Quiz 1 for Statistics 301
Elementary Statistical Methods - Spring 2001
Material Covered: Chapter 3 of Workbook and text
Friday, 26th January

This is a 15 minute quiz, worth 5% and marked out of 5 points. The total possible points awarded for each question is given in square brackets at the beginning of each question. Anything that can fit on one side of an 8\(\frac{1}{2}\) by 11 inch piece of paper may be used as a reference during this quiz. A calculator and appropriate statistical tables may also be used. No other aids are permitted.

Name (please print): ______________________ . ID Number: __________.

last first

1. [2 points] Circle true or false.
   (a) True / False The value of the median will always be one of the data points in the data set.
   (b) True / False In a sample of size \(n\), the median of the sample is \(\frac{n+1}{2}\).
   (c) True / False The standard deviation is always less than the variance.
   (d) True / False The terms median, fiftieth percentile and second quartile are represent the same value.

2. Consider the following questions on Chebyshev’s Theorem.
   (a) [1 point] At least what percent of a set of data will lie within 2.25 standard deviations from the mean?
      (circle closest one) 60.5% / 75.9% / 80.2% / 85.6% / 92.4%.
   (b) [1 point] A sample has a mean of 100 and a standard deviation of 15. At least \(\frac{8}{9}\) of all data will lie between what two values?
      (circle closest one) 100 ± 15 / 100 ± 1.5(15) / 100 ± 2(15) / 100 ± 2.5(15) / 100 ± 3(15).
   (c) [1 point] A sample of size 50 has a mean of 60 and a standard deviation of 10. At least what percent of the data is between 10 and 110?
      (circle closest one) 89.55% / 91.90% / 93.75% / 96.00% / 98.75%.
(1) **False, False** (this is the location, not the median itself)
   **False** (eg. \( s = 0.9 \) and \( s^2 = 0.81 \)) **True**

(2a) 80.2%
\[
1 - \frac{1}{k^2} = 1 - \frac{1}{2.25}
\]

(2b) 100 ± 3(15)
   since \( 1 - \frac{1}{k^2} = 1 - \frac{1}{3^2} = \frac{8}{9} \), interval is given by one 3 SDs from mean

(2c) 96.00%
   since 10 is 5 SDs below mean 60, \( 1 - \frac{1}{k^2} = 1 - \frac{1}{5^2} = 0.96 \)