

SUNY-Stony Brook. Economics Department
Economics 323: Fall 2011
Professor: Hugo Benítez-Silva

Problem Set 4: Due Thursday November 17, 2011

1. Shorter Questions. Remember to justify your answers. (10 points each)

- a) What are the differences between cross-sectional data and time series data? Give an example of each of them. Use examples different from the ones in the notes.

- b) Give examples of at least two variables (with some economic meaning) for which using the mode would be better than using the mean or the median to describe the central tendencies of a distribution in a particular population or sample.

2. The truth will prevail. (Again, justify your answers). (10 points each)

- a) In any given sample, the median is never larger than the mean, unless the distribution is symmetric. **True or False.**

- b) The sign of the correlation coefficient provides us with information regarding how good a line fits the data points we are studying. **True or False.**

- c) The range is always larger than the inter-quartile range. **True or False**

**3. Longer but not more difficult. Show your work: No justification, no credit.
(25 points)**

Suppose you are considering a job offer from a company in London. You are interested in finding out how much employees of the firm spend on housing in order to judge the cost of living in the city. This information will help you decide whether the firm's salary offer is attractive.

There are currently four employees with the firm paying the following rents per month:

<u>Employee</u>	<u>Rent</u> (in British pounds)
Dave	700
Lil	300
Steve	100
Clare	100

Remember, 1 British pound is equal to 1.9 U.S\$

- Calculate the population mean rent for employees
- Suppose that you can only talk with 2 employees. Write down the sample means for all possible pairs of employees that you could have asked about rent.
- Do the same as b) but assuming you could talk with 3 employees.
- From the results in b) and c) would you say that the sample mean is a biased or unbiased estimator of the population mean? Why?
- Does being able to talk with more employees ensure that you have more accurate information?
- Calculate the variance of the sample mean for $n=2$ and $n=3$ using the results of b) and c) (Note that each sample mean counts as one observation). What do you conclude from these results about being able to talk with more employees?

4. Consider the following five observations on Savings and Income for a given population. (25 points)

\underline{Y}_i	\underline{X}_i
0.0	1.9
0.9	12.4
0.4	6.4
1.2	7.0
0.3	7.0

a) Assuming that \underline{Y}_i are observations (in thousands of dollars) on savings, and \underline{X}_i observations on income (also in thousands of dollars), compute by hand and showing all the steps you need to calculate, the regression coefficients β_0 , and β_1 in the regression

$$\underline{Y}_i = \beta_0 + \beta_1 \underline{X}_i + u_i$$

b) Write an equation for the fitted regression line considering the regression coefficients you found.

c) What is the marginal propensity to save in this model? What happens to saving if income increases by \$3500 dollars?