

LAB 0: NAVIGATING THE LINUX TERMINAL

Due Aug 24 by 3:30pm **Points** 5 **Submitting** a media recording or a file upload **Available** until Aug 24 at 3:30pm

This assignment was locked Aug 24 at 3:30pm.

Update: I just learned something new, you need to set your preferences to have a solid background for your terminal or it will show transparent like the below screenshots.

Navigation

Average Time: 15 minutes. This lab goes through some of the basic commands for listing and navigating between files and directories on a Linux machine. You will be turning in one (1) .png or .jpg file for your graded submission. See step 14 for details (i.e. [lab0.jpg](#)).



Step 0:

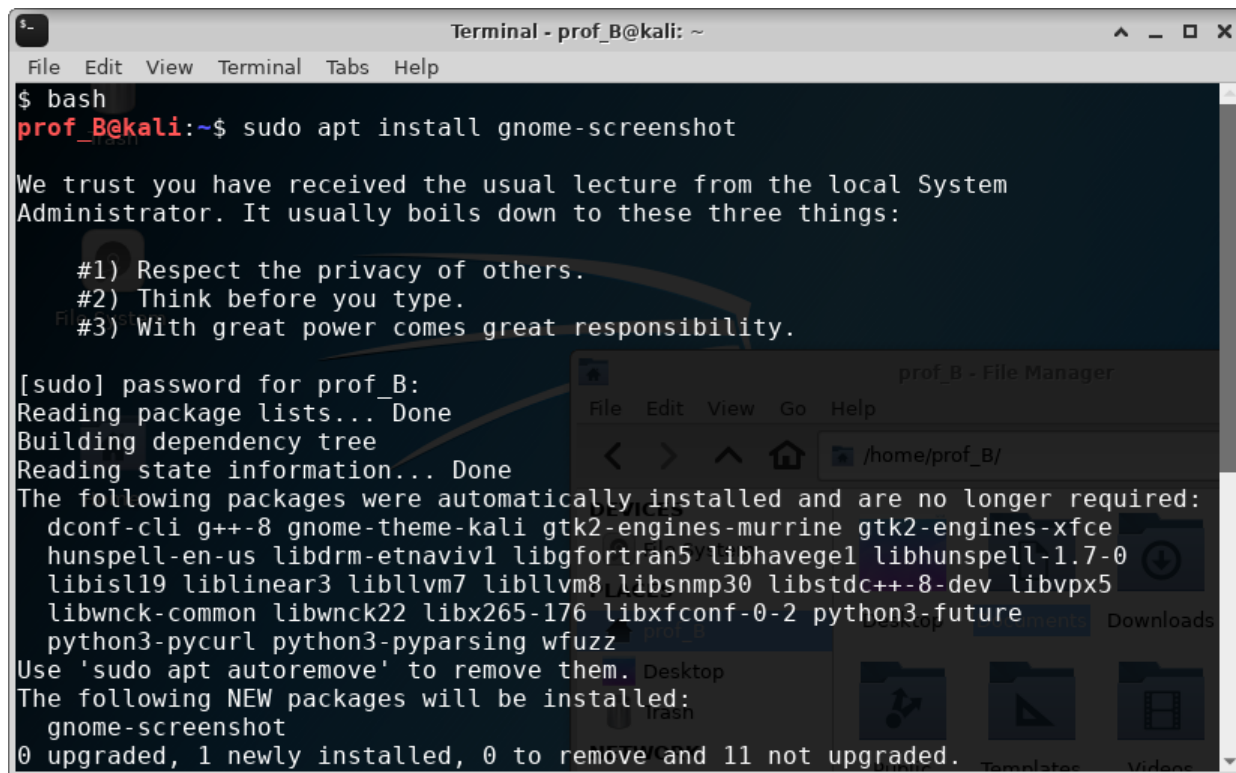
Install gnome-screenshot

Depending on your OS (kali/raspbian), you may want to install a screenshot application. The first thing you want to do is open a terminal and type

```
bash
apt install gnome-screenshot
```

