

PyQB

Monga

docstrings

doctests

# Programming in Python<sup>1</sup>

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# Files

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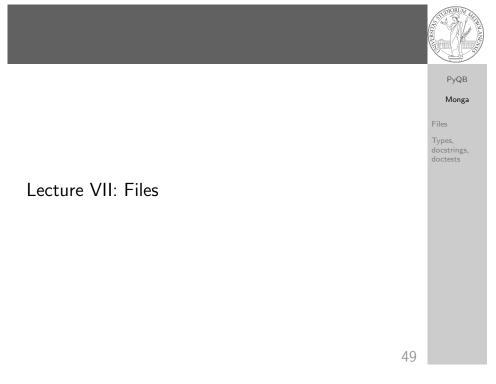
A file is an abstraction the operating system uses to preserve data among the execution of programs. Data must be accessed **sequentially**. (Italian reading people might enjoy this)

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- 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.



# File read access

print(i)

f = open('filename.txt', 'r') # read only
# iterating on a file reads (all) the lines
for i in f:
 print(i)
# End of file already reached, result is ''
f.readline()
f.close()
# File closed, error!
f.readline()
To avoid remembering to close explicitly, Python provides the
context manager syntax.
with open('filename.txt', 'r') as f:
 for i in f:

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# Make a program readable



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# 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

# Example



# from typing import Union Num = Union[int, float] def cube(x: Num) -> Num: """Return the cube of x. >>> cube(-3) -27 >>> abs(cube(0.2) - 0.008) < 10e-5 True """ return x \* x \* x Examples can be tested by:</pre>

python -m doctest filename.py.

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