ECONOMICS 261
STATISTICAL METHODS
PROF. KARSTENSSON

EXAM 1
SPRING SEMESTER 2002

Instructions: Write (1) your name, (2) the course and section number, and (3) the date on the front cover of your Examination Book. Answer all the questions in Parts I, II, and III of this Exam in your Examination Book. Clearly note the question number (and letter if appropriate) at the beginning of your work and/or answer to each question. Turn in your Exam and Exam Book when you are finished with the test.

GOOD LUCK!

Part I: Concept questions: Write the correct term (word or words) for each of the following: (4 points each)

1. The branch of statistics which centers on the estimation of population parameters from sample data.
2. A tool used to order small data sets, that is, for example, to put a continuous variable into an ordered array from the smallest value to the largest value.
3. A table used to display a two-variable data set.
4. The property, or characteristic, of asymmetry in a distribution.
5. The measure that indicates the type of relationship (direct or inverse) and the strength of the relationship (strong, moderate, or weak) between two variables.

Part II: Problem questions: Solve the following problems. Show your work in your Exam Book and designate your final answer in each case by placing a box around it. (15 points each)

6. The following data set consists of the number of hours worked per week among a sample of twenty UNLV students who work in the local hotel industry:

30	22	40	28	40	20	49	35	10	40
20	25	15	40	16	42	10	28	24	15

   (a) Put these data into a relative frequency distribution having five class intervals of ten hours each beginning with the interval, 1-10.

   (b) Describe this distribution (your answer to question 6a) with respect to sample size, central tendency, variation, and symmetry.

7. The UNLV Speculators is an association of students who manage a small investment fund. During the last six months, they have accumulated 1,000 shares of Mississippi.com (MIS), an on-line retailer of books that reported a first-time profit in the fourth quarter of 2001. The Speculators purchased 300 shares of MIS stock last August for $30.00 per share, 500 shares in November at $20.00 per share, and 200 shares in January at $25.00 per share. What was the average price that the UNLV Speculators paid per share for MIS stock?

8. In an effort to maintain a high level of customer satisfaction, Neiman Marcus has tracked the number of complaints received from customers over the last ten years. The number of complaints received over a sample of eight months randomly selected from this ten-year period is as follows:

   6 8 6 12 18 7 9 10

   Calculate the following for this data set:

   (a) Arithmetic mean
   (b) Sum of squares
   (c) Standard deviation
   (d) Coefficient of variation
   (e) Z-value for X = 6

9. The daily room occupancy rate at the Bellagio Hotel during the Summer months (June, July and August) of 2001 was normally distributed with a mean of 88 percent and a variance of 4 percent. What was the room occupancy rate on 68 percent of the days at the Bellagio Hotel?

Part III: Output interpretation questions: The following questions are based on the Excel output which appears on the following page. (10 points each)

10. With reference to the variable, Gen:

   (a) What is the numerical value of $\overline{X}$?

   (b) What information is contained in the numerical value of $\overline{X}$?

11. What does the variable, Job, suggest about the distribution of work for the sample of UNLV students during the Spring Semester 2002 with respect to:

   (a) sample size
   (b) central tendency
   (c) variation
   (d) symmetry

Part IV: Optional extra credit question: The following question refers to the movie, *A Beautiful Mind*. (2 points)

12. Who was Charles Herman? Explain.

* THE END *

If there is time remaining, check your work for accuracy.

Economics 261 Data Set
Spring Semester 2002

Excel Descriptive Statistics Output

Measure	*Gen*	*Chr*	*Job*
Mean	0.517	14.086	21.431
Standard Error	0.047	0.266	1.238
Median	1	15	21.5
Mode	1	15	0
Standard Deviation	0.502	2.864	13.333
Sample Variance	0.252	8.201	177.760
Kurtosis	-2.030	0.935	-0.812
Skewness	-0.070	-0.197	-0.296
Range	1	18	48
Minimum	0	6	0
Maximum	1	24	48
Sum	60	1634	2486
Count	116	116	116
Confidence Level(95.0%)	0.092	0.527	2.452

Variable definitions:

Gen = Gender dummy variable: Male = 0, Female = 1.
Chr = Semester credit hours, number.
Job = Hours per week working on a job, number.

EXAM 1 FORMULAS

Note: $\sqrt{}$ = square root

1. $\bar{X} = \frac{\Sigma X}{n}$ $\mu = \frac{\Sigma X}{N}$

2. $\bar{X}_w = \frac{\Sigma Xw}{\Sigma w}$

3. $S^2 = \frac{\Sigma (X-\bar{X})^2}{n-1}$ $\sigma^2 = \frac{\Sigma (X-\mu)^2}{N}$

4. $S = \sqrt{\frac{\Sigma (X-\bar{X})^2}{n-1}}$ $S = \sqrt{S^2}$ $\sigma = \sqrt{\frac{\Sigma (X-\mu)^2}{N}}$ $\sigma = \sqrt{\sigma^2}$

5. $CV_S = S/\bar{X}\ (100)$ $CV_P = \sigma/\mu\ (100)$

6. $Z = \frac{X-\bar{X}}{S}$ $Z = \frac{X-\mu}{\sigma}$

7. $Sk_S = \frac{3(\bar{X}-Mdn)}{S}$ $Sk_P = \frac{3(\mu-Mdn)}{\sigma}$