Big Data and Automated Content Analysis

Week 2 – Monday »Getting started with Python«

Damian Trilling

d.c.trilling@uva.nl @damian0604 www.damiantrilling.net

Afdeling Communicatiewetenschap Universiteit van Amsterdam

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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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Basic datatypes (variables)

```
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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!)

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



You can write an own function:

```
1  def addone(x):
2     y = x + 1
3     return y
```

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

Thus, running

1 addone(5)

returns 6.

Modifying lists and dictionaries

Basics

Modifying lists

Appending to a list

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

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]
```

, 0

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}

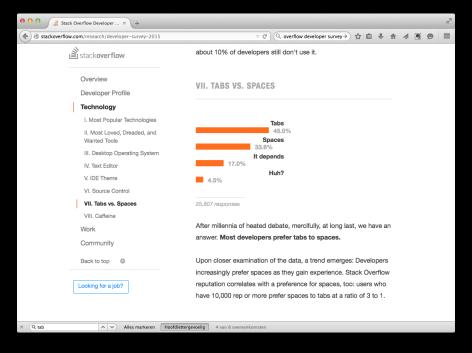
If a key already exists, its value is simply replaced.
```

Indention: The Python way of structuring your program

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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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- 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

Thursday

Do and ask questions in advance about the exercise "Describing an existing structured dataset" (Appendix A).