

Python - introduction

🕒 Objectives

- **describe** what a programming language / Python is
- **implement** simple scripts in Python
- **extend** scripts with additional information

1. Programming languages

Programming languages are similar to plain-old human languages. They both use an **alphabet**, a **vocabulary** and **grammar** rules for example.

The main difference between a programming language and a human one is their main objective: a regular language is used by people to communicate together and to express their **ideas**, whereas a programming language is mainly used to express **algorithms** in a way that both humans and machines¹ can understand it.

📄 Information

In the same way as different languages serve different purposes in different parts of the globe, there exists multiple programming languages that are used for different purposes.

No spoken language is better than another, and no programming language is better than another: they all have their strengths and weaknesses.

2. How to be understood by a machine

A computer is a machine: it does not speak English or French, it speaks **machine code**. Machine code is difficult to read, to write, to understand... It is therefore not a useful programming language, and we need to use intermediary languages to be understood.

When a person that speaks only Japanese has to communicate with a person that speaks only Spanish, they have two ways to do so. They can use an interpreter, which is a person that speaks both languages and will be there with them to communicate, or they can use a translator, which can be a person or a dictionary, to translate the message into the second language.

💡 Idea

Why not use a similar system for programming languages?

¹by the means of interpretation or compilation - see section 2

i Information

The main idea is the same for programming languages. Two main families of programming languages exist: **interpreted** and **compiled**. Interpreted languages use a program that translates the code *on the go*, whereas compiled languages use a program that translates the code *once* to a machine-code file that can be executed by the machine.

3. Python

What is Python?

Python is a programming language that was created by **Guido van Rossum** in the 1990s. It was originally a simple scripting language but has been thoroughly extended since.

It is a **multi-paradigm**² and **multi-platform**² language.

Python is an **interpreted** language, with thousands of available extensions³.

Why are we learning Python then?

Python is commonly used to learn programming, as it is **easy to write** and **easy to play with**. This choice was also motivated for you as Python is often used in 3D software in order to animate objects or scenery automatically.

4. Playing with Python for the first time

We are going to write our first Python script. This script is the classic **Hello world!** example.

To achieve this, open a file in your editor, write the following code in it and save it as **hello.py**.

</> Code

```
print("Hello World!")
```

>_ Output

```
$> python hello.py  
Hello world!
```

²we will talk about this later

³available here: <https://pypi.org/>

5. Your turn!

Here are a couple exercises for you to play around and get better.

Exercise*

Extend the script you wrote earlier so that it prints

>_ Output

```
Hello, my name is first_name last_name
```

where `first_name` and `last_name` are your first and last names respectively. Save this in a file called **presentation.py** and send it to me by email.

Exercise - Multiline printing

Play around with the **print** command so that you get the output:

>_ Output

```
Hello!  
My name is first_name last_name  
I am xx years old
```

Exercise - Character description

Describe your favorite character (from TV, a movie, a video game etc) in one line statements. This is an example:

>_ Output

```
James Bond is British  
James Bond is a spy  
James Bond was born in 1940  
James Bond does not like spinach  
James Bond is very handsome
```

Exercise

Did you feel something bothering you while you were doing the last exercise? Can you think of a better way to print text like this?