

What Is Statistics?

**True / False Questions**

1. A population is a collection of all individuals, objects, or measurements of interest.

True   False

2. Statistics are used as a basis for making decisions.

True   False

3. A listing of 100 family annual incomes is an example of statistics.

True   False

4. The average number of passengers on commercial flights between Chicago and New York City is an example of a statistic.

True   False

5. Statistics are used to report the summary results of market surveys.

True False

6. A sample is a portion or part of the population of interest.

True False

7. To infer something about a population, we usually take a sample from the population.

True False

8. Descriptive statistics are used to find out something about a population based on a sample.

True False

9. There are four levels of measurement: qualitative, quantitative, discrete, and continuous.

True False

10. The ordinal level of measurement is considered the "lowest" level of measurement.

True False

11. A store asks shoppers for their zip code to identify market areas. Zip codes are an example of ratio data.

True False

12. An ordinal level of measurement implies some sort of ranking.

True False

13. Data measured on a nominal scale can only be classified into categories.

True False

14. The terms descriptive statistics and inferential statistics can be used interchangeably.

True False

15. A marketing research agency was hired to test a new DVD player. Consumers rated it outstanding, very good, fair, or poor. The level of measurement for this experiment is ordinal.

True False

16. The Union of Electrical Workers of America with 9,128 members polled 362 members about a new wage package that will be submitted to management. The population is the 362 members.

True   False

17. The CIA World Factbook cited these numbers for the United States:

- The birthrate is 14.14 births per 1,000 population.
- The average life expectancy for females is 80 years.
- Approximately 290 million persons reside in the United States.

Each of these numbers is referred to as a statistic.

True   False

18. If we select 100 persons from 25,000 registered voters and question them about candidates and issues, the 100 persons are referred to as the population.

True   False

19. Statistics is defined as a body of techniques used to facilitate the collection, organization, presentation, analysis, and interpretation of information for the purpose of making better decisions.

True   False

20. Categorizing voters as Democrats, Republicans, and Independents is an example of interval level measurement.

True False

21. The order that runners finish in a race would be an example of continuous data.

True False

22. Based on a sample of 3,000 people, the civilian unemployment rate in the United States was 5.5%. 5.5% is referred to as a statistic.

True False

23. The principal difference between the interval and ratio scale is that the ratio scale has a meaningful zero point.

True False

24. The branch of mathematics used to facilitate the collection, organization, presentation, analysis, and interpretation of numerical information is referred to as statistics.

True False

25. The number of children in a family is a discrete variable.

True   False

### Multiple Choice Questions

26. The main purpose of descriptive statistics is to:

- A. Summarize data in a useful and informative manner.
- B. Make inferences about a population.
- C. Determine if the data adequately represents the population.
- D. Gather or collect data.

27. Which of the following is an example of a continuous variable?

- A. Tons of concrete to complete a parking garage
- B. Number of students in a statistics class
- C. Zip codes of shoppers
- D. Rankings of baseball teams in a league

28. The incomes of 50 loan applicants are obtained. Which level of measurement is income?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

29. When TV advertisements report "2 out of 3 dentists surveyed indicated they would recommend Brand X toothpaste to their patients," an informed consumer may question the conclusion because the:

- A. Sample was only 5 dentists.
- B. Sample of dentists is clearly explained.
- C. Advertisement does not include the total number of dentists surveyed.
- D. Conclusion is not illustrated with a graph.

30. A bank asks customers to evaluate the drive-thru service as good, average, or poor. Which level of measurement is this classification?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

31. A portion or part of a population is called a

- A. Random survey
- B. Sample
- C. Tally
- D. Frequency distribution

32. If Gallup, Harris, and other pollsters asked people to indicate their political party affiliation as Democrat, Republican, or Independent, the data gathered would be an example of which scale of measurement?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

33. The members of each basketball team wear numbers on their jerseys. What scale of measurement are these numbers considered?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio



34. A marketing class of 50 students evaluated the instructor using the following scale: superior, good, average, poor, and inferior. The descriptive summary showed the following survey results: 2% superior, 8% good, 45% average, 45% poor, and 0% inferior.

