***Business Statistics: Communicating with Numbers, 3e* (Jaggia)**

**Chapter 1 Statistics and Data**

1)A knowledge of statistics provides the necessary tools to differentiate between sound and questionable conclusions.

2) Statistics is the methodology of extracting unnecessary information from a data set.

3) The branch of statistical studies called *descriptive statistics* summarizes important aspects of a data set.

4) The branch of statistical studies called *inferential statistics* refers to drawing conclusions about sample data by analyzing the corresponding population.

5) A population is a larger data set than its corresponding sample.

6) Population parameters are used to estimate corresponding sample statistics.

7) Typically, it is possible to examine every member of the population.

8) Cross-sectional data contain values of a characteristic of one subject collected over time.

9) Time series data contain values of a characteristic of a subject over time.

10) Structured data tends to include numbers, dates, and groups of words and numbers called strings.

11) Unstructured data conforms to a predefined row-column format.

12) Big data is a catchphrase that implies a complete set of population data.

13) A qualitative variable assumes meaningful numerical values.

14) Both discrete and continuous variables may assume an uncountable number of values.

15) A discrete variable cannot assume an infinite number of values.

16) A continuous variable assumes any value from an interval (or collection of intervals).

17) A professor's gender (male, female) as well as rank (assistant, associate, full) represent ordinal data.

18) A professor's rank (assistant, associate, and full), as well as salary, represent ordinal data.

19) Many people believe that statistics has no use in real life.

20) The weather forecast cannot be based on only the weather for the last three days.

21) Data and data interpretation do not show up in every facet of life.

22) A population is defined as all possible subjects of a specific group.

23) Researchers use sample results in an attempt to estimate an unknown population statistic.

24) The recorded body temperature of patients in the group of patients under research study is an example of time series data.

25) Body weight is an example of a discrete variable.

26) The mathematical operation of addition can be performed on nominal data.

27) A ZIP code is an example of quantitative data.

28) Ordinal scale reflects a stronger level of measurement than the nominal scale.

29) All mathematical operations can be performed on ratio-scaled data.

30) A respondent to a survey indicates that she drives a Nissan Pathfinder. This is an example of qualitative data.

31) The zero point of an interval scale reflects a complete absence of what is being measured.

32) Nominal and interval scales are used for qualitative variables.

33) The study of statistics can be defined as

A) the language of data.

B) the art and science of getting information from data.

C) the study of collecting, analyzing, presenting, and interpreting data.

D) All of these choices are correct.

34) When reading published statistics (numerical facts), you should

A) never believe what you read, because all statistics are lies.

B) only believe those statistics that are adequately supported.

C) believe what you read, because they wouldn't be published if they weren't correct.

D) only believe those statistics that are presented in so-called quality publications.

35) The two branches of the study of statistics are generally referred to as

A) descriptive and inferential statistics.

B) inferential and differential statistics.

C) descriptive and referential statistics.

D) differential and descriptive statistics.

36) Population parameters are difficult to calculate due to

A) cost prohibitions on data collection.

B) the infeasibility of collecting data on the entire population.

C) the fact that samples are difficult to draw due to the nature of the data.

D) both cost prohibitions on data collection and the infeasibility of collecting data on the entire population.

37) The teachers' union in California wants to know the average salary for high school teachers throughout the country. What is the teachers' union presumably planning to calculate?

A) Sample statistic

B) Sample parameter

C) Population statistic

D) Population parameter

38) A population consists of

A) all items of interest in a sample.

B) a subject of interest in a sample.

C) all items of interest in a statistical problem.

D) a subject of interest in a statistical problem.

39) In inferential statistics, we calculate statistics of sample data to

A) estimate unknown population parameters.

B) conduct tests about unknown population parameters.

C) Both of these choices are correct.

D) Neither of these choices is correct.

40) Which of the following represents a population and a sample from that population?

A) Residents of Albany, New York, and registered voters in Albany, New York

B) Teachers of a high school and members of the parent-teacher group

C) Fans at a concert who purchase T-shirts, and fans at a concert who purchase soda

D) Freshmen at St. Joseph's University and basketball players at St. Joseph's University

41) Which of the following represents a population and a sample from that population?

