

# Python for POF

## *Workshop Series - Part 1*

---

**PLEASE CHOOSE A PARTNER AND SIT NEXT TO  
EACH OTHER**

**Better if Windows users sit together.**

**Linux / MacOS users can mingle**

# Acknowledgements



and many more ...

Thanks to the people who share

# Poll Time

Use of terminal

Programming (C, C++, Fortran, Java)

Windows users

## Part 1.1

- Understand version control
  - Make our first repository
  - Integrate it with github
  - Collaborate with a partner
- 

## Part 1.2

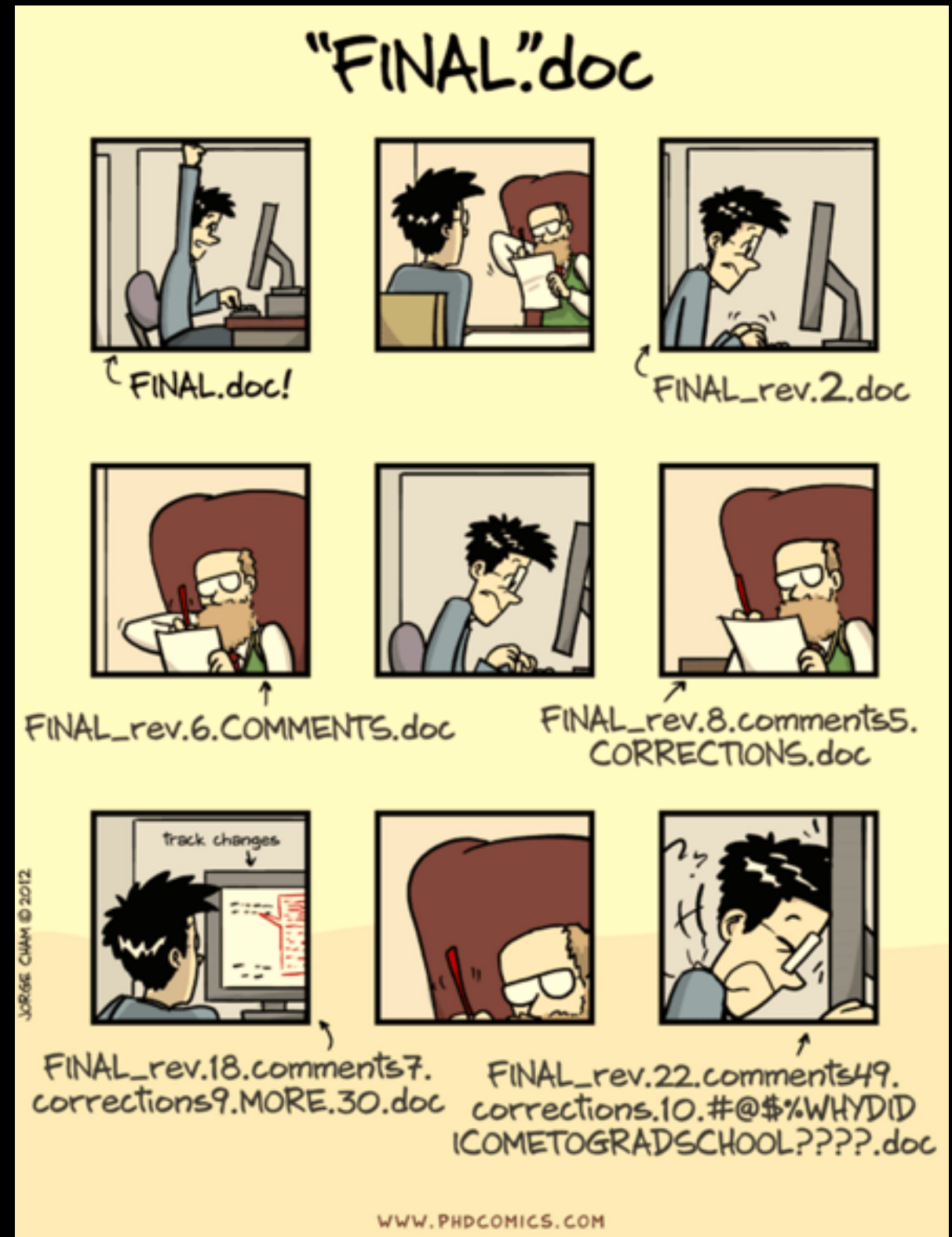
- Basics of python
  - Understand different features
  - Using jupyter notebook
- 

