email which includes your background in math and stats.

2. Read all of the course policies on the outline and syllabus handouts. Be sure to also read the appropriate sections in the *University Calendar*. Visit and explore our Stat 296 course home page.

3. Read the "Preface" (pages xv–xviii) and read Chapter 0 (pages 1–9) of Higgins.

The following three problems were recently assigned in Stat 151. You will probably need to review your Stat 151 material in order to answer them.

4. * It is known that the size of an adult male's foot is a normally distributed variable with mean 25 cm and population standard deviation 3 cm.

(a) Calculate the probability that a randomly selected adult male's foot measures between 22 and 28 cm. (Round your answer to 4 decimal places.)

(b) Calculate the probability that the average foot length for a random sample of 100 adult males measures between 24.7 and 25.3 cm. (Round your answer to 4 decimal places.)

5. * Bright Idea Lighting tests their light bulbs, and finds that they have a mean lifetime of 262 hours, with a standard deviation of 41 hours. They test a sample of light bulbs of their rival, The Electric Company, and discover that they last 340, 190, 150, 280, 250, 180, 380, 300, 250, and 230 hours, respectively.

(a) Find the median, mean, and standard deviation of the lifetime of The Electric Company's light bulbs.

(b) Assuming the distribution of bulb lifetime of both companies follows a normal distribution, how likely is each company to produce a light bulb that lasts 350 hours?

(c) Compute an approximate 95% confidence interval for the true mean lifetime of The Electric Company's light bulbs based on this sample of data. (*Hint*: Since the true variance of The Electric Company's light bulbs' lifetimes is unknown, use a t-based confidence interval.)

(d) Is there evidence to conclude at the $\alpha = 0.05$ significance level that Bright Idea Lighting light bulbs have a different mean lifetime than those of The Electric Company?

(continued)

6. * *Cheap-O-Lube* wants to estimate how much the average time customers have to wait for an oil change has changed over the year. Last year, a sample of 200 customers produced a mean waiting time of 4.5 minutes with a standard deviation of 1 minute. This year a sample of 180 customers produced a mean waiting time of 3.5 minutes with a standard deviation of 1 minute. By conducting an appropriate hypothesis test, determine whether or not there is significant evidence at the $\alpha = 0.05$ level that *Cheap-O-Lube* customers are waiting less this year when compared to last year.

7. * Do the following exercises from Higgins. You must use SAS to (help you) answer them.

- page 21 #1
- page 21 #2

8. * Do the following exercises from Higgins. You may use SAS if you wish, although it is not required.

- page 22 #5

9. * Do the following exercises from Higgins. Do not use SAS for either problem.

- page 22 #4
- page 22 #7