Curso python udemy

- https://www.udemy.com/course/former-python-mega-course-build-10-real-world-applications/learn/lecture/34362798#overview

interesante

- Numpy: manejo de matrices
- Web Mapping: creación mapas interactivos HTML
- Manejo Webcam
- Bokeh: libreria representación gráficos → Python Bokeh
- Pandas: libreria de analisis de datos → Python Pandas
- Flask: web development
- openCV: image processing library
- Mobile app: apk
- Web Scraping
- pyinstaller: creación de ejecutables

jupyter notebook

- `sudo apt install libsqlite3-dev`
- `pip3 install jupyter notebook`
- `jupyter notebook`

Cheatsheet: Data Types

- Integers are used to represent whole numbers:

```
rank = 10
eggs = 12
people = 3
```

- Floats represent decimal numbers:

```
temperature = 10.2
rainfall = 5.98
elevation = 1031.88
```

- Strings represent text:

```
message = "Welcome to our online shop!"
name = "John"
serial = "R001991981SW"
```

- Lists represent arrays of values that may change during the course of the program:

```
members = ["Sim Soony", "Marry Roundknee", "Jack Corridor"]
pixel_values = [252, 251, 251, 253, 250, 248, 247]
```

- Dictionaries represent pairs of keys and values:

```
phone_numbers = {"John Smith": "+37682929928", "Marry Simpons":
"+423998200919"}
volcano_elevations = {"Glacier Peak": 3213.9, "Rainer": 4392.1}
```

- Keys of a dictionary can be extracted with:

```
phone_numbers.keys()
```

- Values of a dictionary can be extracted with:

```
phone_numbers.values()
```

- Tuples represent arrays of values that are not to be changed during the course of the program:

```
vowels = ('a', 'e', 'i', 'o', 'u')
one_digits = (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
```

- You can get a list of attributes of a data type has using:

```
dir(str)
dir(list)
dir(dict)
```

- You can get a list of Python builtin functions using:

```
dir(__builtins__)
```

- You can get the documentation of a Python data type using:

```
help(str)
help(str.replace)
help(dict.values)
```

Tip: Converting Between Datatypes

Sometimes you might need to convert between different data types in Python for one reason or another. That is very easy to do:

- From tuple to list:

```
cool_tuple = (1, 2, 3)
cool_list = list(cool_tuple)
cool_list # [1, 2, 3]
```

- From list to tuple:

```
cool_list = [1, 2, 3]
cool_tuple = tuple(cool_list)
cool_tuple # (1, 2, 3)
```

- From string to list:

```
cool_string = "Hello"
cool_list = list(cool_string)
cool_list # ['H', 'e', 'l', 'l', 'o']
```

- From list to string:

```
cool_list = ['H', 'e', 'l', 'l', 'o']
cool_string = str.join("", cool_list)
cool_string # 'Hello'
```

As can be seen above, converting a list into a string is more complex. Here str() is not sufficient. We need str.join(). Try running the code above again, but this time using str.join(«—», cool_list) in the second line. You will understand how str.join() works.

Cheatsheet: Operations with Data Types

- Lists, strings, and tuples have a positive index system:

```
["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
   0      1      2      3      4      5      6
```

- And they have a negative index system as well:

```
["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
  -7     -6     -5     -4     -3     -2     -1
```

- In a list, the 2nd, 3rd, and 4th items can be accessed with:

```
days = ["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
days[1:4]
Output: ['Tue', 'Wed', 'Thu']
```

- First three items of a list:

```
days = ["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
days[:3]
Output:['Mon', 'Tue', 'Wed']
```

- Last three items of a list:

```
days = ["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
days[-3:]
Output: ['Fri', 'Sat', 'Sun']
```

- Everything but the last:

```
days = ["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
days[:-1]
Output: ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat']
```

- Everything but the last two:

```
days = ["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
days[:-2]
Output: ['Mon', 'Tue', 'Wed', 'Thu', 'Fri']
```

- A dictionary value can be accessed using its corresponding dictionary key:

```
phone_numbers = {"John":"+37682929928","Marry":"+423998200919"}
phone_numbers["Marry"]
Output: '+423998200919'
```

Cheatsheet: Functions and Conditionals

- Define functions:

```
def cube_volume(a):
    return a * a * a
```

- Write if-else conditionals:

```
message = "hello there"

if "hello" in message:
    print("hi")
else:
    print("I don't understand")
```

