SOLUTIONS: MEASURING DATA

(1) For each of the following, indicate whether the data is measured on a nominal, ordinal, interval, or ratio scale.

a) heights of CUNY college students -- ratio scale since there is a "true" 0; someone who is 6' tall is twice as tall as someone who is 3' tall
b) amount of sugar in a cheese danish -- ratio scale since there is a "true" 0; 10 grams of sugar is twice as much as 5 grams of sugar
c) borough of origin of CUNY students – nominal scale. All you can do is analyze the frequencies—how many from Brooklyn, Bronx, etc.
d) amount of snow that falls in Buffalo NY in January - ratio scale since there is a "true" 0
e) languages spoken by CUNY college students – nominal scale. You can collect frequencies and determine the mode.
f) waist size of men who attend Weight Watchers every week – ratio scale since there is a "true" 0; An individual with a 60" waist has twice the girth of one who has a 30" waist.
g) wrist sizes in inches of NFL players – ratio scale since there is a "true" 0
h) gross income of high school dropouts – ratio scale since there is a "true" 0
i) scores on the CPA exam for NYS students –interval scale since there is no "true" 0. Someone who gets a 50 on the test does not know twice as much as someone who gets a 25.
j) how long it takes for SPS students to run the 100-yard dash – ratio scale since there is a "true" 0
k) strength categories of hurricanes (1, 2, …, 5) – ordinal scale
l) genders of students at SPS -- nominal scale. All you can do is analyze the frequencies, e.g., 60% female and 40% male
m) average lifespan of alcoholics – ratio scale; the 0 is a "true" one. Someone who lives to the age of 60 has lived twice as much as one who lived to 30
n) number of defective bulbs in batches of 100 made by GE – ratio scale
o) amount of alcohol (in ounces) consumed by high school seniors –ratio scale; 8 ounces is twice as much as 4 ounces of alcohol consumed
p) how often college students use mouthwash in a typical week – ratio scale
q) scores on an algebra test (range is from 0 to 100) –interval scale; a score of 100 does not mean that you know twice as much algebra as someone who gets a 50. You can compute averages for a class.
r) scores on the GRE Exam – admissions test for graduate school (range is from 200 to 800)— interval scale; a score of 800 does not mean that you know 4 times more than someone who gets a 200.

(2) Indicate which of the following are discrete measurements (D) and which are continuous measurements (C):

The best way to answer this is to ask yourself whether it is possible to answer the question with several decimal places. For example, can your weight be measured more accurately than 120

pounds? Yes, your actual weight may be 120.0000000000004 pounds. In fact, no two people on planet earth weigh exactly the same—if you are willing to measure weight to 100 decimal places. Measures that involve height, weight, time, etc. are continuous.

On the other hand, if you have three children, you do not have 3.000004 children. It makes no sense to use several decimal places. The answer is a whole number: 0, 1, 2, 3, 4, etc. The same with number of siblings, number of defects, how many bathrooms you have in your apartment, number of bedrooms, etc.

> a)life of a Dell monitor -- C
> b) waist size of NFL football players-- C
> c) mileage of Japanese cars -- C
> d) length of NYC rats--C
> e) weight of human brains --C
> f) number of left-handed people on basketball teams -- D
> g) time to complete the task of assembling a computer--C
> h) amount of fat in a cheese danish--C
> i) number of foreign students in each statistics class-- D
> j) speed of NYC roaches--C
> k) number of bedrooms in your home --D

(3) Indicate which of the following is a parameter and which is a statistic:

Parameters (P) are from a population (need census); statistics (S) are measures that come from a sample. A sample is a (hopefully representative) portion of the population.

a) population mean -- P
b) population standard deviation -- P
c) sample standard deviation -- S
d) population variance -- P
e) population median -- P
f) sample mean --S
g) a mean obtained from the U.S. census --P
h) a mean obtained from sampling 2,000 American adults using random digit dialing (phone sample) --S
i) a mean obtained from sampling 10,000 teenagers on Facebook --S
j) average number of defects: a company manufactures 5,000 electron microscopes and tests them all. –P

(4) For each of the following, indicate the appropriate statistical measures that may be used for analysis (e.g., proportions, median, quantiles, mode, mean, …). List as many as are appropriate.

a) For data measured on a nominal scale, you may use: **mode**
b) For data measured on an ordinal scale, you may use: **mode and median**
c) For data measured on an interval scale, you may use: **mode, median, and mean**

(5) Dell Computers manufactures 1,000 super computers. A researcher wants a sample of 50 of them. Each of the computers are assigned numbers and then random numbers are used so that every computer has an equal chance of being selected (5%).

a) This is known as a: **simple random sample [every super computer has a known and equal chance of being selected]**
b) Measurements obtained from this are known as: **statistics**
c) Suppose the researcher decides to sample 1,000 computers. This is called a **census.**
d) Any measurement obtained is known as a **parameter.**