

# Python short reference

## Viabes and value Assignment

```
name = "Darwin"
```

## Simple Datatypes

str - String, "Hallo Welt"

int - Integer, 234

float - Floating point number, 42.23

bool - Boolean- True/False

## Container data types

### Lists

```
names = ["Noether", "Darwin", "Lovelace"]
```

The Elements of the list can be addressed by an index e.g. `names[0]`

### Dictionaris

- Key / value pairs

```
person_and_birth_years = {"Noether": 1882, "Darwin": 1809, "Lovelace": 1815}
```

Values are addressed via keys e.g. `person_and_birth_years["Noether"]`

## Operators

- +, -, \*, /
- ==, !=, <, >, <=, >=
- not, and, or

## for-Loops

```
for <variable> in <list/iterable>:  
    <block to execute>
```

## Conditionals

Execution of a code block under a certain condition

```
if <condition>:  
    <block to execute>
```

Execution of a code block under a certain condition or alternative code block if the condition is not true

```
if <Bedingung>:  
    <block to execute 1>  
else:  
    <block to execute 2>
```

Execution of a code block under certain conditions and alternatives

```
if <condition 1>:  
    <block to execute 1>  
elif <condition 2>:  
    <block to execute 2>  
else:  
    <block to execute 3>
```

## Comments

- Text right of a # is not interpreted

## Using libraries/packages

Importing a library

```
import csv
```

Importing a module of a library

```
import urllib.request  
[...]  
urllib.request.urlopen
```

Import a library with an alias

```
import pandas as pd
```

## Using functions and methods

### Functions

- Functions group several statements
- Functions can have zero to several parameters
- Functions are called by using their names and round brackets ()
- Examples:
  - `print("Hello World!")`
  - `type(counter)`
  - `len([5, 23, 52 ])`

## Methods

- Methods are function that are boud to obejects
- Examples
  - `name.upper()`
  - `name.replace("und", "oder")`

## Opening files

A so called file handle is generated with `open(<my_file_name>)`. The content of the file can be read and returned as string with the `read` methode.

```
my_file_handle = open("My_great_file.txt"):
file_content = my_file_handle.read()
```

Alternatively, the file can read line by line:

```
for line in open("My_great_file.txt"):
    print(line)
```

## Reading recommendation

- “Automate the Boring Stuff with Python”, Al Sweigart, <https://automatetheboringstuff.com/>  
[https://github.com/foerstner-lab/Bits\\_and\\_pieces\\_for\\_the\\_carpentries\\_workshops/blob/master/short\\_references](https://github.com/foerstner-lab/Bits_and_pieces_for_the_carpentries_workshops/blob/master/short_references)