

Exercise 1

Write an implementation of the factorial function.

Tips:

- The factorial function can be recursively defined as follows:

$$\forall n \in \mathbb{N}, \quad \text{factorial}(n) = \begin{cases} 1 & \text{if } n = 0 \\ n \times \text{factorial}(n - 1) & \text{otherwise} \end{cases}$$

- Write your function in a script, then execute it in a terminal (with VS Code: right click on script => "Run Python file in terminal")

Exercise 2

- Write a function `printNegative` which prints all negative elements of an integer or float input list.
- Write a function `filterOdd` which takes a list of integers as input and returns a sub-list of the input containing only its odd elements (tip: the Python modulo operator is `%`; e.g. `7%2` returns `1`).
- Write a function `removeDuplicate` which takes a list of any type as input, and returns a list without any duplicate elements as output.

Exercise 3

Write a function `printReverseString` which takes a sentence under the string format as input (e.g. "Hello world!") and prints the sentence with words in the reverse order (e.g. "world! Hello").

Tips:

- A sentence is an ensemble of words separated by spaces
- The Python string methods `split` and `join` should be useful for this exercise

Exercise 4

Write a function `distanceToSun` which asks the user to input the name of a planet of our solar system in command line, and prints the distance between the planet and the Sun in kilometres.

Tips:

- Pick the online source of your choice to find distances between planets and the Sun.
- Asking for an user input in terminal can be done using the `userInput = input("text to display")` syntax.
- Remember to treat the case where the user input is invalid.
- Stopping a function can be done using `return`
- Reminder: Python dictionary keys are case-sensitive.

Exercise 4

Write a program that makes a two-player Rock-Paper-Scissors game. The program asks for the inputs for both players [rock, paper, scissors]

(Hint: Ask for player plays (using input), compare them, print out a message of congratulations to the winner, and ask if the players want to start a new game)

Remember the rules:

- Rock beats scissors
- Scissors beats paper
- Paper beats rock