STA 580 — Spring 2011 — Dr. Charnigo

Written Assignment 1

This assignment is due on Thursday 03 February at 5:30 p.m. You may work in groups of two or three, submitting one copy of the assignment for the group.

[50] 1. Refer to {Sheet1} of {SBPandExercise.xls}, which contains systolic blood pressure measurements (column SBP) for 25 adults seen at a doctor's office who do not exercise regularly (0 in column Exercise) and for 24 adults seen at a doctor's office who do exercise regularly (1 in column Exercise).

[10] a. Report the sample mean and sample standard deviation for systolic blood pressure among the exercising adults. Do the same for the non-exercising adults.

[10] b. Report the sample median and sample interquartile range for systolic blood pressure among the exercising adults. Do the same for the non-exercising adults.

[10] c. Create side-by-side box plots comparing the sample distribution of systolic blood pressure measurements among the exercising adults to the sample distribution of systolic blood pressure measurements among the non-exercising adults. Comment on the shape of each distribution. Are the two distributions visually similar with respect to central tendency and variability?

[10] d. Suppose that systolic blood pressure measurements are normally distributed in the population of exercising adults. Suppose also that the population mean and population standard deviation happen to be the same as the sample mean and sample standard deviation computed for item a. Under these two suppositions, what is the population percentage of exercising adults who have systolic blood pressure measurements between 120 and 140 (pre-hypertensive)? Above 140 (hypertensive)?

[10] e. Under the two suppositions introduced in part d, find the systolic blood pressure measurement defining the boundary between the top third and bottom two-thirds in the population of exercising adults.

[50] 2. Suppose that 30% of adults are obese. Suppose, moreover, that 15% of obese adults are diabetic and that 7.5% of non-obese adults are diabetic.

[10] a. What percentage of adults are diabetic? What percentage of adults are not diabetic?

[10] b. What percentage of adults are both obese and diabetic? What percentage of adults are neither obese nor diabetic?

[10] c. What percentage of diabetic adults are obese? What percentage of non-diabetic adults are obese?

[10] d. What is the probability that, among 20 randomly selected adults, there are at least 3 who are diabetic? What is the approximate probability that, among 200 randomly selected adults, there are at least 30 who are diabetic?

[10] e. Suppose that, in a certain community, there live 5000 adults. If I told you that 200 of them were diabetic, would that surprise you? Why or why not?