A) Attendees at a sporting event, and those who purchased popcorn at said sporting event

B) Full-time employees at a marketing firm, and temporary summer interns at the marketing firm

C) Seniors at Boston College and students in a first-semester business statistics course

D) Stocks available on the NYSE and stocks on the NASDAQ

42) Which of the following is an example of cross-sectional data?

A) GDP of the United States from 1990–2010

B) Daily price of DuPont stock during the first quarter

C) Quarterly housing starts collected over the last 60 years

D) Results of market research testing consumer preferences for soda

43) Which of the following is an example of time series data?

A) The sale prices of townhouses sold last year

B) Quarterly housing starts collected over the last 60 years

C) Results of market research testing consumer preferences for soda

D) Starting salaries of recent business graduates at Penn State University

44) The estimation of which of the following requires sampling?

A) U.S. unemployment rate

B) Total rainfall in Phoenix, Arizona, in 2010

C) The Cleveland Indians' hitting percentage in 2010

D) The average SAT score of incoming freshmen at a university

45) A company wants to estimate the mean price of oil over the past 10 years. What kind of data does the company need?

A) Time series data

B) Inferential statistics

C) Cross-sectional data

D) Descriptive statistics

46) For which of the following population parameters is sampling not necessary?

A) The average height of NBA players

B) The average life of light bulbs produced by a manufacturer

C) The average content of cereal boxes produced by a manufacturer

D) The percentage of the U.S. public school teachers who support Democrats

47) Sampling is used heavily in manufacturing and service settings to ensure high-quality products. In which of the following areas would sampling be inappropriate?

A) Computer assembly

B) Custom cabinet making

C) Cell phone manufacturing

D) Technical support by phone

48) Which of the following are examples of cross-sectional data?

A) The test scores of students in a class

B) The current average prices of regular gasoline in different states

C) The sales prices of single-family homes sold last month in California

D) All of these choices are correct.

49) An analyst studies a data set of the year-end book value per share for all companies listed on the New York Stock Exchange. This data set is *best* described as

A) time series data.

B) cross-sectional data.

C) neither time series nor cross-sectional data.

D) a combination of time series and cross-sectional data.

50) Which type of data, cross-sectional versus time series, is more important to research?

A) Neither type of data is important.

B) Cross-sectional data is more important than time series data.

C) Time series data is more important than cross-sectional data.

D) Time series data and cross-sectional data are equally as valuable in different types of research.

51) Which of the following variables is qualitative?

A) Height

B) Gender

C) Weight

D) Temperature

52) Which of the following variables is quantitative?

A) Gender

B) Temperature

C) Marital status

D) Religious affiliation

53) Which of the following is a quantitative variable?

A) House age

B) House size

C) House price

D) All of these choices are correct.

54) San Francisco 49ers' linebacker Patrick Willis won the Defensive Rookie of the Year Award in 2007 with a total of 174 tackles. Tackles are measured on what kind of a scale? Is a variable measuring the number of tackles considered continuous or discrete?

A) Ratio scale; discrete

B) Interval scale; discrete

C) Ratio scale; continuous

D) Interval scale; continuous

55) Which of the following variables is not continuous?

A) Height of NBA players

B) Time of a flight between Atlanta and Chicago

C) Average temperature in the month of July in Orlando

D) The number of obtained heads when a fair coin is tossed 20 times

56) The ordinal scale of data measurement is

A) less sophisticated than the nominal scale.

B) more sophisticated than the interval scale.

C) more sophisticated than the nominal scale.

D) as equally sophisticated as the nominal scale.

57) The interval scale of data measurement is

A) less sophisticated than the ratio scale.

B) more sophisticated than the ratio scale.

C) less sophisticated than the ordinal scale.

D) equally sophisticated as the ratio scale because both are appropriate for quantitative data.

58) A recent survey of 200 small firms (annual revenue less than $10 million) asked whether an increase in the minimum wage would cause the firm to decrease capital spending. Possible responses to the survey question were: "Yes," "No," or "Don't Know." This data is *best* classified as

A) ratio scale.

B) ordinal scale.

C) interval scale.

D) nominal scale.

59) Which scale of data measurement is appropriate for the names of companies listed on the Dow Jones Industrial Average?

