Introduction to Python

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What is Python?

A high level scripting language

▶ Interpreted: no compiling or linking necessary, rapid development

▶ Available on Windows, Unix, MacOS

▶ Object-oriented, high level language features

▶ A large collection of useful modules

    ▶ e.g. networking, databases, maths, regular expressions, ...

An interactive interpreter

▶ can use python as a calculator

▶ can try out sections of code while developing scripts

Why use Python?

Widely used in Scientific Computing and the world outside

▶ Often used to provide a front-end control system for various services

▶ can be used to provide a simple interface to complex systems

▶ Many experiments use python to provide user interface scripts or GUIs for things like batch production frameworks or grid job submission, e.g. Ganga

Easy to learn and use

▶ much easier than e.g. perl

▶ largely self-documenting

▶ modules can describe the functions they implement

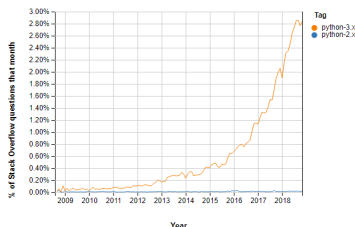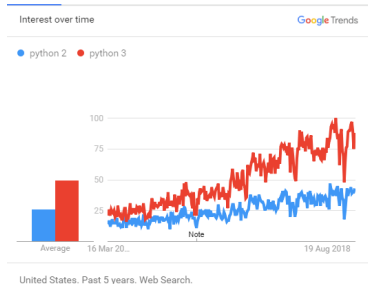▶ embedded comments can present themselves as documentation

Python is powerful
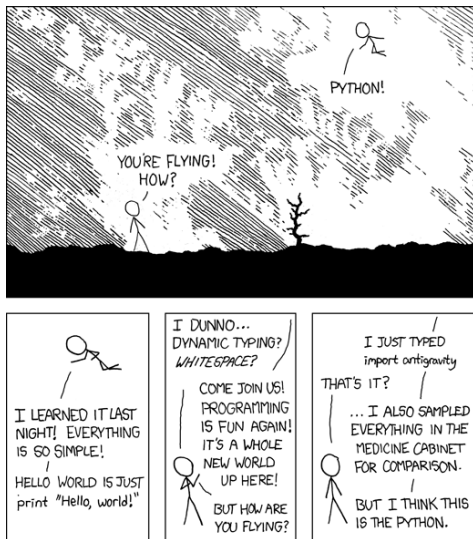
With great thanks to xkcd

But which Python to use?

There are two different flavours of Python in common use python2 and python3.

Points to consider:

- ▶ A lot of the world still uses python2.
- ▶ Python2 has not been supported since December 2019 ... but still carries on ... and on ...
- ▶ The world is moving to python3.
- ▶ Python3 is a much better programming language

Interest over time

Google Trends

● python 2   ● python 3

100

75

50

25

Average   16 Mar 20...   Note   19 Aug 2018

United States. Past 5 years. Web Search.

% of Stack Overflow questions that month

Tag
● python-3.x
● python-2.x

Year

What is the difference between python2 and python3?

There are many web pages that describe the differences one of the best (from which I grabbed the graphs) is https://tinyurl.com/yynbjsul.

The most obvious ones that you will find are `print` and integer mathematics. In python2 you have:

```
>>> print "Hallo cruel world"
Hallo cruel world
```

and

```
>>> 5/4
1
```

In python3 you have:

```
>>> print("Hallo happy world")
Hallo happy world
```

and

```
>>> 5/4
1.25
```

There are other differences (outlined on the link above) but if in doubt google will be your friend here.

You will be using python3 and these last two slides are only included in case you come across some python2 and don't understand why your modification subtly don't work

Now to Jupyter notebooks

You can (and will) write standalone python scripts. However, you will start by using jupyter notebooks. These are very useful for teaching, collaboration and many other things. They start off at a very basic level and will gradually teach you the things that we expect you to know when you start. Don't worry if you find them hard as there are plenty of additional online resources that you can use (google is your frirnd) and you will have plenty of support when you arrive at college.
Now try to work your way through:

- ▶ basic_python.ipynb
- ▶ lambda.ipynb
- ▶ exceptions.ipynb
- ▶ classes.ipynb