
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)

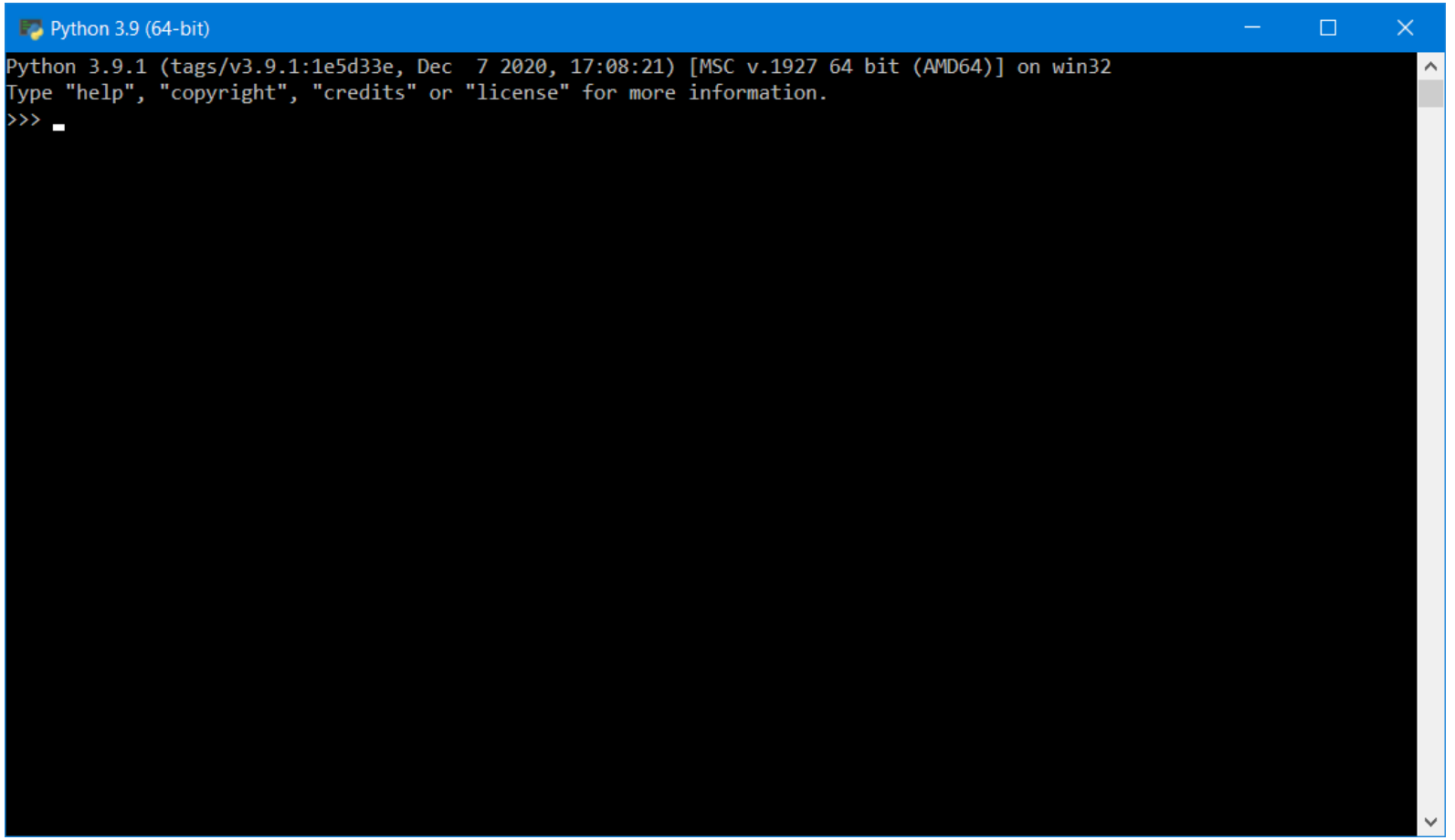
University of Michigan

Cours

4.8 (178 369) | 2,1 M étudiants

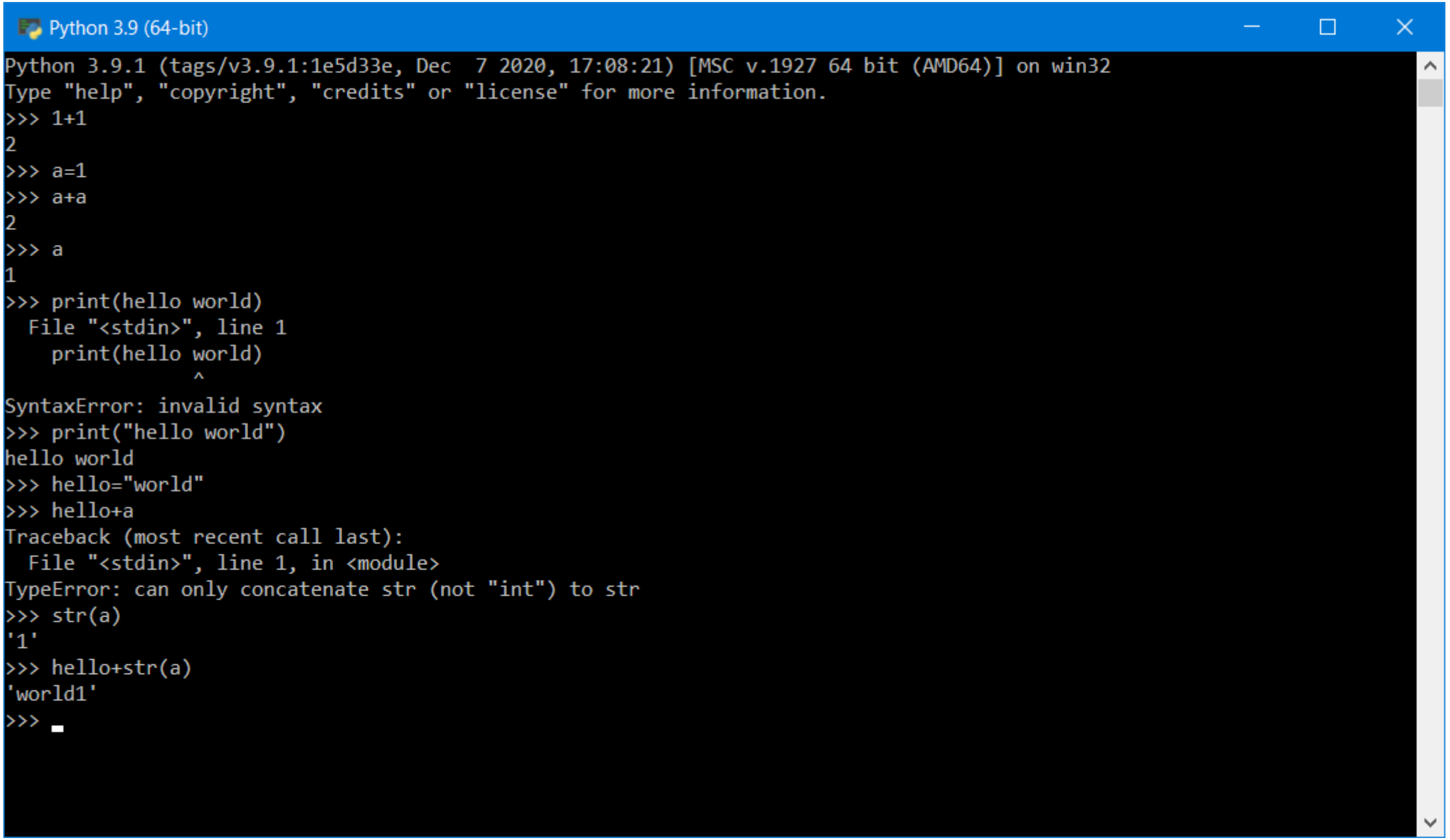
Mixed

