Prepare for Today's Lecture

- If you haven't already done so, clone our meetup group's materials into a directory on your local machine

1. Create directory on your machine where you want to store files from the meetup
2. If you have git on your computer, then you can type:

   git clone https://github.com/ResearchComputing/meetup_fall_2014.git

3. Install python

Setting Up an IPython Notebook

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What is IPython?

- An interactive shell for Python
- Goes beyond the capabilities of the “normal” Python shell
- Improved functionality and flexibility
- Some nice features:
  - Tab completion of functions
  - Highlighting

What is the IPython Notebook?

- In-browser editing
- Web-based interactive computational environment
- Ordered list of input/output cells
- Combine code, text, plots, etc on one page
- Great way to demonstrate code execution in teaching environments
- Serves as a complete computational record of a session
- Can be converted to HTML, PDF, etc
- Frequently used in our meetups

http://ipython.org/notebook.html
http://ipython.org/ipython-doc/dev/notebook/notebook.html#introduction

Launching Notebooks - Local

- From your local machine, launch the example notebook we'll examine in this tutorial

- Download the material from our github site: https://github.com/ResearchComputing/meetup_fall_2014/

- Download the python notebook to a specific directory
- Make sure you have python installed, then run

  pip install ipython

- To run the notebook, type

  ipython notebook 01_introduction.ipynb

Launching Notebooks

- Upon launching the notebook we open a web page
- If just type **ipython notebook** will open a dashboard of all available notebooks
- Can start a new notebook from the dashboard
  - Change title
  - Cells default to code cells
    - Python
    - Can change to Markdown
    - http://nbviewer.ipython.org/github/ipython/ipython/blob/1.x/examples/notebooks/Part%204%20-%20Markdown%20Cells.ipynb

Launching Notebooks - Remote

- You can also launch a notebook on a remote machine and display it
- Some machines you can log in directly, while others you have to do port forwarding

1. Login to Janus (or remote machine)
   ssh knuths@login02.rc.colorado.edu
2. Load the python module
   module load python/anaconda-2.0.0
3. Run the notebook on a random port on Janus
   ipython notebook --no-browser --port=9088 --ip=*
4. Then tunnel into that port
   ssh –L 8099:login02.rc.colorado.edu:9088 –f –N login02.rc.colorado.edu
5. Open a web browser and type:
   localhost:8099

http://researchcomputing.github.io/xsede_2014/python/02_starting_notebooks.html

Launching Notebooks - Remote

BE CAREFUL!!!!!

DO NOT DO HEAVY COMPUTATION ON LOGIN NODES!!!!!!

http://researchcomputing.github.io/xsede_2014/python/02_starting_notebooks.html

Converting to other files

- You can easily convert your ipython notebook to another format
- HTML:

Ipython nbconvert Test.ipynb

- To do PDF, you need to have Latex installed

ipython nbconvert Test.ipynb --to latex --post PDF

Try it out yourself!

- http://researchcomputing.github.io/xsede_2014/python/solution_04_example.html