PYTHON 101

Plan

1. Datatypes (numerics, string, list, dict)
2. Loops , Conditions, Functions
3. Import/export data from files

Programming for Everybody (Getting Started with Python)

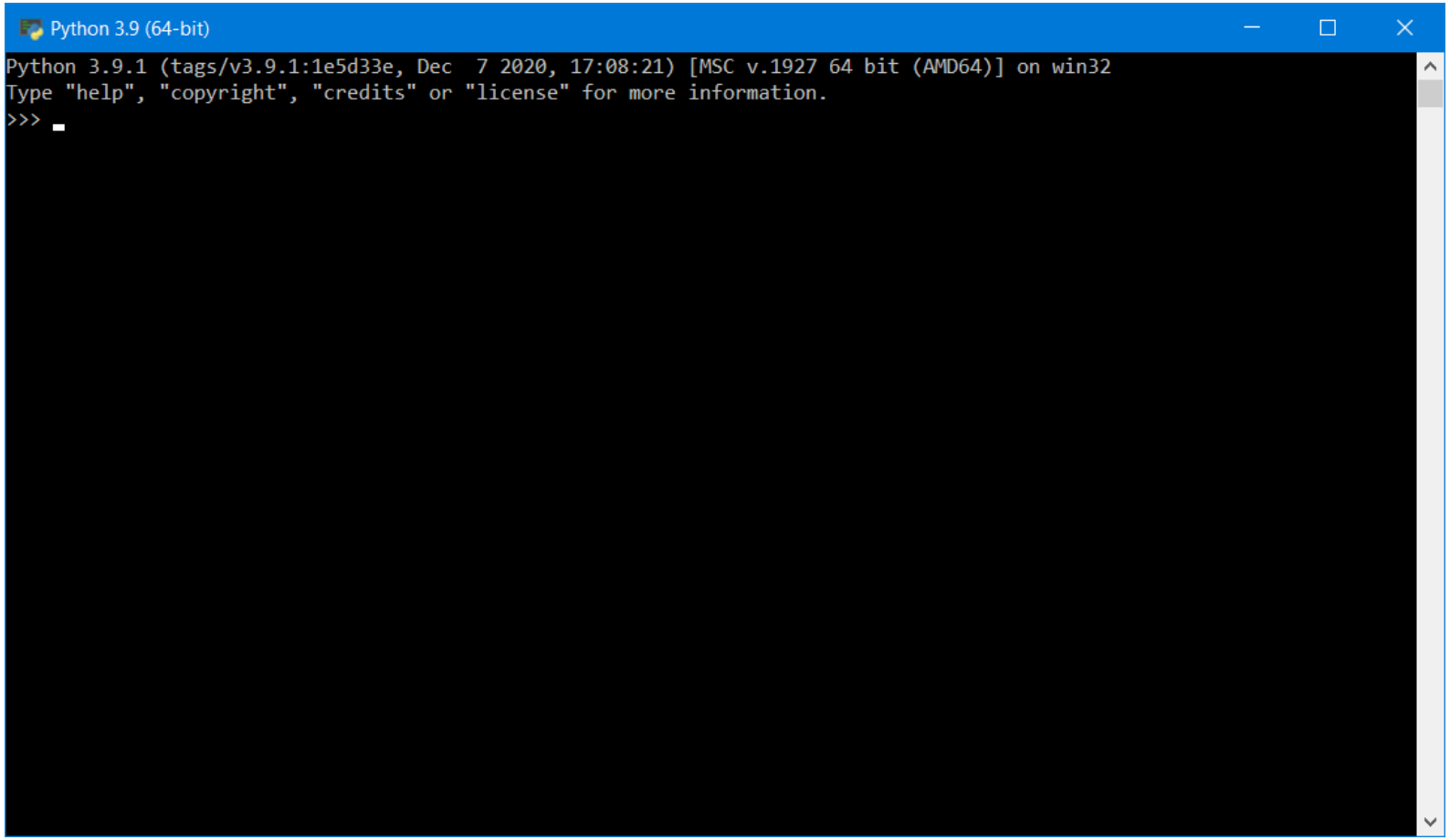
University of Michigan

Cours

4.8 (178 369) | 2,1 M étudiants

Mixed

First steps with the prompt



1. Datatypes

- Integer
- Float
- String
- List
- Dict
- More advanced datatypes:
  - Array
  - Dataframe
  - ...

