

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.
```