**Chapter 1_Practice_Problems**

**Example 1**

Determine if the describe variable is quantitative or qualitative. For every identified quantitative variable, determine if the measure is discrete or continuous.

a. The length of time between full moons.
b. The number of products shipped in a year.
c. The colors of paint manufactured in the United States.
d. The gender of the subjects participating in clinical trials.
e. The temperature of a cup of coffee.
**f.** Political association: Democrat, Republican or Independent.

**Example 2**

In a hospital, patients with cancers are monitored and records are kept that include their age, gender, type of cancer, and tumor size. Clearly state the individuals in the study and the variables being measured, including type of variable (qualitative/quantitative). For every identified quantitative variable, determine if the measure is discrete or continuous.

**Example 3**

Determine whether the given variable is a discrete or continuous measure.

a. The number of members in a club.
b. The temperature of a cup of coffee.
c. Length of time one spends online.
d. The number of participants at a conference.

**Example 4**

Determine whether the given value is a statistic or a parameter.

a. In a study involving babies, 100 babies were selected and the average weight (lbs) was computed to be 6 lb 8 oz.
b. In a census of a company's employees, the entire 458 individual employees where asked if they felt they deserved a pay raise, 406 stated yes they were underpaid.
c. In a study of the entire student body population consisting of 320 members, 260 students are college graduates.
d. A sample of 1000 laptops where selected and the average weight was computed to be 2.3 kg.


**Example 5**

Consider the population of all frequent flyers of an airline. You want to know the number of flights taken by a frequent flyer in a year.

(a) Specify the population unit.
(b) Specify the variable of interest.
(c) Specify the statistical population.


**Example 6**

Which technique for gathering data (observational study or experimental study) do you think was used in the following studies?

a. The Colorado Division of Wildlife netted and released 774 fish at Quincy Reservoir. There were 219 perch, 315 blue gill, 83 pike, and 157 rainbow trout.
b. The Colorado Division of Wildlife caught 41 bighorn sheep on Mt. Evans and gave each one an injection to prevent heartworm. A year later, 38 of these sheep did not have heartworm, while the other three did.
c. The Colorado Division of Wildlife imposed special fishing regulations on the Deckers section of the South Platte River. All trout under 15 inches had to be released. A study of trout before and after regulation went into effect showed that the average length of a trout increased by 4.2 inches after the new regulation.

**d.** An ecology class used binoculars to watch 23 turtles at Lowell Pounds. It was found that 18 were box turtles and 5 were snapping turtles.

**Example 7**

Determine if the following study is an observational study or experimental study.

a. To study the migration patterns of sea otters, a researcher catches 100 sea otters, takes the vital statistics (weight, length, girth, and estimated age), tags and releases them.
b. To study the effects of oxygen on the brain, a researcher has three rooms set up with various levels of oxygen (low, normal, and high). Subjects are asked to take an IQ test in their respective rooms after they have sat in environment for 30 minutes.
**c.** To study the effects of three drugs prescribed over a 20-year period, medical records are reviewed for 150 patients (50 in each group) who had taken the drug over the past 20 years.

**Fill in the blanks.**

**Words:** data collection, descriptive, inferential, parameter, qualitative variable, quantitative variable, statistic, experimental design, variable

A. _____Statistics involving methods of using information from a sample to draw conclusions regarding the population.
B. _____  Statistics involving methods of organizing, picturing, and summarizing information from samples or population.
C. _____Describes a characteristic of an individual to be measured or observed.
D. _____A variable that has a value or numerical measurement for which operations such as addition or averaging make sense.
E. _____  A variable that describes an individual by placing the individual into a category or group.
F. _____  A numerical measure that describes an aspect of a population.

G. _____A numerical measure that describes an aspect of a sample.
H. The branch of statistics called experimental design can guide the investigator in planning the manner and extent of _____.
I. The two main branches of statistics are inferential and _____.