## Part 1.3

- Numpy
- Matplotlib
- Solving simple equations

# Version Control

- Large codes
- Scripts
- Text files
- .tex files
- png files (github)



# Version Control

Back up changing files

Store and access commented history

Manage branching and merging

---

**Time Machine !**  
**for research**



# Git

## Installation

```
🍺 vpn098157:~ which git  
/usr/local/bin/git
```

## Configure git

```
🍺 vpn098157:~ git config --global user.name "Vamsi Spandan"
```

```
🍺 vpn098157:~ git config --global user.email "email@email.com"
```

# Lets get started !

## UNDERSTANDING GIT ENVIRONMENT

*“All the world’s a stage; men and women are merely players”*

Shakespeare

*“All your folder is a stage; files are merely players”*

VS



# Lets get started !

my\_folder

- **Prepare the stage (folder)**

# Lets get started !

my\_folder

- file\_one.txt
- file\_two.txt
- file\_three.txt

- **Prepare the stage (folder)**
- **Recruit actors (files)**

# Lets get started !

my\_folder

- file\_one.txt
- file\_two.txt
- file\_three.txt

- **Prepare the stage (folder)**
- **Recruit actors (files)**
- **Stage the actors (files)**

# Lets get started !

my\_folder

- file\_one.txt
- file\_two.txt
- file\_three.txt

- **Prepare the stage (folder)**
- **Recruit actors (files)**
- **Stage the actors (files)**
- **Snapshot !**

# Lets get started !

my\_folder

- file\_one.txt
- file\_two.txt
- file\_three.txt

- **Prepare the stage (folder)**
- **Recruit actors (files)**
- **Stage the actors (files)**
- **Snapshot !**

**First commit !!!**

# Lets do it together

**Initialise git from a terminal in a directory**

**Open a terminal**

**cd Desktop**

# Managing your git folder

git status

check status of files

git log

check history

git checkout

to rewind to a specific snapshot

# Version Control , Open Science

Scientist collects some data

Write some programs to analyse

Write up paper, and submit (sometimes with data) [rarely code]

After O(months), reviews are back - modify scripts and reanalyse

Resubmit and paper is published



# Version Control , Open Science

Scientist collects some data (stored in an open repository)

Create a repository to hold the work

Repository has everything from scripts to .tex files

Preprint submitted to arXiv

After publishing - everything is available for reproduction

Open work is more widely cited and re-used !

# figshare

*share all your figures in a citable manner*



search on figshare



[Browse](#)

[Upload](#)

[Sign up](#)

[Log in](#)

store, share, discover **research**

get more citations for all of the outputs of your academic research  
over 5000 citations of figshare content to date

ALSO FOR INSTITUTIONS & PUBLISHERS

*"figshare wants to open up scientific data to the world"* **WIRED**

The background figure: [Merged NavCam images of Rosetta...](#) by [K.-Michael Aye](#) in [Planetary Science](#)



# Zenodo

*share your documentation*

[Upload](#)[Communities](#)[Log in](#)[Sign up](#)

## Recent uploads

December 2, 2016 Report Open Access

### Digital History Research Centre Annual Report 2016

Adam Crymble

The annual report of the activities of the Digital History Research Centre at the University of Hertfordshire (2015-16).

Uploaded on December 2, 2016.

[View](#)

February 19, 2012 Dataset Open Access

### Compact continuum source finding for next generation radio surveys

Hancock, P. J.; Murphy, T.; Gaensler, B. M.; Hopkins, A.; Curran, J. R.

This is a data set that accompanies the paper "Compact continuum source finding for next generation radio surveys" (2012MNRAS.422.1812H) The image files and source catalogues contained here were used to test the completeness and false detection rate of a number of source finding algorithms ...

Uploaded on December 2, 2016.

[View](#)

November 9, 2016 Dataset Open Access

### Controlling Business Object States in Business Process Models to Support Compliance

Ludmila Penicina

Business process model

Uploaded on December 2, 2016.

[View](#)

December 31, 2016 Figure Open Access

[View](#)

## Sep 12: Major update

Welcome to the improved Zenodo. See [what's new](#) and [known issues](#).



