Installing Python

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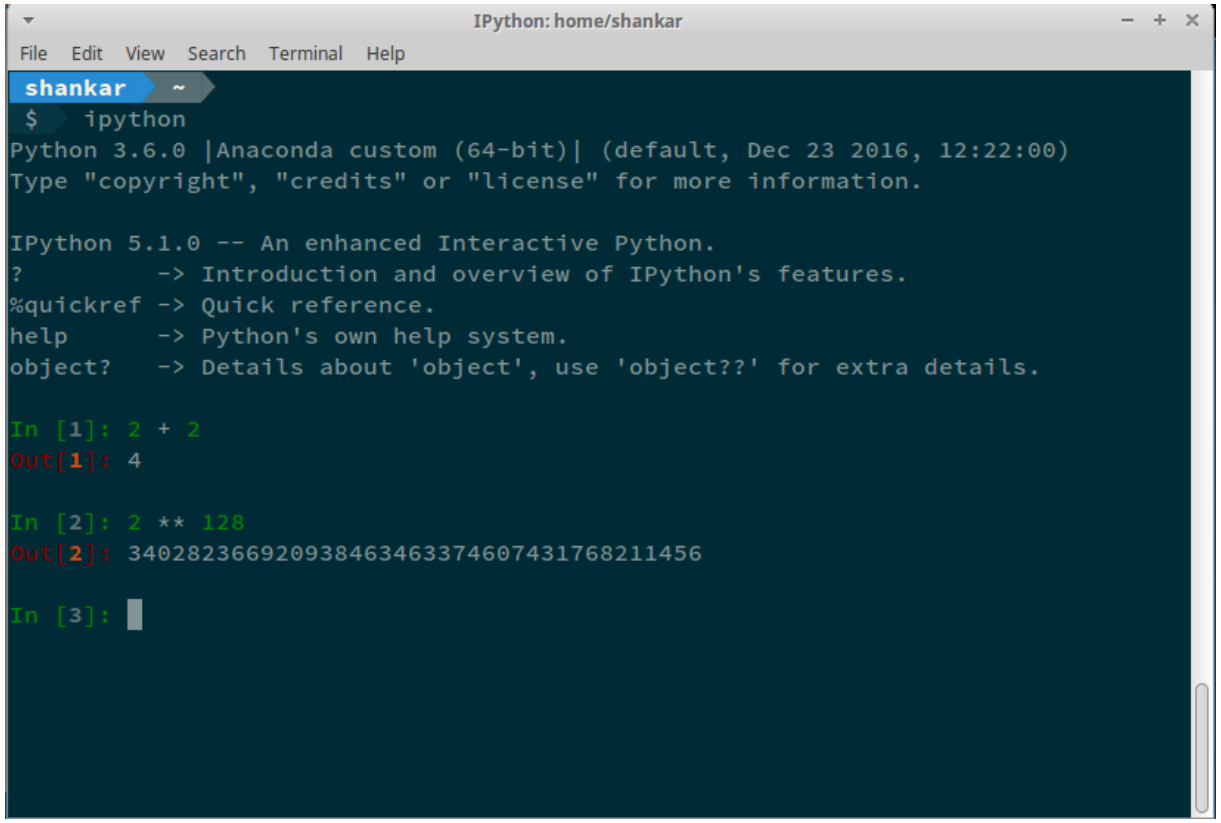
Get Scientific Python!

- Python is a general language, but we care about the science!
- Use the Anaconda distribution
- Includes everything we need