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

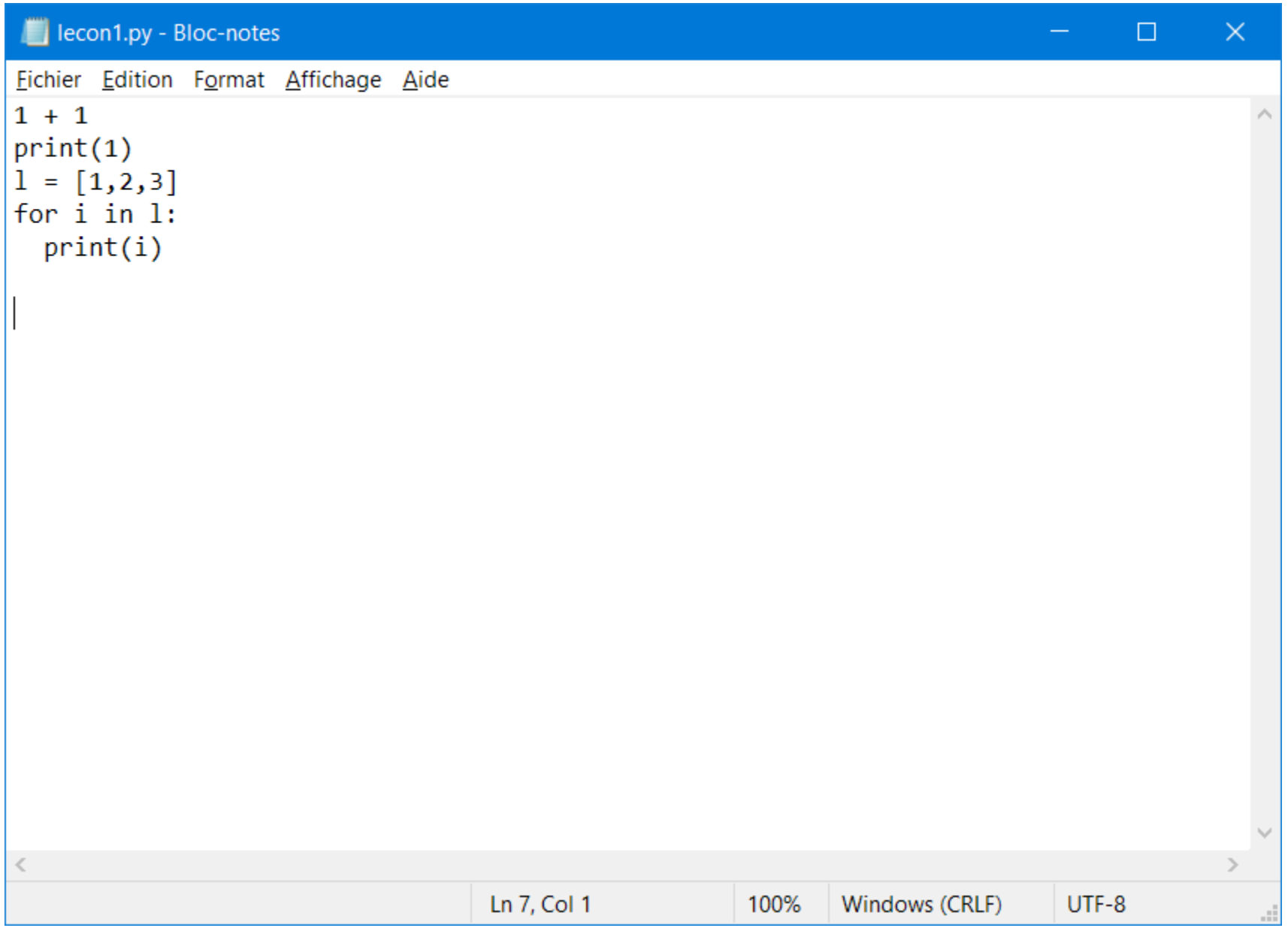
- 6.1: A string is a sequence
- 6.2: Getting the length of a string using len
- 6.3: Traversal through a string with a loop
- 6.4: String Slices
- 6.5: Strings are immutable
- 6.6: Looping and Counting
- 6.7: The in operator
- 6.8: String Comparison
- 6.9: String Methods
- 6.E: Strings (Exercises)
- 6.G: Strings (Glossary)
- 6.10: Parsing strings
- 6.11: Format operator
- 6.12: Debugging

