adequately displays the data. Figure 6-5(c) illustrates a stem-and-leaf display with each stem divided into five parts. There are too many stems in this plot, resulting in a display that does not tell us much about the shape of the data.

Figure 6-6 shows a stem-and-leaf display of the compressive strength data in Table 6-2 produced by Minitab. The software uses the same stems as in Fig. 6-4. Note also that the computer orders the leaves from smallest to largest on each stem. This form of the plot is usually called an *ordered stem-and-leaf diagram*. This is not usually done when the plot is constructed manually because it can be time consuming. The computer adds a column to the left of the stems that provides a count of the observations at and above each stem in the upper half of the display and a count of the observations at and below each stem in the lower half of the display. At the middle stem of 16, the column indicates the number of observations at this stem.

The ordered stem-and-leaf display makes it relatively easy to find data features such as percentiles, quartiles, and the median. The sample **median** is a measure of central tendency that divides the data into two equal parts, half below the median and half above. If the number of observations is even, the median is halfway between the two central values. From Fig. 6-6 we find the 40th and 41st values of strength as 160 and 163, so the median is \((160 + 163)/2 = 161.5\). If the number of observations is odd, the median is the central value. The sample **mode** is the most frequently occurring data value. Figure 6-6 indicates that the mode is 158; this value occurs four times, and no other value occurs as frequently in the sample.

We can also divide data into more than two parts. When an ordered set of data is divided into four equal parts, the division points are called **quartiles**. The **first** or **lower quartile**, \(q_1\), is a value that has approximately 25% of the observations below it and approximately 75% of the observations above. The **second quartile**, \(q_2\), has approximately 50% of the observations below its value. The second quartile is exactly equal to the median. The **third** or **upper quartile**, \(q_3\), has approximately 75% of the observations below its value. As in the case of the median, the quartiles may not be unique. The compressive strength data in Fig. 6-6 contains \(n = 80\) observations. Minitab software calculates the first and third quartiles as the \((n + 1)/4\)