

5. \bar{x} = \$159.8 million; median = \$95.0 million; mode: none; midrange = \$199.5 million. Apart from the obvious and trivial fact that the mean annual earnings of all celebrities is less than \$332 million, nothing meaningful can be known about the mean of the population.
7. \bar{x} = 430.1 hic; median = 393.0 hic; mode: none; midrange = 435.0 hic. The safest of these cars appears to be the Hyundai Elantra. Because the measurements appear to vary substantially from a low of 326 hic to a high of 544 hic, it appears that some small cars are considerably safer than others.
9. \bar{x} = \$16.4 million; median = \$10.0 million; mode: \$4 million, \$9 million, and \$10 million; midrange = \$31 million. The measures of center do not reveal anything about the pattern of the data over time, and that pattern is a key component of a movie's success. The first amount is highest for the opening day when many Harry Potter fans are most eager to see the movie; the third and fourth values are from the first Friday and the first Saturday, which are the popular weekend days when movie attendance tends to spike.
11. \bar{x} = \$59.217; median = \$57.835; mode: none; midrange = \$60.345. None of the measures of center are most important here. The most relevant statistic in this case is the minimum value of \$48.92, because that is the lowest price for the software. Here, we generally care about the lowest price, not the mean price or median price.
13. \bar{x} = 11.05 $\mu\text{g/g}$; median = 9.50 $\mu\text{g/g}$; mode: 20.5 $\mu\text{g/g}$; midrange = 11.75 $\mu\text{g/g}$. There is not enough information given here to assess the true danger of these drugs, but ingestion of any lead is generally detrimental to good health. All of the decimal values are either 0 or 5, so it appears that the lead concentrations were rounded to the nearest one-half unit of measurement ($\mu\text{g/g}$).
15. \bar{x} = 6.5 years; median = 4.5 years; mode: 4 and 4.5; midrange = 9.5 years. It is common to earn a bachelor's degree in four years, but the typical college student requires more than four years.
17. \bar{x} = -14.3 min; median = -16.5 min; mode: -32 min; midrange = -10.5 min. Because the measures of center are all negative values, it appears that the flights tend to arrive early *before* the scheduled arrival times, so the on-time performance appears to be very good.
19. \bar{x} = 50.4; median = 73.0; mode: none; midrange = 48.5. The numbers do not measure or count anything; they are simply replacements for names. The data are at the nominal level of measurement, and it makes no sense to compute the measures of center for these data.
21. White drivers: \bar{x} = 73.0 mi/h; median = 73.0 mi/h. African American drivers: \bar{x} = 74.0 mi/h; median = 74.0 mi/h. Although the African American drivers have a mean speed greater than the white drivers, the difference is very small, so it appears that drivers of both races appear to speed about the same amount.
23. Obama: \bar{x} = \$653.9; median = \$452.0. McCain: \bar{x} = \$458.5; median = \$350.0. The contributions appear to favor Obama because his mean and median are substantially higher. With 66 contributions to Obama and 20 contributions to McCain, Obama collected substantially more in total contributions.

25. \bar{x} = 1.184; median = 1.235. Yes, it is an outlier because it is a value that is very far away from all of the other sample values.
27. \bar{x} = 15.0 years; median = 16.0 years. Presidents receive Secret Service protection after they leave office, so the mean is helpful in planning for the cost and resources used for that protection.
29. \bar{x} = 35.8 years. This result is quite close to the mean of 35.9 years found by using the original list of data values.
31. \bar{x} = 84.7. This result is close to the mean of 84.4 found by using the original list of data values.
33. a. 0.6 parts per million b. $n - 1$
35. \bar{x} = 39.070; 10% trimmed mean: 27.677; 20% trimmed mean: 27.176. By deleting the outlier of 472.4, the trimmed means are substantially different from the untrimmed mean.
37. Geometric mean: 1.036711036, or 1.0367 when rounded. Single percentage growth rate: 3.67%. The result is not exactly the same as the mean, which is 3.68%.
39. 34.0 years (rounded from 33.970588 years); the value of 33.0 years is better because it is based on the original data and does not involve interpolation.

Section 3-3

1. The IQ scores of a class of statistics students should have less variation, because those students are a much more homogeneous group with IQ scores that are likely to be closer together.
3. Variation is a general descriptive term that refers to the amount of dispersion or spread among the data values, but the variance refers specifically to the square of the standard deviation.
5. Range = \$265.0 million; s^2 = 10,548.0 (the units are the square of "million dollars"); s = \$102.7 million. Because the data values are the 10 highest from the population, nothing meaningful can be known about the standard deviation of the population.
7. Range = 218.0 hic; s^2 = 7879.8 hic²; s = 88.8 hic. Although all of the cars are small, the range from 326 hic to 544 hic appears to be relatively large, so the head injury measurements are not about the same.
9. Range = \$54.0 million; s^2 = 210.9 (the units are the square of "million dollars"); s = \$14.5 million. An investor would care about the gross from opening day and the rate of decline after that, but the measures of center and variation are less important.
11. Range = \$22.850; s^2 = 99.141 dollars squared; s = \$9.957. The measures of variation are not very helpful in trying to find the best deal.
13. Range = 17.50 $\mu\text{g/g}$; s^2 = 41.75 ($\mu\text{g/g}$)²; s = 6.46 $\mu\text{g/g}$. If the medicines contained no lead, all of the measures would be 0 $\mu\text{g/g}$, and the measures of variation would all be 0 as well.
15. Range = 11.0 years; s^2 = 12.3 year²; s = 3.5 years. No, because 12 years is within 2 standard deviations of the mean.
17. Range = 43.0 min; s^2 = 231.4 min²; s = 15.2 min. The standard deviation can never be negative.
19. Range = 79.0; s^2 = 1017.7; s = 31.9. The data are at the nominal level of measurement and it makes no sense to compute the measures of variation for these data.
21. White drivers: 4.0%. African American drivers: 3.7%. The variation is about the same.