- Write if-elif-else conditionals:

```
message = "hello there"

if "hello" in message:
    print("hi")
elif "hi" in message:
    print("hi")
elif "hey" in message:
    print("hi")
else:
    print("I don't understand")
```

- Use the and operator to check if both conditions are True at the same time:

```
x = 1
y = 1

if x == 1 and y==1:
    print("Yes")
else:
    print("No")
```

- Use the or operator to check if at least one condition is True:

```
x = 1
y = 2

if x == 1 or y==2:
    print("Yes")
else:
    print("No")
```

- Check if a value is of a particular type with isinstance:

```
isinstance("abc", str)
isinstance([1, 2, 3], list)
# or directly:

type("abc") == str
type([1, 2, 3]) == lst
```

Cheatsheet: Loops

A for-loop is useful to repeatedly execute a block of code.

- You can create a for-loop like so:

```
for letter in 'abc':
    print(letter.upper())
```

output

```
A
B
C
```

  - As you can see, the for-loop repeatedly converted all the items of 'abc' to uppercase.
  - The name after for (e.g. letter) is just a variable name
- You can loop over dictionary keys as follows:

```
phone_numbers = {"John Smith":"+37682929928","Marry Simpons":"+423998200919"}
for value in phone_numbers.keys():
    print(value)
```

output

```
John Smith
Marry Simpsons
```

- You can loop over dictionary values:

```
phone_numbers = {"John Smith":"+37682929928","Marry Simpons":"+423998200919"}
for value in phone_numbers.values():
```

```
    print(value)
```

output

```
+37682929928
+423998200919
```

- You can loop over dictionary items:

```
phone_numbers = {"John Smith":"+37682929928","Marry Simpons":"+423998200919"}
for key, value in phone_numbers.items():
    print(key, value)
```

output

```
John Smith +37682929928
Marry Simpons +423998200919
```

- We also have while-loops. The code under a while-loop will run as long as the while-loop condition is true:

```
while datetime.datetime.now() < datetime.datetime(2090, 8, 20, 19, 30, 20):
    print("It's not yet 19:30:20 of 2090.8.20")
```

    - The loop above will print out the string inside print() over and over again until the 20th of August, 2090.

Cheatsheet: List Comprehensions

A list comprehension is an expression that creates a list by iterating over another container.

- A basic list comprehension:

```
[i*2 for i in [1, 5, 10]]
```

output

```
[2, 10, 20]
```

- List comprehension with if condition:

```
[i*2 for i in [1, -2, 10] if i>0]
```

output

```
[2, 20]
```

- List comprehension with an if and else condition:

```
[i*2 if i>0 else 0 for i in [1, -2, 10]]
```

output

```
[2, 0, 20]
```

Cheatsheet: More on Functions

- Functions can have more than one parameter:

```
def volume(a, b, c):
    return a * b * c
```

- Functions can have default parameters (e.g. coefficient):

```
def converter(feet, coefficient = 3.2808):
    meters = feet / coefficient
    return meters

print(converter(10))
# Output: 3.0480370641306997
```

- Arguments can be passed as non-keyword (positional) arguments (e.g. a) or keyword arguments (e.g. b=2 and c=10):

```
def volume(a, b, c):
    return a * b * c

print(volume(1, b=2, c=10))
```

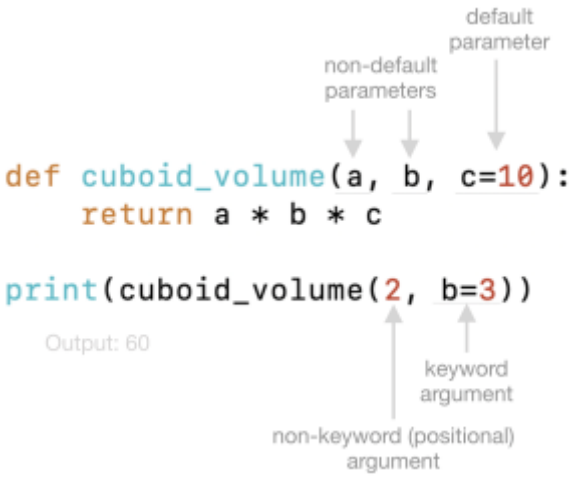
- An *args parameter allows the function to be called with an arbitrary number of non-keyword arguments:

```
def find_max(*args):
    return max(args)
print(find_max(3, 99, 1001, 2, 8))
# Output: 1001
```

- A **kwargs parameter allows the function to be called with an arbitrary number of keyword arguments:

```
def find_winner(**kwargs):
    return max(kwargs, key = kwargs.get)

print(find_winner(Andy = 17, Marry = 19, Sim = 45, Kae = 34))
# Output: Sim
```



