

Introduction to Python Day 2

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Jupyter Notebook

Recap homework

Let's take a look at the homework

Functions part 2

Goal of today

```
import numpy as np
import os

def AP_check(folder):
    AP_sweep_count = 0
    for filename in os.listdir(folder):
        if filename.endswith('.csv'):
            with open(os.path.join(folder, filename), 'r') as file:
                data = np.loadtxt(file, skiprows=1)
                if any(data > 20):
                    AP_sweep_count += 1
                    print("AP found in " + filename)
                else:
                    print('No AP in ' + filename)
    return AP_sweep_count

file_path = 'data/sweeps_csv/'
```

```
sweep_count = AP_check(file_path)
print(sweep_count)
```

This is an example to showcase what we will achieve today.

Global vs. Local

Short interlude

- Whole numbers: Integers `int`

```
type(1)
```

`int`

- Real numbers: Floats `float`

```
type(1.0)
```

`float`

- Most of the time it might not matter¹

```
1 == 1.0
```

`True`

- Sometimes there is a difference and we will see later why

Most of the time python handles the integer vs. float automatically. You will not have to worry about assigning.

¹In python

Conditional statements

The important question of what to do “if” something happens.

- Programming languages are languages
- if something is True
 - you should do something
- else
 - do something else

```
if statement:  
    print("the statement is true")  
else:  
    print("the statement is false")
```

This structure is the simplest of conditionals. The statement has to be **True** to enter the **if** part to execute. Should the statement be **False** it will skip and enter the **else** part which will then be executed.

Multiple if-statements

```
value = 3  
if value == 1:                                ①  
    print("the value is 2")  
elif value == 2:                              ②  
    print("the value is 2")  
elif value == 3:                              ③  
    print("the value is 3")                   ④  
else:  
    print("the value is something else")
```

- ① Check if **value** is 1
- ② Check if **value** is 2
- ③ Check if **value** is 3
- ④ Execute block

the value is 3

Statements will be checked sequentially. Should one statement be **True** the corresponding part of the **if/elif** block will be executed. All other blocks after that will be skipped. This means one **True** expression is enough.

Short forms for conditionals

```
amplitude = 24
is_action_potential = "is AP" if amplitude > 0 else "no AP"
print(is_action_potential)
```

is AP

- You can write a lot on one line
 - Do if you have to but be careful

How to check if everything is true?

- Validate all of the statements in a list

```
everything_is_true = [True, True, True]
something_is_true = [True, False, False]
```

```
all(everything_is_true)
all(something_is_true)
```

True

False

- Sometimes only something has to be true

```
any(everything_is_true)
any(something_is_true)
```

True

True

For loops

Enumerate

Range

List comprehension

Compare different functions

While loops

- Perform a task `while` something is `True`
- Be careful:
 - Some loops never finish (get stuck)
 - Make sure that condition for ending the loop can be fulfilled

```
while check_condition:  
    perform_task()
```

Errors and how to read them

There are useful resources regarding errors

- Simply googling works surprisingly well
- You will often end up on [stackoverflow](#)
 - There is no question which was not already asked²

²if that is not true open up a question

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Manually raising (throwing) an exception in Python

Problem 1: Hiding bugs raise Exception("I know Python!") # Don't! If you catch, likely to hide bugs. ... Best Practices: except clause When inside an except clause, you might want to, for example, log th...

python exception

Aaron Hall 395k answered Jun 5, 2014 at 16:30

778 votes
25 answers
339k views

Why does python use 'else' after for and while loops?

I'm wondering how Python coders read this construct in their head (or aloud, if you like). Perhaps I'm missing something that would make such code blocks more easily decipherable? ... See also Else...

python if-statement for-loop for-else

Kent Boogaart 179k asked Apr 2, 2012 at 16:18

2200 votes

What does if __name__ == "__main__": do?

When your script is run by passing it as a command to the Python interpreter, python myscript.py all of the code that is at indentation level 0 gets executed. ... If your script is being imported into another...

python namespaces program-entry-point python-module idioms

Adam Rosenfield 400k answered Jan 7, 2009 at 4:28

-1 votes
2 answers
42 views

Python Dictionary if clause [duplicate]

as you can tell, I just recently started to learn python. While practising, I stumbled upon an issue, for which I don't have an answer to why this is the case. ... Saigon are not in the dictionary) Python no...

python if-statement

david0711 3 asked Jul 27, 2021 at 15:58

248 votes
6 answers
90k views

How to execute multi-line statements within Python's own debugger (PDB)

Now, when I get to the debugger I want to execute a multi-line statement such as an if clause or a for loop but as soon as I type if condition: and hit the return key, I get the error message *** SyntaxError ...

python debugging multiline pdb

Mike 2,481 asked May 11, 2011 at 16:01

-1 votes

executing wrong if-clause in python [duplicate]

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Hot Network Questions

- What can a bear superhero use as a projectile?
- Looking for an old fantasy book about dragons. Small ones are kept as pets but others are killed. Main character is from an underground society
- Why can pressure be identified as partial of energy with respect to volume?
- How can the Director of National Intelligence be unaware of IMF?
- mks.ext4 to loop: 128-byte inodes cannot handle dates beyond 2038 and are deprecated
- Is it appropriate to abbreviate authors' names in function names, even with proper attribution?
- Is 13 minutes enough time to change platforms in

Types of errors

1. SyntaxErrors
2. NameError
3. TypeError
4. IndexError
5. AttributeError
6. etc.

Fix errors

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