Prof. Dr. Jörg Müller
Arthur Fleig

AI VIII – Serious Games

Exercises for **Programming, Data Analysis, and Deep Learning in Python** (SoSe 2021)

Exercise Sheet no. 4, *Deadline*: Monday, May 10, 10:15

Notes

- Pay attention to the notes on the previous sheet.

Before you start, read the “Comments” section (including “Documentation Strings”) at `https://www.python.org/dev/peps/pep-0008/#comments` and the article about logging at `https://timber.io/blog/the-pythonic-guide-to-logging`.

Exercise 13 Exceptions are the rule (programming exercise) (8 points)

Download and run the script provided on e-Learning. Prevent crashes by catching any exceptions that may occur and issuing your own error messages. Otherwise, do not change the existing code. When intercepting the errors, consider the respective error types, such as `FileNotFoundError`.[1] In part a), in addition to your own error message, write the traceback info to a file using

```
<filename>.write(traceback.format_exc()),
```

then close that file. Pay special attention in which line of code the errors occur in part c), and catch exactly these errors using exceptions inside the function `sum_pair` – even if some errors could be classified as programming bugs.

[1] You can find helpful information about exception handling at `https://docs.python.org/3/tutorial/errors.html`

Exercise 14 What does this code do? (programming exercise) (8 points)

Take a look at the script provided on e-Learning.

a) Find out what each code line does by experimenting with the code. Then comment every uncommented line of code.

b) Log each function call of `fct` and `main` including the arguments. For example, each time a function `fun(x)` is called, a debug message similar to “Function fun(x) called with x = ...” should appear using the `logging.debug()` function. Do not use the `print()` function.

c) In a similar way, at the end of each function, output a debug message stating that the function is finished (with parameters included). Run the code with these debug messages and briefly comment on what you observe regarding the function calls.

d) What data types and what sign should the arguments `length` and `counter` have? What do you get as a result and how does the program produce it? Justify your answer by explaining (the structure of) the program.

Exercise 15 Assertions; Right or left? (programming exercise) (8 points)

a) Briefly explain what `assert` does and provide a short code example where it is useful.

b) On e-Learning you will find a Python code that is meant to be a short guessing game. However, the program has several bugs in it. Your task is to find all bugs and fix them such that the game works correctly. To aid you in this endeavor, run the code a few times and do the following:

   - Log all user’s guesses using the `logging.debug()` function. Do not use the `print()` function.
   - In a similar way, log the other internal game variables.
   - Deal with invalid user entries using a loop (until the user enters valid data) every time a user has to enter something.

   This should help you fix all the bugs. Do not change the code more than necessary.