- Here's a summary of function elements:

Cheatsheet: File Processing

- You can read an existing file with Python:

```
with open("file.txt") as file:
    content = file.read()
```

- You can create a new file with Python and write some text on it:

```
with open("file.txt", "w") as file:
    content = file.write("Sample text")
```

- You can append text to an existing file without overwriting it:

```
with open("file.txt", "a") as file:
    content = file.write("More sample text")
```

- You can both append and read a file with:

```
with open("file.txt", "a+") as file:
    content = file.write("Even more sample text")
    file.seek(0)
    content = file.read()
```

Cheatsheet: Imported Modules

- Builtin objects are all objects that are written inside the Python interpreter in C language.
- Builtin modules contain builtins objects.
- Some builtin objects are not immediately available in the global namespace. They are parts of a builtin module. To use those objects the module needs to be imported first. E.g.:

```
import time
time.sleep(5)
```

- A list of all builtin modules can be printed out with:

```
import sys
```

```
sys.builtin_module_names
```

- Standard libraries is a jargon that includes both builtin modules written in C and also modules written in Python.
- Standard libraries written in Python reside in the Python installation directory as .py files. You can find their directory path with `sys.prefix`.
- Packages are a collection of .py modules.
- Third-party libraries are packages or modules written by third-party persons (not the Python core development team).
- Third-party libraries can be installed from the terminal/command line:
  - Windows:

```
pip install pandas # or use
python -m pip install pandas # if that doesn't work.
```

  - Mac and Linux:

```
pip3 install pandas # or use
python3 -m pip install pandas # if that doesn't work.
```

Flask

```
pip install Flask
```

script1.py

```
from flask import Flask, render_template

app=Flask(__name__)

@app.route("/")
def home():
    return render_template("home.html")

@app.route("/about")
def about():
    return render_template("about.html")

if __name__=="__main__":
    app.run(debug=True)
```

templates/menu.html

```
<!DOCTYPE html>
<html>
    <head>
        <title>Flask app </title>
        <link rel="stylesheet" href="{{ url_for('static',
filename='css/main.css') }}">
    </head>
    <body>
        <header>
            <div class="container">
```

```
                <h1 class="logo">Python Flask test page</h1>
                <ul class="menu">
                    <li><a href="{{ url_for('home') }}">HOME</a></li>
                    <li><a href="{{ url_for('about') }}">ABOUT</a></li>
                </ul>
            </div>
        </header>
        <div class="container">
            {%block content%}
            {%endblock%}
        </div>
    </body>
</html>
```

templates/home.html

```
{%extends "menu.html"%}
{%block content%}
    <h2>HOME PAGE</h1>
{%endblock%}
```

templates/about.html

```
{%extends "menu.html"%}
{%block content%}
    <h2>ABOUT PAGE</h1>
{%endblock%}
```

static/css/main.css

```
body {
  margin: 0;
  padding: 0;
  font-family: "Helvetica Neue", Helvetica, Arial, sans-serif;
  color: #060;
}

/*
 * Formatting the header area
 */

header {
  background-color: #DFB887;
  height: 35px;
  width: 100%;
  opacity: .9;
  margin-bottom: 10px;
}

header h1.logo {
  margin: 0;
  font-size: 1.7em;
  color: #fff;
```

```
  text-transform: uppercase;
  float: left;
}

header h1.logo:hover {
  color: #fff;
  text-decoration: none;
}

/*
 * Center the body content
 */

.container {
  width: 1200px;
  margin: 0 auto;
}

div.home {
  padding: 10px 0 30px 0;
  background-color: #E6E6FA;
  -webkit-border-radius: 6px;
     -moz-border-radius: 6px;
          border-radius: 6px;
}

div.about {
  padding: 10px 0 30px 0;
  background-color: #E6E6FA;
  -webkit-border-radius: 6px;
     -moz-border-radius: 6px;
          border-radius: 6px;
}

h2 {
  font-size: 3em;
  margin-top: 40px;
  text-align: center;
  letter-spacing: -2px;
}

h3 {
  font-size: 1.7em;
  font-weight: 100;
  margin-top: 30px;
  text-align: center;
  letter-spacing: -1px;
  color: #999;
}

.menu {
  float: right;
  margin-top: 8px;
}

.menu li {
```

```
  display: inline;
}

.menu li + li {
  margin-left: 35px;
}

.menu li a {
  color: #444;
  text-decoration: none;
}
```