Why bash? Because i like the color scheme.





```
Terminal - prof_B@kali: ~
File Edit View Terminal Tabs Help
$ bash
prof_B@kali:~$ sudo apt install gnome-screenshot

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

[sudo] password for prof_B:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
dconf-cli g++-8 gnome-theme-kali gtk2-engines-murrine gtk2-engines-xfce
hunspell-en-us libdrm-etnaviv1 libgfortran5 libhavege1 libhunspell-1.7-0
libisl19 liblinear3 libllvm7 libllvm8 libsnmp30 libstdc++-8-dev libvp5
libwnck-common libwnck22 libx265-176 libxftconf-0-2 python3-future
python3-pycurl python3-pyparsing wfuzz
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
gnome-screenshot
0 upgraded, 1 newly installed, 0 to remove and 11 not upgraded.
```



Step 1:

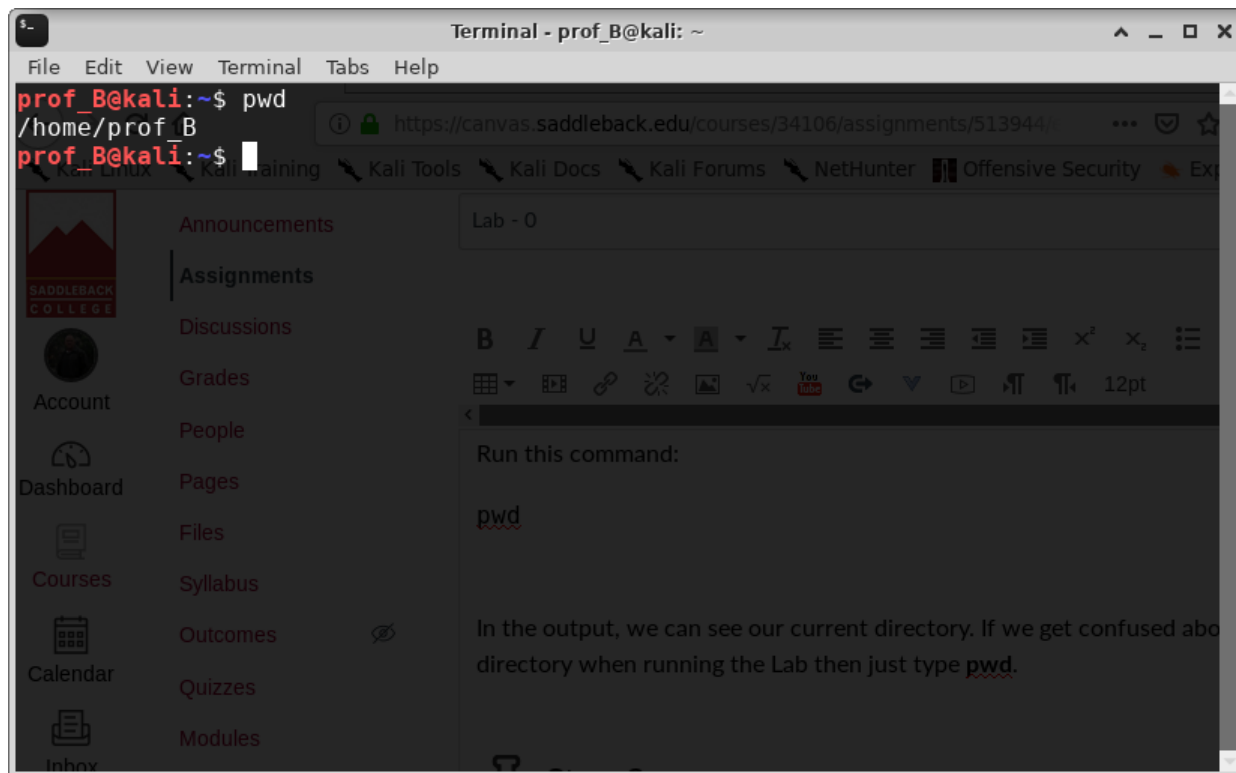
Print Working Directory (pwd)

Let's get started with basic Linux command line usage. The second thing we want to do is to find our current working directory. One of the biggest challenges for people coming from Windows to Linux is understanding the directory structure. Directory structure confusion makes it difficult to know where you are at any given time while you're in the Linux terminal. Fortunately, there's a way to always know. To see your current directory, enter the command **pwd** (print working directory).

Run this command:

```
pwd
```





In the output, we can see our current directory. If we get confused about our current directory when running the Lab then just type **pwd**.



