

CMPS 1500

Bonus Lab 0

Objectives

- Learn to use the bash command line and common commands.

Preliminaries

Mac OS X is built on a code very similar to Linux. So, if you have a Mac laptop, you can just go to Applications – > Utilities – > Terminal. Your shell is open and you can skip to the next section.

On Windows 10 or later, you can install the Windows Subsystem for Linux ([tutorial here](#), quite simple). This is enough to do most of the lab. However, getting a GUI text editor to work is a bit less simple (although not too bad, [tutorial here](#)).

An alternative (much easier for Windows users) is to get access to a remote Linux-like system. On repl.it, create a new repl (when prompted to select a language, choose “bash”).

Type the following command into the command-line window (terminal on Mac OS or Linux, or the window on the right with the dark background on repl.it).

```
date
```

You should see what you typed after the prompt and you should see the result of the command after you hit the Enter key.

1. Linux prompt and commands

Although Linux uses a window manager to give it a GUI interface similar to Windows/iOS, a lot of functionality is best available via a shell window with a command line, where one can direct actions using a text command.

- A shell is a language which communicates with the operating system. It is an interface between the users and the operating system and the computer resources the operating systems manages.
- A shell window is a window with a prompt at which a user can issue commands to the operating system in text. Commands typed into this window are carried out by the operating system. The shell language includes a list of the commands the operating system will take.
- A command line is a text prompt where you can type shell commands.

2. Shell commands

Here is a list of the basic terms and commands you will need.

- A path is a list of folders and subfolders where something resides. For example, your Linux account may be located at the path `/home/accounts/os/`. The Windows operating system also uses paths, e.g.,
 - `C:\Windows\ApplicationData\Mozilla\Firefox`
- A prompt is a symbol or set of characters where you type commands. By default, your prompt displays your username, the computer you are on, and your current folder so it may look similar to the following `[os@debian/cmeps1500]`
- The `gedit` command starts a simple text editor. (If this does not work, try `pico`, `nano`, or `emacs`. In `emacs` use `F10` to access the menu bar. You can also try `vi`, but beware that its commands take some getting used to.)
- The `&` command runs another command in a background mode where you can continue using the current shell window.
- The `pwd` command (print working directory) displays the name and path of the current folder.
- The `ls` command (listing) displays the contents of the current folder.
- The `mkdir` command creates new folders.
- The `cd` command (changing directory) changes from one folder to another.
- The `cp` command copies files and folders.
- The `mv` command moves and/or renames files and folders.
- The `rm` command deletes (removes) files and folders.

3. Practice; bonus0.txt

The file you turn in for the first part will be a “.txt” file. You can use TextEdit (pre-installed on mac) to create it, but it’s recommended to install another one like Atom or Sublime Text which has syntax highlighting.

If you know another text editor (`emacs`, `vi`, etc) feel free to use it as long as you can launch it from the command line! On `repl.it`, use the file editor on the left side of the window.

Save your file “bonus0.txt”.

Number the problems you answer in this file using the following format:

Question 1 answer: here goes my answer to the question 1

Throughout the exercises, feel free to use the copy and paste feature that is available at the command prompt.

1. Question 1: What is your prompt? (This is asking for your actual prompt, not the definition of the term prompt).
2. Displaying your folder path. When you opened the shell window, you started out in your home folder. It’s the base folder for your account. Windows uses the same concept.

You can tell you are in your home folder because your prompt shows a tilde `~` for your current folder name. The tilde is just a shortcut for “ones home folder”. The path to your

home folder is actually much longer. On Windows, you can get to your MyDocuments folder using a shortcut or navigate to C:\Users\yourusername\Documents using the full path. To see the full path to your current folder, type `pwd` at your

prompt and hit the Enter key.

Question 2: What is the full path to your home folder? (Use `pwd` to find out).

3. Displaying the contents of a folder.

To see the contents of the current folder, type `ls` at your prompt and hit the Enter key. (That's a lowercase letter `l` in the command `ls`). You should see your `bonus0.txt` file. If coloring is turned on, files and folders will be shown in different colors. Folder names are usually followed by a `/` symbol.

