

2. The following table contains a partial list of countries, the continents on which they are located, and their respective gross domestic products (GDP) in U.S. dollars. A list of 125 countries and their GDPs is contained in the file *GDPlist*.

WEB file
GDPlist

| Country | Continent | GDP (millions of US\$) |
|------------------------|---------------|---------------------------|
| Afghanistan | Asia | 18,181 |
| Albania | Europe | 12,847 |
| Algeria | Africa | 190,709 |
| Angola | Africa | 100,948 |
| Argentina | South America | 447,644 |
| Australia | Oceania | 1,488,221 |
| Austria | Europe | 419,243 |
| Azerbaijan | Europe | 62,321 |
| Bahrain | Asia | 26,108 |
| Bangladesh | Asia | 113,032 |
| Belarus | Europe | 55,483 |
| Belgium | Europe | 513,396 |
| Bolivia | South America | 24,604 |
| Bosnia and Herzegovina | Europe | 17,965 |
| Botswana | Africa | 17,570 |

- Sort the countries in *GDPlist* from largest to smallest GDP. What are the top ten countries according to GDP?
 - Filter the countries to display only the countries located in Africa. What are the top five countries located in Africa according to GDP?
 - What are the top five countries by GDP that are located in Europe?
3. Ohio Logistics manages the logistical activities for firms by matching companies that need products shipped with carriers that can provide the best rates and best service for the companies. Ohio Logistics is very concerned that it uses carriers that get their customers' material delivered on time, so it carefully monitors its carriers' on-time percentage of deliveries. The following table contains a list of the carriers used by Ohio Logistics and the corresponding on-time percentages for the current and previous year.

WEB file
Carriers

| Carrier | Previous Year On-Time Percentage (%) | Current Year On-Time Percentage (%) |
|------------------------|---|--|
| Blue Box Shipping | 88.4 | 94.8 |
| Cheetah LLC | 89.3 | 91.8 |
| Granite State Carriers | 81.8 | 87.6 |
| Honsin Limited | 74.2 | 80.1 |
| Jones Brothers | 68.9 | 82.8 |
| Minuteman Company | 91.0 | 84.2 |
| Rapid Response | 78.8 | 70.9 |
| Smith Logistics | 84.3 | 88.7 |
| Super Freight | 92.1 | 86.8 |

- Sort the carriers in descending order by their current year's on-time percentage. Which carrier is providing the best service in the current year? Which carrier is providing the worst service in the current year?
- Calculate the change in on-time percentage from the previous to the current year for each carrier. Use Excel's conditional formatting to highlight the carriers whose on-time percentage decreased from the previous year to the current year.
- Use Excel's conditional formatting tool to create data bars for the change in on-time percentage from the previous year to the current year for each carrier calculated in part b.
- Which carriers should Ohio Logistics try to use in the future? Why?

4. A partial relative frequency distribution is given.

| Class | Relative Frequency |
|-------|--------------------|
| A | 0.22 |
| B | 0.18 |
| C | 0.40 |
| D | |

- What is the relative frequency of class D?
 - The total sample size is 200. What is the frequency of class D?
 - Show the frequency distribution.
 - Show the percent frequency distribution.
5. In a recent report, the top five syndicated television programs were *The Big Bang Theory* (BBT), *Judge Judy* (JJ), *Wheel of Fortune* (WoF), *Jeopardy* (Jep), and *Two and a Half Men* (THM). The preferred shows for a sample of 50 viewers are shown in the following table:



| | | | | |
|-----|-----|-----|-----|-----|
| WoF | Jep | JJ | Jep | BBT |
| THM | WoF | BBT | BBT | BBT |
| Jep | BBT | WoF | WoF | WoF |
| WoF | THM | BBT | THM | WoF |
| BBT | JJ | JJ | Jep | BBT |
| BBT | BBT | JJ | JJ | Jep |
| JJ | WoF | THM | WoF | WoF |
| THM | BBT | WoF | JJ | JJ |
| Jep | BBT | WoF | Jep | Jep |
| WoF | THM | BBT | BBT | Jep |

- Are these data categorical or quantitative?
 - Provide frequency and percent frequency distributions.
 - On the basis of the sample, which television show has the largest viewing audience? Which one has the second largest?
6. In a study of how chief executive officers (CEOs) spend their days, it was found that CEOs spend an average of about 18 hours per week in meetings, not including conference calls, business meals, and public events. Shown here are the times spent per week in meetings (hours) for a sample of 25 CEOs:



| | | | | |
|----|----|----|----|----|
| 14 | 15 | 18 | 23 | 15 |
| 19 | 20 | 13 | 15 | 23 |
| 23 | 21 | 15 | 20 | 21 |
| 16 | 15 | 18 | 18 | 19 |
| 19 | 22 | 23 | 21 | 12 |

- What is the least amount of time a CEO spent per week on meetings in this sample? The highest?
 - Use a class width of 2 hours to prepare a frequency distribution and a percent frequency distribution for the data.
 - Prepare a histogram and comment on the shape of the distribution.
7. Consumer complaints are frequently reported to the Better Business Bureau. Industries with the most complaints to the Better Business Bureau are often banks, cable and satellite

