

# Fundamentos de Programación

## Grado en Ingeniería del Software

10/10/23

# Antecedentes

- Paso de parámetros

# Índice

- Type hinting

**TYPE HINTING**

# What is Type Hints function

- Traditional Python code

```
def twice(num):  
    return num * 2
```

- using Type Hints

```
def twice(num: int) -> int:  
    return num * 2
```

- If you set wrong Type, We cannot show runtime error

```
def twice(num: int) -> int:  
    return num * 2.0
```

```
# expected `int` but use `str` 🥵  
print(twice("hello"))
```

```
$ python set_wrong_type.py  
$ hellohello ## 🙄
```

¡¡Python es un lenguaje de tipado dinámico!!

But You use library, e.g. mypy

```
$ mypy --python-version 3.7 example.py
example.py:5: error: Argument 1 to "twice" has incompatible type
"str"; expected "int"
```

The image shows a VS Code interface. On the left, the 'Extensions' view is open with 'mypy' in the search bar. It lists several extensions: 'Mypy' by Matan Gover (137K stars, 4.5 rating), 'Mypy Type Checker' by Microsoft (45K stars, 4 rating), 'gbe0 Python Linter' by gbe0 (402 stars), and 'Trunk Changelog' by Trunk (86K stars, 4.5 rating). The 'Mypy Type Checker' extension is selected, showing its details: 'Mypy Type Checker v2023.2.0', 'Linting support for Python files using mypy', and buttons for 'Install' and 'Open folder in new window (ctrl + click)'. On the right, the 'Terminal' view shows the command 'pip install mypy' being executed. The output indicates that mypy 1.5.1 is being installed for Python 3.10 on a manylinux2014 x86\_64 platform. The installation is successful.

mypy

**Mypy** 137K ★ 4.5  
Type checking for Python files  
Matan Gover [Install](#)

**Mypy Type Checker** 45K ★ 4  
Linting support for Python files using mypy  
Microsoft [Install](#)

**gbe0 Python Linter** 402  
Python linting tool extension  
gbe0 [Install](#)

**Trunk Changelog** 86K ★ 4.5  
One linter to rule them all  
Trunk [Install](#)

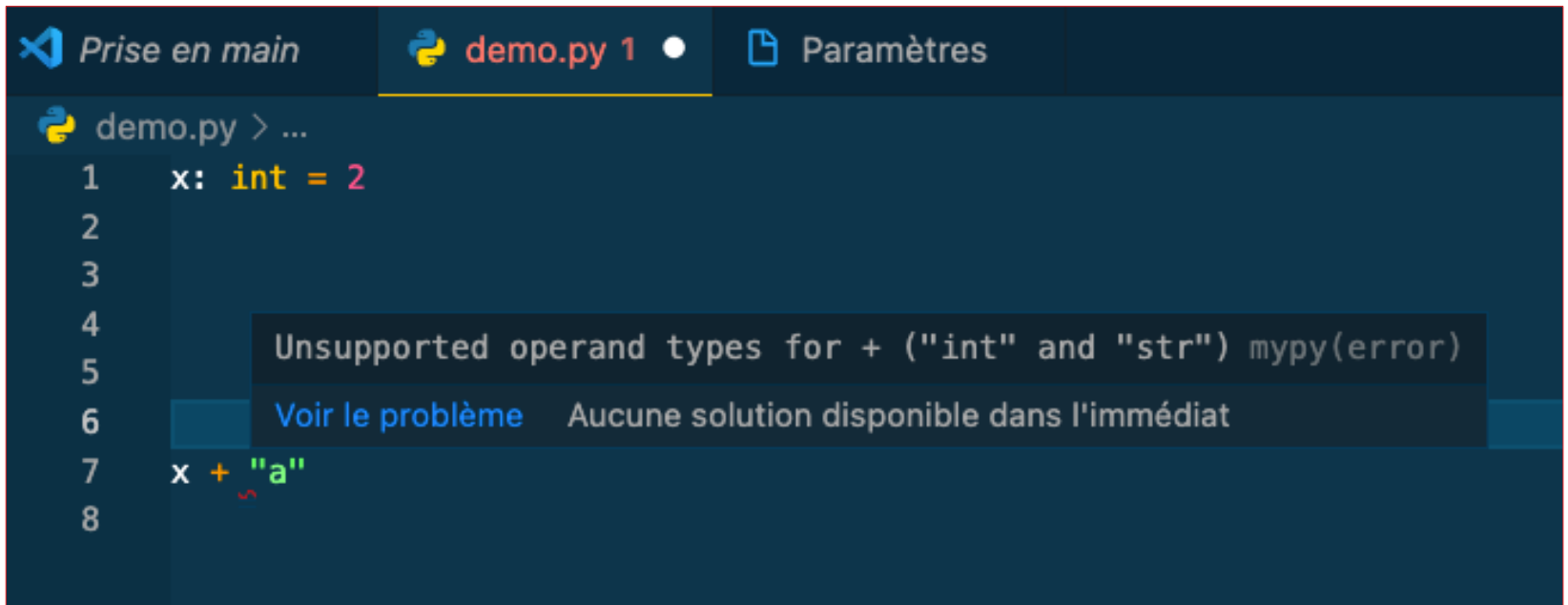
**Mypy Type Checker v2023.2.0**  
Linting support for Python files using mypy  
This publisher has verified ownership  
This extension has a [Pre-Release version](#)

