# Exercises - Graphical Representations and Measures of Location and Variability
### Sara Geremia

# Chapter 2 Exercises: Graphical Representations

## 2.52

A sample of 20 financial analysts was asked to predict the earnings per share of a certain company (dollars per share) for the next year. The results are collected in the following table:

| Prediction | (9.95, 10.45] | (10.45, 10.95] | (10.95, 11.45] | (11.45, 11.95] | (11.95, 12.45] |
|---|---|---|---|---|---|
| Number of analysts | 2 | 8 | 6 | 3 | 1 |

(a) Draw the histogram.

(b) Find the relative frequencies.

(c) Find the cumulative frequencies.

(d) Find and interpret the cumulative percentage frequencies.

## 2.54

A teacher wants to examine the possible relationship between students' scores on the entrance test and their scores (on a broader value scale) in the final exam. The results, for a random sample of 8 students, are collected in the following table:

| Entrance Test (X) | 10 | 29 | 16 | 25 | 14 | 27 | 25 | 20 |
|---|---|---|---|---|---|---|---|---|
| Final Exam (Y) | 19 | 60 | 28 | 49 | 20 | 60 | 56 | 31 |

(a) Represent the scores of the 8 students with an overlapping bar chart. (optional)

(b) Represent the scores of the 8 students with an adjacent bar chart. (optional)

(c) Find the minimum, first quartile, median, third quartile, and maximum of the distributions of variables X and Y.

(d) Construct the box plot.

## 2.64

How do people learn about a new product? A random sample of 200 customers from a certain store, in addition to their age, were asked whether they became aware of the new product from a friend or through advertising in local newspapers. The results indicated that 50 people were under 21 years old, 90 were in the age group between 21 and 35, and 60 were over 35 years old. Of those under 21, 30 had become aware of the new product from a friend and the rest from an advertisement in the local newspaper. A third of the people in the age group from 21 to 35 had learned about the product from the same newspaper advertisement, the rest from a friend. In the category of respondents over 35, 30

(a) Describe the data with a contingency table. (optional)

(b) Describe the data graphically.

# Chapter 3 Exercises: Measures of Location and Variability

### 3.46

A major airport has recently commissioned an external consultant to study problems related to delays in air traffic. The consultant recorded, for a sample of flights, the number of minutes each plane was delayed: the results are collected in the following table:

| Minutes of Delay | (0, 10] | (10, 20] | (20, 30] | (30, 40] | (40, 50] | (50, 60] |
|---|---|---|---|---|---|---|
| Number of flights | 30 | 25 | 13 | 6 | 5 | 4 |

(a) Evaluate the average number of minutes delayed.

(b) Calculate the sample variance and standard deviation.

### 3.53

Consider the following four populations.

- 1, 2, 3, 4, 5, 6, 7, 8

- 1, 1, 1, 1, 8, 8, 8, 8

- 1, 1, 4, 4, 5, 5, 8, 8

- -6, -3, 0, 3, 6, 9, 12, 15

All of them have the same mean. Without performing calculations, order the populations based on the magnitude of their variances, from smallest to largest, and then actually calculate the variances.