- A. The instructor's performance was great!
- B. The instructor's performance was inferior.
- C. Most students rated the instructor as poor or average.
- D. No conclusions can be made.

35. A survey includes a question regarding marital status that has the following responses: single, married, divorced, separated, or widowed. What is the scale of measurement for this question?

- A. Ratio
- B. Interval
- C. Ordinal
- D. Nominal

36. Respondents were asked, "Do you now earn more than or less than you did five years ago?" What is this level of measurement?

- A. Interval
- B. Ratio
- C. Nominal
- D. Ordinal

37. Which word is NOT part of the definition of descriptive statistics?

- A. Organizing
- B. Analyzing
- C. Presenting
- D. Predicting

38. The reported unemployment is 5.5% of the population. What measurement scale is used to measure unemployment?

- A. Nominal
- B. Ordinal
- C. Interval or ratio
- D. Descriptive

39. The Equal Employment Opportunity Act requires employers to classify their employees by gender and national origin. Which level of measurement is this?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

40. What level of measurement is the Centigrade temperature scale?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

41. What type of variable is the number of gallons of gasoline pumped by a filling station during a day?

- A. Qualitative
- B. Continuous
- C. Attribute
- D. Discrete

42. The performance of personal and business investments is measured as a percentage, "return on investment." What type of variable is "return on investment"?

- A. Qualitative
- B. Continuous
- C. Attribute
- D. Discrete

43. What type of variable is the number of robberies reported in your city?

- A. Attribute
- B. Continuous
- C. Quantitative
- D. Qualitative

44. What type of variable is the number of auto accidents reported in a given month?

- A. Interval
- B. Ratio
- C. Continuous
- D. Discrete

45. The names of the positions in a corporation, such as chief operating officer or controller, are examples of what type of variable?

- A. Qualitative
- B. Quantitative
- C. Interval
- D. Ratio

46. What type of variable is "pounds of popcorn" served at a movie theater?

- A. Interval
- B. Ratio
- C. Discrete
- D. Continuous

47. The final rankings of the top 20 NCAA college basketball teams are an example of which level of measurement?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

48. Your height and weight are examples of which level of measurement?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

49. Shoe style is an example of what level of measurement?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

50. The general process of gathering, organizing, summarizing, analyzing, and interpreting data is called \_\_\_\_\_.

- A. Statistics
- B. Descriptive statistics
- C. Inferential statistics
- D. Levels of measurement

51. The Nielsen Ratings break down the number of people watching a particular television show by age. What level of measurement is age?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

52. An example of a qualitative variable is \_\_\_\_\_.

- A. Number of children in a family
- B. Weight of a person
- C. Color of ink in a pen
- D. Miles between oil changes

53. Which one of the following is NOT an example of discrete data?

- A. Number of households watching the Home Shopping Network
- B. Number of employees reporting in sick
- C. Number of miles between New York City and Chicago
- D. Number of members of the Denver Lions Club

54. What level of measurement is a person's "favorite sport"?

- A. Ratio
- B. Ordinal
- C. Interval
- D. Nominal

55. A group of women tried five brands of fingernail polish and ranked them according to preference. What level of measurement is this?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

### Fill in the Blank Questions

56. The monthly consumer price index is called a(n) \_\_\_\_\_.

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57. A variable such as eye color is also referred to as a(n) \_\_\_\_\_ variable.

\_\_\_\_\_

58. A scale used to measure a quantitative variable is either \_\_\_\_\_ or

\_\_\_\_\_.

\_\_\_\_\_

59. Ranked data is an example of a(n) \_\_\_\_\_ level of measurement.

\_\_\_\_\_

60. The prime rate of interest is an example of a(n) \_\_\_\_\_ level of measurement.

\_\_\_\_\_

61. The branch of statistics that does not involve generalizations is called

\_\_\_\_\_.