[Open folder in new window \(ctrl + click\)](#)

```
jorge@jorge-Z16p:~/Escritorio/docencia/fp/2024/IC1-Python$ pip install mypy
Defaulting to user installation because normal site-packages is not writeable
Collecting mypy
  Obtaining dependency information for mypy from https://files.pythonhosted.org/packages/6c/92/68315e0aec041c4a5c720289f6c3ff1234742362659f3229e1668898c250/mypy-1.5.1-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata
  Downloading mypy-1.5.1-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (1.7 kB)
Requirement already satisfied: typing-extensions>=4.1.0 in /home/jorge/.local/lib/python3.10/site-packages (from mypy) (4.1.0)
Requirement already satisfied: tomli>=1.1.0 in /home/jorge/.local/lib/python3.10/site-packages (from mypy) (2.0.1)
Downloading mypy-1.5.1-cp310-cp310-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (12.1 MB)
12.1/12.1 MB 2.6 MB/s eta 0:00:00
Installing collected packages: mypy
Successfully installed mypy-1.5.1
```

<https://www.slideshare.net/masahitojp/enjoy-type-hints-and-its-benefits-123783453>

**Note:** The Python runtime does not enforce function and variable type annotations. They can be used by third party tools such as type checkers, IDEs, linters, etc.



The screenshot shows a Python IDE interface with a dark theme. At the top, there are tabs: 'Prise en main' (with a VS Code icon), 'demo.py 1' (with a Python icon), and 'Paramètres' (with a gear icon). Below the tabs, the file 'demo.py' is open, showing a code editor with line numbers 1 through 8. Line 1 contains the code 'x: int = 2'. Line 7 contains the code 'x + "a"', where a red squiggly line is under the '+' operator. A tooltip is displayed over the '+' operator, containing the text 'Unsupported operand types for + ("int" and "str") mypy(error)' and a link 'Voir le problème' followed by the text 'Aucune solution disponible dans l'immédiat'.

