Homework Questions for Chapter 2 " Using Numerical Measures to Describe Data"

2.3. Ten economists were asked to predict the percentage growth in the Consumer Price Index over the next year. Their forecasts were as follows:

  3.6   3.1   3.9   3.7   3.5   3.7   3.4   3.0   3.7   3.4

  a. Compute the sample mean.
  b. Compute the sample median.
  c. Find the mode.

2.4. A department store chain randomly sampled 10 stores in a state. After a review of sales records, it was found that, compared with the same period last year, the following percentage increases in dollar sales had been achieved over the Christmas period this year:

  10.2   3.1   5.9   7.0   3.7   2.9   6.8   7.3   8.2   4.3

  a. Calculate the mean percentage increase in dollar sales.
  b. Calculate the median.
  c. Comment on symmetry.

2.12. Compute the variance and standard deviation of the following sample data:

  6   8   7   10   3   5   9   8

2.13. Compute the variance and standard deviation of the following sample data:

  3   0   -2   -1   5   10

2.15. The time (in seconds) that a random sample of employees took to complete a task is as follows:

  23   35   14   37   28   45   12   40   27   13   26   25
  37   20   29   49   40   13   27   16   40   20   13   66

  a. Find the mean time.
  b. Find the standard deviation.
  c. Find the five-number summary.
  d. Find the coefficient of variation.

2.16. The following stem-and-leaf display contains sample data:

Stem	Leaves
3	0 1
4	5 8 8
5	0 3 4 5 7 8 9
6	1 4 7 9
7	3 6 9
8	0 3 7

    Calculate IQR.

2.17. A random sample of data has a mean of 75 and a variance of 25.

    a. Use Chebychev's theorem to determine the percent of observations between 65 and 85.
    b. Use the empirical rule to find the approximate percent of observations between 65 and 85.

2.18. If the mean of a population is 250 and its standard deviation is 20, approximately what proportion of observations in the interval between

    a. 190 and 310
    b. 210 and 290?

2.26. Consider the following sample of five values and corresponding weights:

X	W
4.6	8
3.2	3
5.4	6
2.6	2
5.2	5

    a. Calculate the arithmetic man of the x values without weights.
    b. Calculate the weighted mean of the x values.

2.28. Find the weighted mean per capita personal income for the following random sample of seven states for 2007.

State	Population	Per Capita Personal Income
Alabama	4,627,851	38,564
Georgia	9,544,750	33,416
Illinois	12,852,548	40,919
Indiana	6,345,289	33,152
New York	19,297,729	46,664
Pennsylvania	12,432,792	38,740
Tennessee	6,156,719	33,373

2.35. Following is a random sample of seven (x,y) pairs of data points:

$$(1, 5) \ (3, 7) \ (4, 6) \ (5, 8) \ (7, 9) \ (3, 6) \ (5, 7)$$

   a. Compute the covariance.
   b. Compute the correlation coefficient.

2.37. Following is a random sample of price per piece of plywood, X, and quantity sold, Y (in thousands):

Price per Piece (X)	Thousands of Pieces Sold (Y)
6	80
7	60
8	70
9	40
10	0

   a. Compute the covariance.
   b. Compute the correlation coefficient.

2.41. A random sample for five exam scores produced the following (hours of study, grade) data values:

Hours Studied (X)	Test Grade (Y)
3.5	88
2.4	76
4	92
5	85
1.1	60