Step 2:

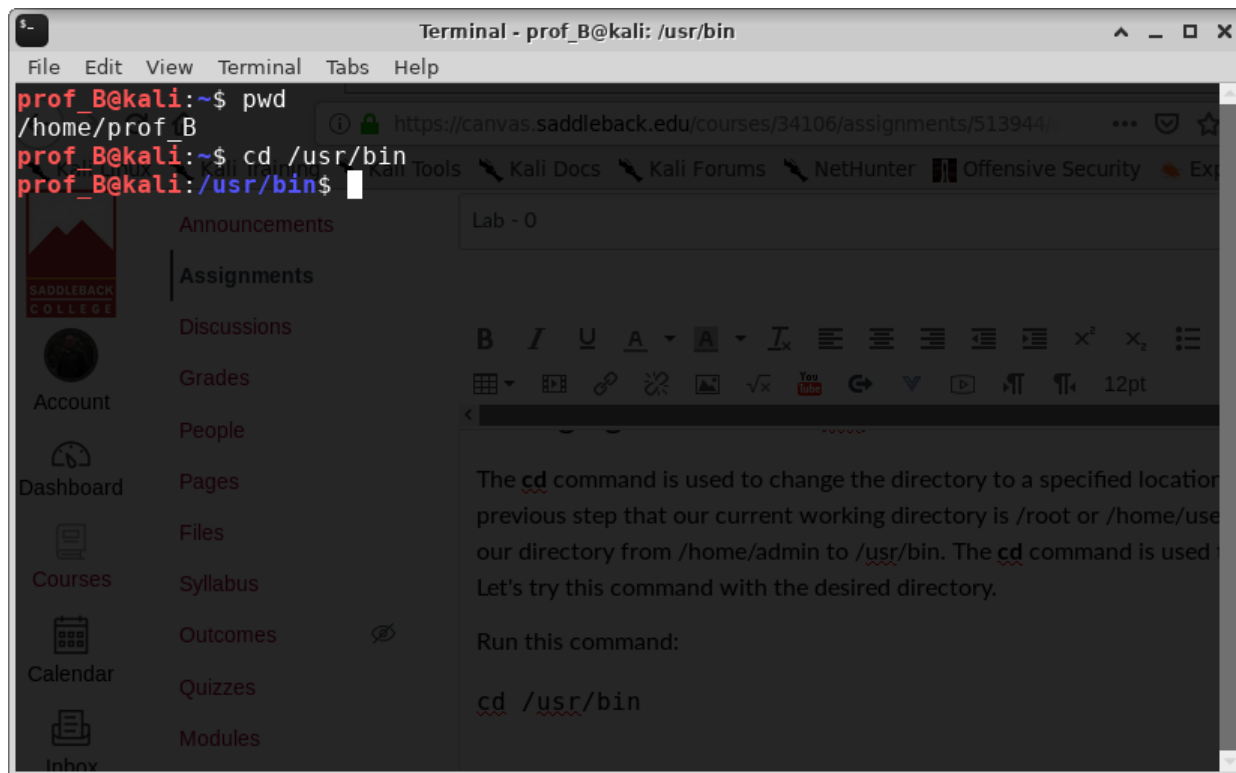
Changing Directories (cd)

The **cd** command is used to change the directory to a specified location. We saw from the previous step that our current working directory is /root or /home/user. Now Let's change our directory from /home/admin to /usr/bin. The **cd** command is used to change directory. Let's try this command with the desired directory.

Run this command:

```
cd /usr/bin
```





Use the **pwd** command and make sure the current directory is /usr/bin.



Step 3:

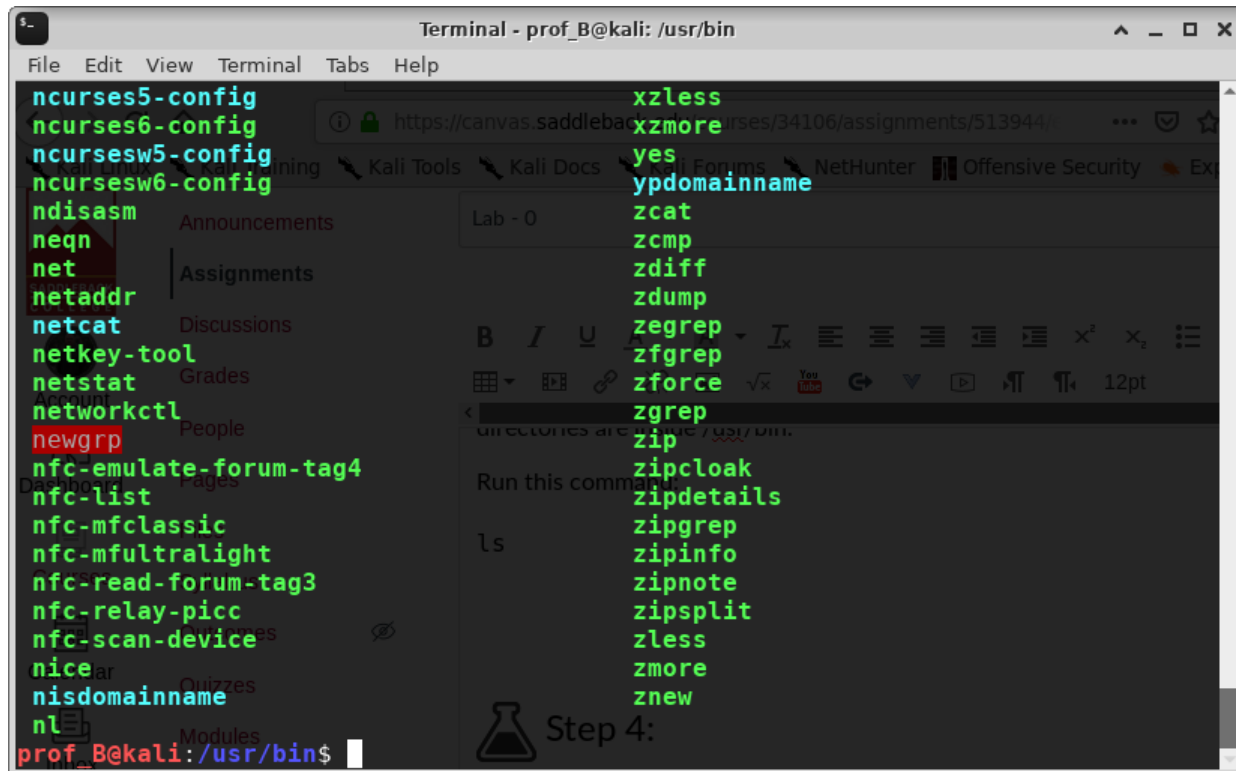
Listing Files and directories (ls)

The ls (list) command returns a list of files and directories and lists them in the terminal. We are currently in the /usr/bin directory so let's run **ls** command and see what files and directories are inside /usr/bin.

Run this command:

```
ls
```





```
Terminal - prof_B@kali: /usr/bin
File Edit View Terminal Tabs Help
ncurses5-config
ncurses6-config
ncursesw5-config
ncursesw6-config
ndisasm
neqn
net
netaddr
netcat
netkey-tool
netstat
networkctl
newgrp
nfc-emulate-forum-tag4
nfc-list
nfc-mfclassic
nfc-mfultralight
nfc-read-forum-tag3
nfc-relay-picc
nfc-scan-device
nice
nisdomainname
nl
xzless
xzmore
yes
yzdomainname
zcat
zcmp
zdiff
zdump
zegrep
zfgrep
zforce
zgrep
zip
zipcloak
zipdetails
zipgrep
zipinfo
zipnote
zipsplit
zless
zmore
znew
prof_B@kali: /usr/bin$
```



Step 4:

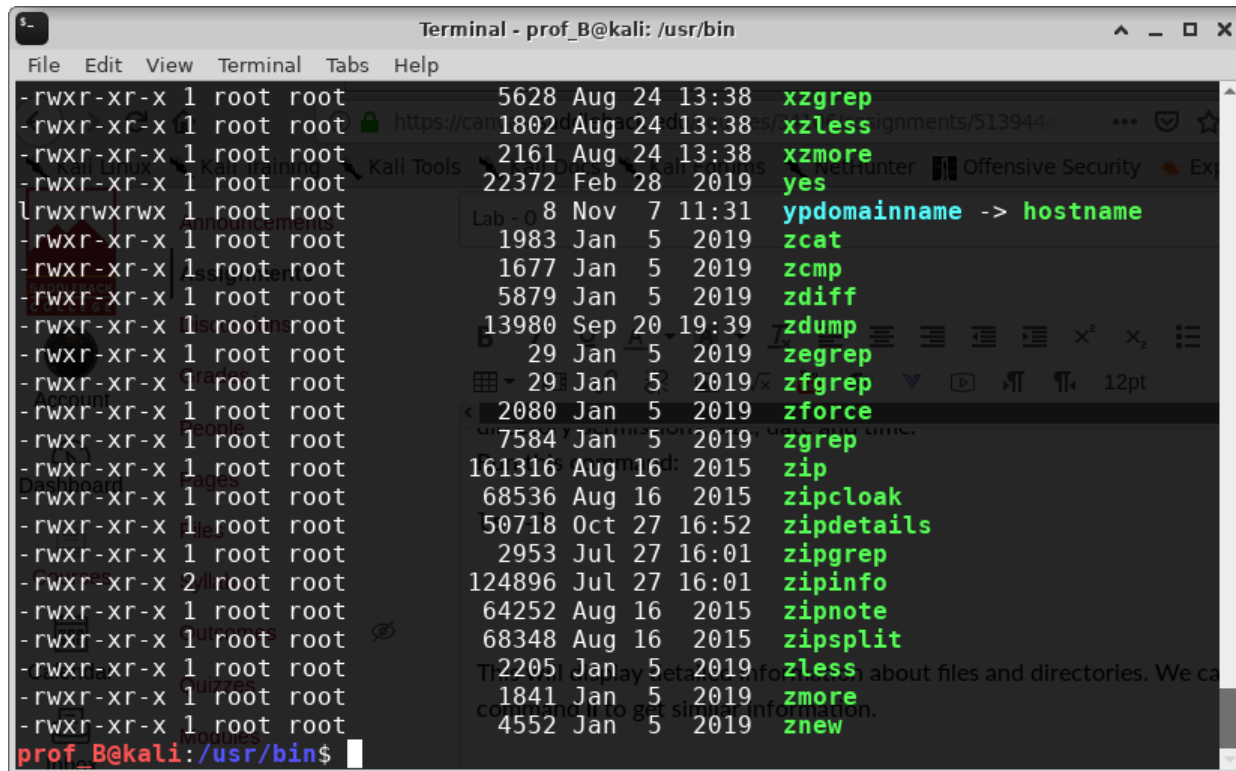
Is with modifier (ls -l)

Let's list the files in the current working directory with detailed information such as file or directory permissions, size, date and time.

Run this command:

```
ls -l
```





```

Terminal - prof_B@kali: /usr/bin
File Edit View Terminal Tabs Help
-rwxr-xr-x 1 root root 5628 Aug 24 13:38 xzgrep
-rwxr-xr-x 1 root root 1802 Aug 24 13:38 xzless
-rwxr-xr-x 1 root root 2161 Aug 24 13:38 xzmore
-rwxr-xr-x 1 root root 22372 Feb 28 2019 yes
lrwxrwxrwx 1 root root 8 Nov 7 11:31 ypdomainname -> hostname
-rwxr-xr-x 1 root root 1983 Jan 5 2019 zcat
-rwxr-xr-x 1 root root 1677 Jan 5 2019 zcmp
-rwxr-xr-x 1 root root 5879 Jan 5 2019 zdiff
-rwxr-xr-x 1 root root 13980 Sep 20 19:39 zdump
-rwxr-xr-x 1 root root 29 Jan 5 2019 zegrep
-rwxr-xr-x 1 root root 29 Jan 5 2019 zfgrep
-rwxr-xr-x 1 root root 2080 Jan 5 2019 zforce
-rwxr-xr-x 1 root root 7584 Jan 5 2019 zgrep
-rwxr-xr-x 1 root root 161316 Aug 16 2015 zip
-rwxr-xr-x 1 root root 68536 Aug 16 2015 zipcloak
-rwxr-xr-x 1 root root 50718 Oct 27 16:52 zipdetails
-rwxr-xr-x 1 root root 2953 Jul 27 16:01 zipgrep
-rwxr-xr-x 2 root root 124896 Jul 27 16:01 zipinfo
-rwxr-xr-x 1 root root 64252 Aug 16 2015 zipnote
-rwxr-xr-x 1 root root 68348 Aug 16 2015 zipsplit
-rwxr-xr-x 1 root root 2205 Jan 5 2019 zless
-rwxr-xr-x 1 root root 1841 Jan 5 2019 zmore
-rwxr-xr-x 1 root root 4552 Jan 5 2019 znew
prof_B@kali: /usr/bin$

```

This will display detailed information about files and directories. We can also use the command **ll** to get similar information.



