

The book has three types of problems in each chapter:

- conceptual exercises: These have short answers to test your understanding. Answers are at the very end of the chapter. Each week, I'll indicate the most relevant conceptual questions. Don't turn in answers to any of these questions. These are for **your benefit**. Check your answer with the book's. If you miss one of them, I suggest you go back and re-read the relevant section of the text. If you don't understand the answer, ask.
- computational exercises: These require you to work with numbers and do what is specified.
- data problems: These, as written in the book, are open ended analysis questions. I will assign a few of these as open ended questions. For others, I will use the context of the question and write my own "do this, then this" questions.

You are to turn answers to the assigned computational/data questions.

Submit your answers using Gradescope. Instructions will be provided. The first part of lab next week (Sept 4) will demonstrate the use of Gradescope. That's why this HW is due on Thursday. Subsequent HW will be due on Tuesdays.

Notes:

1. Some HW problems will come from the text. The numbers are those in the 3rd edition.
2. Many questions ask you to "Briefly explain". One or two phrases or sentences should be more than adequate.
3. If we don't cover the relevant material in lecture by Friday, I'll remove the question from the assignment.

Conceptual questions (for your benefit only, do not turn in) Chapter 1: **1-12**

Computational/Data problems. These are to be handed in.

1. A study collected information on children at a middle school in the investigator's neighborhood. This question concerns two variables: the child's cholesterol level and the number of hours per day they spent on social media. Children who spent more than four hours on social media each day were found to have higher cholesterol levels, on average, than children who spent less.
 - (a) 1 pt. Are units selected at random or not?
 - (b) 1 pt. Are units assigned to groups at random or not?
 - (c) 2 pts. Display 1.5 in the book classifies studies into 4 types. The lecture notes have these names: Survey, observational, experimental (rare) and experimental. What type of study is this? Briefly explain your choice.
 - (d) 2 pts. A newspaper report on this study has the headline: "Television watching bad for your child's health". Is this headline an appropriate summary of the study? Briefly explain why or why not.

- (e) 2 pts. A second newspaper's report on this study has the headline: "Kids who watch more television have higher cholesterol". Is this headline an appropriate summary of the study? Briefly explain why or why not.

A second study was very careful to randomly sample 1000 children from a list of all students attending middle schools in a large city.

- (f) 1 pt. Which of the 4 types of studies is the second study? Briefly explain your choice.
- (g) 1 pt. Is the headline in 1d an appropriate summary of the second study? Briefly explain why or why not
- (h) 1 pt Is the headline in 1e an appropriate summary of the second study? Briefly explain why or why not.
- (i) 1 pt Identify the population used in the second study.
- (j) 1 pt Identify the sample used in the second study.
2. You are studying hospital utilization (number of days spent in the hospital) by the elderly in a particular small Iowa town. You have a list of all elderly residents that town. You randomly select eleven elderly residents from this list and record the number of days in 2023 they were inpatient at the local hospital. The data are: 12, 3, 0, 0, 0, 4, 6, 7, 34, 14, 10. They are in hospital.csv on the class web site.
- (a) 1 pt. Calculate and report the mean of these data.
- (b) 1 pt. Calculate and report the median of these data
- (c) 1 pt. Calculate and report the standard deviation of these data.

Notes: You can calculate the mean, median, and sd by hand or use the computer.

For the next two parts, assume that patterns of hospitalization in 2025 will be the same as those in 2023. Also ignore the potential increase in hospitalization with age.

- (d) 2 pts. Imagine that your mother is an elderly resident of this small town. She hears about your work and asks you "how many days am I likely to be in hospitalized in 2025?". What number would you tell her? Briefly explain your choice.
- (e) 2 pts. Imagine that the administrator of the only hospital in town asks you "Can you estimate the total number of person-days that the elderly of this town will be in the hospital in 2025?". There are predicted to be 605 elderly residents of the town in 2025. What number would you tell her? Briefly explain your choice.
- Note: If you aren't familiar with the concept of person-days, 1 person staying 5 days is 5 person-days. 5 people staying 1 day each is also 5 person-days. One staying 2 days and a second staying 3 days is also 5 person-days. The average of 2 and 3 is 2.5. The last number can be calculated as 2 people each staying the average of 2.5 days.