ASTR 288P

UNIX and Scientific Programming

Spring 2017

- UNIX:
  - Shell (**bash**, tcsh, xonsh) and **shell scripting**
  - File System (/, /usr/bin, /etc, $HOME)
  - Window Manager (X11 on Linux, aqua on Mac)
  - Editors (**emacs**, vi, gedit, pico) [42 listed on wikipedia]
  - Tools
    - Native Unix tools: **ls, cp, mkdir, cd, mv, awk, grep**, **ssh**, …..
    - Community tools: **git**, **gcc**, g++, gfortran, **python**, julia, R, ….
- Scripting
  - Python
  - ipython
  - JupyteR / Beaker (web computing)
- Compilers
  - C/C++, Fortran
- Open Source Software
  - Athena, an astrophysical magnetohydrodynamics (MHD) code
    - Discovering code, Compiling, Running, Analyzing

Software Collaboration (git)

and

Software Documentation

http://www.astro.umd.edu/~teuben/ASTR288P

What we will likely not cover...

- Word processing (e.g. latex)
  - But: jupyter notebook uses “md” (MarkDown)
- Parallel Programming (OpenMP, MPI, CUDA)
- Data Science (but....)
- Machine Learning
- ...

Resources
(check the class website)

- Books? No books! (but: my reading shelf in CSS0223)
- Online? Don’t believe everything you read!
  - Wikipedia
  - http://www.stackoverflow.com Any Questions
  - http://www.codecademy.com Python, Git, ...
  - http://tutorialspoint.com/cprogramming C language
  - http://projecteuler.net Challenging Problems
  - http://rosettacode.org/wiki/Averages/Arithmetic_mean
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Hardware

- Lab machines:
  - Master: ursa.astro.umd.edu (a.k.a. ursa)
  - Nodes: **lab001, lab002, … lab013**
  - Printer: labs.astro.umd.edu
- Virtual Machine (vmware, **virtualbox**)
- Your Own Laptop:
  - Linux (Ubuntu, Redhat, …)
  - MacOSX (10.9, 10.10, 10.11)
    - Be aware to have Xquartz installed so “ssh -X” works!
  - Windows (win10 bash + ubuntu)
    - The program putty will make ssh connections, but what about X11?
    - VNC is another alternative after putty was used to set up a vncserver!

Done!