Step 5:

ls with modifier (ls -lt)

Now, let's learn about several **ls** options. Search for all the files in the current directory (/usr/bin). While at the same time getting detailed information such as file permissions, size, date and time. Sort the returned list by date and time.

Run the following command:

```
ls -lt
```



```

Terminal - prof_B@kali: /usr/bin
File Edit View Terminal Tabs Help
-rwxr-xr-x 1 root root 179 Dec 29 2015 pth-smbget
-rwxr-xr-x 1 root root 223 Dec 29 2015 pth-sqsh
-rwxr-xr-x 1 root root 179 Dec 29 2015 pth-winexe
-rwxr-xr-x 1 root root 9868 Oct 7 2015 nfc-emulate-forum-tag4
-rwxr-xr-x 1 root root 9812 Oct 7 2015 nfc-list
-rwxr-xr-x 1 root root 14020 Oct 7 2015 nfc-mfclassic
-rwxr-xr-x 1 root root 9844 Oct 7 2015 nfc-mfultralight
-rwxr-xr-x 1 root root 9860 Oct 7 2015 nfc-read-forum-tag3
-rwxr-xr-x 1 root root 13988 Oct 7 2015 nfc-relay-picc
-rwxr-xr-x 1 root root 5704 Oct 7 2015 nfc-scan-device
-rwxr-xr-x 1 root root 161316 Aug 16 2015 zip
-rwxr-xr-x 1 root root 68536 Aug 16 2015 zipcloak
-rwxr-xr-x 1 root root 64252 Aug 16 2015 zipnote
-rwxr-xr-x 1 root root 68348 Aug 16 2015 zipsplit
-rwxr-xr-x 1 root root 2696 Aug 11 2015 linux-version
-rwxr-xr-x 1 root root 9816 May 13 2015 get-edid
-rwxr-xr-x 1 root root 17612 May 13 2015 parse-edid
-rwxr-xr-x 1 root root 428 Jun 12 2013 c89-gcc
-rwxr-xr-x 1 root root 454 Jun 12 2013 c99-gcc
-rwxr-xr-x 1 root root 82376 Mar 23 2012 mawk
-rwxr-xr-x 1 root root 13996 Jul 14 2011 abootimg
-rwxr-xr-x 1 root root 362 Jul 14 2011 abootimg-pack-initrd
-rwxr-xr-x 1 root root 272 Jul 14 2011 abootimg-unpack-initrd
prof_B@kali: /usr/bin$

```

Understanding and using package options is a powerful tool.



