

- **Problem1: Chapter 1, Exercise 2 (page 13)**

There are different possible answers, but one of them is:

Qualitative data: rating the quality of batches of ice cream as either poor, fair, good, or exceptional.

Quantitative data: measuring the time (in hours) it takes for each of 1000 integrated circuit chips to fail in a high-stress environment.

- **Problem2: Chapter 1, Exercise 3 (page 13)**

Any relationship between the variables x and y can only be derived from a bivariate sample.

- **Problem3: Chapter 1, Exercise 8 (page 24)**

(a) Rockwell hardness: multivariate (bivariate), repeated measures (paired), quantitative data. Flatness: univariate, qualitative data.

(b)

- **Problem4: Chapter 2, Section 2, Exercise 3 (page 37)**

- **Problem5: Hockey game attendance.**

Caroline performs the following study to see if outside temperature has an effect on attendance at her college's hockey games. For each hockey game at her college, Caroline records the outside temperature and the attendance. Here are her results:

Day of Week		Temperature, deg. F	Attendance
Friday	12/14	35	840
Wednesday	12/19	20	560
Tuesday	1/ 8	-5	340
Friday	1/11	23	775
Wednesday	1/23	14	680
Saturday	2/ 2	30	950
Friday	2/ 8	28	950

1. Is this an experiment or observational study?
2. What type of variable is attendance?

Caroline analyzes her results and finds that outside temperature and attendance have a strong positive correlation (i.e., as one increases, the other also increases). She concludes that higher game day temperatures causes higher attendance at their college's hockey games.

1. Did she come to a proper conclusion for this study? Why or why not?
2. Look at the day of the week of the hockey games. What type of variable is this?
3. Rewrite the data table, adding a new column "School Night" (using the values "no" if the game is on a Friday or Saturday, and "yes" if the game is on any other day). How does Attendance relate to School Night?

- **Problem6: Washer stretching.**

George works for a company that manufactures rubber washers. He randomly selects 1000 washers off the assembly line throughout two weeks for a study on the durability of these washers under stretching. To make sure that the washers are fit to be used in the real world, George must test the washers. Holding heat constant, George subjects each washer to one of various methods of stretching. The washers are randomly assigned to be stretched under one of five different forces (low, medium-low, medium, medium-high, and high). After each test, George classifies a washer as either defective or non-defective.

1. Is this an experiment or observational study?
2. What type of variable is heat?
3. What type of variable is the amount of stretching?
4. What type of variable is response to the stretching method?
5. The 100 selected washers constitutes the sample. What is the population?
6. George analyzes the results and finds that the defect rate increases with the amount of stretching. Can George conclude that the amount of stretching causes a change in the defect rate of the washers? Why or why not?