## Using GitHub?

Just [Log in](#) with your GitHub account and [click here](#) to start preserving your repositories.



## Zenodo in a nutshell

- **Research. Shared.** — all research outputs from across all fields of research are welcome! Sciences and Humanities, really!
- **Citeable. Discoverable.** — uploads gets a Digital Object Identifier (DOI) to make them easily and uniquely citeable.
- **Communities** — create and curate your own community for a workshop, project, department, journal, into which you can accept or reject uploads. Your own complete digital repository!
- **Funding** — identify grants, integrated in reporting lines for research funded by the European Commission via OpenAIRE.
- **Flexible licensing** — because not everything is under Creative Commons

# Make your code and documentation citable

<https://guides.github.com/activities/citable-code/>

End of Part 1

Time for a break



# Part 2

## Understanding the basics of python

Python 2

or

Python 3

2.7

3.5

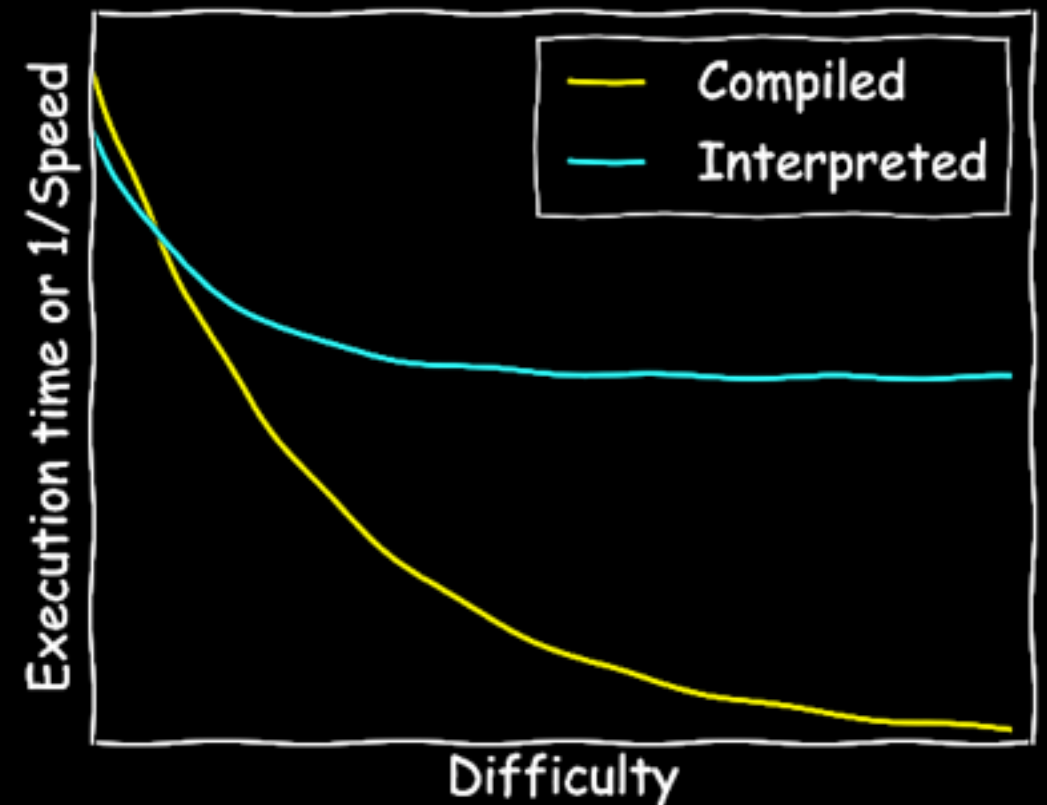
# Part 2

## Understanding the basics of python

Python is a interpreted language

Start the python interpreter

Type 'python' in your terminal



```
🍺 nadnaps-2:~ python
Python 3.5.2 |Anaconda custom (x86_64)| (default, Jul  2 2016, 17:52:12)
[GCC 4.2.1 Compatible Apple LLVM 4.2 (clang-425.0.28)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

# iPython console

```
🍺 nadnaps-2:~ ipython
WARNING: Attempting to work in a virtualenv. If you encounter problems, please install
IPython inside the virtualenv.
Python 3.5.2 |Anaconda custom (x86_64)| (default, Jul  2 2016, 17:52:12)
Type "copyright", "credits" or "license" for more information.