\_\_\_\_\_

62. When we make an estimate or prediction, we use \_\_\_\_\_.

\_\_\_\_\_

63. The branch of statistics that collects, analyzes, and presents data is called \_\_\_\_\_ statistics.

\_\_\_\_\_

64. The branch of statistics that uses sample information to make conclusions about a population is called \_\_\_\_\_ statistics.

\_\_\_\_\_

65. The number of workers calling in sick during any particular week is considered to be \_\_\_\_\_ data.

\_\_\_\_\_

66. If we test a small number of light bulbs from a large group, the small group is called a \_\_\_\_\_.

\_\_\_\_\_

67. Among the many classes held at your college or university, your statistics class has been selected for a study. This one class is referred to as a \_\_\_\_\_.

\_\_\_\_\_

68. The "lowest" level of measurement is \_\_\_\_\_.

\_\_\_\_\_

69. The "highest" level of measurement is \_\_\_\_\_.

\_\_\_\_\_

70. The major advantage of ordinal data over nominal data is that it allows for

\_\_\_\_\_.

\_\_\_\_\_

71. The principal difference between the interval and ratio scale of measurement is that the ratio scale has a \_\_\_\_\_.

\_\_\_\_\_

72. Categorizing students as freshmen, sophomores, juniors, and seniors is an example of the \_\_\_\_\_ level of measurement.

\_\_\_\_\_

73. The collection of all possible objects of interest is referred to as the

\_\_\_\_\_.

\_\_\_\_\_

74. The lowest level of measurement that has some sort of ranking is \_\_\_\_\_.

\_\_\_\_\_

75. A variable that can have any value within a specific range is called

\_\_\_\_\_.

\_\_\_\_\_

76. The science of collecting, organizing, presenting, analyzing, and interpreting data is called \_\_\_\_\_.

\_\_\_\_\_

### **Essay Questions**

77. Describe the difference between a population and a sample.

78. A New York newspaper reported the average gasoline prices in four metropolitan areas and used a bar chart to illustrate the differences. What type of statistics was shown? What activities did the newspaper use to make the report?

79. A company was studying the demographics of their customers. As part of the study, they collected the following variables: gender, marital status, credit rating (low, medium, high), annual income, and age. Label each variable as qualitative or quantitative, discrete or continuous, and nominal, ordinal, interval, or ratio.

## Chapter 01 What Is Statistics? Answer Key

### True / False Questions

1. A population is a collection of all individuals, objects, or measurements of interest.

TRUE

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

2. Statistics are used as a basis for making decisions.

TRUE

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

3. A listing of 100 family annual incomes is an example of statistics.

**FALSE**

A listing of incomes is raw data. Statistics is used to organize, summarize, and present the data.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

4. The average number of passengers on commercial flights between Chicago and New York City is an example of a statistic.

**TRUE**

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

5. Statistics are used to report the summary results of market surveys.

**TRUE**

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

6. A sample is a portion or part of the population of interest.

**TRUE**

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

7. To infer something about a population, we usually take a sample from the population.

**TRUE**

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

8. Descriptive statistics are used to find out something about a population based on a sample.

**FALSE**

Inferential statistics uses sample information to find out something about a population.

*AACSB: Communication*



*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

9. There are four levels of measurement: qualitative, quantitative, discrete, and continuous.

**FALSE**

The four levels of measurement are nominal, ordinal, interval, and ratio.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

10. The ordinal level of measurement is considered the "lowest" level of measurement.

**FALSE**

The nominal scale is the "lowest" level of measurement.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

11. A store asks shoppers for their zip code to identify market areas. Zip codes are an example of ratio data.

**FALSE**

While zip codes use numbers, they are only labels. Therefore they represent a nominal measurement scale.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

12. An ordinal level of measurement implies some sort of ranking.

**TRUE**

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

13. Data measured on a nominal scale can only be classified into categories.

**TRUE**

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

14. The terms descriptive statistics and inferential statistics can be used interchangeably.

**FALSE**

Descriptive statistics are used to organize, summarize, and present data. Inferential statistics uses sample information to make inferences about a population.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

15. A marketing research agency was hired to test a new DVD player. Consumers rated it outstanding, very good, fair, or poor. The level of measurement for this experiment is ordinal.

