

Instructions: The exam consists of five questions. Each question consists of 2 to 4 parts. The points assigned to each question is noted. The maximum points for this exam is 25.

All the paper you should need is provided. If you need additional paper, raise your hand.

You have 105 minutes to finish the exam (or until 1:45pm)

Some comments regarding the questions

1. Every data set is a sample data set.
2. Show all work.
3. Write your name on every sheet of paper.
4. If you are asked to interpret the results, do not go beyond the information provided to you by the analysis.

1. (3 points) Construct a stem and leaf plot for these 20 measurements:

8.69 8.95 2.66 1.33 1.60 7.45 4.25 9.77 3.93 6.03
1.43 5.68 6.32 1.29 3.69 2.97 9.04 4.65 9.29 5.09

- (a) Describe the shape of the graph
(b) What is the smallest value?
(c) what are the eight and ninth largest values?

2. (4 points) Here are 11 values from a sample.

24,4,61,82,88,31,94,77,48,32,30

(a) What is the mean.

(b) The variance is 909.491 and the standard deviation is 30.158 - recalculate these two values to verify that they are correct, (show all work).

3. (5 points) Are some cities windier than others? Does Chicago (my hometown) deserve the nickname of “The Windy City”? Below is the annual average wind speeds (in miles per hour) for a select set of cities in the United States.

6.2	6.2	7	7.1	7.7	7.8	7.9	7.9	7.9	8.2
8.3	8.6	8.7	8.8	8.9	8.9	8.9	8.9	8.9	9.1
9.1	9.1	9.2	9.3	9.4	9.4	9.5	9.6	9.7	10.2
10.4	10.4	10.4	10.5	10.5	10.7	10.8	11	11.1	11.3
11.5	11.9	12.5	12.9						

- (a) Construct a relative frequency table and relative frequency histogram for the data (Note: I have sorted the values from the lowest to the highest.) Use seven categories.
- (b) Describe the shape of the graph.
- (c) Average wind speed in Chicago is 10.4 miles per hour. I define “windy cities” as cities with a wind speed in the highest 10% range of the histogram. Using this definition, indicate which categories contain these cities and discuss whether or not Chicago earns the name of the “Windy City”.

4. (6 points) Your company is adding a new office and you have been put in charge of evaluating the information on the 13 top choices. Your assistant has retrieve the following information. The list (or sample) below are the rents per square foot for the 13 locations.

16.50 20.00 14.00 22.00 18.00 16.00 16.50
19.00 13.50 17.00 10.25 14.65 15.50

- (a) Find the average cost per square foot. Given that the boss is interested in leasing 1,000 square feet, what is total average cost of the lease.
- (b) Find the standard deviation value.
- (c) Your co-worker lives fifteen miles away from the present office site and one mile away from the site priced at \$17.00. She tries to convince the boss to choose this site. Being a budget minded person, the boss turns to you for your assessment. Compared to the *total* average cost of the thirteen sites, how much money would your boss save (or lose) by choosing the site priced at \$17.00?
- (d) The boss wants the list of properties that lie within 25% of the mean. Use Tchebysheff's Theorem and calculate the lower and upper bounds. How many properties fall within this range?
Recall: to obtain k from a given percentage (p)

$$k = \sqrt{\frac{1}{1-p}}$$

5. (7 points) Below is a list of seven cities and their average high temperatures for the months of July and January

City	July	January
Atlanta	88	50
Boston	82	36
Chicago	84	21
Houston	93	61
Los Angeles	84	68
New Orleans	91	61
Seattle	74	46

- (a) Select the lowest and highest July and January temperatures. Using the Empirical Rule, list which of these four values lie outside of the 68% of the measurements (show all of your work).
- (b) Calculate the correlation value between the July and January temperatures. Interpret the value.