Statistics for Business and Economics
BUAD 202-7,8
**Carlos Hurtado**
churtado@richmond.edu
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1. Which of the following is NOT an example of descriptive statistics?

   a.   a histogram depicting the age distribution for 30 randomly selected students

   b.   an estimate of the number of Alaska residents who have visited Canada

   c.   a table summarizing the data collected in a sample of new-car buyers

   d.   the proportion of mailed-out questionnaires that were returned

2. Facts and figures collected, analyzed, and summarized for presentation and interpretation are called _____.

   a.   data

   b.   variables

   c.   elements

   d.   variables and elements

3. The set of measurements collected for an element is called a(n) _____.

   a.   census

   b.   variable

   c.   observation

   d.   sample

4. The graph below best exemplifies a _____.
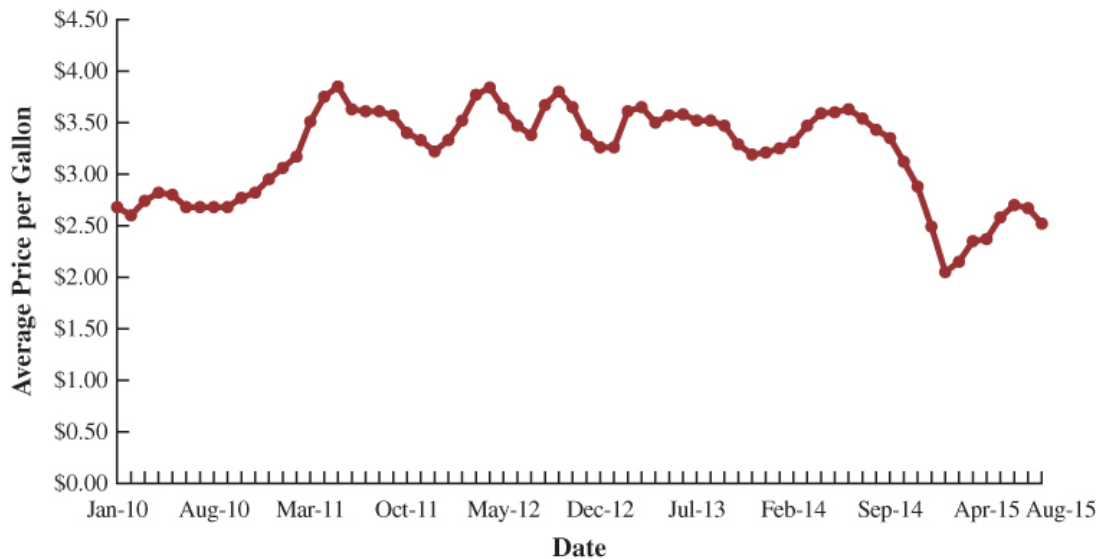
a. bar graph

b. time series graph

c. cross-sectional graph

d. line graph

5. Data collected at the same, or approximately the same, point in time are _____ data.

   a. time series

   b. static

   c. cross-sectional

   d. one-dimensional

6. Statistical inference _____.

   a. refers to the process of drawing inferences about the sample based on the characteristics of the population

   b. is the same as descriptive statistics

   c. is the process of drawing inferences about the population based on the information taken from the sample

   d. is the same as a census

7. Of 800 students in a university, 360, or 45%, live in the dormitories. The 800 is an example of _____.

   a. a sample

   b. a population

   c. statistical inference

   d. descriptive statistics

8. A statistics professor asked students in a class their ages. Based on this information, the professor states that the average age of students in the university is 21 years. This is an example of _____.

   a. a census

   b. descriptive statistics

   c. an experiment

   d. statistical inference

9. The average age in a sample of 90 students at City College is 20. From this sample, it can be concluded that the average age of all the students at City College _____.

   a. must be more than 20, since the population is always larger than the sample

   b. must be less than 20, since the sample is only a part of the population

   c. could not be 20

   d. could be larger, smaller, or equal to 20

10. The following data show the yearly income distribution of a sample of 200 employees at MNM, Inc.

Yearly Income ($1000s)	Number of Employees
20 − 24	2
25 − 29	48
30 − 34	60
35 − 39	80
40 − 44	10

a. What percentage of employees have a yearly incomes of at least $35,000?

