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

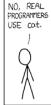
```
IPython: home/shankar
File Edit View Search Terminal Help
shankar ~
```

Real Programmers













THEY OPEN THEIR HANDS AND LET THE DELICATE WINGS FLAP ONCE.



THE DISTURBANCE RIPPLES OUTWARD, CHANGING THE FLOW OF THE EDDY CURRENTS IN THE UPPER ATMOSPHERE.





THESE CAUSE MOMENTARY POCKETS OF HIGHER-PRESSURE AIR TO FORM,

WHICH ACT AS LENSES THAT DEFLECT INCOMING COSMIC RAYS, FOCUSING THEM TO STRIKE THE DRIVE PLATTER AND FLIP THE DESIRED BIT.





NICE:
COURSE, THERE'S AN EMACS
COMMAND TO DO THAT.
OH YEAH! GOOD OL'
C~ I're I'r-butterfly...

DAMMIT, EMACS.

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).



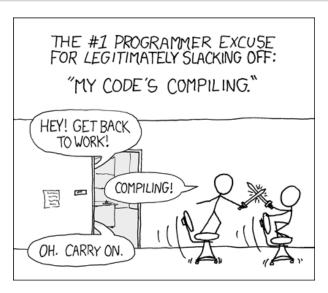
Figure: "Benevolent Dictator For

What is Python?

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

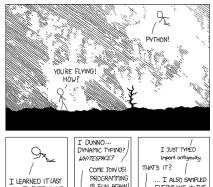
- clean and simple language: Easy to read and easy to learn syntax
- expressive language: Fewer lines of code = fewer mistakes
- dynamically typed: no need to define variable types or function arguments
- automatic memory management: no need to allocate/deallocate memory
- interpreted: No need to compile!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







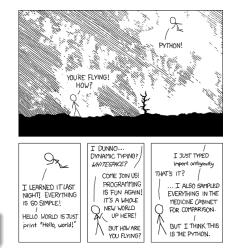
YOU FLYING?



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



Reading bad code

YOUR CODE LOOKS LIKE SONG LYRICS WRITTEN USING ONLY THE STUFF THAT COMES AFTER THE QUESTION MARK IN A URL



NUMBERS FOR FLASHLIGHTS WITH "TACTICAL" IN THEIR NAMES.

TABLE OF MODEL

IT'S LIKE A JSON LIKE YOU READ TURING'S 1936 PAPER ON COMPUTING AND A PAGE OF JAVASCRIPT EXAMPLE CODE AND GUESSED AT EVERYTHING IN BETWEEN.



IT'S LIKE A LEET-SPEAK TRANSLATION OF A MANIFESTO BY A SURVIVALIST CULT LEADER WHO'S FOR SOME REASON OBSESSED WITH MEMORY ALLOCATION.



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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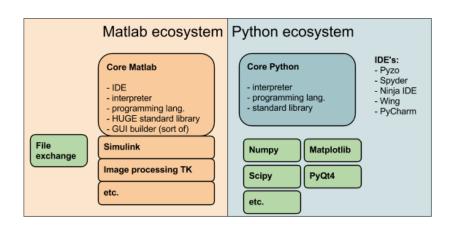
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Learning Python 3

- 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!