

INTRODUCTION TO PYTHON

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WHY PYTHON?

- Python is an interpreted programming language, widely used in multiple environments, especially data science.
- The learning curve is fast and there are currently a large number of libraries that allow the development of countless tasks.

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WHAT MEANS INTERPRETED?

- Exists 2 kind of programs:
- Native compiled programs: They are wrote in a medium - high level programming languages (human readable code) and then:
 - Compiled: They are converted from human readable code to machine readable code.
 - In this step analyse the code, defines variables and kind of variables and check possible execution errors (not logical errors)
 - Linked: look for libraries to be executed and check all the procedures and methods exists
 - Now, it is able to run in the machine, without needs any other program (except Operating System)
 - Hardwired to the processor architecture:
 - A Intel compiled program is not directly compatible with Apple Silicon*



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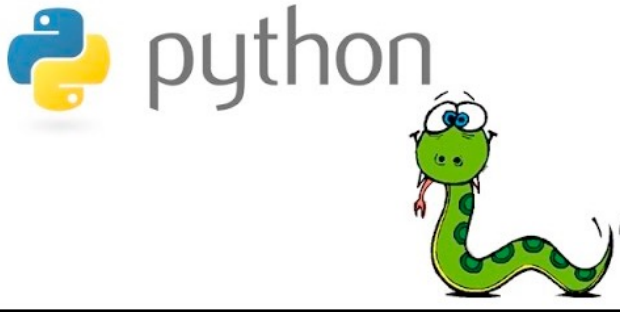
INTERPRETED PROGRAMMING LANGUAGES

- They are high level programming languages to run line by line
- Needs an "interpreter"
 - Python interpreter
 - Javascript interpreter
- Decode an execute line by line, and stop if they found any error in execution.
- Execution very slow:
 - Needs to read line, decode (convert to machine language), lookup for variables and values, execute the line and convert results to human readable.
 - JIT: Just In Time compilation
- The wrote program is universal: It can be executed if the interpreter is available for the native processor.



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WHY PYTHON



- Cost/Profits ratio high:
 - Smooth learning curve
 - Fast interpreter (not the better, not the worse).
 - A lot of libraries and tools for several tasks
 - Scientific
 - Control
 - Economic
 - Maybe have too many libraries

PROBLEMS WITH PYTHON

- Interpreter is single execution thread
 - Use library called multiprocessing
 - Extensions to improve libraries execution (swifter for pandas)
- Slow execution
 - Compile the final code to native using cython
 - Call-backs to c/c++ libraries (NumPy)

JUPYTER NOTEBOOKS

- Nice interface to develop
 - In data analysis the Data Engineer has to analyse a sample of data and applying a first model of his algorithms to check if it works or not.
 - Jupyter Notebooks are a nice interface using Web Browser to analyse, document and check code
- Cons:
 - Unstructured coding
 - Variables and functions wrote when the user wants

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IN THE BEGINNING WAS THE COMMAND LINE

- Why use command line:
 - Debugging purpose:
 - Many error messages will be write in the console.
 - If uses frontends like Anaconda Browser, those messages are not available for the user
 - Recommendation: Use the command line.
 - Terminal in MacOS / Linux / *NIX
 - PowerShell in Windows

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FIRST PRACTICAL WORK

- Introduction to Python:
 - How to code, write comments, use Jupyter Notebook interface
 - How to import libraries
 - How to read and write files
 - Check the command line messages