Python 3.9 (64-bit)

```
Python 3.9.1 (tags/v3.9.1:1e5d33e, Dec  7 2020, 17:08:21) [MSC v.1927 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 1+1
2
>>> a=1
>>> a+a
2
>>> a
1
>>> print(hello world)
  File "<stdin>", line 1
    print(hello world)
                 ^
SyntaxError: invalid syntax
>>> print("hello world")
hello world
>>> hello="world"
>>> hello+a
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: can only concatenate str (not "int") to str
>>> str(a)
'1'
>>> hello+str(a)
'world1'
>>> 
```

More on Strings

2. Loops , Conditions, Functions

- Loops
- Conditions
- Functions

- Write your first program (in Notepad)

Python 3.9 (64-bit)

```
>>> l=[1,2,3]
>>> for i in l:
...     print(i)
...
1
2
3
>>>
```

lecon1.py - Bloc-notes

Fichier Edition Format Affichage Aide

```
1 + 1
print(1)
l = [1,2,3]
for i in l:
  print(i)
```

Ln 7, Col 1 | 100% | Windows (CRLF) | UTF-8

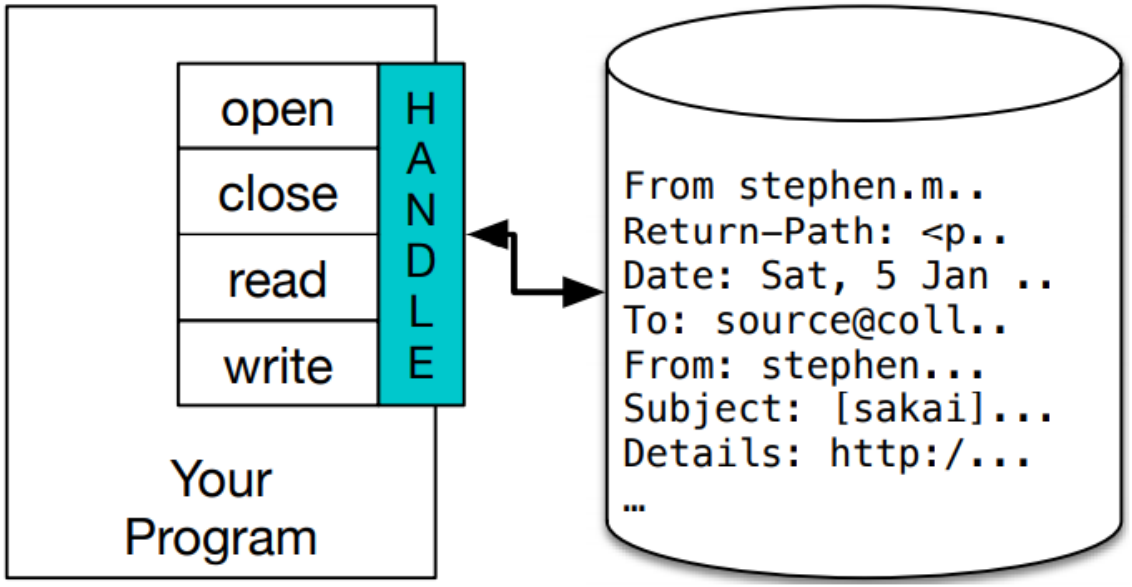
Python 3.9 (64-bit)

```
>>> if  a > 1:
...     print('hello')
...
>>>
```

More on Lists

3. Import/export data from files

```
>>> fhand = open('mbox.txt’)
>>> print(fhand)
<_io.TextIOWrapper name='mbox.txt' mode='r'
encoding='cp1252'>
```



Reading files

```
fhand = open('mbox-short.txt’)
count = 0
for line in fhand:
    count = count + 1
print('Line Count:', count)
```

