Computer Systems Modeling and Verification
(USEEN1)

Getting started

Before you start, you should check that a recent version of Python ($\geqslant 3.12$[1]) is installed and that the Python extension[2] for VS Code is also installed.

Exercises taken from the *Python Programming Primer*[3] (and updated with type hints).

Textbook *Introduction to Python for Computational Science and Engineering* (2022), Chapters 1-2.

Corresponding lecture slides from *Computational Science and Engineering in Python*:

- Python prompt
- Functions
- About Python
- Coding style

Exercises.

1. Define the following function in a file called `ex1.py`.

   ```
   def average(a: int, b: int) -> float:
       """Given␣a␣and␣b,␣compute␣and␣return␣the␣arithmetic␣mean␣of␣a␣and␣b"""
       return (a + b) * 0.5
   ```

   Create a new source file called ex1.py containing this code, and then test the function.

   ```
   >>> average(10, 20)
   15.0

   >>> average(10, 4)
   7.0

   >>> help(average)
   Help on function average in module __main__:

   average(a: int, b: int) -> float
          Given a and b, compute and return the arithmetic mean of a and b.
   ```

2. Define the following test function in a file called `ex1_test.py`.

   ```
   from ex1 import average

   def test_average() -> None:
       expected = 3.5
       actual = average(3, 4)
       assert expected == actual
   ```

1. https://docs.python.org/3.12/whatsnew/3.12.html
2. https://marketplace.visualstudio.com/items?itemName=ms-python.python
3. *Python Programming Primer*, Hans Fangohr *et al.* University of Southampton (2016)