

**Text Exercise Set 7****NAME:**

- 7-1** For each of several fish caught, data is recorded which includes the lake where the fish was caught (North Lake, Blue Lake, Harvey Lake), treated as qualitative-nominal, and the length of the fish (inches), treated as quantitative. Decide if each goal is stated properly in parts (a) through (e), and if not, say why not.
- (a) The data are to be used to study a possible relationship between lake and length of fish.
  - (b) The data are to be used to study the difference between lake and length of fish.
  - (c) The data are to be used to study possible relationships among North Lake, Blue Lake, and Harvey Lake.
  - (d) The data are to be used to study a possible relationship between length of fish and North Lake.
  - (e) The data are to be used to study the difference in length of fish among North Lake, Blue Lake, and Harvey Lake.
  - (f) How can the distribution of length of fish be compared graphically for the three lakes?
- 7-2** For each of several light bulbs, data is recorded which includes the light bulb brand (Brite, Softlite, Nodark), treated as qualitative-nominal, and the light bulb lifetime (hours), treated as quantitative. Decide if each goal is stated properly in parts (a) through (e), and if not, say why not.
- (a) The data are to be used to study a possible relationship between light bulb brand and light bulb lifetime.
  - (b) The data are to be used to study the difference between light bulb brand and light bulb lifetime.
  - (c) The data are to be used to study possible relationships among Brite, Softlite, and Nodark light bulbs.
  - (d) The data are to be used to study a possible relationship between light bulb lifetime and Brite bulbs.
  - (e) The data are to be used to study the difference in light bulb lifetime among Brite, Softlite, and Nodark brand light bulbs.
  - (f) How can the distribution of lifetime be compared graphically for the three bulb brands?

**7-3** Each time a cloud seeding is performed, the amount of rainfall is recorded.  
Decide if each goal is stated properly in parts (a) and (b), and if not, say why not.

- (a) The data are to be used to study the relationship of cloud seeding.
- (b) The data are to be used to study the distribution of inches of rainfall resulting from the cloud seeding.
- (c) What graphical display can be used to study the distribution of inches of rainfall resulting from the cloud seeding?

**7-4** The speed of each car passing a certain point on an expressway is recorded.  
Decide if each goal is stated properly in parts (a) and (b), and if not, say why not.

- (a) The data are to be used to study the relationship of speed.
- (b) The data are to be used to study the distribution of speeds of cars on the expressway.
- (c) What graphical display can be used to study the distribution of speeds of cars on the expressway?

**7-5** For each person in a large group, data is recorded which includes the variable eye color (light, dark) and the variable hair color (light, dark), both treated as qualitative-nominal. Decide if each goal is stated properly in parts (a) through (d), and if not, say why not.

- (a) The data are to be used to study a possible relationship between light eyes and dark hair.
- (b) The data are to be used to study a possible relationship between eye color and hair color.
- (c) The data are to be used to study the difference between eye color and hair color.
- (d) The data are to be used to study the difference in distribution of eye colors between the light-haired and dark-haired individuals.
- (e) What kind of table can be used to summarize and display the data?
- (f) What graphical display can be used to study a possible relationship between eye color and hair color?

- 7-6** For each of several teenagers in a city, data is recorded which includes the variable sex (male, female) and the variable riding a bicycle regularly (yes, no), both treated as qualitative-nominal. Decide if each goal is stated properly in parts (a) through (d), and if not, say why not.
- (a) The data are to be used to study a possible relationship between riding a bicycle regularly and not riding a bicycle regularly.
  - (b) The data are to be used to study a possible relationship between sex of the teenager and riding a bicycle regularly.
  - (c) The data are to be used to study the difference between sex of the teenager and riding a bicycle regularly.
  - (d) The data are to be used to study the difference in proportion of regular bike riders between males and females.
  - (e) What kind of table can be used to summarize and display the data?
  - (f) What graphical display can be used to study a possible relationship between sex of the teenager and riding a bicycle regularly?
- 7-7** Data on systolic blood pressure, diastolic blood pressure, and number of cigarettes smoked per week is recorded for each person in a large group people. All three variables are treated as quantitative. Decide if each goal is stated properly in parts (a) through (f), and if not, say why not.
- (a) The data are to be used to study a possible relationship between systolic blood pressure and diastolic blood pressure.
  - (b) The data are to be used to study the difference in distribution between systolic blood pressure and diastolic blood pressure.
  - (c) The data are to be used to study a possible relationship between systolic blood pressure and number of cigarettes smoked per week.
  - (d) The data are to be used to study the difference in distribution between systolic blood pressure and number of cigarettes smoked per week.