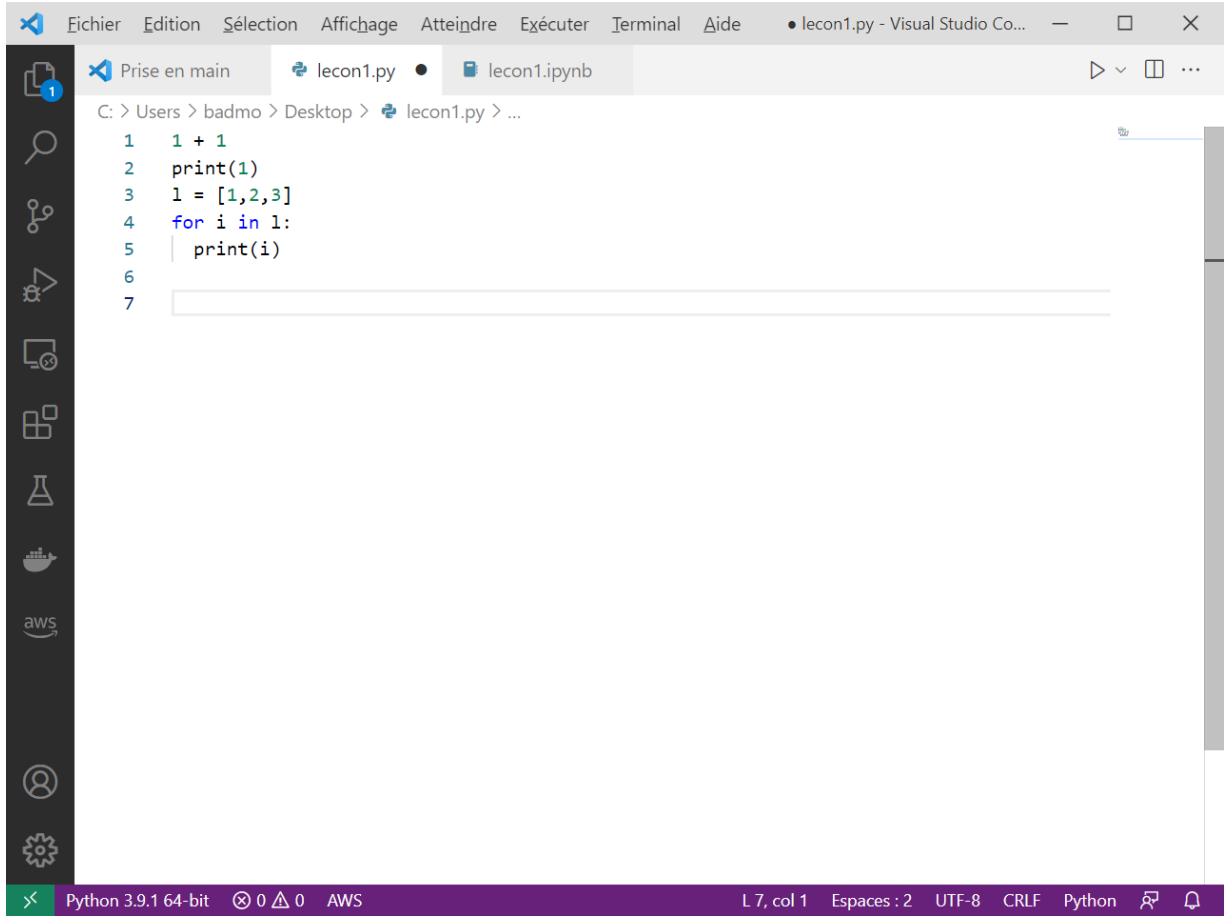
https://www.py4e.com/code3/mbox.txt

Writing files

```
>>> fout = open('output.txt', 'w’)
>>> line1 = "This here's the wattle,\n“
>>> fout.write(line1)
>>> line2 = 'the emblem of our land.\n’
>>> fout.write(line2)
>>> fout.close()
```

