Chapter 8 Section 1

MA1020 Quantitative Literacy

Sidney Butler

Michigan Technological University

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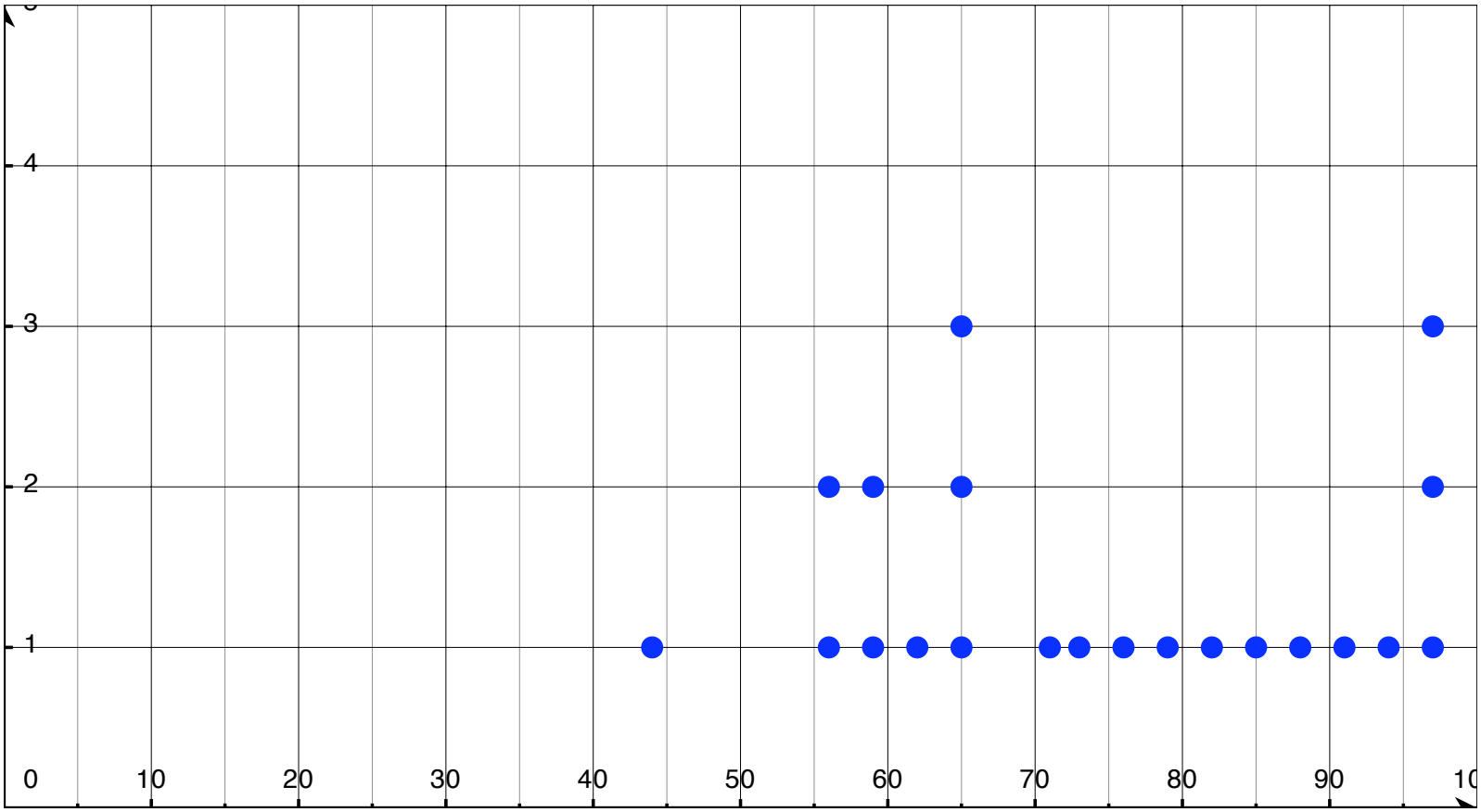
Obtaining Data