b. Is the figure (percentage) that you computed in Part a. an example of statistical inference? If not, what kind of statistics does it represent?

c. Based on this sample, the president of the company said that 45% of all our employees' yearly incomes are at least $35,000. The president's statement represents what kind of statistics?

d. With the statement made in Part c., can we be assured that more than 45% of all employees' yearly incomes are at least $35,000? Explain.

e. What percentage of employees of the sample have a yearly income of less than $30,000?

f. How many variables are presented in the above data set?

g. The above data set represents the results of how many observations?

11. Molly Porter owns and operates two convenience stores, one on the East side of the city and the other on the South side. She has workforce-planning decisions to make and has collected some recent sales data that are relevant to her decisions. Listed below are the monthly sales ($1000s) at her two stores for the past six months.

Store	March	April	May	June	July	August
East	102	100	103	105	109	106
South	72	74	81	86	92	93

a. Is the data set cross-sectional or time series data? Explain.

b. Comment on any apparent patterns you see in the data.

12. The interquartile range is the difference between the _____.

    a.   first and second quartiles

    b.   first and third quartiles

    c.   second and third quartiles

    d.   second and fourth quartiles

13. The empirical rule states that, for data having a bell-shaped distribution, the portion of data values being within one standard deviation of the mean is approximately _____.

   a.   33%

   b.   50%

   c.   68%

   d.   95%

14. Which of the following descriptive statistics is NOT measured in the same units as the data?

   a.   35th percentile

   b.   standard deviation

   c.   variance

   d.   interquartile range

15. A numerical measure, such as a mean, computed from a population is known as a _____.

   a.   population parameter

   b.   sample parameter

   c.   sample statistic

   d.   population statistic

16. A graph with skewness –1.8 would be which of the following?

   a.   moderately skewed left

   b.   highly skewed left

   c.   moderately skewed right

   d.   highly skewed right

17. The mean of a sample is _____.

   a.   always equal to the mean of the population

   b.   always smaller than the mean of the population

   c.   computed by summing the data values and dividing the sum by $(n - 1)$

   d.   computed by summing all the data values and dividing the sum by the number of items

18. After the data have been arranged from smallest value to largest value, the value in the middle is called the _____.

   a.   range

   b.   median

   c.   mean

   d.   None of the answers is correct.

19. The most frequently occurring value of a data set is called the _____.

    a.   range

    b.   mode

    c.   mean

    d.   None of the answers is correct.

20. Which of the following is NOT a measure of location?

    a.   mean

    b.   median

    c.   variance

    d.   mode

Exhibit 3-1

A researcher has collected the following sample data.

5 12 6 8 5

6 7 5 12 4

21. Refer to Exhibit 3-1. The median is _____.

    a.   5

    b.   6

    c.   7

    d.   8

22. Refer to Exhibit 3-1. The mode is _____.

    a.   5

    b.   6

    c.   7

    d.   8

23. Refer to Exhibit 3-1. The mean is _____.

    a.   5

    b.   6

    c.   7

    d.   8

24. Refer to Exhibit 3-1. The 75th percentile is _____.

    a. 5

    b. 6

    c. 7

    d. 8

Exhibit 3-2

A researcher has collected the following sample data. The mean of the sample is 5.

   3 5 12 3 2

25. Refer to Exhibit 3-2. The variance is _____.

    a. 80

    b. 4.062

    c. 13.2

    d. 16.5

26. Refer to Exhibit 3-2. The standard deviation is _____.

    a. 8.944

    b. 4.062

    c. 13.2

    d. 16.5

27. Refer to Exhibit 3-2. The coefficient of variation is _____.

    a. 72.66%

    b. 81.24%

    c. 264%

    d. 330%

28. Refer to Exhibit 3-2. The range is _____.

    a. 1

    b. 2

    c. 10

    d. 12

29. Refer to Exhibit 3-2. The interquartile range is _____.

    a. 1

    b. 2

    c. 10

    d. 12

30. The variance of a sample or a population cannot be _____.

    a.   negative

    b.   calculated

    c.   zero

    d.   less than 1

31. The value of the sum of the squared deviations from the mean, i.e., must always be _____.

    a.   less than the mean

    b.   negative

    c.   either positive or negative, depending on whether the mean is negative or positive

    d.   at least zero

32. The numerical value of the standard deviation can never be _____.

    a.   larger than the variance

    b.   zero

    c.   negative

    d.   All of the answers are correct.