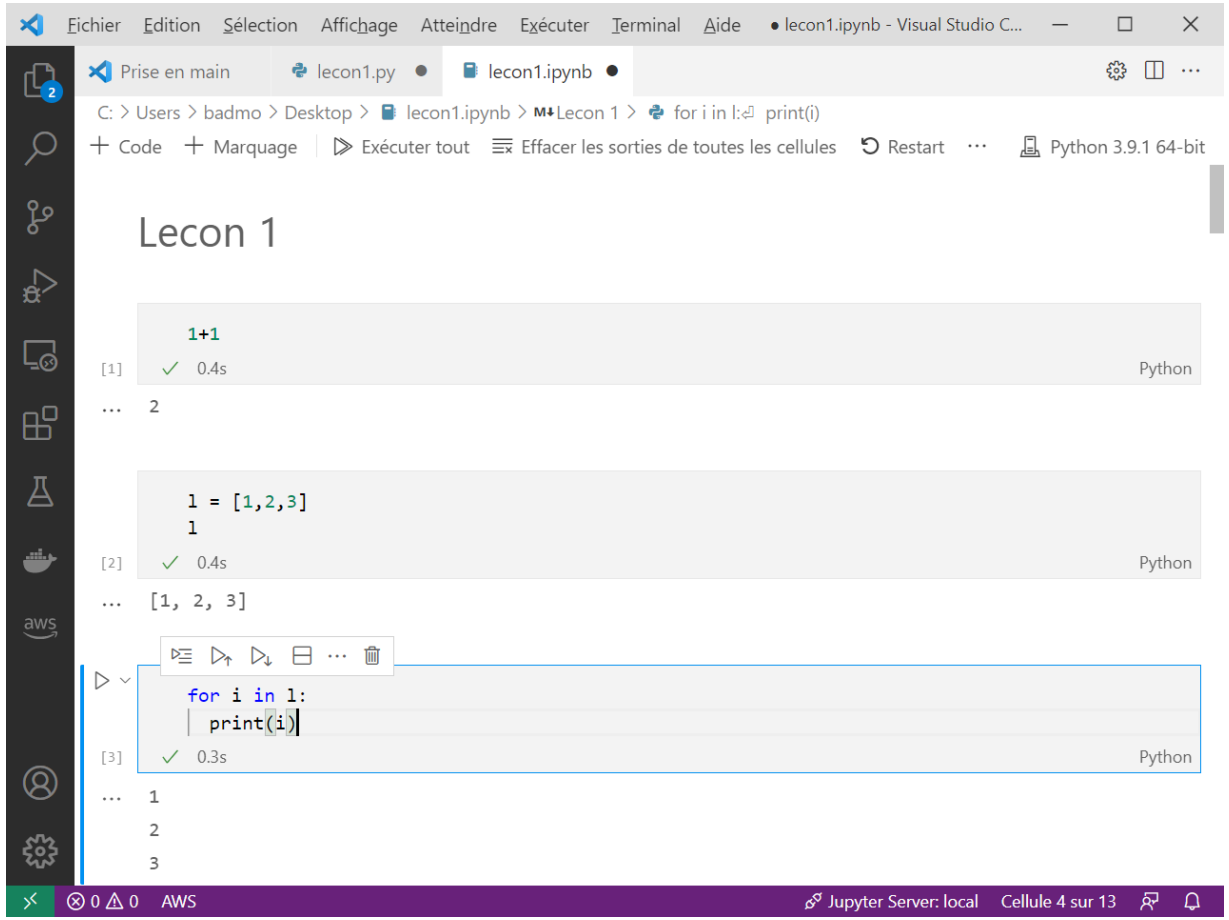
More on Files

Visual Studio Code
Recommended editor for Python



https://code.visualstudio.com/

Notebook format for interactivity



Next…

- Plotting
- Manage packages, Notebooks & Environments

EXERCISES

Immo.py

- Call a function `price`, that will return the price of real estate in Paris as a `dictionary`
- Get a list of location (lat,lon) and price
- Select only the estate under 500k€
- Write a file containing this data
- (Bonus: plot the data on a map)

Immo.py

```python
def dvf(code_commune):
    # demande de valeur financiere
    # dvf(75114)
    import urllib.request
    import json

    try:
        url = "https://26yrburrn0.execute-api.eu-west-3.amazonaws.com/dev/dvf?code_commune="
        response = urllib.request.urlopen(url)
        html = response.read()
        json_data = json.loads(html)

    except urllib.error.URLError:
        # if the API doesnt work, read the file
        print('Problem with the API')

    return json_data
```