- Designed experiment
- Observational study
- Survey
- Population
- Exploratory data analysis

Dot Plots

65, 76, 59, 88, 97, 74, 94, 79, 56, 56, 44, 91, 65, 85, 65, 97, 82, 62, 71, 59, 97



Stem-and-Leaf Plots

65, 76, 59, 88, 97, 74, 94, 79, 56, 56, 44, 91, 65, 85, 65, 97, 82, 62, 71, 59, 97

9	1	4	7	7	7
8	2	5	8		
7	1	4	6	9	
6	2	5	5	5	
5	6	6	9	9	
4	4				

Practice

Consider the following data which gives the number of hours a class of second-graders spent watching television after school.

$$1, 2, 0, 4, \frac{1}{2}, 1, 3, \frac{1}{2}, 1\frac{1}{2}, 2, 6, 1, 1, 2\frac{1}{2}, 1, 2, 1\frac{1}{2}, 2, 2\frac{1}{2}$$

1. Make a dot plot to display the data.
2. What does the horizontal axis represent?
3. What does the vertical axis represent?
4. how many students were in the second-grade class?
5. What was the most frequent number of hours spent watching television?
6. What was the largest amount of tie spent watching television? What was the smallest amount of time spent watching television?

More Practice

In 1798, the English scientist Henry Cavendish measured the density of the Earth in an experiment with a torsion balance. He made 29 repeated measurements with the same instrument and obtained the following data in grams per cubic centimeter.
5.50, 5.61, 4.88, 5.07, 5.26, 5.55, 5.36, 5.29, 5.58, 5.65, 5.57, 5.53, 5.62, 5.29, 5.44, 5.34, 5.79, 5.10, 5.27, 5.39, 5.42, 5.47, 5.63, 5.34, 5.46, 5.30, 5.75, 5.68, 5.85

1. Make a stem-and-leaf plot of Cavendish's experimental data. Show the leaves in terms of hundredths.
2. Most of the data values cluster between what two densities.
3. Describe any gaps in the data. Do there appear to be any outliers? If so, where?

Histograms

- Measurement Classes or Bins
- Frequency Table

65, 76, 59, 88, 97, 74, 94, 79, 56, 56, 44, 91, 65, 85, 65, 97, 82, 62, 71, 59, 97

- Relative Frequency

Practice

Yellowstone National park is home to over 500 geysers. Geysers are hot springs that erupt periodically. Old Faithful is a geyser that erupts more frequently than other geysers. however, it is not the largest or most regular geyser. park rangers keep a log book of geyser activity at the Old Faithful Visitors Center. Consider the following Old Faithful eruption-duration data taken for a 3-day period in August 2003.