A) Ratio scale

B) Ordinal scale

C) Interval scale

D) Nominal scale

60) An analyst collects data on the weekly closing price of gold throughout a year. The scale of this data is

A) ratio scale.

B) ordinal scale.

C) interval scale.

D) nominal scale.

61) An undergraduate student's status (freshman, sophomore, junior, or senior) is an example of which scale of measurement?

A) Ratio scale

B) Ordinal scale

C) Interval scale

D) Nominal scale

62) The Fahrenheit scale for measuring temperature would be classified as a(n)

A) ratio scale.

B) ordinal scale.

C) interval scale.

D) nominal scale.

63) At the end of a semester college students evaluate their instructors by assigning them to one of the following categories: Excellent, Good, Average, Below Average, and Poor. The measurement scale is a(n)

A) ratio scale.

B) ordinal scale.

C) interval scale.

D) nominal scale.

64) What is the scale of measurement of the distance between any two locations?

A) Ratio scale

B) Ordinal scale

C) Interval scale

D) Nominal scale

65) Which scales of data measurement are associated with quantitative data?

A) Interval and ratio

B) Ratio and nominal

C) Ordinal and interval

D) Nominal and ordinal

66) Which data scales of measurement are associated with qualitative data?

A) Interval and ratio

B) Ratio and nominal

C) Ordinal and interval

D) Nominal and ordinal

67) The data represents the stock price for Google at the end of the past four quarters. Which of the following types of data best describe these values?

A) Cross-sectional

B) Nominal

C) Time series

D) Ordinal

68) Your business statistics class had a test last week. The average score for the class is an example of

A) secondary data

B) qualitative data

C) descriptive statistics

D) inferential statistics

69) A sample statistic is an estimate of

A) population parameter.

B) population statistic.

C) sample parameter.

D) descriptive statistic.

70) A \_\_\_\_\_\_\_\_ represents all possible subjects of interest.

A) sample

B) population

C) statistic

D) parameter

71) A major portion of \_\_\_\_\_\_\_\_ is concerned with the problem of estimating population parameters or testing hypothesis about such parameters.

A) descriptive statistics

B) population statistics

C) inferential statistics

D) business statistics

72) Data that describe a characteristic about a sample is known as a

A) population.

B) survey.

C) parameter.

D) statistic.

73) When a characteristic of interest differs among various observations, then it can be termed a

A) parameter.

B) variable.

C) data.

D) information.

74) A(n) \_\_\_\_\_\_\_\_ variable is characterized by infinitely uncountable values and can take any value within interval.

A) discrete

B) infinite

C) continuous

D) quantitative

75) Differences between categories are meaningless with \_\_\_\_\_\_\_\_ data.

A) ordinal

B) interval

C) ratio

D) continuous

76) Which of the following scales represents the strongest level of measurement?

A) Ordinal

B) Nominal

C) Ratio

D) Interval

77) Which of the following scales represents the least sophisticated level of measurement?

A) Ordinal

B) Nominal

C) Ratio

D) Interval

78) The values of data on a(n) \_\_\_\_\_\_\_\_ scale can be categorized and ranked.

A) ordinal

B) nominal

C) ratio

D) interval

79) Which of the following characteristics does the interval scale not have?

A) Values can be categorized.

B) Values can be ranked.

C) There is a true zero point.

D) The differences between values are valid.

80) Which of the following is an example of quantitative data?

A) The ZIP code of your home address

B) Google's closing stock price today

C) Your gender

D) Your Social Security number

81) Which of the following is an example of qualitative data?

A) Today's high temperature

B) The class average of last test

C) The amount of time you spent for your homework

D) Your last name

82) A respondent of a survey is asked whether the Philadelphia Flyers' performance in the last game was excellent, good, fair, or poor. The person indicates that the performance was "good." This is an example of

A) nominal data

B) ordinal data

C) interval data

D) ratio data

83) Philadelphia experienced a record amount of rainfall in August. During the last week of the month, the city received additional rain from a hurricane. Because global warming is thought to cause extreme weather patterns, one conclusion that could be drawn is that these patterns are evidence of global warming. What is wrong with this conclusion?

84) Administrators have concluded that the SAT exam results for 2011 show a distinct change in student capabilities when compared with the year 1991. In 1991 the SAT exam included only multiple choice sections and was later redesigned. What is wrong with this conclusion?