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
>>>

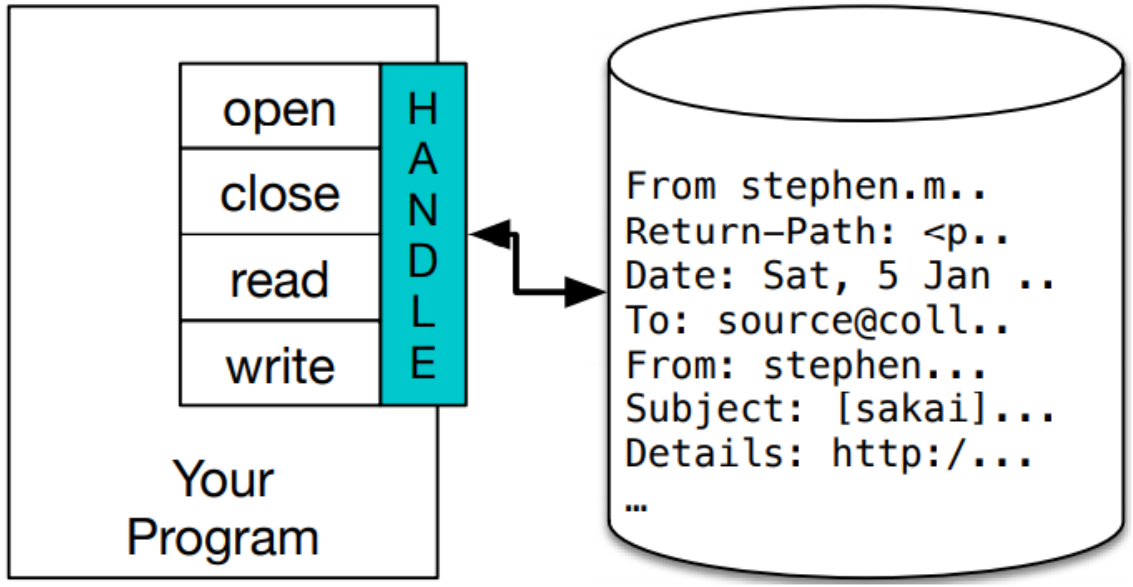

lecon1.py - Bloc-notes
Fichier Edition Format Affichage Aide
1 + 1
print(1)
l = [1,2,3]
for i in l:
print(i)
Ln 7, Col 1
100%
Windows (CRLF)
UTF-8


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

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)