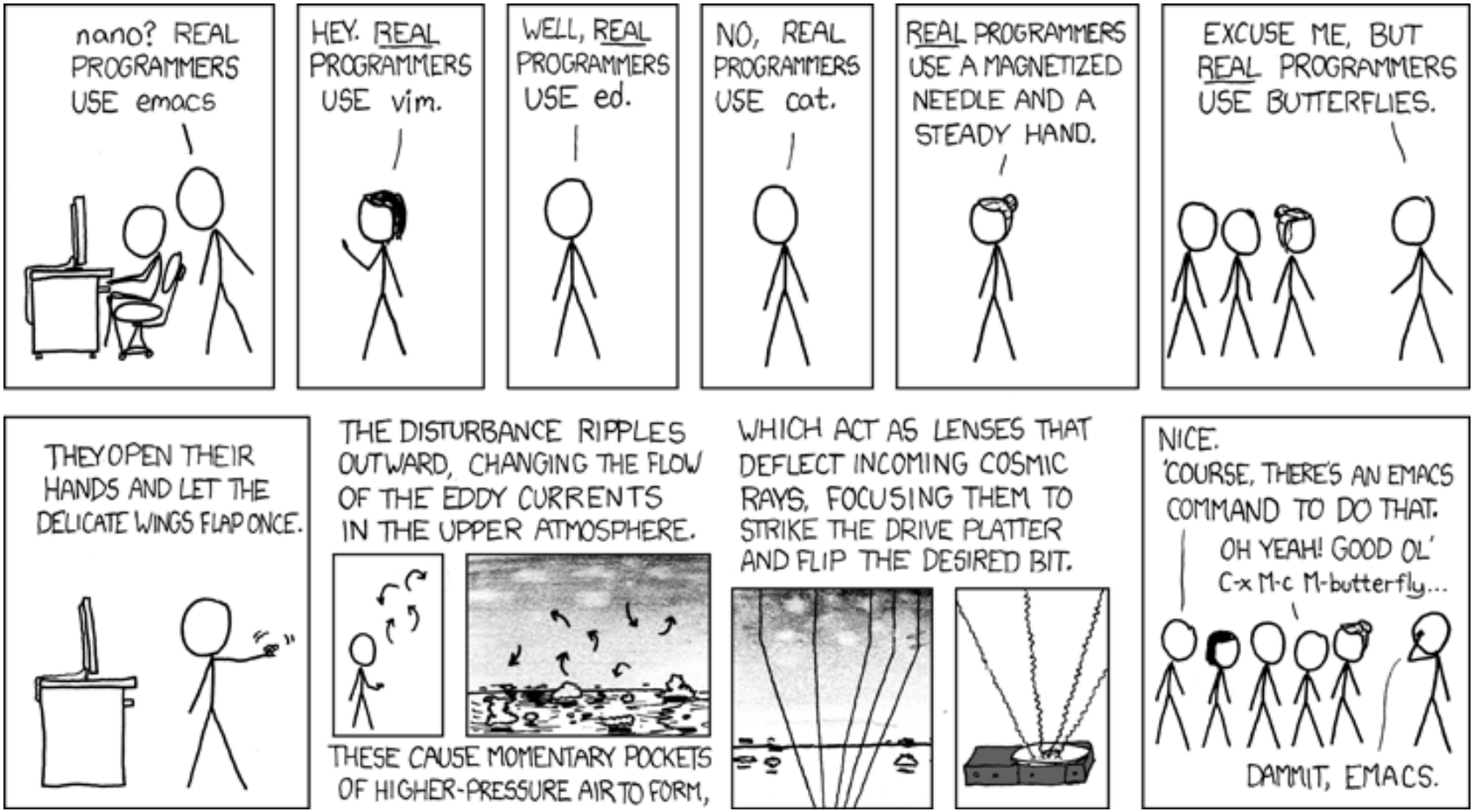
Figure: You want Python 3

Using Python

- Only need to use the "command line" and a text editor
  - Win - `cmd`, OSX - `Terminal`, Linux
  - Atom, Sublime, Notepad++
    - Use 4 spaces instead of tabs



Real Programmers



History of Python

- Guido van Rossum started creating Python in 1989

> Over six years ago, in December 1989, I was looking for a "hobby" programming project that would keep me occupied during the week around Christmas. . . . I chose Python as a working title for the project, being in a slightly irreverent mood (and a big fan of Monty Python's Flying Circus).

