

Introduction to Statistics: Practice for Test One

SECTION ONE: Multiple Choice (On the test there will be 10 multiple choice questions, each worth 5 points, for a total of 50 points.)

- For the list: 20, 20, 0, 5, 10, -5, 10, 15, 15, 20, -40, find the approximate average, approximate standard deviation, and median.
 - Average: A. 6.36 B. 7.00 C. 7.36 D. 8.00
 - Standard Deviation: A. 15.66 B. 16.66 C. 17.66 D. 18.66
 - Median: A. 12.5 B. 10 C. -5 D. -40
- Consider the number of cars each family in Syracuse owns. Suppose the distribution is

cars	0	1	2-3	4-7	More than 7
families (in 10,000s)	4	3	6	2	0

 - In the histogram of this data, if the bar over the interval 4-7 cars is $\frac{1}{2}$ inch tall, how tall should the bar over 2-3 cars be?
A. 1 inch B. 2 inches C. 3 inches D. 4 inches
 - The average of the distribution above is about 2. The SD is closest to which of the following.
A. .3 B. 1.3 C. 2.3 D. 3.3
- It is found that the scatter plot of hours of tv viewed per week and hours of sleep is football shaped with a concentration of data towards the middle. We have found that the average number of hours of tv viewed is 15 hours with a standard deviation of 5 hours; and the average number of hours of sleep is 7.5 hours with a standard deviation of 1.5 hours. The correlation coefficient is $-.4$.
How many hours of sleep do you predict a person who watches 20 hours of tv per week would get?
A. 6.90 hrs B. 5.22 hrs C. 3.75 hrs D. 2.45 hrs
- Below is a (fictional) four week study of outside temperature versus the number of crimes for that night. Let X be the average nightly temperature for the week and Y be the average number of crimes per night for that same week.

X	Y
62.3	220.1
60.0	210.3
66.7	239.9
58.2	199.8

The correlation coefficient for the average nightly temperature for the week versus the average number of violent crimes per night is approximately

- A. 1.99 B. .99 C. .59 D. .09

SECTION TWO: Short Answer (On the test there will be 6 short answer questions, each worth 5 points, for a total of 30 points.)

- Consider the data from question 4.
 - Interpret the meaning of your answer from question 4.
 - If we had the temperature and crime data for each of the 28 days, do you suspect that its correlation coefficient would be the same, higher, or lower? Explain your reasoning.
- Consider the dataset of odometer readings for cars at Colgate (how many miles the car has been driven). Would you expect the median or average to be larger? Briefly justify your answer.

7. Actual studies show that the accident and fatality rates for minivans are lower than for cars. (It doesn't seem to matter how this is specifically measured, the data show lower rates for minivans.) Yet many minivans don't have many of the safety features required of cars. Explain whether or not and why this data shows that minivans are safer to drive than other vehicles.
8. Data is collected for two colleges on student car ownership. The data is divided by where students live: dorms, group housing (specialty houses and Greek system houses), and off campus. The following facts are found:
- A greater number of off campus students own cars at Mental State than at Ilove U.
 - A greater number of dorm dwellers own cars at Mental State than at Ilove U.
 - A greater number of group house students own cars at Mental State than at Ilove U.
 - 20% of the dorm dwelling students at Mental State own cars compared to 10% of the dorm dwelling students at Ilove U.
 - 80% of the group house students at Mental State own cars compared to 60% of the group house students at Ilove U.
 - 95% of the off campus students at Mental State own cars compared to 90% of the off campus students at Ilove U.

Based on these facts, answer the following questions.

- a) Does this imply that more students at Mental State own cars than at Ilove U.? Briefly explain.
- b) Does this imply that a higher percentage of students at Mental State own cars than students at Ilove U.? Briefly explain.

SECTION THREE: Essay (20 points) (You will be asked the questions from one of the units (1–3) appearing on the class webpages.)

SOME FORMULAS

$$\sqrt{\text{Average of } (x - a_x)^2}$$

$$\sqrt{\text{Average of } x^2\text{s} - (a_x)^2}$$

$$\frac{(\text{Avg of } xy\text{'s}) - a_x a_y}{SD_x SD_y}$$

$$y = \pm \left(\frac{SD_y}{SD_x} \right) (x - a_x) + a_y$$

$$\frac{x_1 + x_2 + \cdots + x_n}{n}$$

$$y = r \left(\frac{SD_y}{SD_x} \right) (x - a_x) + a_y$$