

In Exercises 5–20, find the range, variance, and standard deviation for the given sample data. Include appropriate units (such as “minutes”) in your results. (The same data were used in Section 3-2 where we found measures of center. Here we find measures of variation.) Then answer the given questions.

5. Top 10 Celebrity Incomes Listed below are the earnings (in millions of dollars) of the celebrities with the 10 highest incomes in a recent year. The celebrities in order are Steven Spielberg, Howard Stern, George Lucas, Oprah Winfrey, Jerry Seinfeld, Tiger Woods, Dan Brown, Jerry Bruckheimer, J. K. Rowling, and Tom Cruise. Can this “Top 10” list be used to learn anything about the standard deviation of the annual earnings of all celebrities?

332 302 235 225 100 90 88 84 75 67

6. Top 10 Most Expensive Colleges Listed below are the annual tuition amounts of the 10 most expensive colleges in the United States for a recent year. The colleges listed in order are Sarah Lawrence, NYU, George Washington, Bates, Skidmore, Johns Hopkins, Georgetown, Connecticut College, Harvey Mudd, and Vassar. Can this “Top 10” list tell us anything about the standard deviation of the population of all U.S. college tuitions?

\$54,410 \$51,991 \$51,730 \$51,300 \$51,196
\$51,190 \$51,122 \$51,115 \$51,037 \$50,875

7. Car Crash Test Measurements Listed below are head injury measurements from small cars that were tested in crashes. The measurements are in “hic,” which is a measurement of a standard “head injury criterion.” The data are from Data Set 13 in Appendix B, which is based on data from the National Highway Traffic Safety Administration. The listed values correspond to these cars: Chevrolet Aveo, Honda Civic, Volvo S40, VW Jetta, Hyundai Elantra, Kia Rio, and Kia Spectra. Given that all of the cars are small, does it appear that the head injury measurements are about the same for all small cars?

371 356 393 544 326 520 501

8. Tests of Child Booster Seats The National Highway Traffic Safety Administration conducted crash tests of child booster seats for cars. Listed below are results from those tests, with the measurements given in “hic,” which is a measurement of a standard “head injury criterion.” According to the safety requirement, the hic measurement should be less than 1000 hic. Do the different child booster seats have much variation among their crash test measurements?

774 649 1210 546 431 612

9. Harry Potter Listed below are the gross amounts (in millions of dollars) earned in box office receipts for the movie *Harry Potter and the Half-Blood Prince*. The movie opened on a Wednesday, and the amounts are listed in order for the first 14 days of the movie’s release. If you invested in this movie, what characteristic of the data set would you care about most, and is it a measure of center or variation?

58 22 27 29 21 10 10 8 7 9 11 9 4 4

10. Florida Manatee Deaths Listed below are the numbers of manatee deaths caused each year by collisions with watercraft. Manatees, also called “sea cows,” are large mammals that live underwater, often in or near waterways. The data are listed in order for each year of the past decade. The data are from the Florida Fish and Wildlife Conservation Commission. What important feature of the data is not revealed through the different measures of variation?

78 81 95 73 69 79 92 73 90 97

11. Ghost Prices Listed below are the prices listed for Norton Ghost 14.0 software from these vendors: Newegg, Dell, Buycheapsoftware.com, PC Connection, Walmart, and Overstock.com. When trying to find the best deal, how helpful are the measures of variation?

\$55.99 \$69.99 \$48.95 \$48.92 \$71.77 \$59.68