STA2023 Elementary Statistics
Test 1 Study Guide

Content: Chapters 1-3

Concepts & Skills:

1. Recognize terminology such as: *Population, Sample, Survey, Element, Variable, Observation, Data Set, Quantitative Variable, Discrete Variable, Continuous Variable, Qualitative Variable, Cross-Section Data, Time-Series Data, Raw Data, Class, Class Boundary, Class Width, Parameter, Statistic*
2. Be able to identify a data set as a population or a sample.
3. Be able to classify variables as qualitative or quantitative discrete or quantitative continuous.
4. Be able to determine whether data is cross-section data or time-series data.
5. Be able to calculate various summations of data sets.
6. Be able to create a frequency distribution for qualitative and quantitative variables.
7. Be able to calculate the relative frequency and percent frequency for qualitative and quantitative variables.
8. Be able to construct, identify, and interpret correct bar graphs and pie charts for qualitative data sets.
9. Be able to calculate the class boundaries, class width and class midpoint for a quantitative data set.
10. Be able to construct, identify, and interpret histograms and polygons for quantitative data.
11. Be able to create a cumulative frequency distribution for a quantitative data set.
12. Be able to calculate the cumulative relative frequency and cumulative percentage of a quantitative data set.
13. Be able to identify and interpret ogives.
14. Be able to construct, identify, and interpret stem-and-leaf displays for quantitative data sets.
15. Be able to construct, identify, and interpret dotplots.
16. Be able to calculate mean, trimmed mean, weighted mean, median, and mode for ungrouped data sets.
17. Be able to calculate range and standard deviation for ungrouped data sets.
18. Be able to calculate mean and standard deviation for grouped data sets.
19. Be able to apply Chebyshev's Theorem to determine the percentage of values that fall within a range.
20. Be able to apply the Empirical Rule to determine the percentage of values that fall within a range.
21. Be able to calculate quartiles and interquartile range.
22. Be able to calculate percentiles and percentile rank.
23. Be able to construct, identify, and interpret a box-and-whisker plot.

Examples:

1. (C2) Indicate whether each of the following constitutes data collected from a population or a sample.
   a. A group of 25 patients selected to test a new drug
   b. Total items produced on a machine for each year from 1995 – 2012
   c. Yearly expenditures on clothes for 50 persons
   d. Number of houses sold by each of the 10 employees of a real estate agency during 2012.
2. (C3) Indicate which of the following variables are quantitative and which are qualitative. Class the quantitative variables as discrete or continuous.
   a. Women's favorite TV programs
   b. Salaries of football players
   c. Number of pets owned by families
   d. Favorite breed of dog for each of 20 persons.
3. (C4) Classify the following as cross-section or time-series data.
   a. Food bill of a family for each month in 2012
   b. Number of armed robberies each year in Dallas from 1998-2012
   c. Number of supermarkets in 40 cities on December 31, 2011
   d. Gross sales of 200 ice cream parlors in July 2012
4. (C5) The number of types of cereal in the pantries of six households is 6, 11, 3, 5, 6, and 2. Let x be the number of types of cereal in the pantry of a household. Find: (a) $\sum x$ (b) $(\sum x)^2$ (c) $\sum x^2$
5. (C6,C7,C8) A group of 20 students chose their favorite cereal. The results are:

Cheerios	Frosted Mini Wheats	Lucky Charms	Lucky Charms	Golden Grahams
Golden Grahams	Lucky Charms	Frosted Flakes	Frosted Mini Wheats	Lucky Charms
Lucky Charms	Golden Grahams	Frosted Flakes	Cocoa Krispies	Froot Loops
Froot Loops	Lucky Charms	Cocoa Krispies	Frosted Flakes	Froot Loops

   Create a frequency distribution, calculate the relative frequency and percent frequency, and construct a bar graph for the frequency and pie chart for the relative frequency.

6. The following data represents the scores of 15 students on their 1st statistics exam.

87	62	59	90	99	77	62	58
82	80	69	62	69	56	91	

(C6) Create a frequency distribution using classes 50-59, 60-69, 70-79, 80-89, 90-99.
(C7) Calculate the relative and percent frequency.
(C9) Determine the class boundaries, class widths and class midpoints.
(C10) Create a histogram and polygon display.
(C11, C12) Calculate the cumulative frequency distribution, cumulative relative frequency and percent frequency.
(C14) Construct a stem-and-leaf display representing the data.
(C15) Construct a dotpot representing the data.
(C16) Calculate the mean, the 20% trimmed mean, the median, and the mode.
(C17) Calculate the range and standard deviation.
(C19) Identify what range of scores would fall within 2 standard deviations of the mean.
(C21) Calculate Q_1, Q_3 and the IQR.
(C22) Determine the approximate value of the 60th percentile. Find the percentile rank of 50.
(C23) Construct a Box-and-Whisker plot of the data set.

7. (C18) The following table gives the frequency distribution of the times (in minutes) that 50 commuter students at a lare university spent looking for parking spaces on the first day of classes in Fall 2012.

Time	**Number of Students**
0 to less than 4	1
4 to less than 8	7
8 to less than 12	15
12 to less than 16	18
16 to less than 20	6
20 to less than 24	3

Find the mean, variance and standard deviation of the data set. Are these summary measures population parameters or sample statistics?