You are encouraged to start up a Python environment (like Spyder or Jupyter Notebook). If you do so, you can try out the examples while listening. If you prefer to listen only, that's fine as well.

Big Data and Automated Content Analysis I+II

Week 2 – Wednesday »Getting started with Python«

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Today

1 The very, very, basics of programming with Python

Datatypes

Functions and methods

Modifying lists and dictionaries

Indention: The Python way of structuring your program

- 2 Exercise
- 3 Next meetings



The very, very, basics of programming

See also Chapter 4.

Basic datatypes (variables)

```
int 32
float 1.75
bool True, False
string "Damian"
```

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float 1.75
bool True, False
string "Damian"
(variable name firstname)
```

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Basic datatypes (variables)

```
int 32
float 1.75
bool True, False
string "Damian"
(variable name firstname)
```

"firstname" and firstname is not the same.

"5" and 5 is not the same.

But you can transform it: int("5") will return 5.

You cannot calculate 3 * "5" (In fact, you can. It's "555").

But you can calculate 3 * int("5")



More advanced datatypes

More advanced datatypes

```
list firstnames = ['Damian','Lori','Bjoern']
    lastnames =
    ['Trilling','Meester','Burscher']
```

Note that the elements of a list, the keys of a dict, and the values of a dict can have any datatype! (Better to be consistent, though!)



More advanced datatypes

```
list firstnames = ['Damian','Lori','Bjoern']
    lastnames =
    ['Trilling','Meester','Burscher']
list ages = [18,22,45,23]
```

Note that the elements of a list, the keys of a dict, and the values of a dict can have any datatype! (Better to be consistent, though!)

More advanced datatypes

```
list firstnames = ['Damian','Lori','Bjoern']
    lastnames =
    ['Trilling','Meester','Burscher']
list ages = [18,22,45,23]
dict familynames= {'Bjoern': 'Burscher',
    'Damian': 'Trilling', 'Lori': 'Meester'}
dict {'Bjoern': 26, 'Damian': 31, 'Lori':
    25}
```

Note that the elements of a list, the keys of a dict, and the values of a dict can have any datatype! (Better to be consistent, though!)

Functions

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methods are similar to functions, but directly associated with an object. "SCREAM".lower() returns the string "scream"

Functions

functions Take an input and return something else
 int(32.43) returns the integer 32. len("Hello")
 returns the integer 5.

Both functions and methods end with (). Between the (), arguments can (sometimes have to) be supplied.



```
You can write an own function:

def addone(x):
```

```
y = x + 1
return y
```

Functions take some input ("argument") (in this example, we called it \mathbf{x}) and return some result.

Thus, running

```
addone(5)
```

returns 6.

Modifying lists and dictionaries

Modifying lists

Appending to a list

["element 1", "element 2", "element 3"]

```
mijnlijst = ["element 1", "element 2"]
anotherone = "element 3" # note that this is a string, not a list!
mijnlijst.append(anotherone)
print(mijnlijst)
gives you:
```

Modifying lists

```
Merging two lists (= extending)

mijnlijst = ["element 1", "element 2"]
anotherone = ["element 3", "element 4"]
mijnlist.extend(anotherone)
print(mijnlijst)

gives you:
["element 1", "element 2", "element 3", "element 4]
```

Modifying dicts

Adding a key to a dict (or changing the value of an existing key)

```
mydict = {"whatever": 42, "something": 11}
mydict["somethingelse"] = 76
print(mydict)

gives you:

{'whatever': 42, 'somethingelse': 76, 'something': 11}

If a key already exists, its value is simply replaced.
```

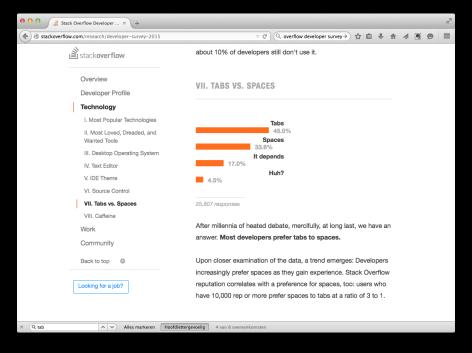
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Indention: The Python way of structuring your program

Structure

The program is structured by TABs or SPACEs





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```
firstnames=['Damian','Lori','Bjoern']
age={'Bjoern': 27, 'Damian': 32, 'Lori': 26}
print ("The names and ages of these people:")
for naam in firstnames:
    print (naam,age[naam])
```

Structure

The program is structured by TABs or SPACEs

```
firstnames=['Damian','Lori','Bjoern']
age={'Bjoern': 27, 'Damian': 32, 'Lori': 26}
print ("The names and ages of these people:")
for naam in firstnames:
    print (naam,age[naam])
```

Don't mix up TABs and spaces! Both are valid, but you have to be consequent!!! Best: always use 4 spaces!

Structure

The program is structured by TABs or SPACEs

```
print ("The names and ages of all these people:")

for naam in firstnames:

print (naam,age[naam])

if naam=="Damian":

print ("He teaches this course")

elif naam=="Lori":

print ("She is a former assistant")

elif naam=="Bjoern":

print ("He helped teaching this course in the past")

else:

print ("No idea who this is")
```

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- an alternative block should be executed if an error occurs (try and except statements)



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- it is only to be executed under specific conditions (if, elif, and else statements)
- an alternative block should be executed if an error occurs (try and except statements)
- a file is opened, but should be closed again after the block has been executed (with statement)



Exercise

We'll now together do some simple exercises . . .

Exercises

1. Warming up

• Create a list, loop over the list, and do something with each value (you're free to choose).

2. Did you pass?

- Think of a way to determine for a list of grades whether they are a pass (>5.5) or fail.
- Can you make that program robust enough to handle invalid input (e.g., a grade as 'ewghjieh')?
- How does your program deal with impossible grades (e.g., 12 or -3)?
- . . .

Next meetings

Friday

We will work together on "Describing an existing structured dataset" (Appendix A).

Preparation: Make sure you understood all of today's concepts!