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AS1 (Assignment 1): Unit 1

Introduction to Terminology, Scales of Measurement, Notation and Basic Computation

1. A researcher is investigating the effectiveness of a treatment for adolescent boys taking medication for depression. A group of 30 boys is selected and half receive the new treatment in addition to their medication and the other half continue to take their medication without treatment. For this study

   a. Identify the population: all adolescent boys who take medication for depression

   b. Identify the sample: the group of 30 boys that were selected

2. Define the terms:

   a. Population: The entire group that the researcher is interested in studying

   b. Sample: a group selected from the population to study

   c. Parameter: the summarized data from a population

   d. Statistic: summarized data from a sample

3. Name 3 descriptive statistics method

   1) Organizing and summarizing data into frequency tables, histograms, or bar graphs

   2) Calculating measures of central tendency (mean, median, and mode)

   3) Calculating measures of variability (standard deviation)

Please place a T if the statement is true and an F if the statement is false in the space provided.

___F___4. A researcher calculates a mean from a sample. Her mean is an example of a parameter.

___F___5. A researcher calculates a mean from a population set of data. His mean is a statistic.

___T___6. The entire group of voters in Florida is an example of a population.

___T___7. A researcher who selects a sample from a population should expect some difference between the sample mean and the true population parameter.

__F___8. The participants in a research study are classified as high, medium, or low in self-esteem. This classification involves measurement on a nominal scale.

__F____9. A discrete variable must be measured on a nominal or an ordinal scale.

__T____10. Students in an introductory art class are classified as art majors and non-art majors. This is an example of measurement on a nominal scale.

___F___11. Men's shirt sizes are classified as small, medium, large, and extra-large. This is an example of measurement on a nominal scale.

___T___12. A researcher records the number of mathematics problems answered correctly during a 15 minute period. This is an example of measurement on a ratio scale.

__T____13. To determine how much difference there is between two individuals, you must use either an interval or a ratio scale of measurement.

___T___14. If a researcher measures two individuals on a nominal scale, it is impossible to determine which individual has the larger score.

__T____15. Recording the number of students who are absent each day at a high school would be an example of measuring a discrete variable.

___T___16. A high school gym teacher records how much time each student requires to complete a one-mile run. This is an example of measuring a continuous variable.

___T___17. A researcher records the gender of each child born in the county hospital during the month of June. This researcher is measuring discrete a variable.

___T___18. A data set is described as consisting of n = 15 scores. Based on the notation being used, the data set is a sample.

___T___19. To compute $(\Sigma X)^2$, you first add the scores, then square the total.

__T___20. For the following scores, 1, 2, 5, $\Sigma X^2 = 30$.

__F___21. For the following scores, 1, 4, 2, 0, $(\Sigma X)^2 = 21$.

22. Statistical techniques are classified into two major categories: Descriptive and Inferential. Describe the general purpose of each category.

Descriptive statistics describe a data but does not explain why. This type of statistics organize and summarize data recorded from the study and simplify the data into tables and graphs. Inferential statistics allow researchers to study samples, explain the data, and infer their findings to populations and establish a cause and effect.

23. Define the concept of "sampling error." Note: Your definition should include the concepts of sample, population, statistic, and parameter.

A population is the entire group that a researcher is interested in studying. Summarized data from a population is referred to as parameters. However some population are too large to collect data from. For example, if a researcher is interested in Latin working women's salary in the US. The population would be too large to collect data and measure from every working Latina in the US. Instead, researchers select a group of individuals from that population that they are interested in, to take part in a research study which is called a sample. The results they get from this sample is referred to statistics. However, because the entire population is not included in the sample, samples will not look exactly like the population they were taken from. While the goal is for the sample to represent the entire population, the researcher should expect some differences. The difference between the population and the sample is called sampling error.

24. Calculate each value requested for the following set of scores. Scores: 1, 7, 6, 4, 3, 0

N = __6___ ΣX = __21____ ΣX^2 = ___111_____ $(\Sigma X)^2$ = ____441____

25. For the following set of scores, find the value of each expression: 12, 14, 10, 9

ΣX = _45_____

ΣX^2 = ___521_____

$(EX)^2$ = _____2025_____

26. For the following set of scores, find the value of each expression

X
5
1
3

a. ΣX = ____9_____

b. ΣX^2 = ____35_____

c. $(EX)^2$ = _____81_____

27. For the following set of scores, find the value of each expression:

X
6
-2
0
-3
-1

n= _5__

EX= ___0____

EX^2 = ___50____

$(EX)^2$ = __0____

28. Two scores, X and Y, are recorded for each of $n = 4$ subjects. For these scores, find the value of each expression.

Subject	X	Y
A	3	4
B	0	7
C	-1	5
D	2	2

ΣX = __4____

ΣY = ___18___

29. For each set of scores at the right, find the value of each expression.

X
1
6
2
3

n= __4_____

EX= ___12___

EX^2 =___50_____

$(EX)^2$ = __144_____