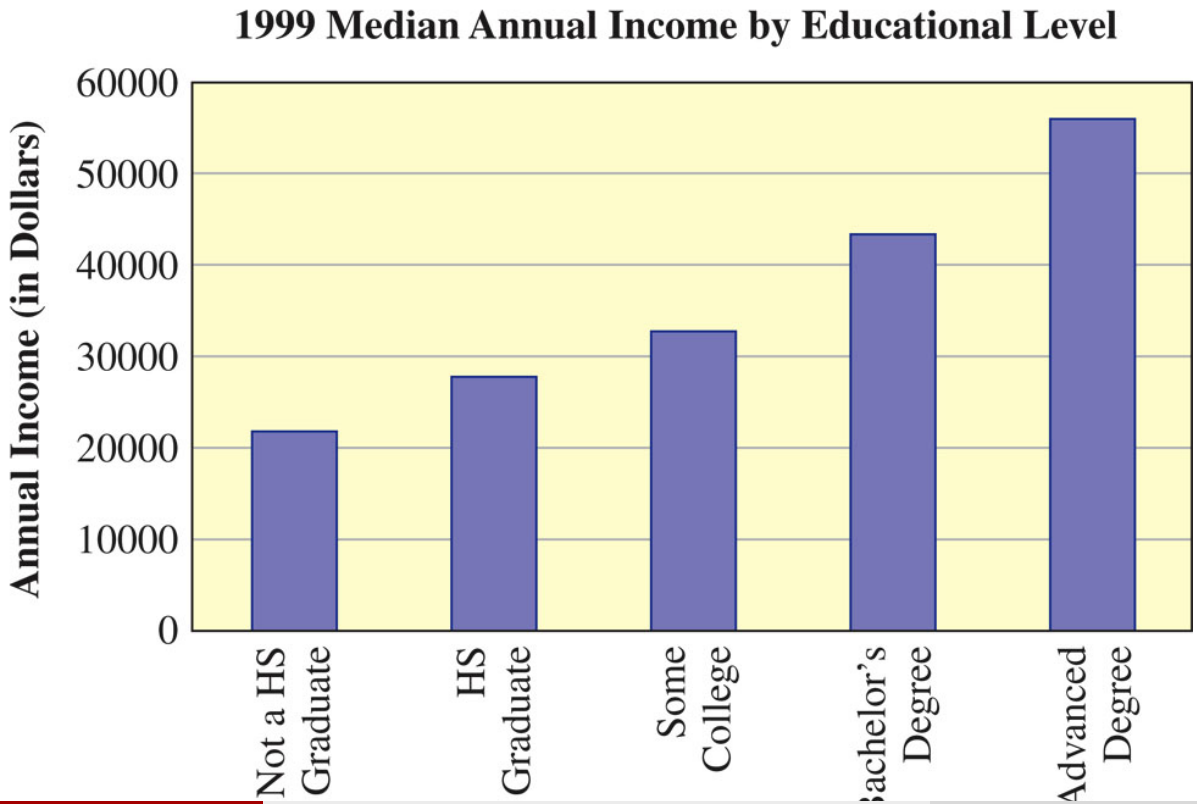
Minutes:Seconds		
4:34	1:56	4:12
4:10	3:53	1:48
1:50	4:23	4:48
4:24	1:51	2:01
4:28	5:00	4:45
2:20	4:08	1:53
4:45	4:06	4:31
2:13	4:30	1:47
4:36	4:22	4:48

Bar Graphs

Definition

A bar graph is any graph in which the height or length of bars is used to represent frequencies or quantities.

