Homework #7
RPAD 316
Professor Stephen Holt

Instructions: You will be doing some of the problems in this assignment by hand. For the problems by hand, show your work for each step. For any Stata questions, when asked for graphs, save the graph as a .png file and paste the image into the appropriate section of the word document. Paste your code that produced the graph below the graph. When asked for tables, use the esttab process covered in class to create the "csv" tables and paste them into the homework. Paste the code used to create the table under the table. If the item does not ask for a table, a .png screenshot of the Stata output is acceptable.

Dataset 1. Wages of participants and non-participants in jobs counseling program.

ID	Hourly Wage (Year 1)	Hourly Wage (Year 3)	Difference
1	12	19	7
2	7.5	7.5	0
3	12	9.5	-2.5
4	13	10	-3
5	7.25	10.5	3.25
6	12	12.5	0.5
7	10	13	3
8	19	12	-7
9	7.75	8	0.25
10	8	15	7
11	10	22	12

Dataset 1 contains the wages at two points in time among a sample of participants in a job counseling program. Participants were assigned a job counselor to help them find a job and give persistent career advice for three years. The program served recently incarcerated individuals after they were released from prison.

1. What is the mean of wages of participants in year 1 and year 3?

2. If the standard deviation of year 1 is 2.99 and the standard deviation of year 3 is 6.51:
    a. What is the standard error for the estimate of wages in year 1?
    b. What is the standard error for the estimate of wages in year 3?

3. Policy makers are interested in the program and want to know that by year 3 of the counseling program, participants are not making minimum wage, which is $7.25 per hour.
    a. What would the null hypothesis be if you were testing this using your sample of 11 randomly selected participants?

b. Calculate the p-value for year 3 using the null hypothesis above.

Using Dataset 2 from Blackboard, use Stata to answer the following questions.

1. What is the mean and standard deviation for the number of assaults in prisons?

2. What is the standard error and 95% confidence interval of the number of assaults?

3. What is the average number of assaults, standard error, and 95% confidence interval for the number of assaults in minimum security facilities?

4. What is the likelihood that the average number of assaults in minimum security prisons is actually zero?

5. A policy maker has set a goal for wardens to reduce the number of assaults in maximum security prisons to no more than 10 per year.
    a. What is the null hypothesis you would use to test this?

    b. Use Stata to test the probability that wardens are reaching this goal given what you observe in your sample.

Extra credit

1. Using the information in dataset 1 above, the standard error for the difference between year 1 wages and year 3 wages is 1.308.
    a. What is the average difference in wages?

    b. Policy makers want to know if there was a change in wages between year 1 and year 3. What is the null hypothesis you would use to test this?

    c. Given the average difference observed in your sample, what is the likelihood that the null hypothesis is true?

2. A policy maker has decided to see if offering college education (variable college_ed) in super maximum security prisons reduces the number of assaults in the prison.
    a. What is the null hypothesis you would be testing?

    b. What is the average difference in the average number of assaults in super max prisons without college credit programs and super max prisons with college credit programs?

    c. What is the probability that you will see a sample with an average difference that you observe in your sample if the null hypothesis is actually true?