1 — PHY 494: Homework assignment (15 points total)

Due Thursday, Jan 18, 2018, 1:30pm.
Submit a PDF through Blackboard (name it `lastname_firstname_hw1.pdf`). Homeworks must be legible or may otherwise be returned ungraded with 0 points.

This assignment contains **bonus problems**. A bonus problem is optional. If you do it you get additional points that count towards this homework's total, although you can't get more than the maximum number of points. If you don't do it you can still get full points. Bonus problems and bonus points are indicated with an asterisk "*".

Note: In general, for full credit you need to (1) show the commands that you used and (2) answer the question. Sometimes you should also copy and paste output.

1.1 Commands and paths (8 points)

(The following questions do not require you to show code unless explicitly stated.)

(a) Briefly describe the function of the `cd` and the `pwd` command? **[2 points]**

(b) Show commands for two different ways to change to your home directory, assuming you are currently in the root directory. **[1.5 points]**

BONUS: Show a third possibility. **[bonus +0.5*]**

(c) Given the path `/home/dvader/Documents/../data/bases`:

(i) Is this an absolute or relative path? **[0.5 points]**

(ii) If you are located in the home directory of user dvader (`/home/dvader`) then what is the shortest path to `bases`? **[1 points]**

(d) If you were in a directory `/home/dvader/data` and you executed the command `cd ./.././/.././.`, what would be the output of running the `pwd` command afterwards? **[1 points]**

(e) Describe two ways by which you could learn more about the function of a Unix command `frbzz` that you don't know anything about. **[2 points]**

(f) BONUS: (Skim)read Neal Stephenson's *In the Beginning was the command line* from 1999 (PDF[1])[2]. What are the advantages and disadvantages of using the command line instead of a graphical user interface? **[bonus +4*]**

[1] https://becksteinlab.physics.asu.edu/file_download/7/NealStephenson_Commandline.pdf?mimetype=pdf

[2] originally available from http://www.cryptonomicon.com/beginning.html

1.2 Copy, rename, delete (4 points)

Work through the Copy, rename, delete: Activity[3] (note that this exercise builds on previous parts of 01 The Unix Shell[4], which you should have also done). After you completed the activity (points 1 – 11) you should end up with a specific directory structure under `~/PHY494/01_shell`. Show the output of the commands

```
cd ~
ls -R PHY494/01_shell
```

which will be compared against the expected directory structure and content. **[4 points]**

1.3 Danger Zone (3 points)

DO NOT TRY THE FOLLOWING COMMAND JUST TO FIND OUT WHAT IT DOES. You have been warned!

Describe what the command `rm -rf /` might do. Should you *ever* use it?

1.4 BONUS: Pipes and Filters (+5* points)

Work through the activities in the section Pipes and Filters[5]. Answer the following questions and show the commands that you used to arrive at the answer.

(a) How many lines does the file `planets_2.dat` contain? **[bonus +1*]**

(b) What are the three biggest planets (by diameter) in the file `planets.dat`? **[bonus +1*]**

(c) Which planets contain *ice* terrain? **[bonus +1*]**

(d) What is the most frequent and the least frequent first letter amongst *all* the planets? **[bonus +2*]**

[3] https://asu-compmethodsphysics-phy494.github.io/ASU-PHY494/2018/01/11/01_Unix_Shell/#copy-rename-delete

[4] https://asu-compmethodsphysics-phy494.github.io/ASU-PHY494/2018/01/11/01_Unix_Shell/

[5] https://asu-compmethodsphysics-phy494.github.io/ASU-PHY494/2018/01/11/01_Unix_Shell/#pipes-and-filters