Python

https://gist.github.com/slevin48/05c0d4f348f0f10870a0fa721cfcb1b1

Immo.py

```python
d=dvf(75114)
```

Python

```python
d.keys()
```

Python

```python
v=d['valeur_fonciere']
v
```

Python

```
{'9969': 95000.0,
 '9970': 545000.0,
 '9971': 220000.0,
 '9972': 132500.0,
```

Immo.py

```python
for i in v:
    # print(v[i])
    if v[i]>500000:
        print("indice : " + i + " - valeur : "+ str(v[i]))
```

Python

```
indice : 9970 - valeur : 545000.0
indice : 9973 - valeur : 590000.0
```

```python
f = open("mes_prix.txt","w")
for i in v:
    # print(v[i])
    if v[i]>500000:
        f.write("indice : " + i + " - valeur : "+ str(v[i]))
        f.write("\n")
f.close()
```

Python

Music.py

- Parse Streaming History
  - Create a `dictionary`
    - `id`
    - artist name
    - track name
- Music Taste Analysis
  - Get music features
  - Plot features
- Get recommendation

Music for loop

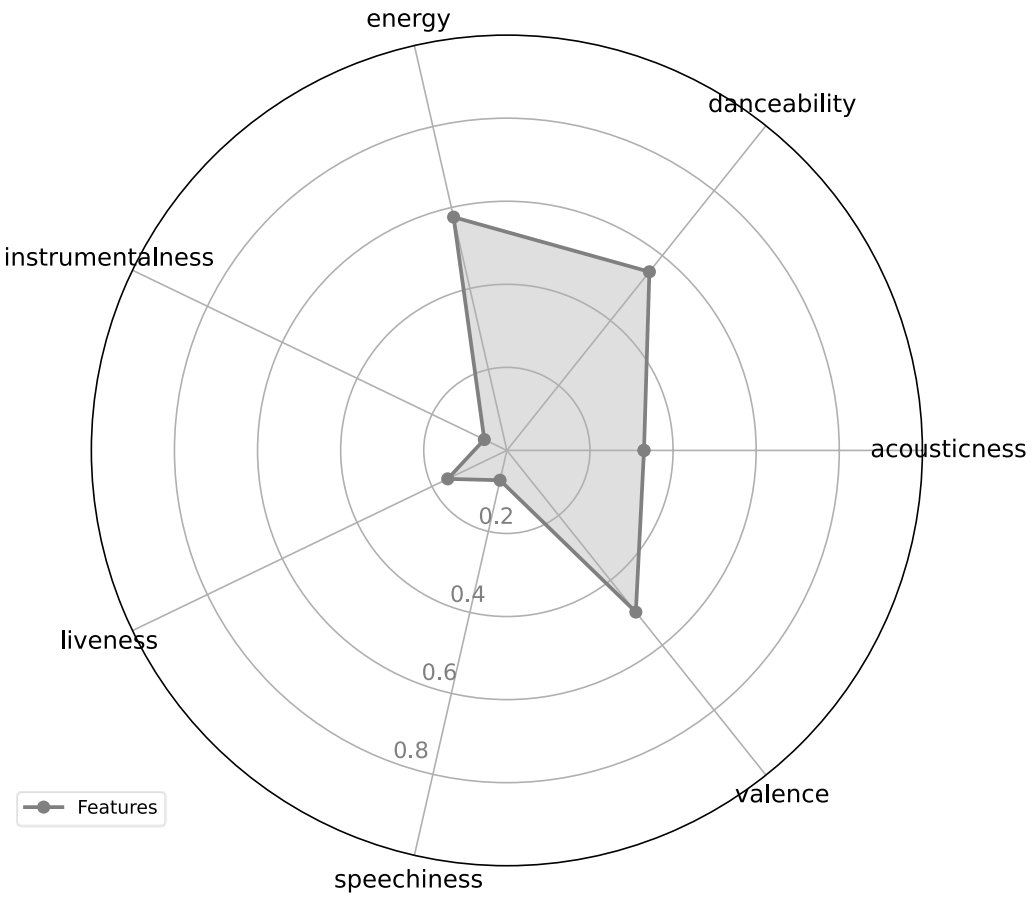
```
with open("saved_tracks_20210306.json","r") as f:
    results = json.load(f)

tracks = []
for idx, item in enumerate(results['items']):
    track = item['track']
    tracks.append([idx, track['artists'][0]['name'],
 track['name']])
```