**TRUE**

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

16. The Union of Electrical Workers of America with 9,128 members polled 362 members about a new wage package that will be submitted to management. The population is the 362 members.

**FALSE**

The 362 members are a sample or portion of the population of 9,128 union members.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

17. The CIA World Factbook cited these numbers for the United States:

- The birthrate is 14.14 births per 1,000 population.
- The average life expectancy for females is 80 years.
- Approximately 290 million persons reside in the United States.

Each of these numbers is referred to as a statistic.

**TRUE**

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

18. If we select 100 persons from 25,000 registered voters and question them about candidates and issues, the 100 persons are referred to as the population.

**FALSE**

The 100 people are a sample or portion of the population of 25,000 registered voters.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

19. Statistics is defined as a body of techniques used to facilitate the collection, organization, presentation, analysis, and interpretation of information for the purpose of making better decisions.

**TRUE**

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

20. Categorizing voters as Democrats, Republicans, and Independents is an example of interval level measurement.

**FALSE**

Political party is a label that corresponds to a nominal level of measurement.

*AACSB: Communication*

*Blooms: Apply*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

21. The order that runners finish in a race would be an example of continuous data.

**FALSE**

The order that runners finish a race is an example of an ordinal level of measurement and is discrete data.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

22. Based on a sample of 3,000 people, the civilian unemployment rate in the United States was 5.5%. 5.5% is referred to as a statistic.

TRUE

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

23. The principal difference between the interval and ratio scale is that the ratio scale has a meaningful zero point.

TRUE

*AACSB: Communication*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

24. The branch of mathematics used to facilitate the collection, organization, presentation, analysis, and interpretation of numerical information is referred to as statistics.

TRUE

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

25. The number of children in a family is a discrete variable.

TRUE

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

### Multiple Choice Questions

26. The main purpose of descriptive statistics is to:

- A. Summarize data in a useful and informative manner.
- B. Make inferences about a population.
- C. Determine if the data adequately represents the population.
- D. Gather or collect data.

Descriptive statistics summarizes existing data. It does not collect new data, nor draw conclusions about a population.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*



27. Which of the following is an example of a continuous variable?

- A. Tons of concrete to complete a parking garage
- B. Number of students in a statistics class
- C. Zip codes of shoppers
- D. Rankings of baseball teams in a league

A continuous variable assumes any value within a range. Number of students, zip codes, and rankings have "gaps" between the values and hence are not continuous.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

28. The incomes of 50 loan applicants are obtained. Which level of measurement is income?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Incomes are measured on a ratio scale because the variable has a zero point (no income) and the ratio between two values is meaningful.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

29. When TV advertisements report "2 out of 3 dentists surveyed indicated they would recommend Brand X toothpaste to their patients," an informed consumer may question the conclusion because the:

- A. Sample was only 5 dentists.
- B. Sample of dentists is clearly explained.
- C. Advertisement does not include the total number of dentists surveyed.
- D. Conclusion is not illustrated with a graph.

The ad implies that most dentists would recommend the product. However, without knowing anything about how many dentists were selected, and how they were selected, it would be difficult to accept the results of the survey.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

30. A bank asks customers to evaluate the drive-thru service as good, average, or poor. Which level of measurement is this classification?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Ordinal is the correct answer because a "good" response is better than an "average" one. However, the difference between the responses is not a constant size.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

31. A portion or part of a population is called a

A. Random survey

B. Sample

C. Tally

D. Frequency distribution

A sample is a subset of a population of interest.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

32. If Gallup, Harris, and other pollsters asked people to indicate their political party affiliation as Democrat, Republican, or Independent, the data gathered would be an example of which scale of measurement?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Political party affiliation is measured with a label or name and therefore is nominal. It is a categorization with no natural order and cannot be ranked or ordered.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

33. The members of each basketball team wear numbers on their jerseys. What scale of measurement are these numbers considered?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Jersey numbers are labels for identification purposes only. It is a label with no natural order and cannot be ranked or ordered.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

34. A marketing class of 50 students evaluated the instructor using the following scale: superior, good, average, poor, and inferior. The descriptive summary showed the following survey results: 2% superior, 8% good, 45% average, 45% poor, and 0% inferior.

