

Exercises

1. **Lohr Chapter 2, Exercise 33** Have students use amazon.com to conduct the following exercise. This can be done in groups or individually. This will also require students to self-teach confidence intervals for SRS (Lohr section 2.5)
 - a. In the books search window, type in a genre you like, such as mystery or sports; you may want to narrow your search by selecting a subcategory since an upper bound is placed on the number of books that can be displayed. Choose a genre with at least 20 pages of listings. The list of books forms your population.
 - b. What is your target population? What is the population size, N ?
 - c. Take an SRS of 50 books from your population. Describe how you selected the SRS, and record the amount of time you spent taking the sample and collecting the data.
 - d. Record the following information for each book in your SRS: price, number of pages, and whether the book is paperback or hardback.
 - e. Give a point estimate and a 95% CI for the mean price of books in the genre you selected.
 - f. Give a point estimate and a 95% CI for the mean number of pages for books in the genre you selected.
 - g. Interpret your confidence intervals.
2. **Lohr Chapter 3, Exercise 36** This is a continuation/extension of the previous SRS exercise. Instruct students to use the same book genre for this problem.
 - a. Stratify the population into two categories: hardcover and paperback. You can obtain the population counts in the paperback category by refining your search to include the word paperback.
 - b. Take a stratified random sample of 40 books from your population using proportional allocation. Record the price and number of pages for each book.
 - c. Give a point estimate and a 95% CI for the mean price of books and the mean number of pages for books in the population.
 - d. Compare your CI's to those from the previous exercise where you used an SRS. Does stratification appear to increase the precision of your estimate?
 - e. **BONUS:** Use your SRS from Chapter 2 to estimate the within-stratum variance of book price for each stratum. In this case, you are using the SRS as a pilot sample to help design a subsequent sample. Find the optimal allocation for a stratified random sample of 40 books. How does the optimal allocation differ from the proportional allocation?