

# python\_core\_language\_part2

November 26, 2021

```
[ ]: # get formatting done automatically according to style `black`  
     #%load_ext lab_black
```

## 1 Python core language part 2

### Content

You will learn how to: - Copy objects with Section ?? - Crunch numbers with Section ?? - Make decisions with Section ?? - Let the computer do the work with Section ?? - Make your life easy with Section ??

### 1.1 Copy Objects

The difference between shallow and deep copying is only relevant for compound objects (objects that contain other objects, like lists or class instances):

- A shallow copy constructs a new compound object and then (to the extent possible) inserts references into it to the objects found in the original.
- A deep copy constructs a new compound object and then, recursively, inserts copies into it of the objects found in the original.

```
[ ]: import copy  
  
[ ]: a = [1, 2, 3]  
     b = ['one', 'two', 'three']  
     c = [obj1, obj2]
```

#### 1.1.1 Shallow Copy

```
[ ]: c_copy = copy.copy(c)  
[ ]: print(id(c_copy)==id(c))  
[ ]: print(id(c_copy[0])==id(c[0]))
```

### 1.1.2 Deep Copy

```
[ ]: c_deepcopy = copy.deepcopy(c)
[ ]: print(id(c_deepcopy)==id(c))
[ ]: print(id(c_deepcopy[0])==id(c[0]))
```

### 1.1.3 Exercise

1. Can you create a new object with the assign statement (new\_object = old\_object)?
2. Create a list with several items and create a copy with .copy and .deepcopy
3. Can you illustrate the difference between these two operations?

```
[ ]: # 1.
[ ]: # 2.
[ ]: # 3.
```

## 1.2 Basic Operators and Math Functions

Basic mathematical operators are: - + addition - - subtraction - \* multiplication - / division  
Additionally you can use Python's math functions.

```
import math
math.degrees(math.pi)

180.0
```

All functions can be found in the [Python docs](#).

### 1.2.1 Exercise

1. Perform an arbitrary calculation, which includes an addition, subtraction, multiplication and division.
2. What happens if you add two string variables?
3. Can you multiply a string with an integer? If yes, what will happen?
4. Have a look at the math functions. Chose three of them and include them in an arbitrary calculation.

```
[ ]: # 1.
[ ]: # 2.
[ ]: # 3.
[ ]: # 4.
```