EN.540.635 "Software Carpentry"

Lab 1 - Fight the Virus

In this lab, you will learn/practice the following skills:

- **ssh** - How to connect, remotely, to another computer. `ssh <username@destination_IP_or_Website>`
- **cd** - How to change folders. `cd <path_name>`
- **ls** - How to list the files and folders. `ls <directory_of_interest (blank if current directory)>`
- **pwd** - How to show the current folder. `pwd`
- **mv** - How to move a file/folder. `mv <source_path> <destination_path>`
- **rm** - How to delete a file/folder. `rm <file_name>`
- **touch** - How to make a new file. `touch <new_file_name>`
- **mkdir** - How to make a new folder. `mkdir <new_directory_name>`
- **grep, awk, sed, xargs** ... (These are all extras that, if we get to, make life much easier)

Choose one of 3 locations for this assignment: (a) ssh into a Linux computer, (b) Rockfish, (c) locally on your machine.

1. **Softcar**: Open your computer's respective command terminal (on Windows, this is the command prompt, on Mac, this is the Terminal), and run the following command to SSH into a computer hosted by Clancy Lab, using a whitelisted user with the username *softcar1*. NOTE: If you are doing this remotely, you should have already set up Pulse Secure, a VPN that localizes you to the Johns Hopkins network (where the server is accessible).

```
ssh softcar1@10.160.167.86
```

After a prompt which may or may not appear addressing whether or not you actually intended to connect to this device (say Yes), you will be prompted to provide a password. The password for this account will be given in class. If you need to access this resource outside of class, ask the instructor to provide the password to you.

Using the **cd** command, move into your respective user directory after going into "Documents," and then "SCUsers." Every time you jump directories with **cd**, you can use the **ls** command to get your bearings on where you are in the file path by seeing the children of the current directory you're in. Once in SCUsers, a list of directories, each associated with a JHU user in the class, will be presented when you run **ls**. If you cannot find your directory, ask an instructor for help. You can confirm you have gotten to your directory by using the **pwd** command to check your current directory once you think you have arrived, and the command should return your JHU username. Use **ls** in your directory to make sure it is empty to start with. If it is not, ask an instructor for help.

2. **Rockfish**: Alternatively, you could also do this assignment on Rockfish logging in via the command

```
ssh username@login.rockfish.jhu.edu
```

where username is your JHU username.

3. **Locally**: Or, you could do this assignment locally on your computer in a folder of your choosing. If you choose to do this, please utilize the command terminal!

To begin the assignment, navigate to the folder you would like to work with using the **cd** and **ls** commands. Check that you have done so with **pwd**. Then use the **wget** command to upload the code from the Clancy Github webpage into your directory, and then run the script from there. This is done with the following commands (make sure that the underscores in the URL have copied!):

```
wget https://clancylab.github.io/software_carpentry/Labs/Lab_1_Code_Handout_Virus.py
```

OR

```
curl -0 https://clancylab.github.io/software_carpentry/Labs/Lab_1_Code_Handout_Virus.py
```

There should be a clear audit log in the terminal indicating that the download has taken place, but to check to make sure you have successfully downloaded it, **ls** your directory.

To start the game, run the following command (note that for some, you may have to type **python3**). Before you do, make sure you read the notes below though!!

```
python Lab_1_Code_Handout_Virus.py > logfile.log 2>&1 & disown
```

Remember that typical copy/paste shortcuts do not work in the Linux terminal, so if you wish to paste a command from your clipboard, you can use `Ctrl+Shift+V` on Windows or `Cmd+Shift+V` on MacOS.

BEFORE STARTING:

The lab objective is as follows. The python code you are running will run in the background (this is due to the call to "disown"). It will generate a fake file tree with several fake text files. Some of these files will have the word "VIRUS" (in all caps) within them. Every now and then, the python code will propagate the VIRUS to new files. Your goal is to annihilate the virus before it can propagate to all files. To do so, you have the following tools at your disposal:

- Make a "SAFE" file. If you have a file named "SAFE" (it can be blank) in a folder, and no "VIRUS" exists in that folder, then the "VIRUS" cannot propagate to that folder.
- You can manually remove the word "VIRUS" from a file by editing the file however you see fit. It is also ok to delete files that have been infected by the virus (but clearly, the more you can salvage the better!).
- If you believe you have succeeded, wait 30 seconds. A GAME_OVER file will be generated in the "my_cool_stuff" folder IF you have succeeded.
- A good place to start is to use the **grep** command to get your bearings on where the viruses currently are so that you can eliminate them, or to figure out which directories you want to prioritize putting SAFE files inside as to avoid further virus spread (viruses will spread inside a directory with a SAFE file if there is already a virus in one of the files in that directory).

Finally, please keep in mind there are several ways to accomplish this task. If you succeed, let us know and try an alternative. If you are stuck, please ask for a hint.

SOME GOOD SOURCES:

- grep: https://www.geeksforgeeks.org/grep-command-in-unixlinux/
- xargs: https://www.howtogeek.com/435164/how-to-use-the-xargs-command-on-linux/
- google :)