

E 370 – Fall 2004
In-Lab Examination One
Statement of Academic Integrity:

“I swear that I have neither given nor received assistance on this exam and that I will not discuss this exam until all sections have completed it, that is until 14:00 on Saturday, October 12, 2004.”

I have read and agree with the above statement.

Signature: _____

Instructions

1. Write your name on every page of your exam.
2. Answer the questions in the spaces provided on the exam.
3. Do not provide computer output unless it is **required**. Whenever you print out anything, you **MUST TYPE your Name and 5-digit Team Number on your work before you print it.**
4. **You must show your work and explanation to receive full credit. You must write any EXCEL functions used, with arguments, as well as the numerical output. For example Include 4 decimal places in your answer.**
5. You may only use EXCEL for this exam.
6. Only the exam, pencils, erasers, and the tool cards may be on your desk. Put all the rest of your belongings along the wall or at the front of the room.
7. Remember, a student is to avoid even the appearance of cheating. Keep your eyes on your exam or on your computer screen. Any questionable behavior on your part is sufficient reason for me to confiscate your exam and ask you to leave the room.
8. The value of each question is given by each question. **Budget your time accordingly.**
9. When you are finished, you may turn in all pages of the exam and leave the room as soon as you are able to without disturbing your classmates.
10. Stay calm and do your best.
11. **DATA INSTRUCTION: Open Internet Explorer. Type the URL your instructor gives you to get YOUR data to use on the exam. Save it to the desktop as a TEMP file. Close Internet Explorer.**

Name _____

1. The Wood County sheriff classifies crimes by age (in years) of the criminal and whether the crime is violent or nonviolent. As shown below:

Type of Crime	Age (in years)			Total
	Under 20	20 to 40	Over 40	
Violent		46	19	
Nonviolent	17			68
Total	44		36	

- a. Complete the contingency table given above. (6 points)

If a case is selected at random, what is the probability that:

- b. It involved a violent crime? (3 points)
- c. It involved a violent crime or an offender less than 20 years old? (3 points)
- d. It was committed by an offender above 20 given that it involved a violent crime? (3 points)
- e. It involved a nonviolent crime and was committed by someone between 20 and 40 years of age? (3 points)
- f. Based on this information, do you think age has any influence on type of crime? Justify your answer. (2 points)

Name _____

2. Open the 'Fund' worksheet in your data set. The data is a sample of domestic general stock funds' returns in dollars.

a. Create a frequency distribution table and histogram with 6 classes using excel. **(Print out your results with your name and 5-digit team number typed and turn it in with your exam)** (5 points)

b. Describe the shape of the distribution according to your graph. (5 points)

c. Calculate all relevant descriptive statistics for the stock fund returns. Be sure to include inter-quartile range. Then use these statistics to **describe the data set and its distribution.** (5 points)

d. What would be the best measure of center for the stock fund returns? Why? (5 points)

Name _____

3. Open the “MLB” worksheet in your data set. This is a sample of data from Major League Baseball about number of wins (WINS), earned run average (E.R.A.) and runs score (Runs Scored). (20 points)
 - a. Calculate the covariance between WINS and E.R.A., and between WINS and Runs Scored. Describe the relationships between WINS and E.R.A., and between WINS and Runs Scored. (5 points)
 - b. Between E.R.A. and Runs Scored, which one has the stronger relationship with WINS? Why? (Justify your answer) (5 points)
 - c. If you want to predict team wins by using only runs scored, what would be your model for prediction (equation)? (5 points)
 - d. Among these three variables, which one has the highest variation? (5 points)

Name _____

4. The following table is a report on costs for minor repairs during last month from a randomly selected auto shop. (20 points)

Costs for minor repair (\$)	Cumulative Frequency
0-100	10
100-200	28
200-300	88
300-400	158
400-500	200
500-600	228

(a) Calculate average costs and standard deviation for minor repair. (7 points)

(b) What would be the Modal and Median classes for this data? (7 points)

(c) What would the sign of the skewness coefficient be for this data and why? (6 points)

Name _____

5. A vendor at the baseball stadium in Bloomington is going to determine whether to sell ice cream or soft drinks at tomorrow's IU vs. Purdue game. The vendor estimates the following profits that will be made given tomorrow's possible weather conditions when he invests \$100. (20 points)

Probability	Weather	Sell Soft Drinks	Sell Ice Cream
.25	Cool	\$50	\$20
.60	Warm	\$60	\$80
.15	Hot	\$70	\$90

- (a) Compute the expected profit and standard deviation for selling only soft drinks and those for selling only ice cream. (12 points)

- (b) Compute the covariance of selling soft drinks and selling ice cream. (8 points)

- (d) **(BONUS QUESTION)** Now, the vendor is going to sell both soft drinks and ice cream by the proportion of 7:3. Compute the expected profit and standard deviation for selling both items. **(5 extra credit points)**