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shell web document: http://swcarpentry.github.io/shell-novice/02-filedir/index.html

URL for data: http://swcarpentry.github.io/shell-novice/data/data-shell.zip

Bash prompt:

In bash there is a bit of black magic that defines the prompt for each command I type... In git bash I find it annoyingly long, even spread onto a second line!:

    mjm@PLAB-HSY0-001 MINGW64 ~
$

- There is an environment variable, called PS1, which controls the prompt;
- To see its value, do "echo $PS1"
-

You can minimise it with this command:

    export PS1=" $ "

Further Resources
* coding club runs on Wednesday afternoons, Crew Building, KB. Each session covers specific topics of datascience at all levels. Opportunity to improve your general programming skills (R, python, fortran (I believe) and to find out about specific stuff
https://ourcodingclub.github.io/
* university wide research software engineering forum, group:
   https://cerse.github.io/
   the idea is to form a community of people who develop research software, either as part of their studies/phd or postdocs or professional staff. The next meeting where we will all gather is this Friday
   https://cerse.github.io/2019-01-25-ArgyleHouse/

Python Discussion and Questions

5287 is the splashtop session number.

http://swcarpentry.github.io/python-novice-inflammation/setup/

Python Setup and Files needed:

http://swcarpentry.github.io/python-novice-inflammation/setup/

http://swcarpentry.github.io/python-novice-inflammation/data/python-novice-inflammation-data.zip
http://swcarpentry.github.io/python-novice-inflammation/code/python-novice-inflammation-code.zip

Finding the files from IPython

University account users: Note you can download either to the local C drive or your network drive,

<u>**IPython Shortcuts**</u>
- ``Enter``: insert new line (may cause execution, see above).
- ``Ctrl-Enter``: *force* new line, *never* causes execution.
- ``Shift-Enter``: *force* execution regardless of where cursor is, no newline added.
- ``Up``: step backwards through the history.
- ``Down``: step forwards through the history.
- ``Shift-Up``: search backwards through the history (like ``Control-r`` in bash).
- ``Shift-Down``: search forwards through the history.
- ``Control-c``: copy highlighted text to clipboard (prompts are automatically stripped).
- ``Control-Shift-c``: copy highlighted text to clipboard (prompts are not stripped).
- ``Control-v``: paste text from clipboard.
- ``Control-z``: undo (retrieves lost text if you move out of a cell with the arrows).
- ``Control-Shift-z``: redo.
- ``Control-o``: move to 'other' area, between pager and terminal.
- ``Control-l``: clear terminal.
- ``Control-a``: go to beginning of line.
- ``Control-e``: go to end of line.
- ``Control-u``: kill from cursor to the begining of the line.
- ``Control-k``: kill from cursor to the end of the line.
- ``Control-y``: yank (paste)
- ``Control-p``: previous line (like up arrow)
- ``Control-n``: next line (like down arrow)
- ``Control-f``: forward (like right arrow)
- ``Control-b``: back (like left arrow)
- ``Control-d``: delete next character, or exits if input is empty
- ``Alt-<``: move to the beginning of the input region.
- ``alt->``: move to the end of the input region.
- ``Alt-d``: delete next word.
- ``Alt-Backspace``: delete previous word.
- ``Control-.``: force a kernel restart (a confirmation dialog appears).
- ``Control-+``: increase font size.
- ``Control--``: decrease font size.
- ``Control-Alt-Space``: toggle full screen. (Command-Control-Space on Mac OS X)

%hist - to see recent commands

%matplotlib inline
only works in jupyter notebooks. if you run it in your ipython session it messes up the output (ie you don't get any). run
%matplotlib
to reset. I seem to have needed to run it twice

Alternate Reverse String

oldstring = 'Newton'
newstring = oldstring[-1::-1]
print(newstring)

Other Software Carpentries tutorials are here:
    https://software-carpentry.org/lessons/index.html

There is also good material here:
        https://ourcodingclub.github.io/tutorials/

Runnning Python Programs as scripts or from the command line
Check Python versions:

   python --version

   Python 3 may not be the default python version!

   sometimes it is invoked using "python3 myscript.py"

   Running from within Ipython or Jupyter notebook:

     %run myscript.py

     (make sure you have changed to the directory first.

