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AS1 (Assignment 1): Unit 1

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

1. A researcher investigates the effects of amphetamine on memory. The researcher selects a random sample of 50 undergraduate students from a major New Jersey University. Half (25) of the students selected receive amphetamine while studying a word list and half (25) of the students receive a placebo. For this study
 - a. Identify the population: 50 undergraduate students.
 - b. Identify the sample: 25 Students that received amphetamine.
2. Define the terms:
 - a. Population__ The entire group that researchers are interested in studying.
 - b. Sample_ A group of individuals selected from a population that take part in a research study.
 - c. Parameter__ Summarized data from a population.
 - d. Statistic_ Summarized data from a sample.
3. Name 3 descriptive statistics methods
 - 1) Mean – the arithmetic average.
 - 2) Frequency Table
 - 3) Graph

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

- T 4. A researcher calculates a mean from a population. Her mean is an example of a parameter.
- T 5. A researcher calculates a mean from a sample set of data. His mean is a statistic.
- T 6. The entire group of alcoholics in the state of NJ is an example of a population.
- F 7. A researcher who selects a sample from a population should expect no difference between the sample mean statistic and the true population parameter.
- T 8. The participants in a research study are classified as high, medium, or low in self-esteem. This classification involves measurement on an ordinal scale.
- T 9. A continuous variable must be measured on a nominal or an ordinal scale.

- F 10. Students in an introductory art class are classified as art majors and non-art majors. This is an example of measurement on an ordinal scale.
- F 11. Men's shirt sizes are classified as small, medium, large, and extra-large. This is an example of measurement on an interval scale.
- T 12. A researcher records the number of errors a rat makes running a maze. This is an example of measurement on a ratio scale.
- F 13. To determine how much difference there is between two individuals, you must use either a nominal or interval scale of measurement.
- T 14. If a researcher measures two individuals on a nominal scale, it is possible to determine which individual has the smaller score.
- F 15. Recording the number of students who are absent each day at a high school would be an example of measuring a continuous variable.
- F 16. A track coach records how much time each runner takes to complete the 100-yard dash. This is an example of measuring a discrete variable.
- T 17. Gender is a discrete variable while age is a continuous variable.
- F 18. A data set is described as consisting of $n = 15$ scores. Based on the notation being used, the data set is a population.
- F 19. To compute $(\Sigma X)^2$, you have to remember to first square all of the scores.
- T 20. For the following scores, 1, 3, 5, $\Sigma X^2 = 35$.
- F 21. For the following scores, 4, 4, 2, 0, $(\Sigma X)^2 = 36$.

22. Statistical techniques are classified into two major categories: Name the categories and differentiate one major difference between them:

Descriptive Methods organize and simplify data.

Inferential Methods explain the data.

23. You (1) select 30 people from a population, (2) measure the IQ of those 30 people, and (3) calculate a mean statistic = 110. What should you expect as far as the mean parameter? That is, would you expect the corresponding mean parameter to also be 110?

I expect the answer to be the same and yes, I would expect the corresponding mean parameter to also be 110.

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

$$N = \underline{8} \quad \Sigma X = \underline{22} \quad \Sigma X^2 = \underline{104} \quad (\Sigma X)^2 = \underline{484}$$

25. For the following set of scores, find the value of each expression: 10, 11, 10, 9, 7

$$\Sigma X = \underline{47}$$

$$\Sigma X^2 = \underline{451}$$

$$(\Sigma X)^2 = \underline{2,209}$$

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

X
4
0
-3

a. $\Sigma X = \underline{1}$

b. $\Sigma X^2 = \underline{25}$

c. $(\Sigma X)^2 = \underline{1}$

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

X
6
-2
3
-1

$$n = \underline{4}$$

$$\Sigma X = \underline{6}$$

$$\Sigma X^2 = \underline{36}$$

$$(\Sigma X)^2 = \underline{36}$$

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

<u>Subject</u>	<u>X</u>	<u>Y</u>
A	4	3
B	0	7
C	-1	5
D	3	2

$$\Sigma X = \underline{\underline{6}}$$

$$\Sigma Y = \underline{\underline{17}}$$

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

x
2
4
0
-2

$$n = \underline{\underline{4}}$$

$$\Sigma X = \underline{\underline{4}}$$

$$\Sigma X^2 = \underline{\underline{24}}$$

$$(\Sigma X)^2 = \underline{\underline{16}}$$