- A. The instructor's performance was great!
- B. The instructor's performance was inferior.
- C. Most students rated the instructor as poor or average.
- D. No conclusions can be made.

The percentages indicate that 90% of the 50 students rated the instructor as average or poor. No students rated the instructor as inferior. "Great" was not measured.

*AACSB: Communication*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*



35. A survey includes a question regarding marital status that has the following responses: single, married, divorced, separated, or widowed. What is the scale of measurement for this question?

- A. Ratio
- B. Interval
- C. Ordinal
- D. Nominal

Marital status is a nominal because it has no natural order and cannot be ranked or ordered.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

36. Respondents were asked, "Do you now earn more than or less than you did five years ago?" What is this level of measurement?

- A. Interval
- B. Ratio
- C. Nominal
- D. Ordinal

The survey asks for a relative measure of income today in comparison to five years ago. The response is either "more" or "less." There is no absolute measure of income to compute how much more or less is earned.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

37. Which word is NOT part of the definition of descriptive statistics?

- A. Organizing
- B. Analyzing
- C. Presenting
- D. Predicting

Descriptive statistics does not predict or make inferences about the future.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

38. The reported unemployment is 5.5% of the population. What measurement scale is used to measure unemployment?

- A. Nominal
- B. Ordinal
- C. Interval or ratio
- D. Descriptive

Unemployment percentages have a zero point (no unemployment) and the ratio between two values is meaningful.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

39. The Equal Employment Opportunity Act requires employers to classify their employees by gender and national origin. Which level of measurement is this?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Gender and national origin are labels with no natural order and cannot be ranked or ordered.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

40. What level of measurement is the Centigrade temperature scale?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Temperature can be ranked and the distance between temperatures can be computed, but there is no natural value of zero on the centigrade scale.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

41. What type of variable is the number of gallons of gasoline pumped by a filling station during a day?

A. Qualitative

B. Continuous

C. Attribute

D. Discrete

The number of gallons pumped is a numerical variable that can assume any value within a range. There are no "gaps" in the scale.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

42. The performance of personal and business investments is measured as a percentage, "return on investment." What type of variable is "return on investment"?

- A. Qualitative
- B.** Continuous
- C. Attribute
- D. Discrete

"Return on investment" can assume any value within a range. There are no "gaps" in the scale.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

43. What type of variable is the number of robberies reported in your city?

- A. Attribute
- B. Continuous
- C. Quantitative
- D. Qualitative

The number of robberies is counted and must be a whole number, such as 0, 500, or 3,125,874.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-04 Explain the difference between qualitative and quantitative variables.*

*Topic: Types of Variables*



44. What type of variable is the number of auto accidents reported in a given month?

- A. Interval
- B. Ratio
- C. Continuous
- D. Discrete

The number of auto accidents is counted and must be a whole number, such as 0, 500, or 3,125,874.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

45. The names of the positions in a corporation, such as chief operating officer or controller, are examples of what type of variable?

A. Qualitative  
B. Quantitative  
C. Interval  
D. Ratio

The variable, job title, is qualitative.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-04 Explain the difference between qualitative and quantitative variables.*

*Topic: Types of Variables*

46. What type of variable is "pounds of popcorn" served at a movie theater?

A. Interval  
B. Ratio  
C. Discrete  
D. Continuous

"Pounds of popcorn" can assume any value within a range. There are no "gaps" in the scale.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

47. The final rankings of the top 20 NCAA college basketball teams are an example of which level of measurement?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

While the rankings indicate which team is better than another, they do not measure how much better a team is relative to another.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

48. Your height and weight are examples of which level of measurement?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

Height and weight are ratio variables that have a zero point, and the ratio between two values is meaningful.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

