

Version control using Git and Plotting Tutorial

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Overview

Version
control using
Git and
Plotting
Tutorial

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- Version control
- Plotting using gnuplot
- Vim

Why you should use version control

- Does this seem familiar?

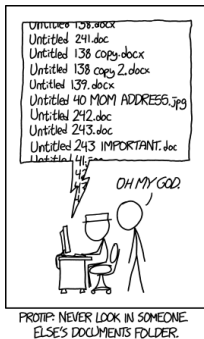


Figure: Bad version control¹

¹<https://xkcd.com/1459/>

What is Git?

- Git is one of most used version control software in the world
- Git is cross-platform and easy to use²

²<https://try.github.io/levels/1/challenges/1>

What is GitHub?

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- Github is a cloud service for git which lets you store your repository online
- Why would you store your repository online?
 - Working remotely
 - Collaborative work
 - Hard drive failure!

Making a repository

- You can do this online on the Github website ³
- Create a new repository
- Then click clone to get the url, open git on your computer and type:
`git clone url`

³<https://github.com/>

Making a repository

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- Go to the folder and right click git with bash
- You are now able to use bash for the rest of the talk!

Basic Git commands

- There are four⁴ important commands you will need for git:
- `git pull`
- `git add *`
- `git commit -a`
- `git push`

⁴I cheat here and write a bash script which does these in order so I only have to run a single command.

A brief note on text editors: Vim

- Vim is a powerful cross-platform text editor, released in 1991 and is still regarded as one of the most popular editors ⁵.
- Flexible with thousands of plugins available e.g. I use Vim to compile latex documents, this presentation was written in Vim.
- Computing clusters normally only have CLI so if you are running high performance code you will need to be familiar with Vim, Emacs or Nano.
- You can feel like a Hacker.

⁵Along with Emacs

Vim commands

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- The most important thing to remember is that Vim has two main modes, *NORMAL*, ESC and *INSERT*, i
- All commands are run from *NORMAL* mode using :
- to quit use, ESC:q (meaning go to *NORMAL* mode, : means command and q is quit without saving)
- to save and quit use, ESC:wq (w stands for write)

Adding your first commit

- Every repository should contain a readme
- Then either run:
- `git add *`
- `git commit -a`
- `git push`

Or use the windows GUI version and commit them to your repository.

gnuplot

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- Gnuplot is popular, multi-platform and standard software on computing clusters⁶
- <https://sourceforge.net/projects/gnuplot/files/gnuplot/5.2.4>

⁶standard on most of the popular linux distributions

Example 0, Quick plotting

- Go to the src folder
- open gnuplot and type
`plot 'data.txt'`

Example 0, Quick plotting

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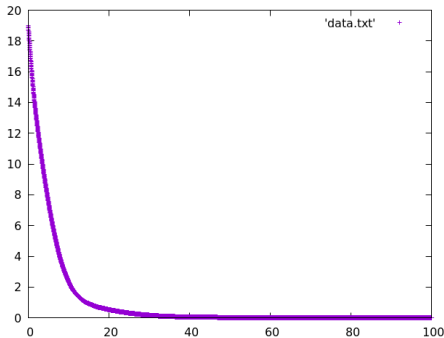


Figure: function plotting

Lets you very quickly see what the data is doing

Example 1, Plotting functions

- Go to the src folder
- open gnuplot and type
load 'ex1_basic.p'

```
set title "ex1 Simple Plots"  
set xlabel "x"  
set ylabel "y"
```

```
plot [-10:10] sin(x), \  
      atan(x)
```

Example 2, Saving plots

- Go to the src folder
- open gnuplot and type
load 'ex2_saving.p'

```
set terminal pngcairo enhanced font "arial,10"  
↪ fontscale 1.0 size 600, 400  
set output 'ex2.png'
```

```
set title "ex2 Saving Simple Plots"  
set xlabel "x"  
set ylabel "y"
```

```
plot [-10:10] sin(x), \  
      atan(x)
```


Example 2, Plotting functions

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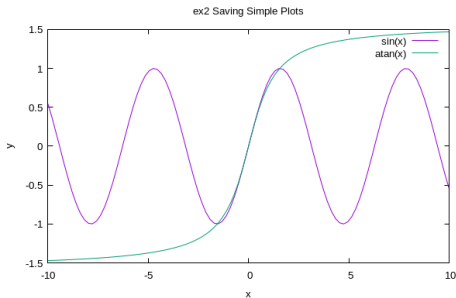


Figure: function plotting

Produces a png

Example 2, Plotting data!

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- once again, in the src folder open `ex3data.py`
- Run `all.py` and choose 3

Example 2, Plotting data!

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- figure

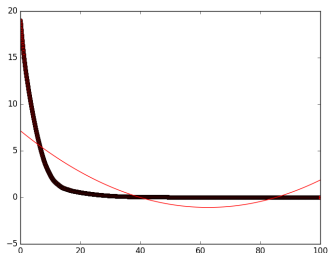


Figure: function plotting

Example 5, Subplots!

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- In the src folder open `ex5subplots.py`
- Run `all.py` and choose 5

Example 5, Subplots!

- Figures!

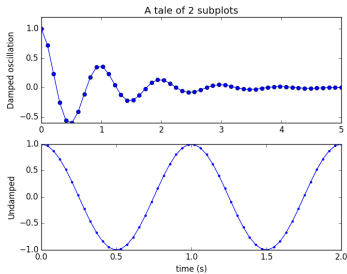


Figure: function plotting

Example 4, Histograms!

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- once again, in the src folder open `ex4hist.py`
- Run `all.py` and choose 4

Example 4, Histograms!

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- figure

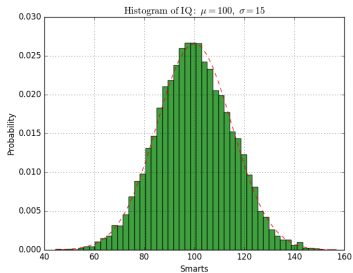


Figure: function plotting

Advanced Git commands

- One of the great things about Git is that you can get by with just the four (main) commands mentioned earlier.
- The git man page is very useful, especially,
`man gittutorial`
`man giteveryday`
- `giteveryday` is a super useful collection of the 20 commands you will need regularly.

Branching

- Branching is useful, it lets you test something out separately to the main branch.
- To make a new branch called test
`git branch test`
- You can check all of the current branches and which branch you are on with
`git branch`

Branching

- To switch to the test branch type:
`git checkout test`

Adding Collaborators

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- Go to a repository and on the settings tab click collaborators, you can then search for the github username

Thanks for listening!



Figure: If it all goes wrong ...⁷

¹<https://xkcd.com/1597/>