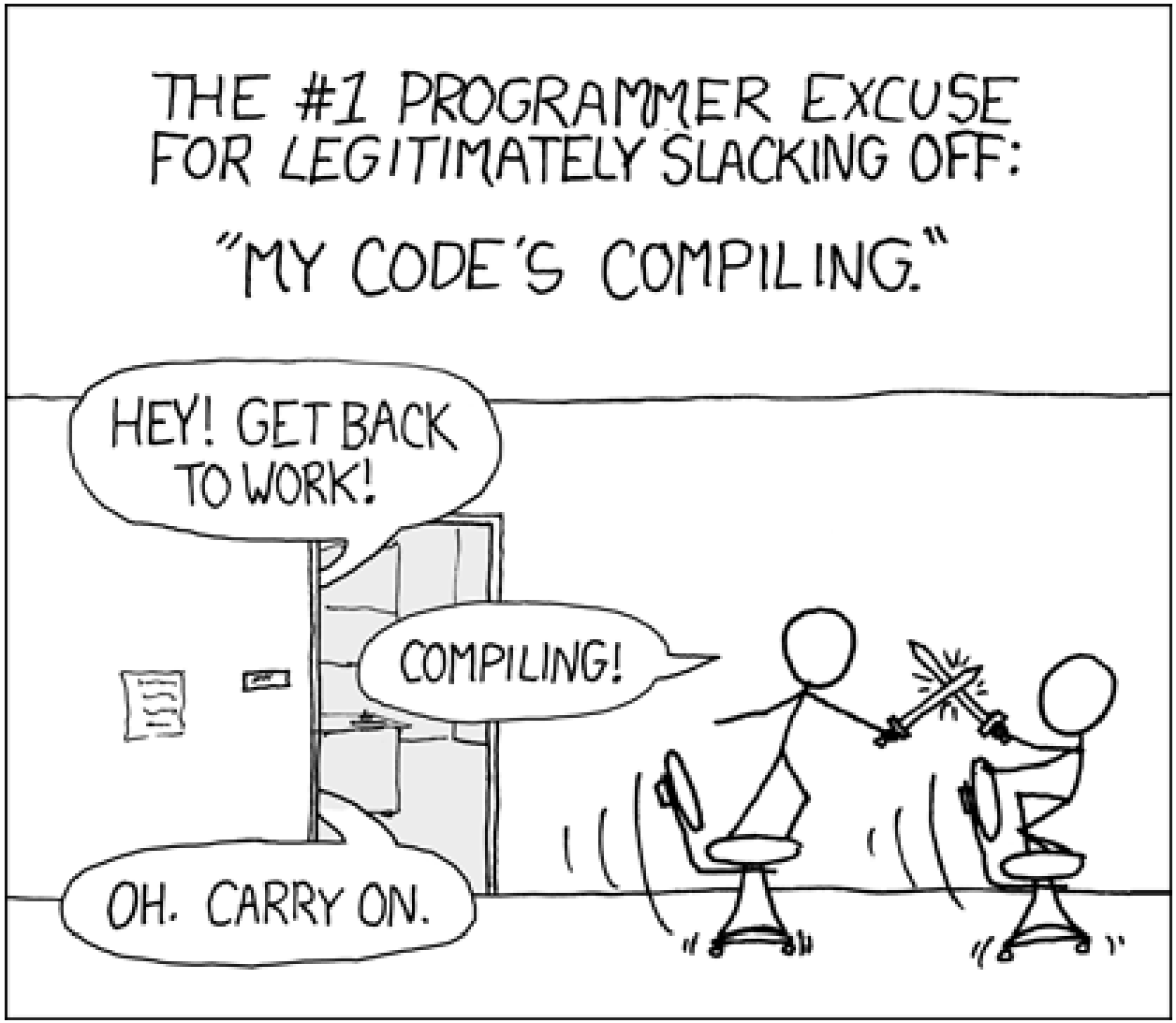
Figure: "Benevolent Dictator For

What is Python?

Python is a modern, general-purpose, object-oriented, high-level language.

- *clean and simple language*: Easy to read and easy to learn syntax
- *expressive language*: Fewer lines of code = fewer mistakes
- *dynamically typed*: no need to define variable types or function arguments
- *automatic memory management*: no need to allocate/deallocate memory
- *interpreted*: No need to compile! Fast and easy

