MAT101 Programming – Homework 1

Deadline: Monday, 03.10.2022, 1:00 PM

Login to `https://w3.math.uzh.ch/my/` with your UZH credentials to submit your solved exercises for grading. You can find more information on how to upload/submit your exercises on `https://wiki.math.uzh.ch/public/studentUpload`. (If the module "Programming" isn't showing on My, then you're most likely not registered for the course and should rectify that as soon as possible.)

For submission, please upload **at most 1** Python file **per exercise**. You could even just upload 1 Python file for the whole exercise sheet, in any case please add comments stating which (sub-)exercise you are working on. You can use comments and/or print statements to answer non-programming tasks, or upload 1 pdf/picture for non programming tasks.

For this exercise sheet, it is probably easiest if you upload 1 pdf/picture for the exercises 1 and 2, and 1 script for the exercises 3 and 4.

Exercise 1. **13** P.

This exercise should make you familiar with the types of numbers and the most common operators.

(a) Write down the `type` of each of the numerical variables defined below: (**7** P.)

- a = 1
- b = 1.0
- c = 2*a
- d = 2 + b
- e = a - b
- f = c/a
- g = (-b)**(0.5)

(b) There are a lot more operations that can be used on `ints` and `floats`, here are two new ones that come in handy from time to time.

(i) Given the examples below try to find out what `%` does and write it down. (**2** P.)

- 4%3 evaluates to 1
- 8%2 evaluates to 0
- 4.5%2 evaluates to 0.5

(ii) Given the examples below try to find out what `//` does and write it down. (**2** P.)

- 4//2 evaluates to 2
- 3//2 evaluates to 1
- 3.0//4 evaluates to 0.0

(iii) In the examples above, you may have noticed that some results are `ints` while some are `floats`. Try to find a rule to predict the `type` of `z = x%y` and `w = x//y`, when `x`, `y` are `ints` and/or `floats`. (**2** P.)

Exercise 2. **7** P.

This exercise should make you familiar with `bool` (booleans).
Write down the value of the variables defined below.

- a = True
- b = False
- c = a and b
- d = a or b
- e = a*b
- f = e or a
- g = a and False or b

Exercise 3. **10** P.

This exercise should make you familiar with `str` (strings).
Use the functions discussed during the lecture to solve the following tasks efficiently.

(a) Define in your script: sentence = "You are using Python right now." (**1** P.)

(b) `print` the `type` of "sentence". (**1** P.)

(c) `print` the first character of "sentence". (**1** P.)

(d) `print` the last seven characters of "sentence". (**2** P.)

(e) Use slicing to isolate one word from "sentence" and `print` it. (**3** P.)

(f) `print` the length of "sentence". (**2** P.)

Exercise 4. **10** P.

This exercise should make you familiar with `lists`.
Use the functions discussed during the lecture to solve the following tasks efficiently.

(a) Define in your script: array = [2, "xyz", 5, [2.71]] (**1** P.)

(b) `print` the `type` of "array". (**1** P.)

(c) `print` the last element of "array". (**1** P.)

(d) Create a new `list` "names" containing your first and last name. (**3** P.)

(e) Concatenate "array" and "names" into "concatenated". (**2** P.)

(f) `print` the length of "concatenated". (**2** P.)

Note: since `list` is a datatype in Python, it has inherent meaning and functionality. Therefore, you should not use "list" as a variable name, the same goes for `str`, `int`, etc.