**7-7** - *continued*

- (e) The data are to be used to study a possible relationship between diastolic blood pressure and number of cigarettes smoked per week.
  
- (f) The data are to be used to study the difference in distribution between diastolic blood pressure and number of cigarettes smoked per week.
  
- (g) Indicate how each of the following can be displayed graphically:
  - (i) the relationship between systolic blood pressure and diastolic blood pressure
  
  - (ii) the difference in distribution between systolic blood pressure and diastolic blood pressure
  
  - (iii) the relationship between systolic blood pressure and number of cigarettes smoked per week
  
  - (iv) the relationship between diastolic blood pressure and number of cigarettes smoked per week

**7-8** Data on weekly study hours, weekly TV hours, and grade point average is recorded for each of several high school students. All three variables are treated as quantitative. Decide if each goal is stated properly in parts (a) through (f), and if not, say why not.

- (a) The data are to be used to study a possible relationship between weekly study hours and weekly TV hours.
  
- (b) The data are to be used to study the difference in distribution between weekly study hours and weekly TV hours.
  
- (c) The data are to be used to study a possible relationship between weekly study hours and grade point average.
  
- (d) The data are to be used to study the difference in distribution between weekly study hours and grade point average.

**7-8** - *continued*

- (e) The data are to be used to study a possible relationship between weekly TV hours and grade point average.
  
- (f) The data are to be used to study the difference in distribution between weekly TV hours and grade point average.
  
- (g) Indicate how each of the following can be displayed graphically:
  - (i) the relationship between weekly study hours and weekly TV hours
  
  - (ii) the difference in distribution between weekly study hours and weekly TV hours
  
  - (iii) the relationship between weekly study hours and grade point average
  
  - (iv) the relationship between weekly TV hours and grade point average

**7-9** For each of the data sets listed, (i) obtain the five-number summary and the interquartile range, (ii) identify all potential outliers, and (iii) construct a modified box plot.

- (a) The ages (years) for all individuals in the SURVEY DATA, displayed as Data Set A.1 in the appendix, consist of the following observations:

35 20 35 41 39 59 20 52 44 46 40 34 24 62 44  
44 38 47 44 45 56 32 54 41 50 59 44 62 53 59

**7-9** - *continued*

- (b) The ages (years) for only the males in the SURVEY DATA, displayed as Data Set A.1 in the appendix, consist of the following observations:

35 41 39 59 52 46 62 44 47 44 54 50 62 53 59

- (c) The ages (years) for only the females in the SURVEY DATA, displayed as Data Set A.1 in the appendix, consist of the following observations:

20 35 20 44 40 34 24 44 38 45 56 32 41 59 44

**7-10** For each of the data sets listed, (i) obtain the five-number summary and the interquartile range, (ii) identify all potential outliers, and (iii) construct a modified box plot.

- (a) The yearly incomes (\$1000s) for all individuals in the SURVEY DATA, displayed as Data Set A.1 in the appendix, consist of the following observations:

34 28 71 35 55 75 26 30 27 53 45 34 30 78 68  
29 40 39 60 49 39 33 65 25 61 41 44 45 64 39

- (b) The yearly incomes (\$1000s) for only the males in the SURVEY DATA, displayed as Data Set A.1 in the appendix, consist of the following observations:

34 35 55 75 30 53 78 68 39 60 65 61 45 64 39

**7-10** - *continued*

- (c) The yearly incomes (\$1000s) for only the females in the SURVEY DATA, displayed as Data Set A.1 in the appendix, consist of the following observations:

28 71 26 27 45 34 30 29 40 49 39 33 25 41 44

**7-11** Decide whether or not it would be appropriate to place each of the following pairs of box plots on the same graph, and say why or why not (without actually constructing the box plots):

- (a) the box plot in Exercise 7-9(b) and the box plot of Exercise 7-9(c)
- (b) the box plot in Exercise 7-9(b) and the box plot of Exercise 7-10(b)
- (c) the box plot of weekly TV hours and the box plot of weekly study hours from the STUDENT DATA, displayed as Data Set A.4 in the appendix

**7-12** Decide whether or not it would be appropriate to place each of the following pairs of box plots on the same graph, and say why or why not (without actually constructing the box plots):

- (a) the box plot in Exercise 7-10(b) and the box plot of Exercise 7-10(c)
- (b) the box plot in Exercise 7-9(c) and the box plot of Exercise 7-10(c)
- (c) the box plot of weekly TV hours and the box plot of radio hours from the SURVEY DATA, displayed as Data Set A.1 in the appendix