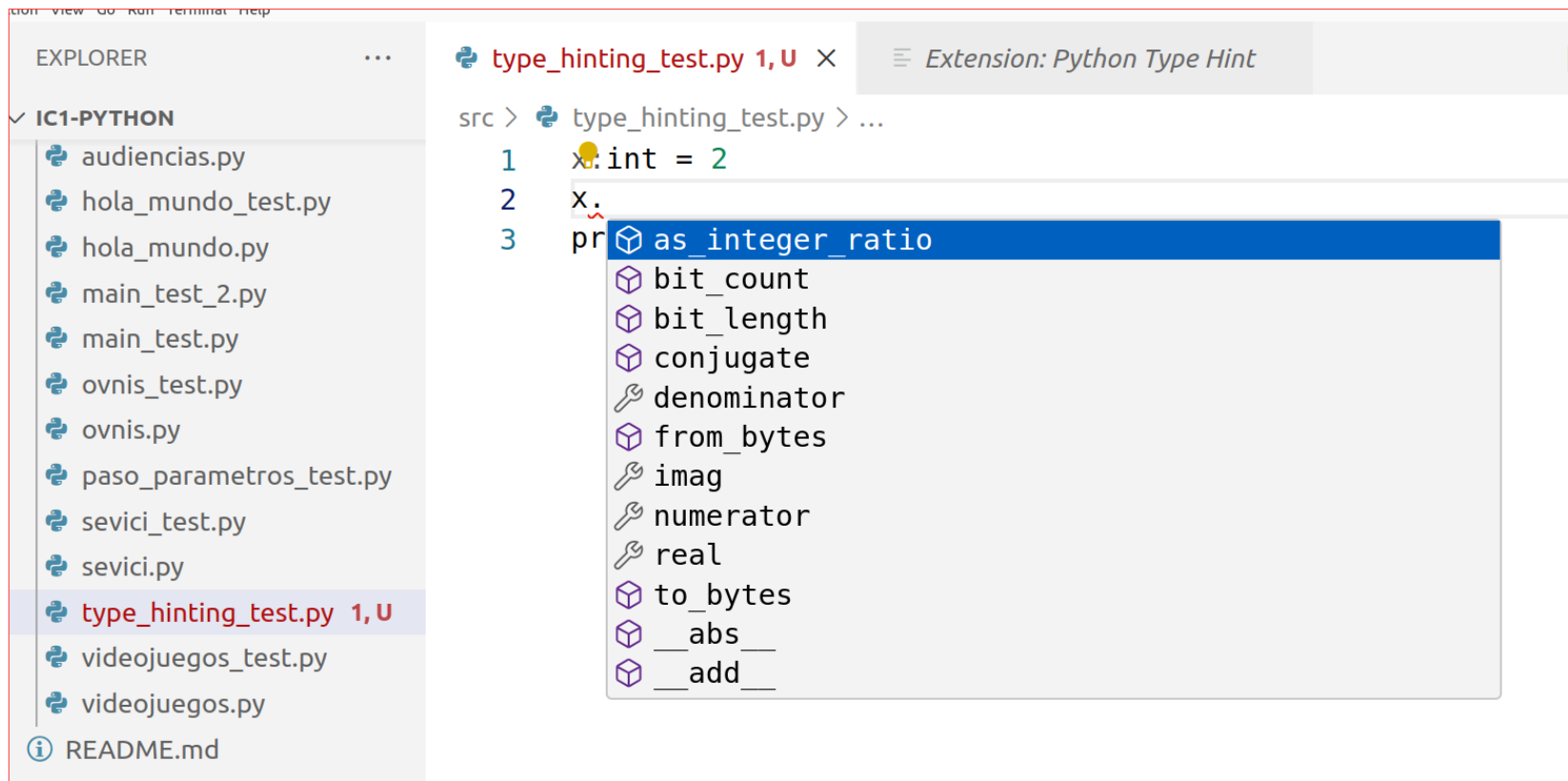
```
1 x: int = 2
2
3
4
5
6
7 x + "a"
8
```

Unsupported operand types for + ("int" and "str") mypy(error)  
Voir le problème Aucune solution disponible dans l'immédiat

<https://docs.python.org/3/library/typing.html>

<https://towardsdatascience.com/12-beginner-concepts-about-type-hints-to-improve-your-python-code-90f1ba0ac49>






File View Go Run Terminal Help

EXTENSION...    ...



**stylable-int...**  4K  5

Stylable Language Ser...

 Wix

Install




**Python ...**  466K  4.5

Type hint completion f...

