Assignment 10. Chi-Square
Due Thursday, December 6 at 3PM

As always with hypothesis testing, f*or each problem, make sure to state your null and research hypotheses <u>in words</u> as well as using <u>formal notation</u>. After finishing the test, state your <u>formal conclusion</u> with regard to the null hypothesis as well as your <u>substantive answer</u> to the question.* Please make sure to print out and include your Stata output with this assignment.

1. You are interested in evaluating whether gender shapes opinion on death penalty. The survey asked a random sample of 130 American women and 70 American men whether they support or oppose death penalty. The results are as follows: Strongly Support: 30 women, 30 men; Support: 30 women, 20 men; Oppose: 50 women, 15 men; Strongly Oppose: 20 women, 5 men.
   a. Construct a contingency table of these data with column percentages.
   b. Describe the pattern that you are seeing in the contingency table for the sample.
   c. Do a chi-square test of independence on the data <u>by hand</u> using 95% confidence level in order to determine whether there is a relationship between gender and opinion on death penalty. (Feel free to check your work using Stata!)
   d. If you conclude that the overall relationship exists in the population, conduct a post-hoc assessment to describe the likely pattern of differences in the population.

2. Assume you have a random sample of 1000 employed Americans and you want to determine whether their education level affects whether they think flexible work hours are important for them in a job. Among those with less than high school degree, 50 think flexible work hours are important, 40 say they are neither important nor unimportant, and 10 state they are not important. Among those with a high school degree, 250 report they are important, 160 think they are neither important nor unimportant, and 110 say they are unimportant. Finally, among those with more than high school degree, 200 think they are important, 100 state they are neither important nor unimportant, and 80 report they are unimportant.
    a. Construct a contingency table of these data with column percentages.
    b. Describe the pattern that you are seeing in the contingency table for the sample.
    c. Use Stata to do a chi-square test of independence on the data using 95% confidence level in order to determine whether, among Americans, there is a relationship between education levels and whether people think flexible work hours are important to them in a job.
    d. If you conclude that the overall relationship exists in the population, conduct a post-hoc assessment to describe the likely pattern of differences in the population.

3. Use Stata on gss2012.dta dataset and focus on variables *happy* and *degree* to evaluate whether education has effects on general happiness among Americans.
   a. Construct a contingency table of these data with column percentages.
   b. Describe the pattern that you are seeing in the contingency table for the sample.
   c. Use Stata to do a chi-square test of independence on the data using 99% confidence level in order to determine whether, in the U.S. population, there is a relationship between education and general happiness.
   d. If you conclude that the overall relationship exists in the population, conduct a post-hoc assessment to describe the likely pattern of differences in the population.