49. Shoe style is an example of what level of measurement?

- A. Nominal
- B. Ordinal
- C. Interval
- D. Ratio

Shoe style is a nominal variable because it is a label with no natural order and cannot be ranked or ordered.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

50. The general process of gathering, organizing, summarizing, analyzing, and interpreting data is called \_\_\_\_\_.

- A. Statistics
- B. Descriptive statistics
- C. Inferential statistics
- D. Levels of measurement

Statistics is the science of collecting, organizing, presenting, analyzing, and interpreting data to assist in making more effective decisions.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

51. The Nielsen Ratings break down the number of people watching a particular television show by age. What level of measurement is age?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

Age is a ratio variable because it has a zero point, and the ratio between two values is meaningful.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

52. An example of a qualitative variable is \_\_\_\_\_.

- A. Number of children in a family
- B. Weight of a person
- C. Color of ink in a pen
- D. Miles between oil changes

Color is a qualitative variable because it is an attribute that can be observed but not measured.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-04 Explain the difference between qualitative and quantitative variables.*

*Topic: Types of Variables*

53. Which one of the following is NOT an example of discrete data?

- A. Number of households watching the Home Shopping Network
- B. Number of employees reporting in sick
- C. Number of miles between New York City and Chicago
- D. Number of members of the Denver Lions Club

Discrete variables can assume only certain values and there are "gaps" between the values. Miles is not discrete because it can be measured with any number of decimal points.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*



54. What level of measurement is a person's "favorite sport"?

- A. Ratio
- B. Ordinal
- C. Interval
- D. Nominal

The variable, person's "favorite sport," is a label with no natural order and cannot be ranked or ordered.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

55. A group of women tried five brands of fingernail polish and ranked them according to preference. What level of measurement is this?

A. Nominal

B. Ordinal

C. Interval

D. Ratio

The rankings are ordinal. While the rankings indicate which brand is preferred over another, they do not measure how much more they are preferred.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

## Fill in the Blank Questions

56. The monthly consumer price index is called a(n) \_\_\_\_\_.

### Statistic

Descriptive Statistics Summarize and Present Information.

The consumer price index is a statistic that summarizes the rate of inflation.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

57. A variable such as eye color is also referred to as a(n) \_\_\_\_\_ variable.

### Qualitative

Qualitative variables measure observable attributes such as eye color.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-04 Explain the difference between qualitative and quantitative variables.*

*Topic: Types of Variables*

58. A scale used to measure a quantitative variable is either \_\_\_\_\_ or \_\_\_\_\_.

### Interval, ratio

Quantitative variables are continuous. Therefore, an interval or ratio scale is used to measure them.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

59. Ranked data is an example of a(n) \_\_\_\_\_ level of measurement.

### Ordinal

Ranked data is ordinal. Rankings indicate which item is "higher" or "better" than another. They do not measure how much more of them there are.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

60. The prime rate of interest is an example of a(n) \_\_\_\_\_ level of measurement.

### Ratio

The prime rate of interest is measured on a ratio scale because it has a zero point, and the ratio between two values is meaningful.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

61. The branch of statistics that does not involve generalizations is called \_\_\_\_\_.

### Descriptive statistics

Inferential statistics are the methods used to make generalizations about a population on the basis of a sample. Descriptive statistics are the methods of organizing, summarizing, and presenting data in an informative way.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

62. When we make an estimate or prediction, we use \_\_\_\_\_.

### **Inferential statistics**

Inferential statistics are the methods used to estimate a property of a population on the basis of a sample. Descriptive statistics are the methods of organizing, summarizing, and presenting data in an informative way.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

63. The branch of statistics that collects, analyzes, and presents data is called \_\_\_\_\_ statistics.

### **Descriptive**

Descriptive statistics are the methods of organizing, summarizing, and presenting data in an informative way.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

64. The branch of statistics that uses sample information to make conclusions about a population is called \_\_\_\_\_ statistics.