IPython 4.2.0 -- An enhanced Interactive Python.
?                -> Introduction and overview of IPython's features.
%quickref        -> Quick reference.
help             -> Python's own help system.
object?         -> Details about 'object', use 'object??' for extra details.

In [1]: 1 + 2
Out[1]: 3

In [2]: print('Hello')
Hello

In [3]: █
```



# Jupyter notebook

The image displays a Jupyter Notebook interface with a notebook titled "Lorenz Differential Equations (autosaved)". The notebook content includes:

## Exploring the Lorenz System

In this Notebook we explore the [Lorenz system](#) of differential equations:

$$\begin{aligned}\dot{x} &= \sigma(y - x) \\ \dot{y} &= \rho x - y - xz \\ \dot{z} &= -\beta z + xy\end{aligned}$$

This is one of the classic systems in non-linear differential equations. It exhibits a range of complex behaviors as the parameters  $(\sigma, \beta, \rho)$  are varied, including what are known as *chaotic solutions*. The system was originally developed as a simplified mathematical model for atmospheric convection in 1963.

In [7]: `interact(Lorenz, N=fixed(10), angle=(0.,360.),  
sigma=(0.0,50.0),beta=(0.,5), rho=(0.0,50.0));`

The interactive widget shows sliders for the following parameters:


- angle: 308.2
- max\_time: 12
- $\sigma$ : 10
- $\beta$ : 2.6
- $\rho$ : 28


Below the sliders is a plot of the Lorenz attractor, showing the characteristic butterfly shape with multiple colored trajectories.

The background Jupyter interface shows a "Welcome to the Jupyter Notebook Server" message and a warning: "WARNING: Don't rely on this server. Your server is hosted on a public IP address." Below this, it says "Run some Python code" and provides instructions: "1. Click on the cell to select it. 2. Press SHIFT+ENTER to run the code." It also mentions "A full tutorial for using the Jupyter Notebook is available at [https://jupyter.org/](#)".

In [ ]: `matplotlib inline  
import pandas as pd  
import numpy as np  
import matplotlib`

# Everything under one roof Navigator

 **ANACONDA NAVIGATOR** BETA

 [Sign in to Anaconda Cloud](#)

[Home](#)

[Environments](#)

[Learning](#)




[Community](#)

Navigator

[Documentation](#)


[Developer Blog](#)

[Feedback](#)

### My Applications

Refresh




jupyter  
notebook

4.2.1

Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.

[Launch](#)




IP[y]:  
qtconsole

4.2.1

PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.

[Launch](#)

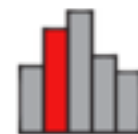


spyder

2.3.9

Scientific PYTHON Development EnviRonment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features

[Launch](#)



glueviz

0.9.1

Multidimensional data visualization across files. Explore relationships within and among related datasets.

[Install](#)

spyder

*matlab like development environment*

# Next steps

# Excellent tutorials online

Numpy, Sci-Py, Matplotlib, Sci-Kit-Image, Machine Learning and many more  
Youtube channel of 'Enthought'


The screenshot displays the Enthought YouTube channel interface. At the top, there is a search bar and navigation links for Home, Videos, Playlists, Channels, Discussion, and About. The 'Playlists' tab is selected. Below the navigation bar, the page shows a grid of video playlists. Each playlist card includes a thumbnail image, the number of videos in the playlist, and the playlist title. The playlists are arranged in three rows. The first row contains five playlists, the second row contains five playlists, and the third row contains two playlists. The playlists include:

- SciPy 2016: Scientific Computing with Python Conference (92 VIDEOS)
- Enthought Webinars (6 VIDEOS)
- Enthought Canopy: Python Distribution and Integrated (9 VIDEOS)
- Enthought Python Training on Demand (20 VIDEOS)
- Enthought Canopy Geoscience (3 VIDEOS)
- Enthought Python Software Consulting Projects (8 VIDEOS)
- EuroSciPy 2015: European Scientific Computing with Python (32 VIDEOS)
- SciPy 2015: Scientific Computing with Python Conference (116 VIDEOS)
- EuroSciPy 2014 (22 VIDEOS)