Question 3: What files and folders are inside your home folder? (Use `ls` to find out).

4. Creating and entering folders. Let's create a folder for this course. Call the new folder `cmps1500`. To create a folder, type `mkdir cmps1500` at your prompt and hit the Enter key. To enter this folder, type `cd cmps1500` at your prompt and hit the Enter key. Your prompt should now show that you are in the `cmps1500` folder.

Question 4: What is the full path to your `cmps1500` folder? (Use `pwd` to find out).

To go back up a folder, type `cd ..` (that is the command `cd` followed by two dots) at your prompt and hit the Enter key. You can also go into a folder from any other folder by using its path (full or shortcut). The shortcut path to your `cmps1500` folder is `~/cmps1500`. To get to this folder using its path, type `cd ~/cmps1500` at your prompt and hit the Enter key. You can get back to your home folder again by typing `cd` at your prompt and hitting the Enter key (typing plain `cd` will work too).

5. Copying, moving, and renaming files.

- Files and folders can be copied, moved, and renamed as needed. We'll make a copy of your `bonus0.txt` file. Go into your home folder. Then type `cp bonus0.txt copy.txt` at your prompt and hit the Enter key. Use `ls` to see that the `copy.txt` file now exists. You can open it using the command `gedit copy.txt` to make sure it really copied. (If `gedit` does not work, try `pico`, `nano`, or `emacs`. In `emacs` use `F10` to access the menu bar. You can also try `vi`, but beware that its commands take some getting used to.)

You can move a file from one folder to another using the `mv` command. To move `copy.txt` into your `cmps1500` folder, type `mv copy.txt ~/cmps1500/` at your prompt and hit the Enter key. This moved the `copy.txt` file from the current folder into the `cmps1500` folder. (Use `ls` and `cd` to see that the file has moved).

You can also rename files using the same `mv` command. To rename `copy.txt` to `extra.txt`, type `mv copy.txt extra.txt` at your prompt and hit the Enter key. (Use `ls` to see that the file has been renamed).

These commands can be combined and can be used locally as seen here or with paths when you want to move a file in some other folder. Go back to your home directory. Type “mv ./cmpr1500/extra.txt ./copy.txt” at your prompt and hit the Enter key. Notice that the file has moved back into your home folder and been renamed back to copy.txt. (Use ls to verify this).

Question 5: What is the command to move your bonus0.txt into your cmpr1500 folder? Quit editing your bonus0.txt file first. Then move the file, edit bonus0.txt again, and enter the command you used. The cp and mv commands will also copy, move, and rename folders.

6. Deleting files.

Your copy.txt file should be currently found in your home folder. Go into your home folder. To delete copy.txt, type rm copy.txt at your prompt and hit the Enter key. You may be asked if you really want to delete the file. Type y or yes and hit Enter. You can also use shortcut paths with the delete (rm) command.

Question 6: What is the command to delete copy.txt from a given folder in your home folder (use the shortcut path)?

To delete a folder, you have to recursively delete all files and subfolders inside the folder. To test this out, first use mkdir to create a folder named extra. To delete this folder, type “rm -r extra” at your prompt and hit the Enter key. Again, you may be asked if you really want to delete it. (The -r option after the command rm stands for “recursive”.)

4. Running Python on the command line

Create a new folder within cmpr1500 called “bonus0”. Within bonus0, create a file called “bonus0b.py”. In this file, write and save a simple python program to print out 0 to 100 each on a different line.

On the command-line, run this file with the command “python bonus0b.py” (it may not work depending on your \$PATH variable. If it doesn’t, try python3 instead of python).

Now run “python bonus0b.py > out.txt” and then run “more out.txt” . (If “more” does not work, run “cat” instead.)

Question 7: Explain what is achieved by appending “> out.txt” to “python bonus0b.py”.

Question 8: Explain what the “more” command does.

5. Submission

Submit your bonus0.txt file to Canvas before the deadline.