- Histograms are a special type



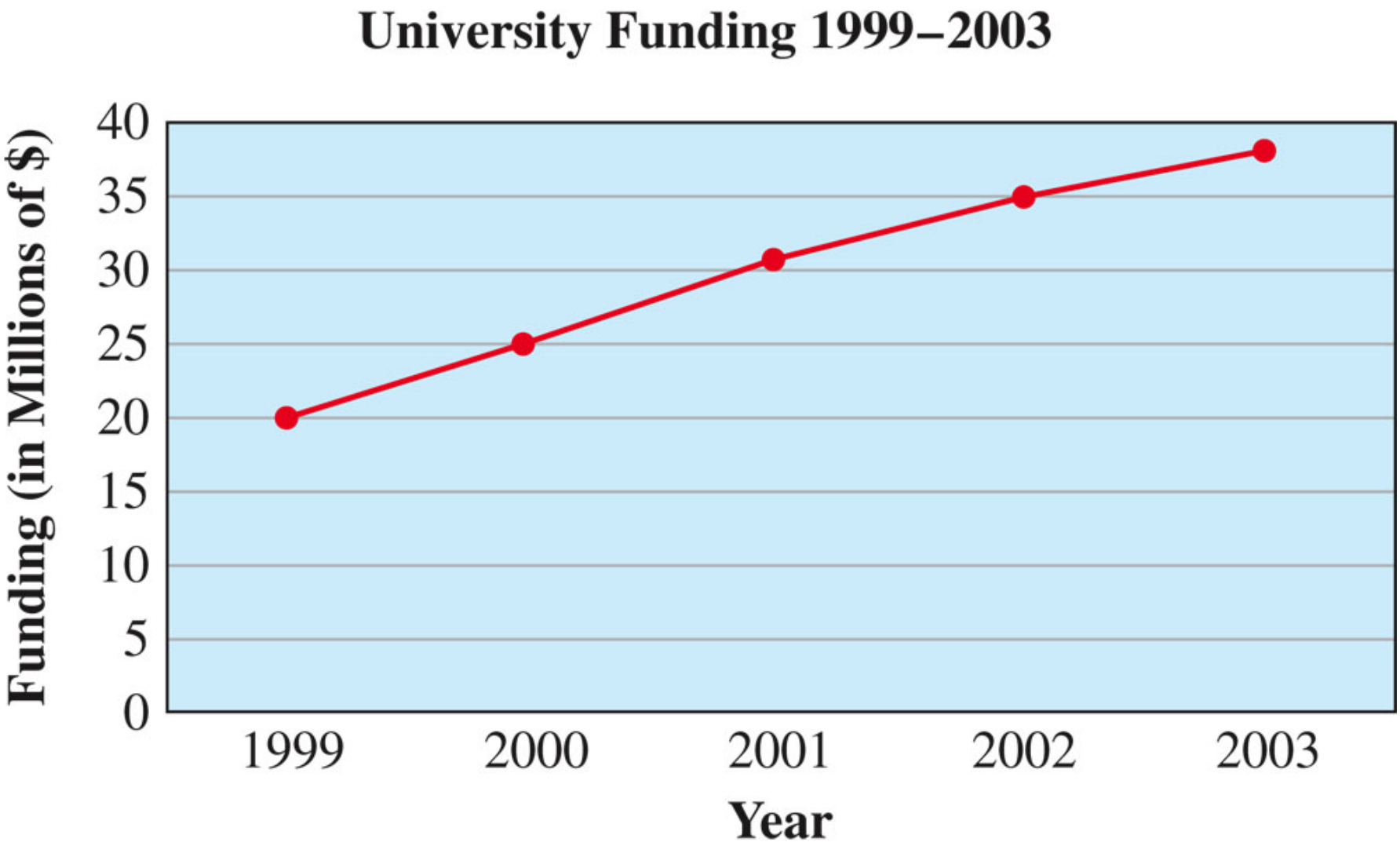
Practice

The Arizona State Legislature established the Homeless Youth Intervenion Program, which began on January 1, 2000. In June 2003, the homeless youth population in Arizona had the following composition. (Source: www.azchildren.org.)

45% Anglo
33% Hispanic
12% African American
4% Native American

Draw a bar graph to represent this information.

