2.6 Visualizing Two Numerical Variables

Problems for Section 2.6

LEARNING THE BASICS

2.46 The following is a set of data from a sample of $n = 11$ items:

$X$: 7 5 8 3 6 0 2 4 9 5 8
$Y$: 1 5 4 9 8 0 6 2 7 5 4

a. Construct a scatter plot.
b. Is there a relationship between $X$ and $Y$? Explain.

2.47 The following is a series of annual sales (in millions of dollars) over an 11-year period (2000 to 2010):

Year: 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
Sales: 13.0 17.0 19.0 20.0 20.5 20.5 20.0 19.0 17.0 13.0

a. Construct a time-series plot.
b. Does there appear to be any change in annual sales over time? Explain.

APPLYING THE CONCEPTS

2.48 Movie companies need to predict the gross receipts of individual movies once the movie has debuted. The following results, stored in [HarryPotter.xls], are the first weekend gross, the U.S. gross, and the worldwide gross (in millions of dollars) of the six Harry Potter movies that debuted from 2001 to 2009.

<table>
<thead>
<tr>
<th>Title</th>
<th>First Weekend</th>
<th>U.S. Gross</th>
<th>Worldwide Gross</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorcerer's Stone</td>
<td>90,295</td>
<td>317,558</td>
<td>976,458</td>
</tr>
<tr>
<td>Chamber of Secrets</td>
<td>88,357</td>
<td>261,988</td>
<td>878,988</td>
</tr>
<tr>
<td>Prisoner of Azkaban</td>
<td>93,687</td>
<td>249,559</td>
<td>795,539</td>
</tr>
<tr>
<td>Goblet of Fire</td>
<td>102,335</td>
<td>290,013</td>
<td>896,013</td>
</tr>
<tr>
<td>Order of the Phoenix</td>
<td>77,108</td>
<td>292,005</td>
<td>938,469</td>
</tr>
<tr>
<td>Half-Blood Prince</td>
<td>77,836</td>
<td>301,460</td>
<td>934,601</td>
</tr>
</tbody>
</table>


a. Construct a scatter plot with first weekend gross on the $X$ axis and U.S. gross on the $Y$ axis.
b. Construct a scatter plot with first weekend gross on the $X$ axis and worldwide gross on the $Y$ axis.
c. What can you say about the relationship between first weekend gross and U.S. gross and first weekend gross and worldwide gross?

2.49 The file [data.xls] contains data on the calories and total fat (in grams per serving) for a sample of 12 veggie burgers.


a. Construct a scatter plot with calories on the $X$ axis and total fat on the $Y$ axis.
b. What conclusions can you reach about the relationship between the calories and total fat in veggie burgers?

2.50 College basketball is big business, with coaches' salaries, revenues, and expenses in millions of dollars. The file [data.xls] contains the coaches' salary and revenue for college basketball at 60 of the 65 schools that played in the 2009 NCAA men's basketball tournament (data extracted from "Compensation for Division 1 Men's Basketball Coaches," USA Today, April 2, 2010, p. 8C; and C. Isadore, "Nothing but Net: Basketball Dollars by School," money.cnn.com/2010/03/18/news/companies/basketball_profits/).

a. Do you think schools with higher revenues also have higher coaches' salaries?
b. Construct a scatter plot with revenue on the $X$ axis and coaches' salaries on the $Y$ axis.
c. Does the scatter plot confirm or contradict your answer to (a)?

2.51 College football players trying out for the NFL are given the Wonderlic standardized intelligence test. The file [data.xls] contains the average Wonderlic scores of football players trying out for the NFL and the graduation rate for football players at selected schools (data extracted from S. Walker, "The NFL's Smartest Team," The Wall Street Journal, September 30, 2005, pp. W1, W10).

a. Construct a scatter plot with average Wonderlic score on the $X$ axis and graduation rate on the $Y$ axis.
b. What conclusions can you reach about the relationship between the average Wonderlic score and graduation rate?

2.52 How have stocks performed in the past? The following table presents the data stored in [data.xls] that shows the performance of a broad measure of stocks (by