### Inferential

Inferential statistics are the methods used to estimate a property of a population on the basis of a sample.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

65. The number of workers calling in sick during any particular week is considered to be \_\_\_\_\_ data.

### Discrete

The variable "number of sick workers" is counted and can assume only certain values. There are "gaps" between the values.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

66. If we test a small number of light bulbs from a large group, the small group is called a \_\_\_\_\_.

### Sample

The selection of a subgroup from a large group of light bulbs is a sample because it is only a portion, or part, of the population of interest.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

67. Among the many classes held at your college or university, your statistics class has been selected for a study. This one class is referred to as a \_\_\_\_\_.

### Sample

The selected class is a sample because it is only a portion, or part, of the population of all classes held at your college or university.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*



68. The "lowest" level of measurement is \_\_\_\_\_.

### Nominal

Nominal-level data is based on the observation of attributes like color or gender. No mathematical operations can be applied to nominal variables.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

69. The "highest" level of measurement is \_\_\_\_\_.

### Ratio

Ratio-level data has a zero point and is measured on a continuous scale. All mathematical operations can be applied to data measured on a ratio scale.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

70. The major advantage of ordinal data over nominal data is that it allows for \_\_\_\_\_.

### **Ranking or ordering**

Ordinal data can be ranked or ordered. Nominal data are labels or attributes that do not have any logical order.

*AACSB: Communication*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

71. The principal difference between the interval and ratio scale of measurement is that the ratio scale has a \_\_\_\_\_.

### **Meaningful zero point**

The difference is that ratio-level data has a zero point. Therefore, the ratio between two numbers is meaningful.

*AACSB: Communication*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

72. Categorizing students as freshmen, sophomores, juniors, and seniors is an example of the \_\_\_\_\_ level of measurement.

### Ordinal

The class ranks can be ranked or ordered, but the distance between successive classes is not meaningful.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

73. The collection of all possible objects of interest is referred to as the \_\_\_\_\_.

### Population

A population is the entire set of individuals or objects of interest.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

74. The lowest level of measurement that has some sort of ranking is \_\_\_\_\_.

### Ordinal

Ordinal-level data can only be ranked. No mathematical operations can be applied to ordinal data.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Levels of Measurement*

75. A variable that can have any value within a specific range is called \_\_\_\_\_.

### Continuous

A continuous variable can assume any value within a specified range.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Topic: Types of Variables*

76. The science of collecting, organizing, presenting, analyzing, and interpreting data is called \_\_\_\_\_.

### **Statistics**

Descriptive statistics are the methods of organizing, summarizing, and presenting data in an informative way.

*AACSB: Communication*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 01-01 List ways that statistics is used.*

*Topic: Statistics*

### **Essay Questions**

77. Describe the difference between a population and a sample.

A population is the entire set of individuals or objects that could be observed or measured. A sample is a subset or portion of a population.

*AACSB: Communication*

*Blooms: Analyze*

*Difficulty: 1 Easy*

*Learning Objective: 01-03 Understand the differences between a sample and a population.*

*Topic: Population versus Sample*

78. A New York newspaper reported the average gasoline prices in four metropolitan areas and used a bar chart to illustrate the differences. What type of statistics was shown? What activities did the newspaper use to make the report?

The newspaper used descriptive statistics. The statistical techniques used to make the report were collecting data, summarizing the data, and presenting the data.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-02 Know the differences between descriptive and inferential statistics.*

*Topic: Types of Statistics*

79. A company was studying the demographics of their customers. As part of the study, they collected the following variables: gender, marital status, credit rating (low, medium, high), annual income, and age. Label each variable as qualitative or quantitative, discrete or continuous, and nominal, ordinal, interval, or ratio.

Gender: qualitative, discrete, nominal;

Marital status: qualitative, discrete, nominal;

Credit rating: qualitative, discrete, ordinal;

Annual income: quantitative, continuous, ratio;

Age: quantitative, continuous, ratio.

*AACSB: Communication*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 01-04 Explain the difference between qualitative and quantitative variables.*

*Learning Objective: 01-05 Compare discrete and continuous variables.*

*Learning Objective: 01-06 Recognize the levels of measurement in data.*

*Topic: Types of Variables*