Pledge:

9/12/04 MATH 271 Name: Solution
Dr. Lunsford Applied Stats (20 points possible)

The following are the quiz scores (max possible is 20) of 20 randomly selected students from an Introduction to Statistics class:

10 11 13 14 15 15 15 15 16 16 16 16 16 17 17 18 18 18 19 19

(mode: 16 16 16 16 16; med.: 16)

(a) Find the median, mode, and mean of this sample data. Clearly indicate your answers. (2 points) Median = 16, Mode = 16, mean = $\bar{x} = \frac{\Sigma x}{n} = 15.7$

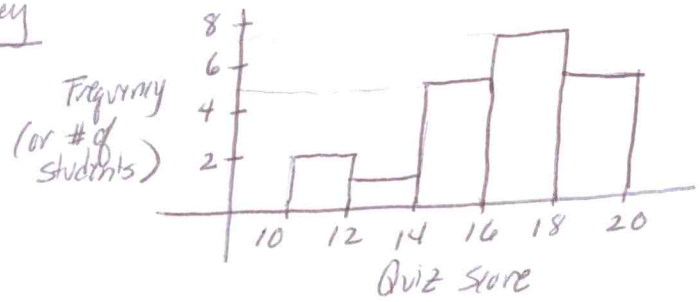
(b) Find the sample standard deviation of this sample data. Please show how you would plug the data into the appropriate formula to compute this value. (3 points)

Via Calculator $s = 2.386$ → Using $s^2 = \frac{n\Sigma x^2 - (\Sigma x)^2}{n(n-1)}$

$s = \sqrt{\frac{20(5038) - (314)^2}{20(19)}}$ OR → see back page...

(c) Create a frequency distribution and graph the corresponding histogram for the data by using a class width of 2 and the minimum value of the data as the lower class limit for the first class. Please show your frequency table as well as the graph of the histogram. Also please be sure to label the axes of your histogram. (5 points)

Class Limits	Frequency
10 – 11	2
12 – 13	1
14 – 15	5
16 – 17	7
18 – 19	5



(d) Please classify the "shape" of the data and justify your classification based on your answers above. (2 points)
The data has a slight skew to the left (negative skew). The histogram has a left tail & this tail data pulls the mean to the left of the median.

Given the vectors $X = \begin{bmatrix} 1 \\ 2 \\ -3 \\ 4 \end{bmatrix}$ and $Y = \begin{bmatrix} 10 \\ -9 \\ -8 \\ 7 \end{bmatrix}$ find the following: (2 points each – 4 points total)

(a) $XY + U(4)$

$= \begin{bmatrix} 1 \\ 2 \\ -3 \\ 4 \end{bmatrix}\begin{bmatrix} 10 \\ -9 \\ -8 \\ 7 \end{bmatrix} + \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ -18 \\ 24 \\ 28 \end{bmatrix} + \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 11 \\ -17 \\ 25 \\ 29 \end{bmatrix}$

(b) $-3X + Y$

$= -3\begin{bmatrix} 1 \\ 2 \\ -3 \\ 4 \end{bmatrix} + \begin{bmatrix} 10 \\ -9 \\ -8 \\ 7 \end{bmatrix} = \begin{bmatrix} -3 \\ -6 \\ 9 \\ -12 \end{bmatrix} + \begin{bmatrix} 10 \\ -9 \\ -8 \\ 7 \end{bmatrix} = \begin{bmatrix} 7 \\ -15 \\ 1 \\ -5 \end{bmatrix}$

Pledge:

Give an example of each of the following: (1 point each – 4 points total)

Answers from student papers...

A descriptive statistic — Batting average (so if so hit 0.353 last year.)

An inferential statistic — - 60% of all people prefer Pepsi
- The trend of the stock market based upon the previous year.

Continuous data — ↳ Amount of rainfall; Temperature; Weight

Qualitative data — ↳ Color (Red, Blue, or Green)
Gender (male or female)

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

$$= \sqrt{\frac{\left[(10-15.7)^2 + (11-15.7)^2 + (19-15.7)^2 + (4)(15-15.7)^2 + \cdots + (2)(19-15.7)^2\right]}{19}}$$