PYTHON FOR ASTRONOMY AND PLOTTING
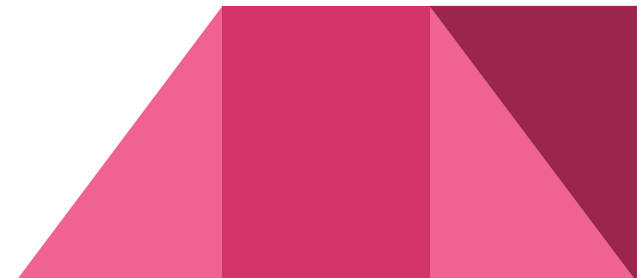
2016-01-10

PYTHON IN ASTRONOMY astropy

A Community Python Library for Astronomy

Until ~2012 python astronomy modules were scattered.

Several core modules are now unified under astropy:

- **astropy.wcs** (World coordinate system (WCS) supported by PyWCS.)

- **astropy.io.fits** (FITS files support supported by PyFITS.)

- **astropy.coordinates** (Celestial coordinate and time transformations.)

- **astropy.units** (Unit and physical quantity conversions, physical constants specific to astronomy.)
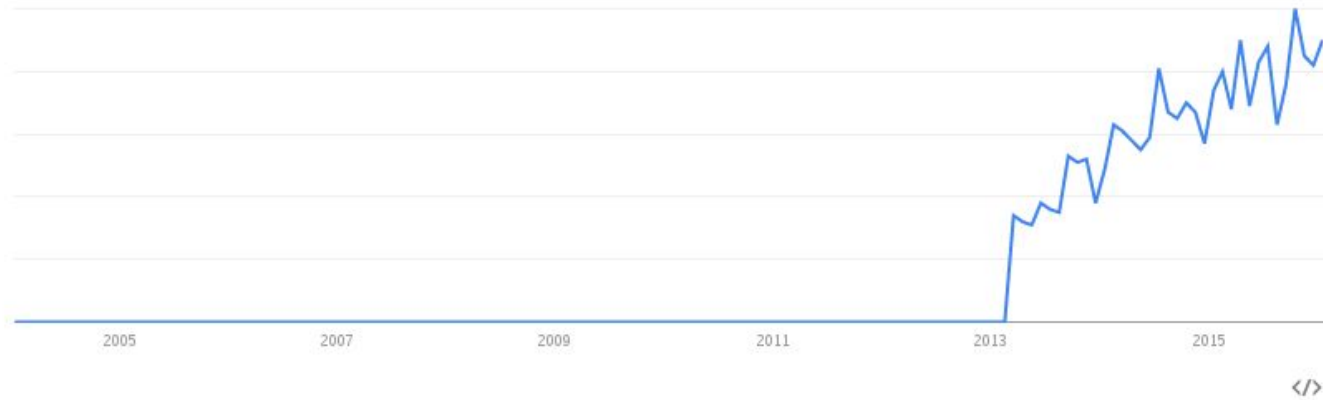
Compare
Search terms ▾

astropy	+ Add term
Search term	

Interest over time
☐ News headlines ⑦   ☐ forecast ⑦


```
2005        2007        2009        2011        2013        2015
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</>

Regional interest ⑦

Region | **Town/City**

United States   100 ▬▬▬

Symbolic/numerical/statistical packages
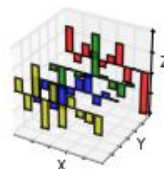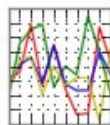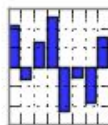
- symbolic
  - sympy
- numerical
  - numpy
  - scipy
- statistical
  - scikit-learn
 - pandas

Python plotting / visualising packages

- matplotlib
  - all-round, major plotting in python
- aplpy
  - fits image plotting in high quality
- yt
  - large data / volumetric data visualising
- bokeh
 - interactive plots in html & javascript

Python accessing external software

- mirpy
  - Python wrapper for MIRIAD commands.
- pyds9
  - Python connection to SAOimage DS9 via XPA
- your bash shell
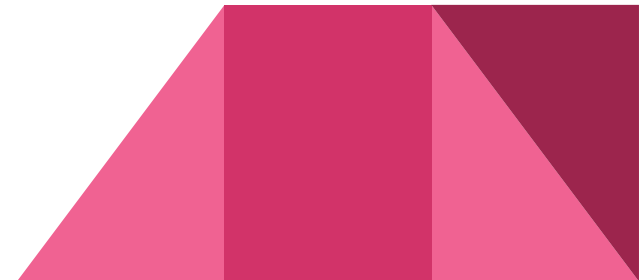
Demonstration

- Basic data structure :
  - String, List, tuple, dictionary
- Loop and function
- Matplotlib : Line / Scatter plot
- Astropy : Load fits
- APLpy : Fits image & colour map
- APLpy : 3 colour image
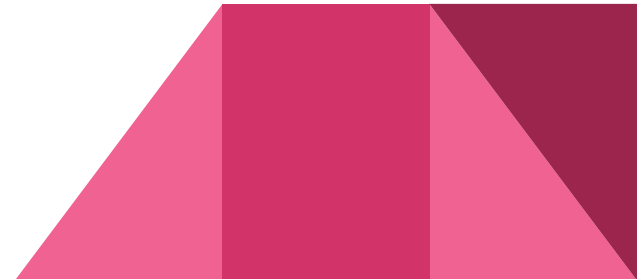
Basic data structure

- Tuple
- List
- Dictionary (dict)
- numpy array

everything in python is an object ==> call specific function of that object ==> dot operator