85) A university is interested in tracking the success of its graduates by measuring the length of each graduate's job search before getting a position in his or her chosen field. How would you define the appropriate population?

86) We would like to determine whether there is a difference between the height of a college team of basketball players at the Ohio State University and the height of the overall student body. Identify the two populations in this study.

87) In each of the following statements, determine whether the branch of statistics is best classified as descriptive statistics or inferential statistics.

A. The average of a data set is equal to 35.7.

B. The minimum value of a data set is 78, and the maximum value is 146.

C. Because the average age in a sample is 23, it is likely that the average age in the population is about 23.

D. Because the values in the sample are so widely dispersed, the spread of the population must be high.

88) A car company wants to know the average age of cars of their brand that are still on the road. How would you define the appropriate population? Will the car company calculate a population parameter or a sample statistic? Why?

89) What are the primary reasons that sampling is necessary?

90) An investor wants to know today's average closing price of the stocks listed on the Standard and Poor's 500 Index. Will the investor calculate a population parameter or sample statistic? Why?

91) We would like to determine the average height of a college team of basketball players at Ohio State University. Is it necessary to take a sample of basketball players? Explain.

92) We would like to determine the average height of the overall student body at Ohio State University. Does it seem necessary to take a sample from the overall student body?

93) Researchers are interested in completing a study examining trends in the sale of foods in the U.S. They have decided to examine the quantity of organic vegetables sold by supermarkets. Will researchers be able to gather population data?

94) Every 10 years, a census is taken in the U.S. by the Census Bureau. Despite the intent of gathering data on the population of the United States, issues exist that make true population data impossible to gather. Identify at least two issues in collecting these data.

95) Social networking sites support themselves in large part by selling advertising space. The hit rate on these ads is a critical measure when trying to solicit advertising. The hit rate is used as a measure of success for ads. How would you recommend a social networking site use sampling to evaluate its existing ads?

96) The following table includes the number of white women over the age of 20 in the civilian labor force. Because it is time series data, what would the entries of the first column refer to?

|  |  |
| --- | --- |
| **?** | **Number in Civilian Labor Force** |
|   | 43216 |
|   | 43479 |
|   | 44663 |
|   | 45409 |
|   | 45543 |
|   | 46613 |
|   | 47051 |
|   | 47833 |
|   | 48611 |
|   | 49128 |
|   | 48562 |

Source: http://data.bls.gov

97) A study of teen smoking is planned. Researchers are interested in collecting cross-sectional data, which allow them to draw conclusions about the likelihood, frequency, and longevity of teen smoking. You have been asked to design this study and will collect no more than five pieces of data. What information will you collect?

98) Define the measurement scale of a car's fuel efficiency (measured in miles per gallon). Is a car's fuel efficiency discrete or continuous?

99) A study of teen smoking is planned. Researchers are interested in collecting data which allow them to draw conclusions about the likelihood, frequency, and longevity of teen smoking. The questions asked include: "What is your gender?" "What is your age?" "Do you smoke (yes or no)?" "How many cigarettes per day do you smoke?" "For how long have you smoked (in years)?" What is the measurement scale for each variable?

100) The following data represent a sample of property sales in Cape May County during the year 2000. Identify the qualitative and quantitative variables. What are the natural categories for Town and Class? Identify the measurement scales for all variables.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Town |   | Class |   | Date |   | Price |   | Assessment |
| Avalon |   | Residential |   | 12/28/2000 |   | $ | 500,000 |   |   | $ | 288,600 |   |
| Avalon |   | Residential |   | 04/14/2000 |   | $ | 500,000 |   |   | $ | 325,900 |   |
| Wildwood |   | Commercial |   | 05/01/2000 |   | $ | 500,000 |   |   | $ | 250,000 |   |
| Avalon |   | Residential |   | 05/22/2000 |   | $ | 500,000 |   |   | $ | 332,500 |   |
| North Wildwood |   | Commercial |   | 06/02/2000 |   | $ | 500,000 |   |   | $ | 607,700 |   |
| Avalon |   | Residential |   | 09/16/2000 |   | $ | 518,000 |   |   | $ | 269,900 |   |
| North Wildwood |   | Residential |   | 04/07/2000 |   | $ | 520,000 |   |   | $ | 373,100 |   |
| Avalon |   | Commercial |   | 01/15/2000 |   | $ | 520,000 |   |   | $ | 414,600 |   |
| Avalon |   | Residential |   | 01/15/2000 |   | $ | 525,000 |   |   | $ | 373,500 |   |
| Wildwood |   | Residential |   | 06/14/2000 |   | $ | 525,000 |   |   | $ | 379,600 |   |