Case Heavenly Chocolates Web Site Transactions

Heavenly Chocolates manufactures and sells quality chocolate products at its plant and retail store located in Saratoga Springs, New York. Two years ago, the company developed a Web site and began selling its products over the Internet. Web site sales have exceeded the company's expectations, and management is now considering strategies to increase sales even further. To learn more about the Web site customers, a sample of 50 Heavenly Chocolate transactions was selected from the previous month's sales. Data showing the day of the week each transaction was made, the type of browser the customer used, the time spent on the Web site, the number of Web site pages viewed, and the amount spent by each of the 50 customers are contained in the file named *Shoppers*. A portion of the data is shown in the table that follows:

| Customer | Day | Browser | Time (min) | Pages Viewed | Amount Spent (\$) |
|----------|-----|-------------------|------------|--------------|-------------------|
| 1 | Mon | Internet Explorer | 12.0 | 4 | 54.52 |
| 2 | Wed | Other | 19.5 | 6 | 94.90 |
| 3 | Mon | Internet Explorer | 8.5 | 4 | 26.68 |
| 4 | Tue | Firefox | 11.4 | 2 | 44.73 |
| 5 | Wed | Internet Explorer | 11.3 | 4 | 66.27 |
| 6 | Sat | Firefox | 10.5 | 6 | 67.80 |
| 7 | Sun | Internet Explorer | 11.4 | 2 | 36.04 |
| . | . | . | . | . | . |
| . | . | . | . | . | . |
| . | . | . | . | . | . |
| 48 | Fri | Internet Explorer | 9.7 | 5 | 103.15 |
| 49 | Mon | Other | 7.3 | 6 | 52.15 |
| 50 | Fri | Internet Explorer | 13.4 | 3 | 98.75 |



HeavenlyChocolates

Heavenly Chocolates would like to use the sample data to determine whether online shoppers who spend more time and view more pages also spend more money during their visit to the Web site. The company would also like to investigate the effect that the day of the week and the type of browser have on sales.

Managerial Report

Use the methods of descriptive statistics to learn about the customers who visit the Heavenly Chocolates Web site. Include the following in your report.

1. Graphical and numerical summaries for the length of time the shopper spends on the Web site, the number of pages viewed, and the mean amount spent per transaction. Discuss what you learn about Heavenly Chocolates' online shoppers from these numerical summaries.
2. Summarize the frequency, the total dollars spent, and the mean amount spent per transaction for each day of week. What observations can you make about Heavenly Chocolates' business based on the day of the week? Discuss.
3. Summarize the frequency, the total dollars spent, and the mean amount spent per transaction for each type of browser. What observations can you make about Heavenly Chocolate's business based on the type of browser? Discuss.
4. Develop a scatter diagram, and compute the sample correlation coefficient to explore the relationship between the time spent on the Web site and the

dollar amount spent. Use the horizontal axis for the time spent on the Web site. Discuss.

5. Develop a scatter diagram, and compute the sample correlation coefficient to explore the relationship between the number of Web site pages viewed and the amount spent. Use the horizontal axis for the number of Web site pages viewed. Discuss.
6. Develop a scatter diagram, and compute the sample correlation coefficient to explore the relationship between the time spent on the Web site and the number of pages viewed. Use the horizontal axis to represent the number of pages viewed. Discuss.

Appendix Creating Box Plots in XLMiner

XLMiner, an Add-in for Excel developed by Frontline Systems, can be used for basic statistical analysis, data visualization, and data mining. In this chapter appendix, we demonstrate the use of XLMiner in making box plots. There are no easy methods for creating box plots in Excel without an Add-in. XLMiner makes it very easy to create box plots for single- and multiple-variable data sets.

We demonstrate the use of XLMiner to create a box plot with multiple variables using an expanded form of the home sales data illustrated in Figure 2.22. The data used in generating the box plots in this figure are entered into an Excel Worksheet. In addition to data on the location of the home and selling price, the Excel Worksheet contains data on the type of home sold (detached or condo) and on the size of the home in square feet. Rows 1–20 of this Excel Worksheet are shown in Figure 2.27.

WEB file

HomeSalesComparison

FIGURE 2.27 USING XLMINER TO ANALYZE HOME SELLING PRICE COMPARISON DATA

| | A | B | C | D | E | F | G | H | I | J | K | L |
|----|--------------------|-------------------------|-----------|----------|---|---|---|---|---|---|---|---|
| 1 | Selling Price (\$) | Size (ft ²) | Location | Type | | | | | | | | |
| 2 | 302,000 | 2150 | Fairview | Detached | | | | | | | | |
| 3 | 265,000 | 1890 | Fairview | Detached | | | | | | | | |
| 4 | 280,000 | 1540 | Fairview | Detached | | | | | | | | |
| 5 | 220,000 | 1790 | Fairview | Detached | | | | | | | | |
| 6 | 149,000 | 1500 | Fairview | Detached | | | | | | | | |
| 7 | 155,000 | 1450 | Fairview | Detached | | | | | | | | |
| 8 | 198,000 | 1700 | Fairview | Condo | | | | | | | | |
| 9 | 187,000 | 1900 | Fairview | Condo | | | | | | | | |
| 10 | 208,000 | 1800 | Fairview | Detached | | | | | | | | |
| 11 | 174,000 | 1650 | Fairview | Detached | | | | | | | | |
| 12 | 336,000 | 1750 | Shadyside | Condo | | | | | | | | |
| 13 | 398,000 | 1950 | Shadyside | Condo | | | | | | | | |
| 14 | 378,000 | 1780 | Shadyside | Condo | | | | | | | | |
| 15 | 298,000 | 1600 | Shadyside | Detached | | | | | | | | |
| 16 | 425,000 | 2250 | Shadyside | Detached | | | | | | | | |
| 17 | 344,000 | 1780 | Shadyside | Condo | | | | | | | | |
| 18 | 302,000 | 1750 | Shadyside | Condo | | | | | | | | |
| 19 | 300,000 | 1700 | Shadyside | Detached | | | | | | | | |
| 20 | 298,000 | 1540 | Shadyside | Detached | | | | | | | | |

