Informatics for Astronomers - WS2020

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Exercise sheet 3 - Python basics and Data types

The following will be also part of the assessment:

(1) Try to present exercises in a way that everyone can understand (even those who didn't do the exercises), so please explain the vital parts of your solution in a clear way.

(2) Try to also include some background information where applicable, and/or explain the possible context/motivation for the given exercise.

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1. Start a `python` shell and type

   ```
   import this
   ```

   Explain what you are doing and the result.

2. There are a few ways to run `python` code, e.g.

   - `python` shell
   - `ipython`
   - scripts
   - `jupyter` notebooks

   Explain some of the advantages and disadvantages of these methods. In which cases you should use each of them?

3. Create a `jupyter` notebook and use it to explain the most important `python` data types (e.g. `str`, `int`, `float`, `list`, `dict`, `tuple`, etc)

   - How do you determine the type of a variable?

4. Write a `python` script that takes 3 numbers as command line arguments, adds them up and prints the result. Access to the command line arguments is provided by the module `sys`, where `sys.argv[n]` represents the argument at the `n` position.

5. The function `sys.getsizeof(object)` returns the size (in bytes) of a `python` object in memory. According to that function, How much memory a *float* uses **in** `python`? Please explain the difference with respect to the the system requirements.