Questions last lecture ?

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A few things to announce before the actual contents

- ❑ Next Wednesday (7th Dec), sessions will most likely be virtual (probability > 90%)
  I need to meet my boss and the boss of my boss in Shell Den Haag Campus at 11 am.

- ❑ Lecture and lab time is switched around.

So original timeslots but
lab in the morning,
lecture in the afternoon !

A few things to announce before the actual contents

- ❑ **Send me your choice for the ‘Spy School’ assignment by the end of this week.**

- ❑ **Initiation meetings(optional) happens next week.**

You can do it during the lab session, or book 1 or 2 consecutive Q&A slot(s). Should be less than 20 minutes/group

- ❑ **New lecture schedule will be published in the newly updated general intro slide pack**

- ❑ **Lab assignment instructions and grading scheme will come during the weekend.**

The assignments will give you huge amount of freedom, because I trust you all. And I want my students to be one of the strongest in either academics or industry. The only way to become one of the strongest is to take initiative yourself. I’ll try my best to help you through this.

- ❑ **The GPIO class(was tbd) next week will be altered to a large mid-term Q&A session**

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Intelligent Control
Lecture 3 – Iterations and Conditionals

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Hanshu Yu

2nd Dec. 2022

De persoonlijke hogeschool

Contents

Demo

Simple style guide for Python

Statements in one single line
One single statement ends with EOL (end-of-line) or with ;

Multiple lines statements:
    between brackets (), {}, []
    or \

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Simple style guide for Python

Readable code!
the code itself in your IDE/text editor should look clean and good

# comment
4 spaces indentation

Simple style guide for Python – Identifier conventions

Functions: lowercase & underscores
Global constant variable: UPPERCASE
Global variable & local variable: lowercase
Class: Capitalized word
Module: lowercase (with digits), usually should be short

Keywords: pass, break, continue

pass: a dummy statement

(future code, commented out code for temporary testing or debugging, marker for debuggers, empty functions or classes)

break: stop the loop immediately and break out, execute next statement after the loop

continue: stop this iteration, ignore the rest of the statement in this iteration, and begin next iteration (if there still is a next one).

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Iterations –while

```
while condition:
        statement(s)
```

Continues looping when the condition is **True**, stops immediately when condition evaluated as **False** in runtime

Iterations - while-else

```
while condition:
   statement(s)
else:
   statement(s)
```

Continues looping when the condition is **True**, when condition evaluated as **False** in runtime, the statement(s) in else is executed once, then the loop ends.
(else block is optional)

Iterations - while-else

```
while condition:
    statement(s)
else:
    statement(s)
```

Continues looping when the condition is **True**, when condition evaluated as **False**, running the statement(s) in else is executed once, then the loop ends.

This implies that when while-else loop is interrupted by break statement in the while block, the else block will not execute!

Iterations – for(-else)

```
for element in sequence:
    statement(s)
else:
    statement(s)
```

Continues looping when the all elements in the sequence are visited. The **else** block is executed once after the for-loop.

Like before, when the **for** loop is terminated by **break**, else won't be executed. (Again, else block is optional)

Iterations – Comparison while & for

While-loop is typically used when number of iterations are unknown.

When the number of iterations are certainly known, then typically for-loops are used.

Iterations – iterators

- ❑ **range(**start, stop, step**)**
  outputs an immutable sequence which is an instance of the class ‘range’

- ❑ counter, value **= enumerate(**sequence**,** starting_index = 0(default)**)**

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Python Zip & Unzip

Combine iterables into one tuple easily!

This improves readability of your code, especially for loops!

```
dealers = [‘Pete’, ‘Jesse’, ‘Badger’, ‘Heisenberg’]
income = [5, 40, 5, 50]
total_distribution = zip(dealers, income)
dealers, income = zip(*total_distribution)
```

but **dealers** and **income** are now tuples instead of lists

Python pack & unpack

a, b = b, a

(actually, currently not using pack & unpack)

a, b, c = c, a, b

More than 3! Pack & unpack occur

Unpacking:

* for tuples, lists

** for dictionaries

Conditionals - if

```
if condition:
    statement
elif condition:
    statement
elif condition:
    statement
else:
    statement
```

Ternary construction:

```
a = 10
b = input()
smaller_one = b if b < a else a
```

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Exceptions

```
try:
    statement(s)
except Exception:
    statement(s)
else:
    statement(s)
```

Something wrong in try, for example an error occurs.
The exception block handles the error.
Else is executed if nothing went wrong in try.

Wrap-up

- ✓ Some python style
- ✓ Key words (pass, break, continue)
- ✓ While loop
- ✓ For loop
- ✓ Iterators
- ✓ Zip and unzip, pack and unpack
- ✓ If-elif-else
- ✓ Try-except

Wrap-up

✓ **Practice makes perfect.**