

# Exercise sheet 1

Statistics Pre-course 2024

Alfonso Russo

## Exercise 1

Consider the following observations:

0, 43, 70, 14, 22, 13, 90, 50

- (a) Find the mean.
- (b) Find the median.

## Exercise 2

The owner of a company in downtown Rome is concerned about the large use of gasoline by her employees due to urban sprawl and traffic congestion. She'd like to promote the use of public transportation. She decides to investigate how many kilometers her employees travel on public transportation during a typical day. The values for her 10 employees (recorded to the closest kilometer) are

0, 0, 4, 0, 0, 0, 10, 0, 6, 0

- (a) Find and interpret the mean, mode and median.
- (b) She hires an additional employee who lives in a different city and travels 90km a day on public transport. Recompute the mean and median and comment.

## Exercise 3

In a sample of 4838 individuals, subjects were asked how many people who they personally know have completed their PhD in the past six months. The table summarizes response.

People Dismissed	Frequency
0	3944
1	279
2	97
3	40
4 or more	23
<b>Total</b>	<b>4383</b>

- (a) Find the mean (use 4.5 as score for the class "4 or more").
- (b) Find the median.

### Exercise 4

Consider the following two sets of observations:

$$\mathcal{S}_1 = 2, 3, 3, 3, 4, 4, 4$$

$$\mathcal{S}_2 = 2, 3, 3, 3, 3, 3, 4$$

- (a) Determine which set has the higher variability.

### Exercise 5

A Professor recorded the following scores from a Statistics exam:

$$70, 84, 59, 73, 86, 35, 81, 75.$$

- (a) Find the mean and the median.
- (b) Based on your results from the previous point, can you tell something about the distribution of the data?
- (c) Find the standard deviation.

### Exercise 6

The following table reports answers to the question "How many times have you flown overseas in the last 12 months?"

Flights	0	1	2	3	4
Count	25	15	20	5	0

- (a) Find mean, variance and standard deviation.

### Exercise 7

We report fertility rates for 18 countries worldwide in the following table:

Country	Fertility	Country	Fertility
Austria	1.4	Netherlands	1.7
Belgium	1.7	Norway	1.8
Denmark	1.8	Spain	1.3
Finland	1.7	Sweden	1.6
France	1.9	Switzerland	1.4
Germany	1.3	United Kingdom	1.7
Greece	1.3	United States	2.0
Ireland	1.9	Canada	1.5
Italy	1.3	Mexico	2.4

- (a) Find quartiles ( $Q_1, Q_2, Q_3$ ) for the fertility rates.

### Exercise 8

An instructor of Statistics collected data from one of her classes in Spring 2016 to investigate the relationship between Study time per week (number of hours) to predict the final grade. For the 8 students in her class the data were as shown in the Table.

<b>Student</b>	<b>Time</b>	<b>Grade</b>
1	14	26
2	25	30
3	15	20
4	5	18
5	10	23
6	12	25
7	5	21
8	21	28

- (a) Identify response variable and explanatory variable and their natures.  
(b) Investigate correlation and interpret the results.