Music Dict

```
trackDict = {"id":[], "artist":[],"name":[]}
for idx, item in enumerate(results['items']):
    track = item['track']
    trackDict["id"].append(idx)
    trackDict["artist"].append(track['artists'][0]['
name'])
    trackDict["name"].append(track['name'])
```

Music taste analysis



Music taste analysis

```
import spotifyAPI
from secret import clientId,clientSecret
token  = spotifyAPI.get_token(clientId,clientSecret)
lucy_id = spotifyAPI.get_track_id2('Lucy in the Sky'
, token, artist = 'The Beatles’)

url = "https://open.spotify.com/track/"+lucy_id
import webbrowser
webbrowser.open(url)
```

```
import pandas as pd

lucy_features = spotifyAPI.get_features(lucy_id,toke
n)
df = pd.DataFrame(lucy_features, index=[0])
df_features = df.loc[: ,['acousticness', 'danceabili
ty', 'energy', 'instrumentalness', 'liveness', 'spee
chiness', 'valence’]]

spotifyAPI.feature_plot(df_features)
```

Music recommendation

```
json_response = spotifyAPI.get_track_reco(lucy_id,to
ken)
uris =[]
for i in json_response['tracks']:
            uris.append(i)
            print(f"\"{i['name']}\" by {i['artists']
[0]['name']}")
```

Sources

Python Data Structures

University of Michigan

Data Structures

1 COURS

Using Python to Access Web Data

University of Michigan

Using Python to Access Web Data

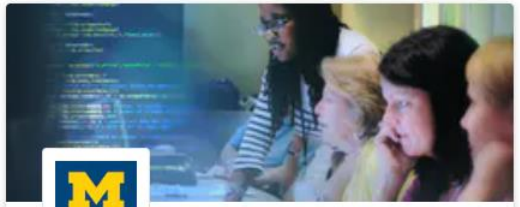
1 COURS

Using Databases with Python

University of Michigan

Using Databases with Python

1 COURS



Capstone: Retrieving, Processing, and Visualizing Data with Python

University of Michigan

Capstone: Retrieving, Processing, and Visualizing Data with Python

1 COURS

PY4E - Python for Everybody

Python for Everybody (dr-chuck.com)

Go further

Crash Course on Python | Google

Using Python to Interact with the Operating System

Google

Using Python to Interact with the Operating System

1 COURS

Google IT Automation with Python

Google

Google IT Automation with Python

6 COURS

Configuration Management and the Cloud

Google

Configuration Management and the Cloud

1 COURS

Troubleshooting and Debugging Techniques

Google

Troubleshooting and Debugging Techniques

1 COURS

Introduction to Git and GitHub | Google

Automating Real-World Tasks with Python | Google

Data Science

Python for Data Science and AI

IBM

Cours

4.6 (19 833) | 260 000 étudiants

Beginner

Data Analysis with Python

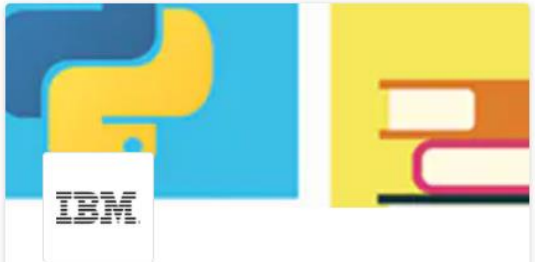
IBM

1 COURS

Data Visualization with Python

IBM

1 COURS



Machine Learning with Python

IBM

1 COURS

Statistics for Data Science with Python

IBM

1 COURS

Uninstall Python