STA 580 — Fall 2008 — Dr. Charnigo

Written Assignment 1

This assignment is due on Thursday 18 September at 5:20 p.m. You may work in self-selected groups of two or three, in which case you may hand in one copy of the assignment for the group.

[50] 1. Refer to {Sheet1} of {SMKandSBP.xls}, which contains systolic blood pressure measurements (column SBP) for 32 non-smokers (0 in column SMK) and 25 smokers (1 in column SMK).

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

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

[10] c. Create side-by-side box plots comparing the sample distribution of systolic blood pressure measurements among the non-smokers to the sample distribution of systolic blood pressure measurements among the smokers. 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 non-smokers. 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 non-smokers who have systolic blood pressure measurements between 140 and 160? Above 160?

[10] e. Under the two suppositions introduced in part d, find the systolic blood pressure measurement defining the boundary between the top 15% and bottom 85% in the population of non-smokers. What about the boundary between the top 5% and bottom 95%?

[50] 2. Suppose that 15% of adults who exercise (eventually) develop coronary heart disease, 25% of adults who do not exercise develop coronary heart disease, and 30% of adults exercise.

[10] a. What percentage of adults develop coronary heart disease? Are coronary heart disease and exercise independent?

[10] b. What percentage of adults exercise and develop coronary heart disease? What percentage of adults exercise and do not develop coronary heart disease?

[10] c. Among adults who develop coronary heart disease, what percentage do not exercise? Among adults who do not develop coronary heart disease, what percentage do not exercise?

[10] d. What is the probability that, among 13 randomly selected adults, there are at least 5 who exercise? What is the approximate probability that, among 130 randomly selected adults, there are at least 50 who exercise?

[10] e. Suppose that, among 1600 adults who live in a certain community and who do not exercise, 385 develop coronary heart disease. Is 385 more or less than what you would have expected? Is the difference between 385 and what you would have expected remarkable?