Chapter 2

2.1 Nominal: Occupation, undergraduate major. Ordinal: Rating of university professor, Taste test ratings. Interval: age, income

2.2 a Interval
b Interval
c Nominal
d Ordinal

2.3 a Interval
b Nominal
c Ordinal
d Interval
e Interval

2.4 a Nominal
b Interval
c Nominal
d Interval
e Ordinal

2.5 a Interval
b Interval
c Nominal
d Interval
e Nominal

2.6 a Interval
b Interval
c Nominal
d Ordinal
e Interval

2.7 a Interval
b Nominal
c Nominal
d Interval
e Interval
f Ordinal

2.8 a Interval
b Ordinal
c Nominal
d Ordinal

2.9 a Interval
b Nominal
c Nominal

2.10 a Ordinal
b Ordinal
c Ordinal

2.11
2.18

2.19

Residential
Non-Residential

Recycled Glass, 1%
Recycled Paper, 11%
Recycled Metal, 3%
Recycled Organic, 1%
Recycled Construction/Demolition, 1%
Recycled Other, 1%

Disposed Plastic, 10%
Disposed Organic, 18%
Disposed Metal, 8%
Disposed Paper, 31%
Disposed Glass, 3%
Disposed Other, 6%
Disposed Construction/Demolition, 7%

2.20 a.
c. The bar chart provides the frequencies and the pie chart displays the relative frequencies.
Males

Females

© 2016 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website for classroom use.
2.24

- Buy something: 40%
- Pay down debt: 27%
- Invest: 19%
- Pay medical bills: 6%
- Save: 5%
- Other: 3%

2.25

- Groceries: 23%
- Gas: 19%
- Furniture: 3%
- Electronics: 8%
- Clothing: 3%
- Spas/salon time: 3%
- Home improvement: 13%
- Automobiles: 3%
- Appliances: 3%
- Impulse: 4%
- Down payment house: 2%
- Vacation: 11%

© 2016 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website for classroom use.
2.26

Location 39%
Majors 22%
Academic reputation 10%
Career focus 16%
Community 5%
Number of students 8%

2.27

Consumer guide 52%
Dealership 28%
Word of mouth 12%
Internet 8%

© 2016 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website for classroom use.
2.28

<table>
<thead>
<tr>
<th>Room</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement</td>
<td>32%</td>
</tr>
<tr>
<td>Kitchen</td>
<td>27%</td>
</tr>
<tr>
<td>Bedroom</td>
<td>9%</td>
</tr>
<tr>
<td>Bathroom</td>
<td>23%</td>
</tr>
<tr>
<td>Living/dining room</td>
<td>9%</td>
</tr>
</tbody>
</table>

2.29

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Frequency</th>
<th>Relative Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily News</td>
<td>141</td>
<td>.39</td>
</tr>
<tr>
<td>Post</td>
<td>128</td>
<td>.36</td>
</tr>
<tr>
<td>Times</td>
<td>32</td>
<td>.09</td>
</tr>
<tr>
<td>WSJ</td>
<td>59</td>
<td>.16</td>
</tr>
</tbody>
</table>

b

The Daily News and the Post dominate the market.
2.30a  

<table>
<thead>
<tr>
<th>Degree</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA</td>
<td>88</td>
</tr>
<tr>
<td>BBA</td>
<td>37</td>
</tr>
<tr>
<td>B Eng</td>
<td>51</td>
</tr>
<tr>
<td>B Sc</td>
<td>24</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
</tr>
</tbody>
</table>

b. About 4 applicants in 10 have the BA degree, about one-fifth have a BEng, and one-sixth have a BBA.
c Dell is most popular with 40% proportion, followed by other, 26%, IBM, 21% and Compaq, 13%.

<table>
<thead>
<tr>
<th>Software</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excel</td>
<td>34</td>
</tr>
<tr>
<td>Minitab</td>
<td>17</td>
</tr>
<tr>
<td>SAS</td>
<td>3</td>
</tr>
<tr>
<td>SPSS</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
</tr>
</tbody>
</table>
c Excel is the choice of about half the sample, one-quarter have opted for Minitab, and a small fraction chose SAS and SPSS.
Three out of four Americans are White. Note that the survey did not separate Hispanics.

Half of American adults finished high school only. More than one-third received some kind of post-secondary education.
Almost half the sample is married and about one out of four were never married.

Nine of out of 10 Americans classify themselves as middle or working class.
2.38

Three out of four Americans are White.

2.39

Half of American adults finished high school only. More than one-third received some kind of post-secondary education.
The “Less than high school” category has remained constant, while the number of college graduates has increased.

The state and local consumption has increased rapidly compared to the other categories.
2.42 Australian Energy Sources

The dominant source in Australia is coal. In New Zealand it is oil.

New Zealand Energy Sources

The dominant source in New Zealand is oil.
Street crime has decreased while all the other categories have remained constant.

Universities 1 and 2 are similar and quite dissimilar from universities 3 and 4, which also differ. The two nominal variables appear to be related.
### 2.45

<table>
<thead>
<tr>
<th>Count of Owner</th>
<th>Exxon</th>
<th>Amoco</th>
<th>Texaco</th>
<th>Other</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exxon</td>
<td>39</td>
<td>36</td>
<td>51</td>
<td>23</td>
<td>149</td>
</tr>
<tr>
<td>Amoco</td>
<td>36</td>
<td>32</td>
<td>46</td>
<td>20</td>
<td>134</td>
</tr>
<tr>
<td>Texaco</td>
<td>54</td>
<td>46</td>
<td>65</td>
<td>29</td>
<td>194</td>
</tr>
<tr>
<td>Other</td>
<td>24</td>
<td>20</td>
<td>28</td>
<td>10</td>
<td>82</td>
</tr>
<tr>
<td>Grand Total</td>
<td>153</td>
<td>134</td>
<td>190</td>
<td>82</td>
<td>559</td>
</tr>
</tbody>
</table>

The column proportions are similar; the two nominal variables appear to be unrelated. There does not appear to be any brand loyalty.

### 2.46

<table>
<thead>
<tr>
<th>Count of Respondent</th>
<th>Smoke?</th>
<th>Do not smoke</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neither</td>
<td>73</td>
<td>14</td>
<td>87</td>
</tr>
<tr>
<td>Father</td>
<td>26</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Mother</td>
<td>31</td>
<td>18</td>
<td>49</td>
</tr>
<tr>
<td>Both</td>
<td>10</td>
<td>41</td>
<td>51</td>
</tr>
<tr>
<td>Grand Total</td>
<td>140</td>
<td>85</td>
<td>225</td>
</tr>
</tbody>
</table>

The two variables are related.
There are large differences between men and women in terms of the reason for unemployment.

The number of prescriptions filled by all stores except independent drug stores has increased.
There appears to be differences between female and male students in their choice of light beer.

More than 40% rate the food as less than good.
2.51

- Computer: 44%
- Computer and Manual: 38%
- Manual: 18%

2.52 Canada

- Google: 62%
- Microsoft: 12%
- Yahoo: 15%
- Other: 11%
There are considerable differences between the two countries.

2.53

More students disagree than agree.
Customers with children rated the restaurant more highly than did customers with no children.

There is a great deal of variation between countries. Moreover some countries tax manufacturers more and some countries tax services more. The United States has the highest corporate tax rates.
The United States owes a lot of money to many lenders.
Males and females differ in their areas of employment. Females tend to choose accounting marketing/sales and males opt for finance.

Area and job satisfaction are related. Graduates who work in finance and general management appear to be more satisfied than those in accounting, marketing/sales, and others.