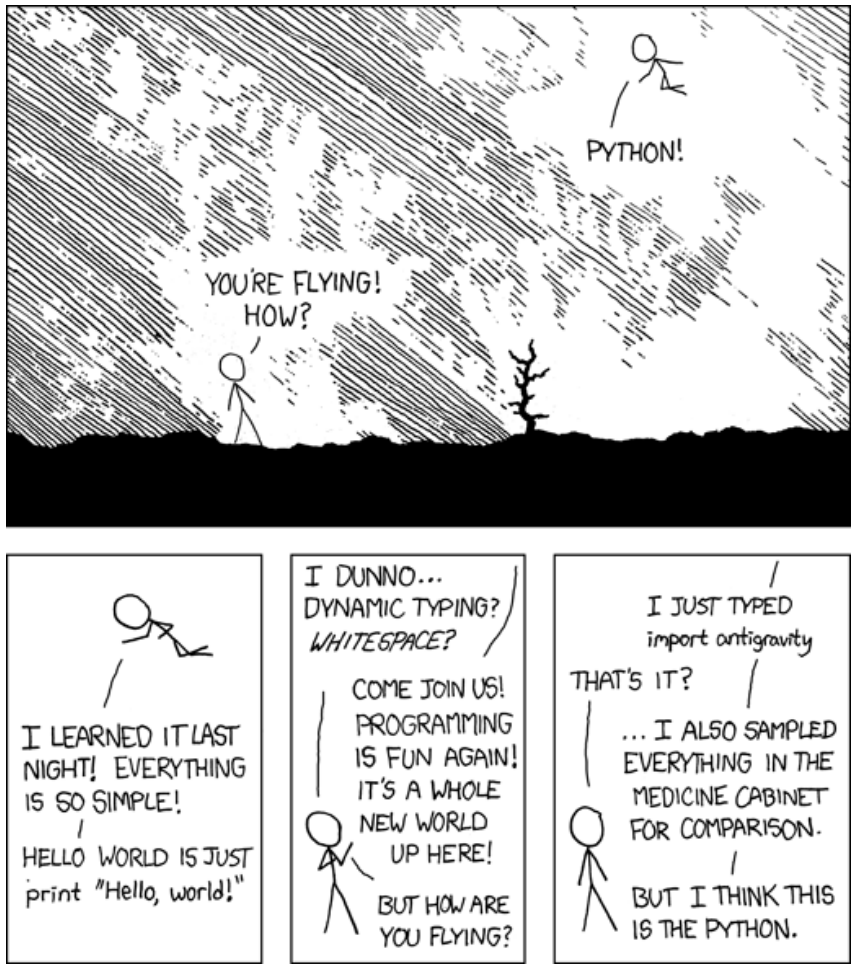
No more compiling!



Why Python?

- Free - free as in beer AND free as in speech
- General purpose - packages/modules for everything!
- Dynamic - no compiling
- Easy to read - enforces good structure!
- Open - everything is an object

It's harder to read code than to write it!