njqdev

Install

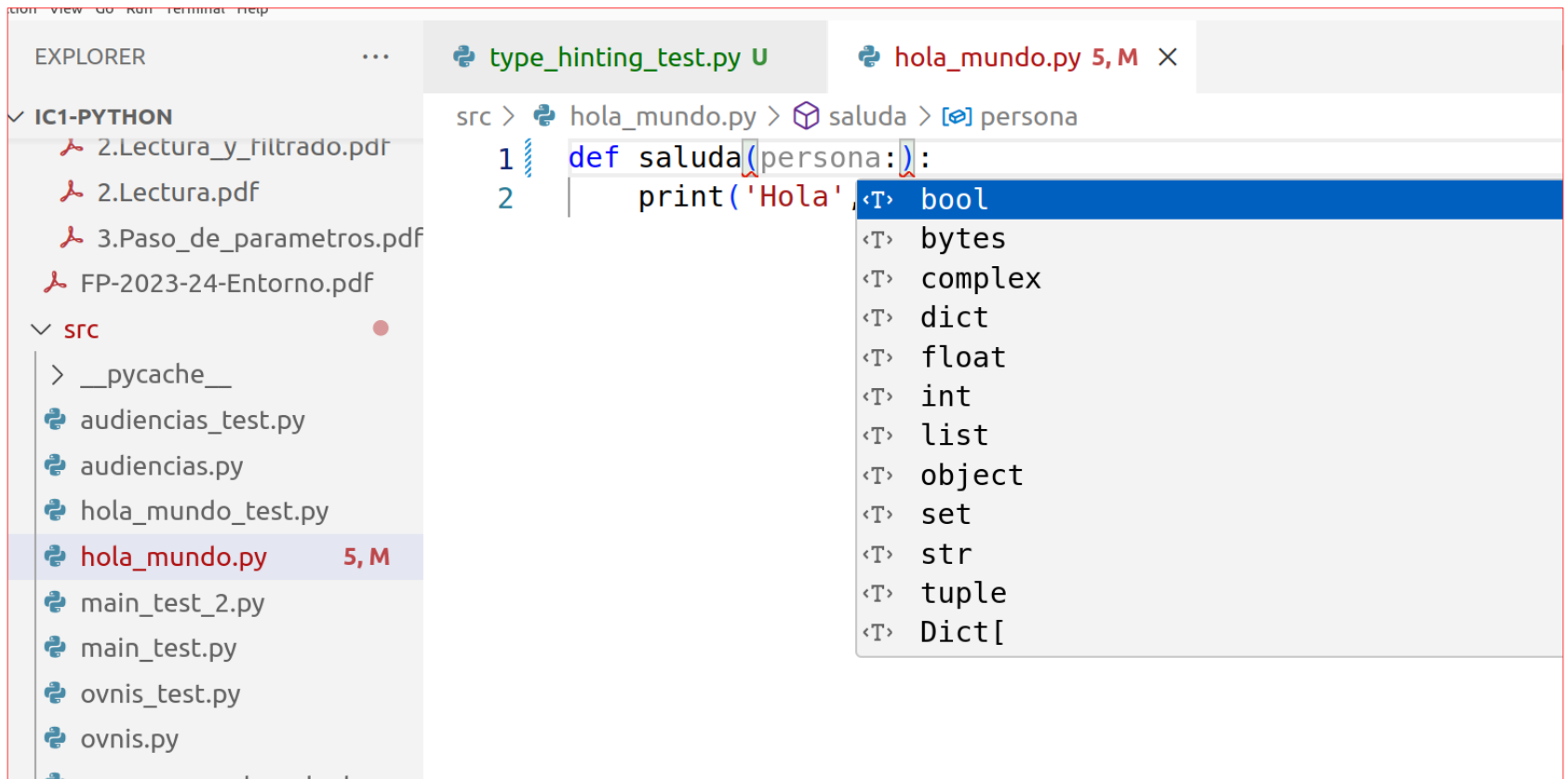
 type\_hinting\_test.py 

src >  type\_hinting\_test.py > ...

```
1 x:int = 2
2 len(x)
3 print(x + "hola")
```

**Python Type Hint** v1.5.1

Type hint completion for Python.



- NamedTuple

In Python 3.5(PEP 484)

```
Point = namedtuple('Point', ['x', 'y'])  
p = Point(x=1, y=2)
```

In Python 3.6(PEP 526)

```
from typing import NamedTuple
```

```
class Point(NamedTuple):  
    x: int  
    y: int  
p = Point(x=1, y=2)
```

```
# We can write pep484 style code in 3.6 backward compatibility
hour = 24 # type: int

# PEP 526 style
hour: int; hour = 24

hour: int = 24
```

# TAREA

- Notebooks de teoría 1, 2 y 3
- Modificar el código hecho hasta ahora para incorporar el typing.