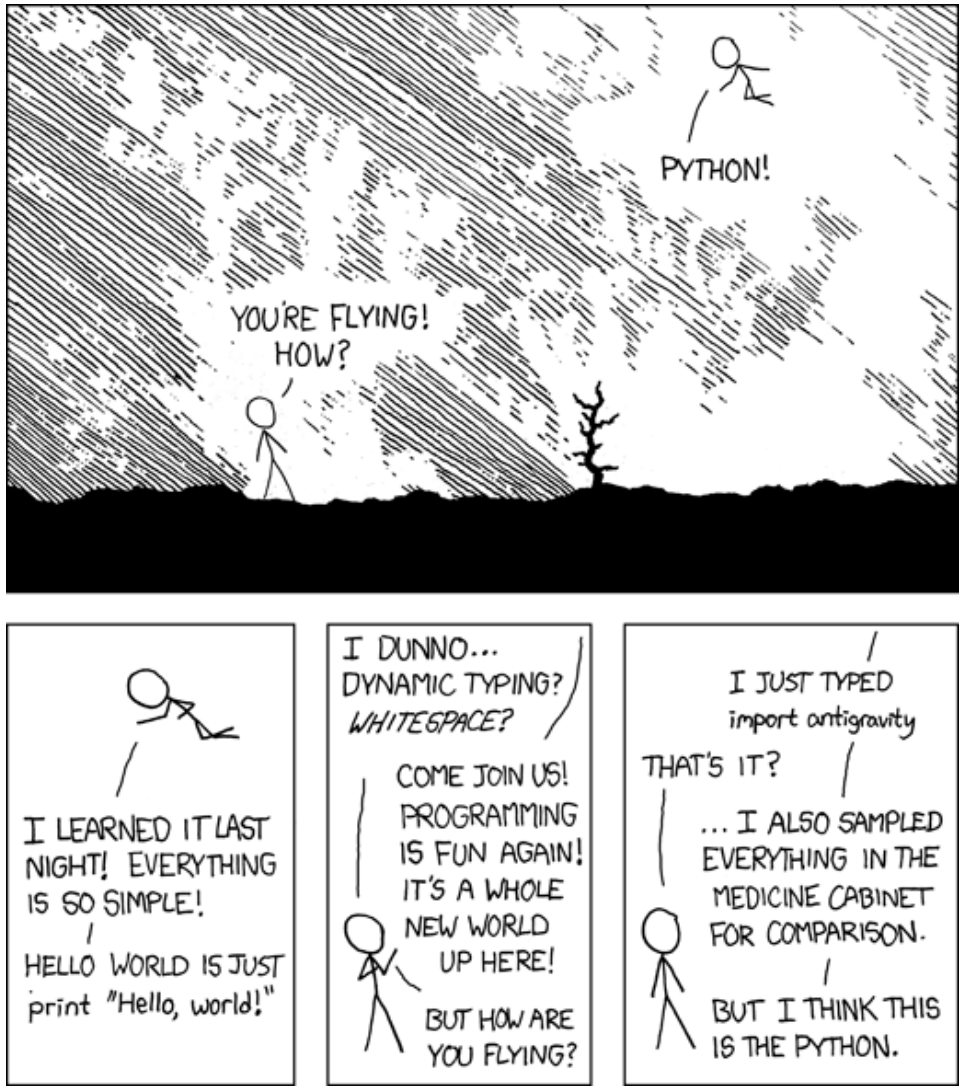
Introduction to Python

Python gives you wings!



http://xkcd.com/353/

The Python Language

- Python is a general-purpose programming language, meaning you can write any kind of program in Python
  - The opposite of a general purpose language is a domain-specific language, which is designed for one kind of application. Later we'll learn a domain-specific langauge called SQL which is just for manipulating relational databases.
- Python is interpreted, meaning you can run programs directly after you write them; you don't have to compile programs to some intermediate form for the operating system or a virtual machine to execute.

The coolest thing about Python ...

The Python Name

https://en.wikipedia.org/w/index.php?curid=6130072

Python was named for Monty Python, of which Python's creator, Guido van Rossum, is a big fan.

The ‘python‘ Program

Practically speaking, Python is a program on your computer that interprets Python programs and statements.

- You can ask ‘python3‘ a question without running any Python code. For example, this is how you ask which version of Python is installed (Note: the ‘$‘ character is the command prompt in the Unix Bash shell. The Windows command prompt is ‘C:\>‘.):

```
$ python --version
Python 3.5.2 :: Continuum Analytics, Inc.
```

  If you get some other response, like command not found, then you haven't properly installed Python.

Executing Python Code

- You can run a Python program, which has a .py extension by convention:

```
$ python myprogram.py
```

- Or you can invoke the interactive Python shell (sometimes called REPL for "Read-Eval-Print Loop"):

```
$ python3
Python 3.5.2 |Continuum Analytics, Inc.| (default, Jul 2 2016, 17:53:06)
[GCC 4.4.7 20120313 (Red Hat 4.4.7-1)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

To exit the Python shell type Ctrl-D on Unix, or Ctrl-Z on Windows.

Hello, Python

Since Kernighan and Ritchie's "The C Programming Language" it's customary for your first program in a new language to be "Hello, world!"

- Open your text editor, paste the following code into a buffer (or tab or window or whatever your editor calls it), and save it as ‘hello.py‘:

```
print("Hello, world!")
```

- Then open your command shell (terminal on Unix or CMD.exe on Windows), go to the directory where you saved ‘hello.py‘ and enter:

```
$ python3 hello.py
```

Hello, world! will be printed to the console on the next line.

Interpreting Python Programs

What happens when we enter ‘python3 hello.py‘ at an operating system command shell prompt?

1. ‘python3‘ tells the OS to load the Python interpreter into memory and run it. ‘python3‘ is the name of an executable file on your hard disk which your OS can find because its directory is on the ‘PATH‘
2. We invoke ‘python3‘ with a command line argument, which ‘python3‘ reads after it starts running
3. Since the command line argument was the name of a file (‘hello.py‘), the ‘python3‘ loads the file named by the argument and executes the Python code in it.

A Python program, or script, is just a sequence of Python statements and expressions.

The Python REPL

Invoke the Python interactive shell by entering python3 at your command shell's prompt without any arguments and type in the same line we put in hello.py:

```
$ python3
Python 3.5.2 |Continuum Analytics, Inc.| (default, Jul 2 2016, 17:53:06)
[GCC 4.4.7 20120313 (Red Hat 4.4.7-1)] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

'»>' is the command prompt for the Python REPL.

- REPL stands for *R*ead *E*val *P*rint *L*oop – *R*ead an expression or statement at the command prompt, *E*valuate the expression or execute the statement, *P*rint the result to the console, *L*oop back to *R*ead step

We'll spend a lot of time in the REPL.