33. Which of the following is a measure of dispersion?

    a.   percentiles

    b.   quartiles

    c.   interquartile range

    d.   All of the answers are correct.

34. Which of the following is not a measure of dispersion?

    a.   range

    b.   50th percentile

    c.   standard deviation

    d.   interquartile range

35. _____ can be used to determine the percentage of data values that must be within one, two, and three standard deviations of the mean for data having a bell-shaped distribution.

    a.   Chebyshev's theorem

    b.   The empirical rule

    c.   A five-number summary

    d.   A box plot

36. The amount of time that a sample of students spends watching television per day is given below.

Student	Time (minutes)
1	40
2	28
3	71
4	48
5	49
6	35
7	40
8	57

a. Compute the mean.

b. Compute the median.

c. Compute the standard deviation.

d. Compute the 75th percentile.

37. A researcher has obtained the number of hours worked per week during the summer for a sample of 15 students.

40 25 35 30 20 40 30 20 40 10 30 20 10 5 20

Using this data set, compute the following:

a. Median

b. Mean

c. Mode

d. 40th percentile

e. Range

f. Sample variance

g. Standard deviation

38. A sample of 11 individuals shows the following monthly incomes.

Individual	Income ($)
1	1,500
2	2,000
3	2,500
4	4,000

Individual	Income ($)
5	4,000
6	2,500
7	2,000
8	4,000
9	3,500
10	3,000
11	43,000

a. What would be a representative measure of central location for the above data? Explain.

b. Determine the mode.

c. Determine the median.

d. Determine the 60th percentile.

e. Drop the income of individual number 11 and compute the standard deviation for the first 10 individuals.

39. Suppose annual salaries for sales associates from Geoff's Computer Shack have a mean of $32,500 and a standard deviation of $2,500.

a. Calculate and interpret the z-score for a sales associate who makes $36,000.

b. Use Chebyshev's theorem to calculate the percentage of sales associates with salaries between $26,250 and $38,750.

c. Suppose that the distribution of annual salaries for sales associates at this store is bell-shaped. Use the empirical rule to calculate the percentage of sales associates with salaries between $27,500 and $37,500.

d. Use the empirical rule to determine the percentage of sales associates with salaries less than $27,500.

e. Still suppose that the distribution of annual salaries for sales associates at this store is bell-shaped. A sales associate makes $42,000. Should this salary be considered an outlier? Explain.

40. The following observations are given for two variables.

x	y
5	2
8	12
18	3
20	6
22	11

x   y
      30 19
      10 18
       7   9

a. Compute and interpret the sample covariance for the above data.

b. Compute and interpret the sample correlation coefficient.

41. Missy Walters owns a mail-order business specializing in baby clothes. She is considering offering her customers a discount on shipping charges based on the dollar amount of the mail order. Before Missy decides the discount policy, she needs a better understanding of the dollar amount distribution of the mail orders she receives. Missy had an assistant randomly select 50 recent orders and record the value, to the nearest dollar, of each order as shown below.

136 281 226 123 178 445 231 389 196 175

211 162 212 241 182 290 434 167 246 338

194 242 368 258 323 196 183 209 198 212

277 348 173 409 264 237 490 222 472 248

231 154 166 214 311 141 159 362 189 260

a. Determine the mean, median, and mode for this data set.

b. Determine the 80th percentile.

c. Determine the first quartile.

d. Determine the range and interquartile range.

e. Determine the sample variance, sample standard deviation, and coefficient of variation.

f. Determine the z-scores for the minimum and maximum values in the data set.