

PyQB

Monga

Types,

doctests

Files

Programming in Python¹

Mattia Monga

Dip. di Informatica Università degli Studi di Milano, Italia mattia.monga@unimi.it

Academic year 2024/25, I semester

¹©⊙© 2024 M. Monga. Creative Commons Attribuzione — Condividi allo stesso modo 4.0 Internazionale. http://creativecommons.org/licenses/by-sa/4.0/deed.it

Make a program readable



Types,

docstrings,

doctests

PyQB

Monga

You never write a program only for a machine! You,

others, tools will *read* the program for different purposes. Every minute spent in making a program more understandable pays off hours saved later.

- Type hinting makes clear what a function needs to work properly, and what it produces
- Documentation helps understanding without the need to read implementation details
- Examples of use make easy to remember how to use a function and can be used for verification



PyQB Monga

55

Types,

docstrings,

doctests

def cube(x: Num) -> Num:
"""Return the cube of x.

>>> cube(-3) -27

Num = int | float

Example

>>> abs(cube(0.2) - 0.008) < 10e-5 True """

return x * x * x

Examples can be tested by: python -m doctest filename.py.



PyQB

A file is an abstraction the operating system uses to preserve data among the execution of programs. Data must be accessed **sequentially**. (Italian reading people might enjoy this)

Monga Types, docstrings, doctests

Files

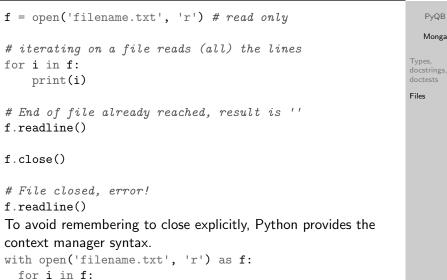
- We need commands to ask to the OS to give access to a file (open).
- It is easy to read or write data sequentially, otherwise you need special commands (seek) to move the file "cursor"
- The number of open files is limited (≈ thousands), thus it is better to close files when they are not in use

Files contain bits (normally considered by group of bytes, 8 bits), the interpretation ("format") is given by the programs which manipulate them. However, "lines of printable characters" (plain text) is a rather universal/predefined interpretation, normally the easiest to program.

58

File read access

print(i)



59