

EXAMPLE 3.6

STARTING SALARIES

Comparing the Mean and the Median

Understand the problem.

A college administrator wonders about the numbers reported by the placement office on graduates' salaries. She thinks that the mean seems inflated and wonders whether it gives an accurate picture of what is really happening. She decides to collect some data on the salaries earned by students who graduate from the School of Business and to calculate both the mean and the median. The college takes a random sample of 100 graduates from the past year and obtains these data:

\$25,000	\$25,400	\$25,600	\$25,800	\$25,900	\$26,200	\$26,400	\$26,600	\$27,000	\$28,000
25,100	25,400	25,600	25,800	25,900	26,200	26,400	26,600	27,100	28,200
25,100	25,400	25,600	25,800	26,000	26,200	26,400	26,600	27,100	28,300
25,200	25,500	25,700	25,800	26,000	26,200	26,400	26,600	27,100	28,300
25,200	25,500	25,700	25,800	26,000	26,200	26,400	26,600	27,200	28,400
25,200	25,500	25,700	25,800	26,100	26,200	26,400	26,700	27,300	28,500
25,200	25,500	25,700	25,900	26,100	26,200	26,500	26,700	27,400	28,600
25,300	25,600	25,700	25,900	26,100	26,300	26,500	26,800	27,600	29,400
25,300	25,600	25,700	25,900	26,100	26,300	26,500	26,900	27,700	30,700
25,300	25,600	25,800	25,900	26,100	26,300	26,500	26,900	27,700	30,800

The mean of the salaries is

$$\bar{X} = \frac{2,638,500}{100} = \$26,385$$

The median is the average of the 50th and 51st observations in the data set:

$$\text{Median} = \frac{26,100 + 26,200}{2} = \$26,150$$

In this case, the actual difference between the mean and the median is

$$\$26,385 - \$26,150 = \$235$$

Clearly the mean is larger than the median, but are they different enough to indicate that the data are skewed? If we apply the 10% rule, we find

$$10\% \text{ of } \$26,385 = \$2638.50$$

The actual difference of \$235 is much less than \$2638.50, so if we use the 10% rule, the salaries do not appear to be skewed.

The college administrator decides to use a histogram from a statistical software package to decide whether the conclusion of no skew is consistent with what she sees. From the histogram, we see that, in fact, the data are skewed right. This is not what the administrator expected.

Analyze the data.

Remember! No one statistical tool will provide all of the information in a sample.