101) The following data represent a sample of non-elementary mathematics teachers in Bergen County, New Jersey. Identify the qualitative and quantitative variables, the categories associated with each qualitative variable, and the measurement scales for all variables.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| School |   | Degree |   | Years Experience |   | Salary |   | Classes Taught |
| Brookside E.S. |   | Masters |   |   | 8 |   |   | $ | 67,945 |   |   | 6 |
| Program 3-Emotionally Distur. |   | Masters |   |   | 25 |   |   | $ | 82,910 |   |   | 4 |
| Program 3-Emotionally Distur. |   | Bachelors |   |   | 25 |   |   | $ | 86,030 |   |   | 7 |
| Program 3-Emotionally Distur. |   | Bachelors |   |   | 3 |   |   | $ | 62,690 |   |   | 5 |
| Program 3-Emotionally Distur. |   | Masters |   |   | 21 |   |   | $ | 82,620 |   |   | 5 |
| Program 5-Life Skills |   | Masters |   |   | 11 |   |   | $ | 82,330 |   |   | 5 |
| Program 5-Life Skills |   | Masters |   |   | 41 |   |   | $ | 79,790 |   |   | 4 |
| Bergen Academies-Hackensack |   | Masters |   |   | 31 |   |   | $ | 82,626 |   |   | 5 |
| Bergen Academies-Hackensack |   | Masters |   |   | 10 |   |   | $ | 82,626 |   |   | 4 |
| Bergen Academies-Hackensack |   | Masters |   |   | 3 |   |   | $ | 98,291 |   |   | 4 |

Source: http://php.app.com/edstaff/results2.php?county=BERGEN&district=%25&school=%25&lname=&fname=&job1=Math+Non-Elementary&Submit=Submit

102) The following data concern a sample of employees of the U.S. Marshalls in the state of New York. Identify the qualitative and quantitative variables, the categories associated with each qualitative variable, and the measurement scales for all variables.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Country |   | Station |   | Title |   | Grade |   | Salary |
| New York Country |   | NEW YORK-NY |   | MISCELLANEOUS CLERK AND ASSISTANT |   | GS 07 |   | $ | 51,030 |   |
| New York Country |   | NEW YORK-NY |   | MISCELLANEOUS CLERK AND ASSISTANT |   | GS 07 |   | $ | 55,405 |   |
| Kings Country |   | NEW YORK-KINGS |   | ACCOUNTING TECHNICIAN |   | GS 07 |   | $ | 45,196 |   |
| Erie Country |   | BUFFALO |   | ADMINISTRATIVE OFFICER |   | GS 13 |   | $ | 95,023 |   |
| Onondaga Country |   | SYRACUSE |   | BUDGET ANALYSIS |   | GS 09 |   | $ | 53,773 |   |
| New York Country |   | NEW YORK-NY |   | GENERAL BUSINESS AND INDUSTRY |   | GS 11 |   | $ | 66,887 |   |
| Onondaga Country |   | SYRACUSE |   | GENERAL BUSINESS AND INDUSTRY |   | GS 11 |   | $ | 74,628 |   |
| Erie Country |   | BUFFALO |   | MISCELLANEOUS ADMINISTRATION AND PROGRAM |   | GS 09 |   | $ | 59,962 |   |
| New York Country |   | NEW YORK-NY |   | MISCELLANEOUS ADMINISTRATION AND PROGRAM |   | GS 09 |   | $ | 57,065 |   |
| Kings Country |   | NEW YORK-KINGS |   | GENERAL BUSINESS AND INDUSTRY |   | GS 11 |   | $ | 66,887 |   |

Source: http://php.app.com/fed\_employees10/results.php?fullname=&agency\_name=U.S.+MARSHALS+SERVICE&statename=New+York&countyname=%25&Submit=Search