MAT 1372 Statistics with Probability HW4

**p.105**

3.5.1 The following data give the per capita consumption of milk in the years from 1983 to 1987. The data are from the U.S. Department of Agriculture, *Food Consumption, Prices, and Expenditures*, annual.

**Year Amount (in gallons per capita)**

1983 26.3

1984 26.2

1985 26.4

1986 26.3

1987 25.9

Find the sample mean and the sample variance of this set.

3.5.2 You are given these data sets:

*A*: 66, 68, 71, 72, 72, 75

*B*: 2, 5, 9, 10, 10, 16

**(a)** Which one appears to have the larger sample variance?

**(b)** Determine the sample variance of data set *A*.

**(c)** Determine the sample variance of data set *B*.

3.5.6 An individual needing automobile insurance requested quotes from 10 different insurers for identical coverage and received the following values (amounts are annual premiums in dollars):

720, 880, 630, 590, 1140, 908, 677, 720, 1260, 800

Find **(a)** The sample mean **(b)** The sample median **(c)** The sample standard deviation

**p.114**

**3.6.1.** The daily numbers of animals treated at a certain veterinarian clinic over a 24-day period are as follows:

22, 17, 19, 31, 28, 29, 21, 33, 36, 24, 15, 28, 25, 28, 22, 27, 33, 19, 25, 28, 26, 20, 30, 32

**(a)** Plot these data in a histogram.

**(b)** Find the sample mean.

**(c)** Find the sample median.

**(d)** Is this data set approximately normal?

**3.6.2.** The following data give the injury rates per 100,000 worker-hours for a sample of 20 semiconductor firms:

1.4, 2.4, 3.7, 3.1, 2.0, 1.9, 2.5, 2.8, 2.2, 1.7, 3.1, 4.0, 2.2, 1.8, 2.6, 3.6, 2.9, 3.3, 2.0, 2.4

**(a)** Plot the data in a histogram.

**(b)** Is the data set roughly symmetric?

**(c)** If the answer to (b) is no, is it skewed to the left or to the right?

**(d)** If the answer to (b) is yes, is it approximately normal?

**3.6.6.** The following data give the age at inauguration of all 43 presidents of the United States.

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**(a)** Find the sample mean and sample standard deviation of this data set.

**(b)** Draw a histogram for the given data.

**(c)** Do the data appear to be approximately normal?

**(d)** If the answer to (c) is yes, give an interval that you would expect to contain approximately 95 percent of the data observations.

**(e)** What percentage of the data lies in the interval given in part (d)?

**8.** A sample of 36 male coronary patients yielded the following data concerning the ages at which they suffered their first heart attacks.

7 |1, 2, 4, 5

6 |0, 1, 2, 2, 3, 4, 5, 7

5 |0, 1, 2, 3, 3, 4, 4, 4, 5, 6, 7, 8, 9

4 |1, 2, 2, 3, 4, 5, 7, 8, 9

3 |7, 9

**(a)** Determine and *s*.

**(b)** From the shape of the stem-and-leaf plot, what percentage of data values would you expect to be between − *s* and + *s*? Between

− 2*s* and + 2*s*?

**(c)** Find the actual percentages for the intervals given in (b).

**9.** If the histogram is skewed to the right, which statistic will be larger— the sample mean or the sample median? (*Hint* : If you are not certain, construct a data set that is skewed to the right and then calculate the sample mean and sample median.)

**10.** The following data are the ages of a sample of 36 victims of violent crime in a large eastern city:

25, 16, 14, 22, 17, 20, 15, 18, 33, 52, 70, 38, 18, 13, 22, 27, 19, 23,

33, 15, 13, 62, 21, 57, 66, 16, 24, 22, 31, 17, 20, 14, 26, 30, 18, 25

**(a)** Determine the sample mean.

**(b)** Find the sample median.

**(c)** Determine the sample standard deviation.

**(d)** Does this data set appear to be approximately normal?

**(e)** What proportion of the data lies within 1 sample standard deviation of the sample mean?

**(f)** Compare your answer in (e) to the approximation provided by the empirical rule.