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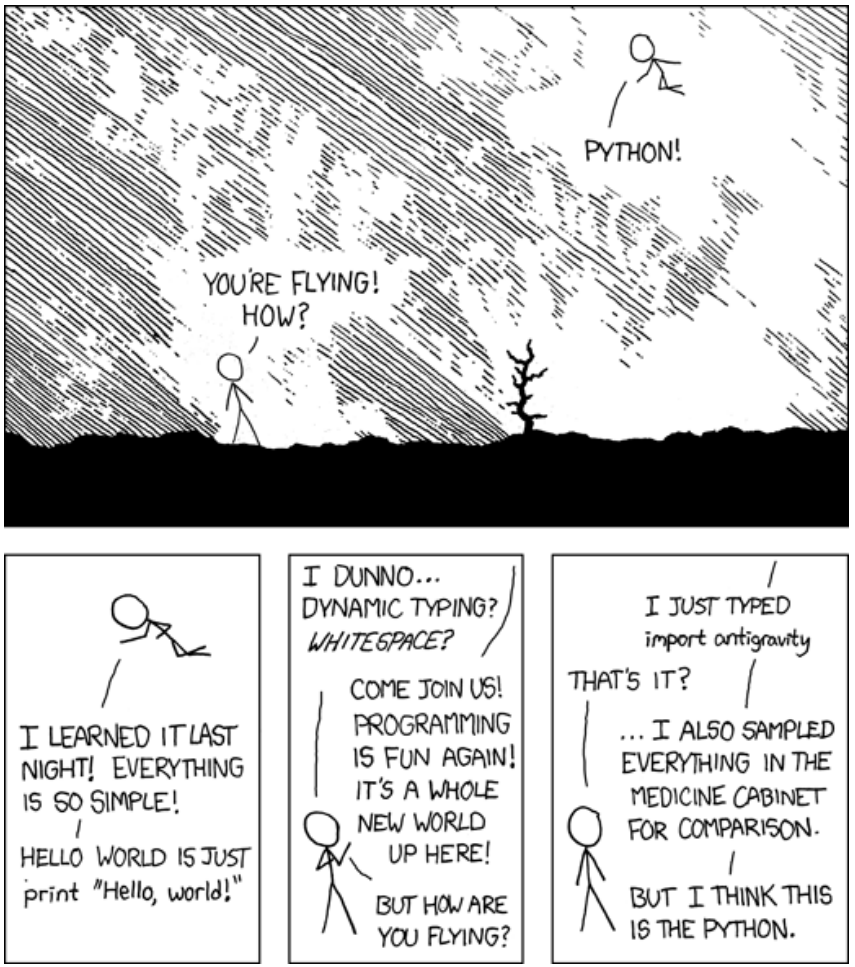
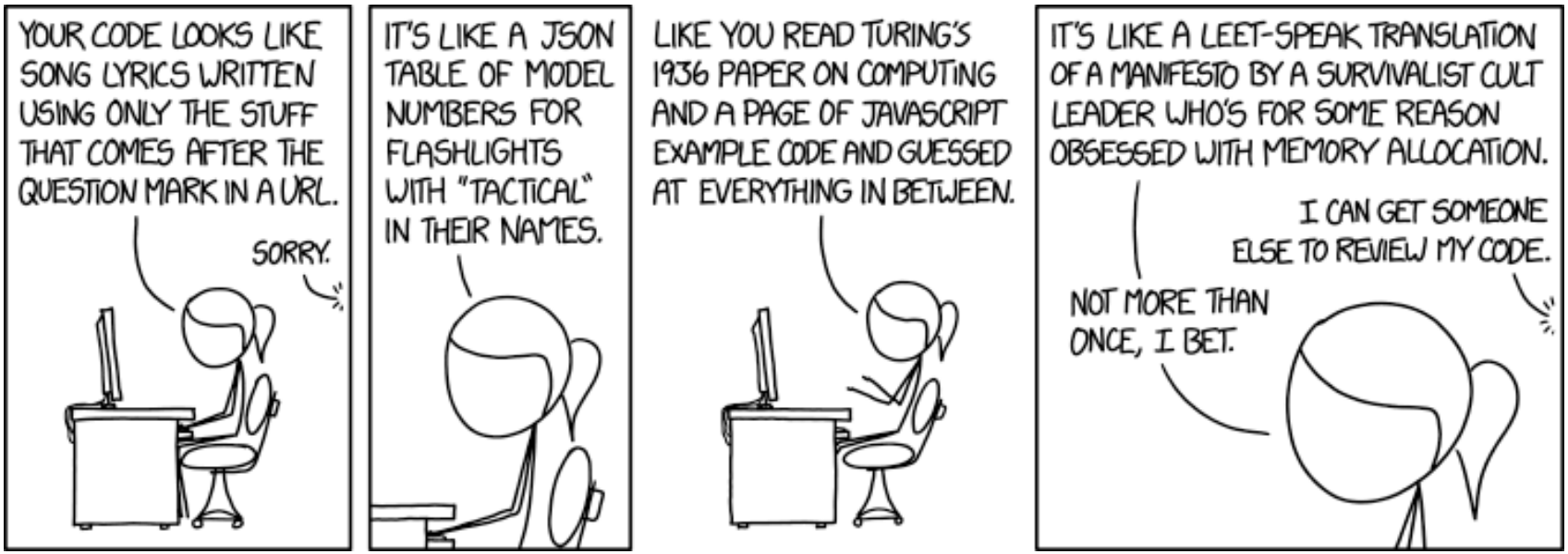


Reading bad code



Python vs. Matlab

Disadvantages:

- Matlab is a commercial product - entire computing environment with code, IDE
- Matlab is expensive - Between $49 - $2150 per license! Extra for toolboxes
- Matlab is proprietary - Cannot inspect source code and restrictions on sharing
- Matlab is closed - difficult to extend functionality

Advantages:

- Matlab handles arrays automatically and by design
- Lots of functionality - control design, linear algebra, optimization, ODEs etc.
- Real engineers (with funding) use it so students have to as well
- Simulink is still unmatched
- Powerful plotting capability

Python can offer all of the same functionality and some extra!