Line Graphs



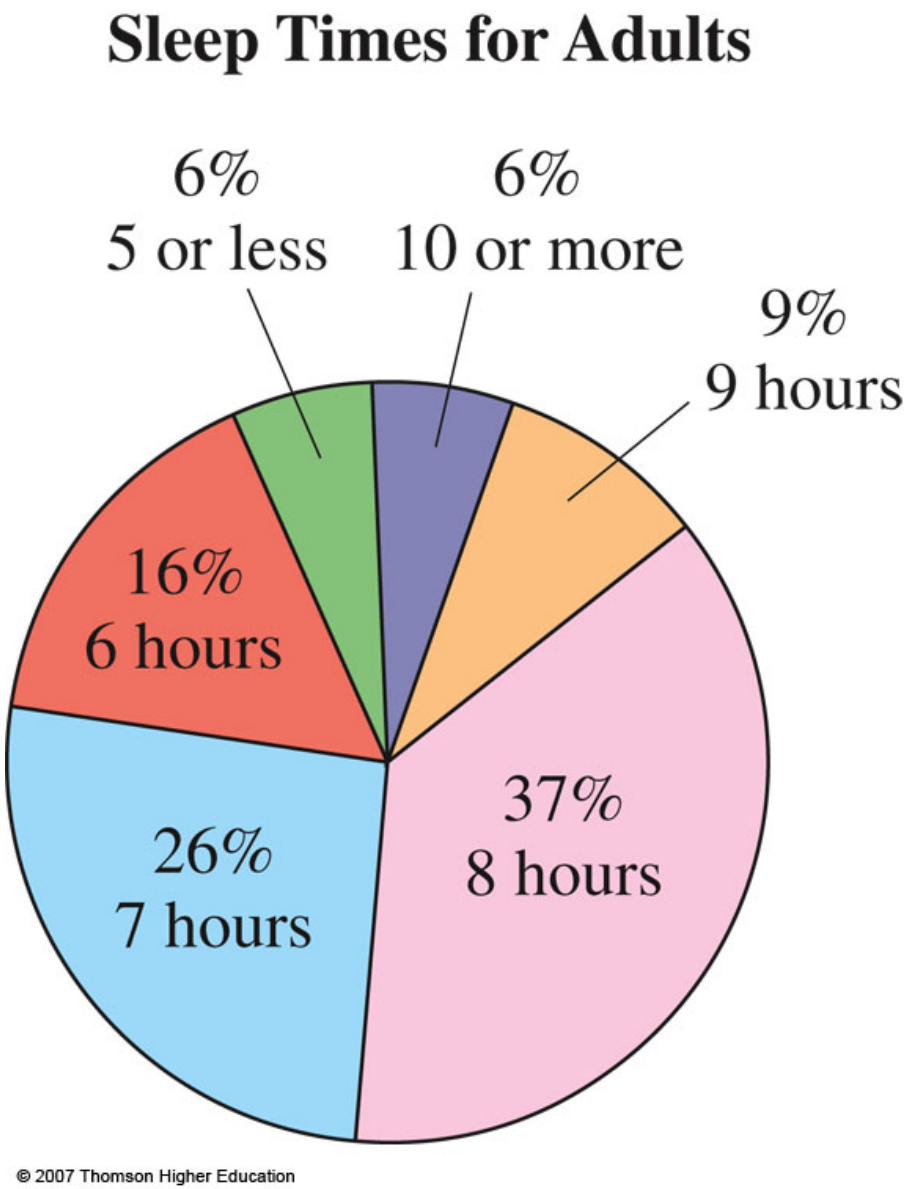
Practice

The per-capital personal income in the US from 1991 to 2001, according to the U.S. Department of Commerce, is given in the following table. (Source: www.bea.doc.gov.)

Year	Per-Capita Personal Income
1991	20,023
1992	20,960
1993	21,539
1994	22,340
1995	23,255
1996	24,270
1997	25,412
1998	26,893
1999	27,880
2000	29,760
2001	30,413

1. Make a line graph to represent these data.
2. Identify the year in which the smallest increase in per-capita income

Pie Charts


Sleep Times for Adults
6%
5 or less
6%
10 or more
9%
9 hours
16%
6 hours
37%
8 hours
26%
7 hours
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Practice

The following table shows the main causes of death for people aged 25 to 40 in the US in 2001.

Causes	# of Deaths
Unintentional injuries	27,784
Malignant neoplasms	20,563
Diseases of the heart	16,486
Suicide	11,705
Homicide	9472
HIV	7968
Liver diseases	3723
Diabetese mellitus	2553
Influenza and pneumonia	1322
Other	31,781

Choosing an Appropriate Graph

Table 8.7

Type of Chart/Graph	Use
Stem-and-leaf plot	Displays numerical data grouped into categories (all the data can be recovered from the plot)
Histogram	Displays data grouped into measurement classes
Bar chart	Displays data grouped by category, can be used to show trends
Line graph	Displays trends and variation
Pie chart	Displays and compares percentages of a whole