

# Basic Unix

Carver J. Bierson

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## 1 Why Unix

Unix is the underlying architecture of Macs and Linux machines.

### 1.1 Basic Commands

This is a list of the most common unix commands. Command arguments are shown in brackets, do not include the brackets when you use the commands. Options for the command can be given with "-<option>". You can usually include multiple options after a single dash.

- `man <command name>` - open the manual page for the named command
- `pwd` - Print working directory - Prints the name of your current folder
- `ls`
  - `-l`: long format. Lists extra information like file size and time modified.
  - `-a`: list all files including hidden files. On unix hidden files are those that have a file name that starts with a period.
  - `-h`: human readable. Simplifies file sizes and other information to make it easier to read.
  - `-t`: list files in order of most recently edited first
- `cd <folder>` - Change directory - Change your folder
  - `.`: a single period in unix represents the current directory
  - `..`: a double period in unix represents the parent directory
  - `-`: a slash instead of a folder will return you to your previous folder
  - `~`: a tilde instead take you to your home folder
- `cp <file> [new location/name]` - Copy file
- `mv <file> [new location/name]` - move or rename a file
- `mkdir <new folder name>` - Make directory - Creates a new folder with the given name
- `rm <file>` - Remove - deletes file. Note that this cannot be undone so use with caution

- **-r**: recursive, use to remove folders and all their contents. Use with caution!
- **chmod <file>** - Change file permissions, make sure to add the option you want
  - **+**: add permission for the following action
  - **-**: remove permission for the following action
  - **r**: read permission
  - **w**: write permission
  - **x**: execute permission
  - example:
 

```
chmod Myfile.py +x
```

Adds executable permissions to the file *Myfile.py*

Some examples

```
carverb@Gazelle-Professional:AST119$ ls
AstroEarth119_Spring Previous Summer17
carverb@Gazelle-Professional:AST119$ ls -lh
total 24K
drwxrwxr-x 9 carverb carverb 4.0K Jun 13 08:20 AstroEarth119_Spring
drwxrwxr-x 3 carverb carverb 4.0K Feb 27 16:44 Previous
drwxrwxr-x 4 carverb carverb 4.0K Jun 22 14:07 Summer17
carverb@Gazelle-Professional:AST119$ cd Summer17/
carverb@Gazelle-Professional:Summer17$ pwd
/home/carverb/Extra Drive 1/Dropbox/Teaching/AST119/Summer17
carverb@Gazelle-Professional:Summer17$ mkdir testfolder
carverb@Gazelle-Professional:Summer17$ ls -lht
total 280K
drwxrwxr-x 2 carverb carverb 4.0K Jun 25 10:19 testfolder
drwxrwxr-x 3 carverb carverb 4.0K Jun 25 10:17 Lectures
-rw-rw-r-- 1 carverb carverb 12K Jun 22 14:07 Syllabus.tex
-rw-rw-r-- 1 carverb carverb 17K Jun 22 14:07 Syllabus.log
-rw-rw-r-- 1 carverb carverb 117K Jun 22 14:07 Syllabus.pdf
-rw-rw-r-- 1 carverb carverb 31K Jun 22 14:07 Syllabus.synctex.gz
-rw-rw-r-- 1 carverb carverb 662 Jun 22 14:07 Syllabus.aux
-rw-rw-r-- 1 carverb carverb 0 Jun 22 14:07 Syllabus.out
drwxrwxr-x 2 carverb carverb 4.0K Jun 13 17:11 Homeworks
-rw-rw-r-- 1 carverb carverb 989 May 4 10:55 MasterNotes.tex
-rw-rw-r-- 1 carverb carverb 34K May 4 10:55 MasterNotes.pdf
carverb@Gazelle-Professional:Summer17$ rm -r testfolder
```

## 1.2 Vi/Vim

The two basic file editors in unix are Emacs and Vim. While they perform the same functions they are very different to use. There are long debates online

about which is better. You can use either for this class. I use Vim so that is what I will show you.

To open vim type *vi* onto the terminal with a file name (including the file extension. If the file already exists you will be able to edit it. If the file does not exist it will create a new one. Once you are in Vim, there is a long list of keyboard commands you can look up online. Here I will list the basic commands.

- **a** - append - start editing file
- **esc** - escape key - stop editing file
- **:w** - write file changes
- **:q** - quit Vim
- **:wq** - Write and quit Vim
- **:q!** - quit Vim without saving changes
- **u** - undo last change
- **/<string>** - search for string in file

## 2 Starting python

To start python simply type *python* on the command line. This will still start python 2.7 on most machines. To start python 3 type *python3*. To run a python file type *python <filename.py>* or just *./filename.py* if you added the python shebang (**#!**).