

# Exercises - Week 1

## Exercise 1: Last digit

Write a function in Python that returns the last digit of the number received as a parameter.

## Exercise 2: Chemical compound

Write a function in Python that receives as parameters the number of carbon, hydrogen, and oxygen atoms of a chemical compound and returns the molecular mass of the corresponding substance, knowing that oxygen has an atomic mass of 16, hydrogen has an atomic mass of 1, and carbon has an atomic mass of 12.

## Exercise 3: Equation of degree 2

Write a function in Python that takes three integer parameters  $a$ ,  $b$ , and  $c$ , respectively, and prints the solutions of the quadratic equation  $ax^2 + bx + c = 0$ , or a message if there are no real solutions.

## Exercise 4: Leap year

Write a function in Python that determines whether a (integer) year given as a parameter is a leap year, returning a boolean. If a year is a leap year or not, it can be determined according to the following rules (you will have to reformulate or reorder them to write the function):

- a) a year divisible by 4 is a leap year, otherwise not
- b) with the exception of a), years divisible by 100 are not leap years
- c) with the exception of b), years divisible by 400 are leap years

## Exercise 5: Branch function

Implement in Python the mathematical function defined below:

$$f : \mathbb{Z} \rightarrow \mathbb{Z}, f(x) = \begin{cases} 2x + 1 & \text{pentru } x < -3 \\ 0 & \text{pentru } x = -3 \\ 3x^2 + 6x - 5 & \text{pentru } x > -3 \end{cases}$$

## Exercise 6: Interval

Implement a function in Python that receives as parameters three natural numbers  $a$ ,  $b$ , and  $c$ , respectively, and returns True if the number  $c$  is inside the interval  $[a; b]$ , otherwise return False.

**Note:** Structures of the type will not be used in the implementation *if...elif...else*.

## Exercise 7: Sort

Implement a function in Python that takes three numbers,  $a$ ,  $b$ , and  $c$ , as parameters, and returns the 3 numbers in descending order.

**Note:** Structures of the type will not be used in the implementation *if...elif...else*.

**Remark:** It is recommended to use the predefined functions `min()` and `max()`. Both functions can take

a variable number of parameters or a list and returns the minimum/maximum.

**Exercise 8: Departure/arrival time**

Implement a function in Python that receives as parameters two character strings symbolizing the arrival time and the departure time for an airplane, in the format *HH:MM:SS* and returns the difference in seconds between the two.

**Note:** You can extract parts of a string like this: *string\_name[start\_index : end\_index]*. Basically instead of extracting a single character like in the lab example, you can extract a substring.

**Exercise 9: Circle**

Implement a function in Python that takes the radius of a circle as a parameter and returns both the length of the disk and its area.

**Exercise 10: Number of days**

Implement a function in Python that receives as parameters two years (integers) and returns the number of days between them (You can use the function implemented in exercise 4).

**Note:** It is not allowed to use the datetime module or any other similar module.