Today's Splashtop code 8157

Import Statements

Save space and energy by taking advantage of python import statements format

e.g.

from glob import glob

print(glob('inflammation*.csv'))

Guide to Python import statements:
https://chrisyeh96.github.io/2017/08/08/definitive-guide-python-imports.html

List Comprehension vs if/elif/else

https://docs.python.org/3/tutorial/datastructures.html#list-comprehensions

[print(num, "is positive") if num > 0 else print(num, "is negative") if num < 0 else print("is zero") for num in range(-3,4)]

or

```
for num in range(-3,4):
   if num > 0:
      print(num, "is positive")
   elif num < 0:
      print(num, "is negative")
   else:      print(num, "is zero")
```


tabs vs spaces:

   Most IDEs or editors have the ability to change the tab character to 'n' spaces. This avoids the potential of mixing and matching tabs and spaces but means you still get to use the tab key without feeling guilty.

In Notepad++
   Menu Bar: Settings->Preferences->Language: Replace by Space checkbox
   To convert existing tabs to spaces, press Edit->Blank Operations->TAB to Space

module 'matplotlib' has no attribute 'pyplot'?

import matplotlib.pyplot

pyplot is a submodule, not an attribute of matplotlib (See answer for more detail here:)
https://stackoverflow.com/questions/14812342/matplotlib-has-no-attribute-pyplot

Further Exercise

Save the figures with unique filenames

Think about the savefig arguments - it requires at least a filename

https://matplotlib.org/api/_as_gen/matplotlib.pyplot.savefig.html

Zen of Python

import this

The Incredible Growth of Python (blog)

 interesting perspective on the growth
of Python - worth a quick read or look at the plots.

https://stackoverflow.blog/2017/09/06/incredible-growth-python/

Git

http://swcarpentry.github.io/shell-novice

Git reference
https://git-scm.com/docs

The university is running a gitlab service which you can use to host your own projects
https://www.wiki.ed.ac.uk/pages/viewpage.action?
spaceKey=ResearchServices&title=Version+Control+Service+-+GitLab

https://git.ecdf.ed.ac.uk/

git ignore pattern matching:

    https://git-scm.com/docs/gitignore/2.3.0

Ignoring folder but not subfolder - the trailing '*' is important:

    https://stackoverflow.com/questions/5533050/gitignore-exclude-folder-but-include-specific-subfolder

on linux you can use the program meld to show a graphical diff. so instead of using
git diff
you can use
meld .
Before I add/commit anything I tend to run meld to make sure I don't accidentally commit somehting I
shouldn't

I tried 'meld .' and got the following error:

$ meld .
Failed to connect to Mir: Failed to connect to server socket: No such file or directory
Unable to init server: Could not connect: Connection refused
Failed to connect to Mir: Failed to connect to server socket: No such file or directory
Unable to init server: Could not connect: Connection refused

(meld:12586): Gtk-CRITICAL **: gtk_icon_theme_get_for_screen: assertion 'GDK_IS_SCREEN
(screen)' failed

Traceback (most recent call last):
  File "/usr/bin/meld", line 282, in <module>
    setup_resources()
  File "/usr/bin/meld", line 191, in setup_resources
    Gtk.IconTheme.get_default().append_search_path(icon_dir)
AttributeError: 'NoneType' object has no attribute 'append_search_path'

Is this because I'm remoted over ssh to another PC?

meld is a graphical program. so assuming your remote machine is linux you need to enable x forwarding, ie run with
ssh -X remotemachine
on your local machine you need to have an x server. if you are using windows, you can use mobaxterm which comes with all the bits. on linux it should work straight out of the box. on mac you will need ot install an xserver

you can check that x is correctly forwarded by checking the environment variable DISPLAY on the remote machine, ie
echo $DISPLAY
it should be set to something