- SciPy 2014: Scientific Computing with Python (121 VIDEOS)
- SciPy 2013: Scientific Computing with Python (33 VIDEOS)
- Favorites (10 VIDEOS)


# Use stack overflow

StackExchange

1+10

 11 • 1 help

Search Q&A




QuestionsJobsDocumentationBetaTagsUsersBadgesAsk Question

## Announcing Developer Story

You're more than your resume. Show off what you've built.

[Check out my Developer Story →](#)



Dismiss

Top Questions

interesting385featuredhotweekmonth

0votes

0answers

1view

Remove decimal point from currency using Regex?

javascriptregex

asked 58 secs agoManiram 132

0votes

0answers

2views

How to achieve language switch in i18next plugin?

javascriptbackbone.jsi18nextlanguage-switching

asked 1 min agoharsh 3

0votes

0answers

3views

How to Integrate Payment Gateway in Qt Mobile App Development

javascriptc++qtqt-creatorpayment-gateway

asked 1 min agoUma Sankar Buddi 1

0votes

0answers


13views


Using mail-templated for Django, how do I NOT display a bullet at the end of my sent emails?

pythondjangoemailtemplating

modified 1 min agoRodent 74

FEATURED ON META

 November 2016 Community Moderator Election RESULTS

 Documentation Update, November 29th

HOT META POSTS

9

Plagiarism and using/copying code from Stack Overflow and submitting it in an...

15

Should people who've never asked or answered a question for C be allowed to...

Favorite Tags [edit](#)



# Use Github

The screenshot shows a GitHub pull request page for `ReScience/ReScience-submission#25`. The page is divided into a main content area on the left and a right sidebar. The main area displays a list of comments and stars. The right sidebar shows repositories the user contributes to and a list of their own repositories.

**Search GitHub** **Pull requests** **Issues** **Gist**

**nadnaps**

21 hours ago  
**pdebuyi** commented on pull request [ReScience/ReScience-submission#25](#)  
Hi @RafaelNH Thanks for your updates. A first referee has accepted to review and should show up in this discussion soon. There is no action require...

★ **GaelVaroquaux** starred [pdfpc/pdfpc](#) a day ago

a day ago  
**RafaelNH** commented on pull request [ReScience/ReScience-submission#25](#)  
Hi @pdebuyi Thanks for your availability! I already addressed your three first comments. Let me known if something else is required at this point.

★ **takluyver** starred [michaelpacer/hiding\\_tags\\_nbconvert](#) a day ago

2 days ago  
**pdebuyi** commented on pull request [ReScience/ReScience-submission#25](#)  
Hi @delsuc, Thanks for the update. You will probably enter the game after the other reviewer (coming soon) but that is reasonable. (Unless I happen...

2 days ago  
**delsuc** commented on pull request [ReScience/ReScience-submission#25](#)  
Hi @pdebuyi, Yes I think I can review this work, the problem is that I am very busy for the moment, and I will not be able to work on this before m...

2 days ago  
**pdebuyi** commented on pull request [ReScience/ReScience-submission#25](#)  
@delsuc can you review this?

**Repositories you contribute to** 9

- [Verzicco-Rome/mlsibm\\_cart](#) 0 ★
- [PhysicsofFluids/mlsibm\\_cart](#) 0 ★
- [BiljanaG/trial](#) 0 ★
- [Verzicco-Rome/heart\\_mech](#) 0 ★
- [PhysicsofFluids/AFID](#) 8 ★

Show 4 more repositories...

**Your repositories** 25 **New repository**

Find a repository...

All Public Private Sources Forks

- [PyPof-Series-1](#)
- [mls\\_hit](#)
- [mlsibm\\_tc](#)
- [BiljanaG/trial](#)
- [mls\\_jcp\\_2016](#)
- [mlsibm\\_cart](#)
- [PhysicsofFluids/3DChan\\_Slab](#)
- [mlsibm\\_if](#)
- [PhysicsofFluids/mlsibm\\_cart](#)

# References

## Books

Effective Computation in Physics, Anthony Scopatz, Kathryn Huff, O'Reilly Media.

Python for Scientists, John Stewart, Cambridge.

## Links

<https://www.youtube.com/channel/UCkhm72fuzkS9fYGlGpEmj7A>

<http://pyvideo.org/events.html>

<http://www.scipy-lectures.org/>

<https://github.com/ipython/ipython/wiki/A-gallery-of-interesting-IPython-Notebooks>

<http://jrjohansson.github.io/>