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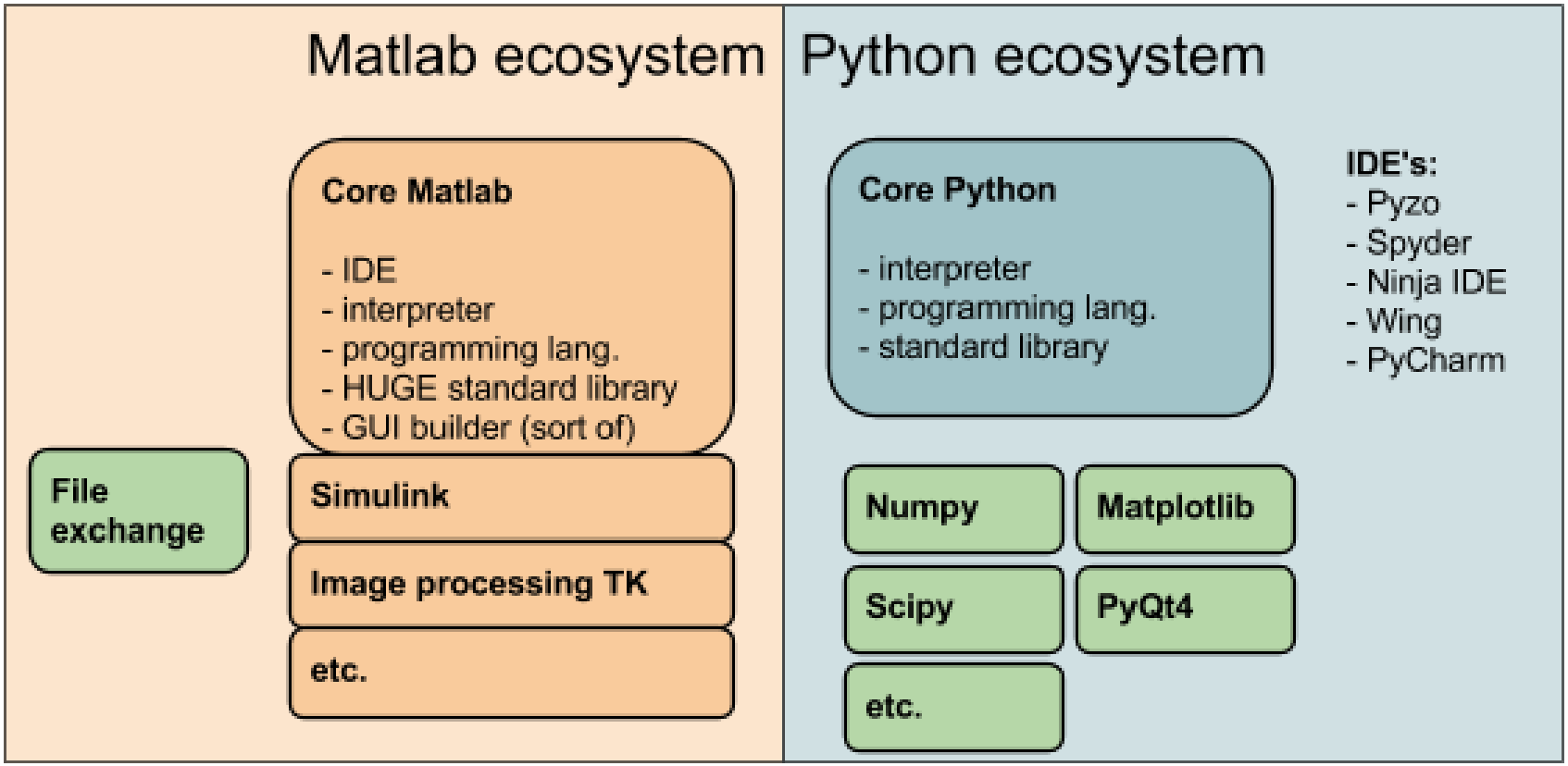

Learning Python 3

- We have Python installed from Anaconda
- There are many, many free Python tutorials online
  - Learn Python 3 the Hard Way
  - Python Tutorial
  - Go through these to learn the basics of Python!