

**DEPARTMENT OF POLITICAL SCIENCE
AND
INTERNATIONAL RELATIONS**

Posc/Uapp 816

Assignment 1

Name_____

(Printed)

Student Number_____

(Social Security Number)

E-mail_____

The purpose of this assignment is to make sure that everyone 1) can communicate with me via e-mail; 2) has access to the course web page; 3) knows how to surf the net to retrieve data and information; and 4) is comfortable with hypothesis testing, estimation, and confidence intervals.

Note: it's important that you be neat. Please do not use the assignment sheet for scratch work. Attach notes to plain paper.

1. First, send me an e-mail message (to htr@udel.edu).
2. Next, I would like you to manually obtain a random sample of data from the "School District Data Book," a very interesting and useful source of data on thousands of school districts across the nation. We can use the data to estimate means and compare them to the known population values.
 - A. Actually, you won't draw your own sample since I need to standardize the assignment. But you can think of this exercise as drawing 12 cases at random from California and 8 from Delaware.
 - B. To reach the file go to the course web site (www.udel.edu/htr/Statistics), then Sources of Information and Software page, then Social and Economic Data, then **CDE Online Bookshelf**, then **School District Data Book Profile**.
 - i. Or just open page govinf.kerr.orst.edu/sddb-stateis.html
 - C. Select California either by clicking on the map or by selecting it from the list.
 - D. Then go to each of the school districts in the table below and obtain their "total expenditures per student," "students per teacher" ratio, and "median housing value."
 - E. Note for California use the **unified** districts.
 - F. Then, go back to the Profile page and select Delaware. Pick the districts indicated in the table and supply the corresponding information.

District	Expenditures	Ratio	Housing	District	Expenditures	Ratio	Housing
U.S.							
California				Delaware			
ABC				Appouinimik			
Alameda City				Brandywine			
Big Pine				Cape Henlopen			
Carlsbad				Christina			
Lincoln				Indian River			
Mammoth				Red Clay			
Medocino				Symrna			
Novato				Woodbridge			
Ripon							
San Jacinto							
Walnut Valley							
Yuba City							

i. Make sure you have the “unified” districts in California.

G. In addition to the district data include the state and national totals.

3. Using the sample estimate the California and Delaware means and standard deviations

	California	Delware
Mean		
Standard deviation		
N (sample size)		

A. You should be able to do so by hand or with a statistical calculator, but you might as well enter the numbers into a MINITAB (or SPSS) worksheet and save them for another day.

i. **Note: don’t enter state or national totals in the worksheet unless you know what you’re doing. Otherwise, you will mess up the column totals.**

B. These are of course “sample” estimates than can be compared to the population values. But for the moment let’s pretend parameters are unknown.

4. Use the small sample t test to investigate the hypothesis that the mean total expenditure per student in California is \$5203.

A. Using the **.01** level what is the critical t for the two-tailed test that $\mu_{\text{California}} = \$5,203$? _____ Make sure you have the correct degrees of freedom.)

B. What is the observed t? _____

C. What is your decision? Do you accept or reject the null hypothesis? Why?

D. What is the “attained” probability of the t? _____

E. Calculate 99 percent confidence intervals for your sample mean:

F. Do these intervals include the hypothesized value? If yes (or no), what does that fact tell you about the null hypothesis?

5. Now carry out a similar test for Delaware, but use $H_0: \mu_{\text{Delaware}} = \$4,500$.

A. What is the critical value at the **.05** level? _____

B. What is the observed t? _____

C. What is your decision? Do you accept or reject the null hypothesis? Why?

D. What is the “attained” probability of the t? _____

- E. Calculate **95** percent confidence intervals for your sample mean:
- F. Do these intervals include the hypothesized value? If yes (or no), what does that fact tell you about the null hypothesis?
- _____
- _____
- _____
6. Now use your sample means to test the hypothesis that the mean Student-teacher ratio is the same in California as in Delaware against the alternative hypothesis that they differ.
- A. What is the critical value at the **.05** level, again using a two-tailed test?. _____
(If you are going to do this by hand, make sure you have the correct degrees of freedom. But if you are using MINITAB, use the degrees of freedom it supplies.)
- B. What is the observed t? _____
- C. What is your decision? Explain it.
- _____
- _____
- _____
- D. Find 95 percent confidence limits for the observed difference of means.
- _____
- E. Do these intervals include 0? If so (or not) what do you conclude?
- _____
- _____
- _____

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