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

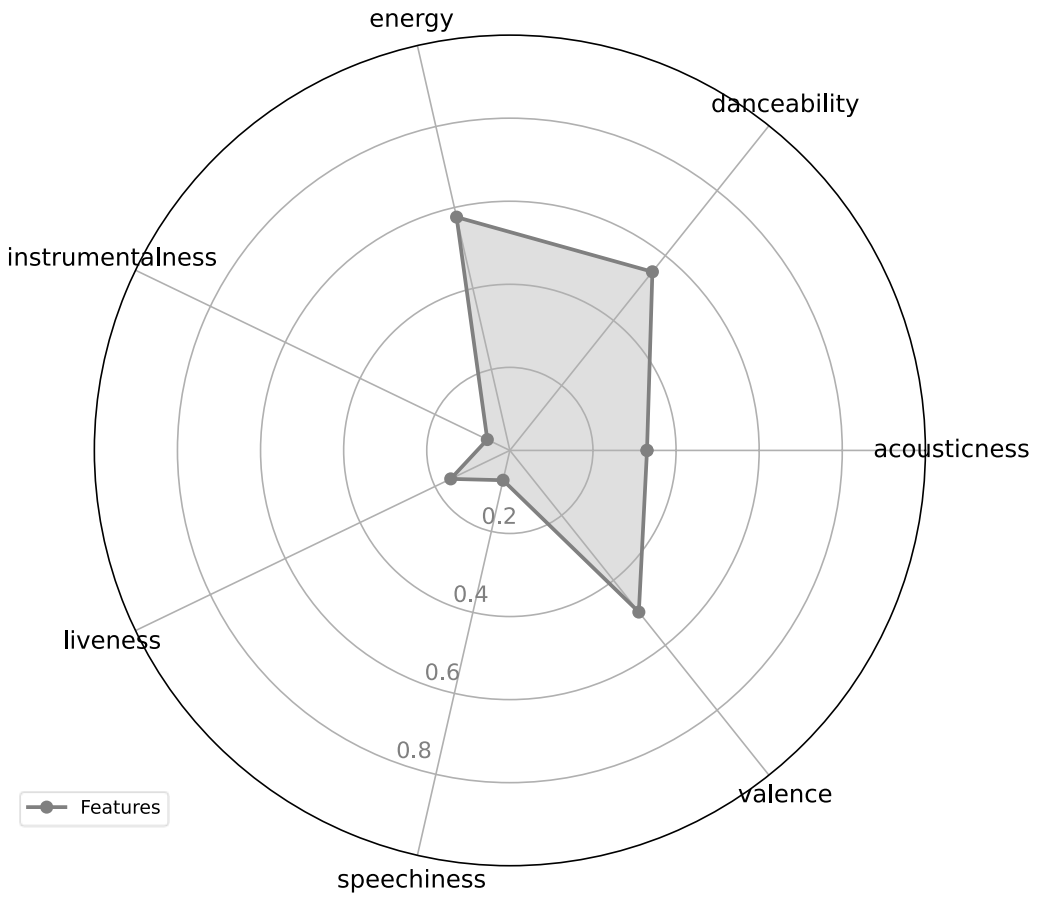
```
with open("saved_tracks_20210306.json","r") as f:
    results = json.load(f)


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

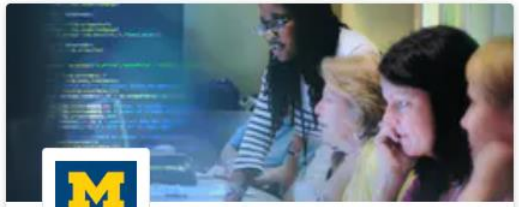
[Using Python to Access Web Data]

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

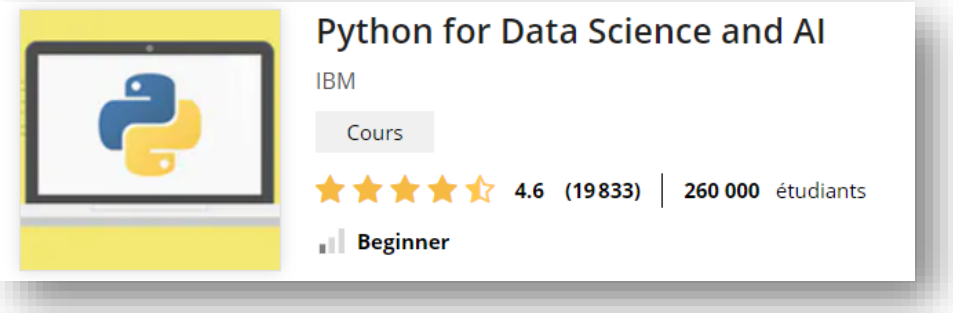
Troubleshooting and Debugging Techniques

1 COURS

Introduction to Git and GitHub | Google

Automating Real-World Tasks with Python | Google

Data Science



Data Analysis with Python

IBM

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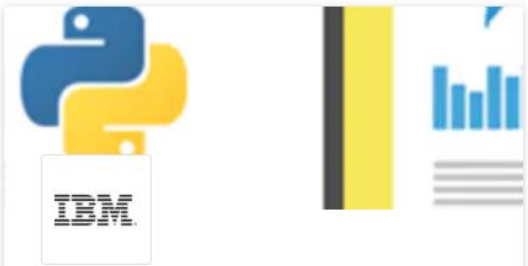

Data Visualization with Python

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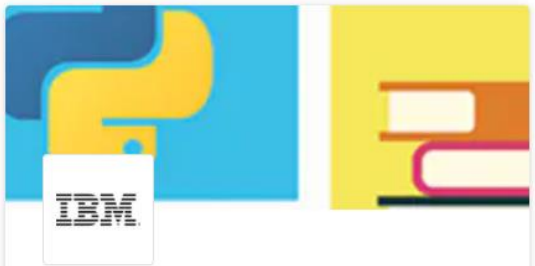

Machine Learning with Python

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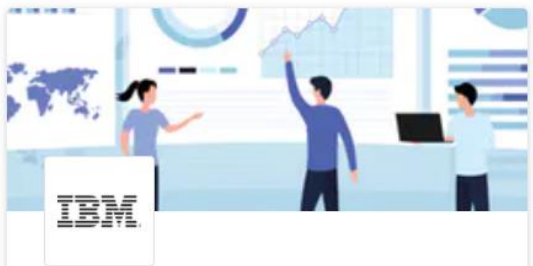

Statistics for Data Science with Python

IBM

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Uninstall Python