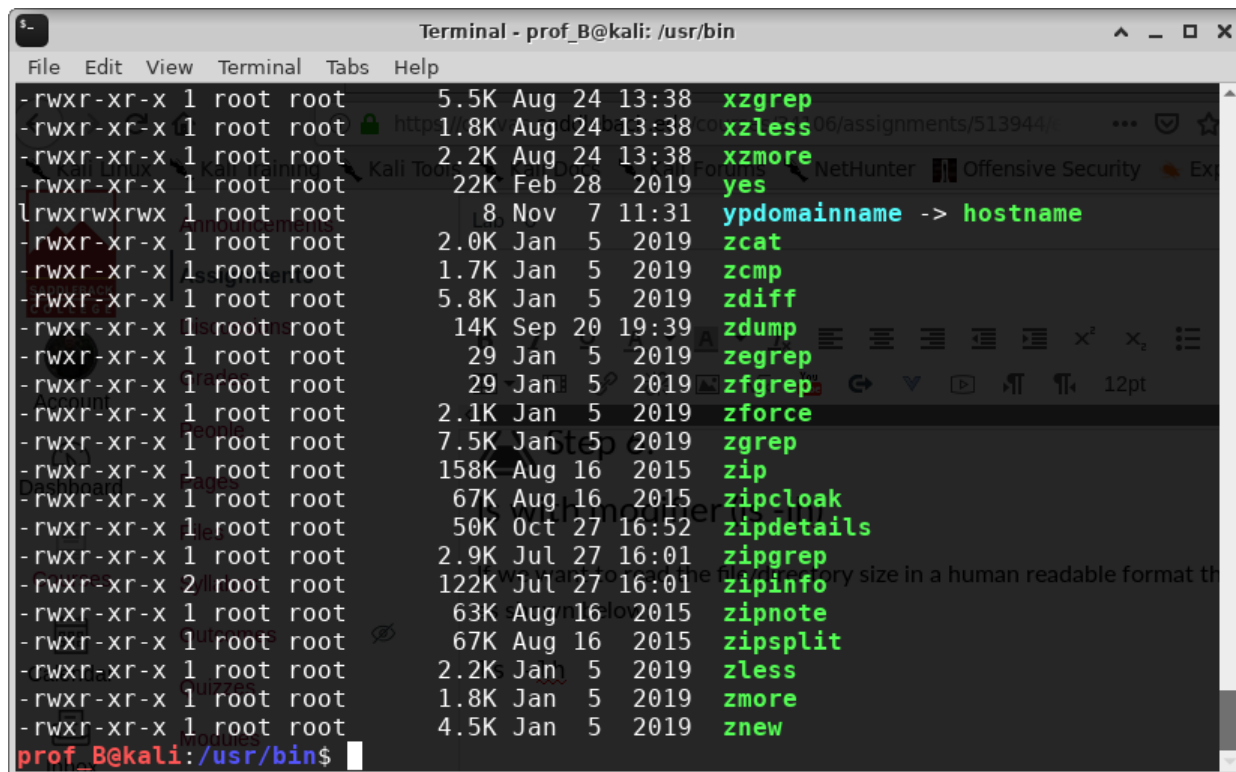
Step 6:

Is with modifier (ls -lh)

If we want to read the file/directory size in a human readable format then run the command as shown below:

```
ls -lh
```





```
Terminal - prof_B@kali: /usr/bin
File Edit View Terminal Tabs Help
-rwxr-xr-x 1 root root 5.5K Aug 24 13:38 xzgrep
-rwxr-xr-x 1 root root 1.8K Aug 24 13:38 xzless
-rwxr-xr-x 1 root root 2.2K Aug 24 13:38 xzmore
-rwxr-xr-x 1 root root 22K Feb 28 2019 yes
lrwxrwxrwx 1 root root 8 Nov 7 11:31 ypdomainname -> hostname
-rwxr-xr-x 1 root root 2.0K Jan 5 2019 zcat
-rwxr-xr-x 1 root root 1.7K Jan 5 2019 zcmp
-rwxr-xr-x 1 root root 5.8K Jan 5 2019 zdiff
-rwxr-xr-x 1 root root 14K Sep 20 19:39 zdump
-rwxr-xr-x 1 root root 29 Jan 5 2019 zegrep
-rwxr-xr-x 1 root root 29 Jan 5 2019 zfgrep
-rwxr-xr-x 1 root root 2.1K Jan 5 2019 zforce
-rwxr-xr-x 1 root root 7.5K Jan 5 2019 zgrep
-rwxr-xr-x 1 root root 158K Aug 16 2015 zip
-rwxr-xr-x 1 root root 67K Aug 16 2015 zipcloak
-rwxr-xr-x 1 root root 50K Oct 27 16:52 zipdetails
-rwxr-xr-x 1 root root 2.9K Jul 27 16:01 zipgrep
-rwxr-xr-x 2 root root 122K Jul 27 16:01 zipinfo
-rwxr-xr-x 1 root root 63K Aug 16 2015 zipnote
-rwxr-xr-x 1 root root 67K Aug 16 2015 zipsplit
-rwxr-xr-x 1 root root 2.2K Jan 5 2019 zless
-rwxr-xr-x 1 root root 1.8K Jan 5 2019 zmore
-rwxr-xr-x 1 root root 4.5K Jan 5 2019 znew
prof_B@kali: /usr/bin$
```

We can see that all the files are listed in a human readable format. Also, as with the previous steps, we can get all the details of directories.



Step 7:

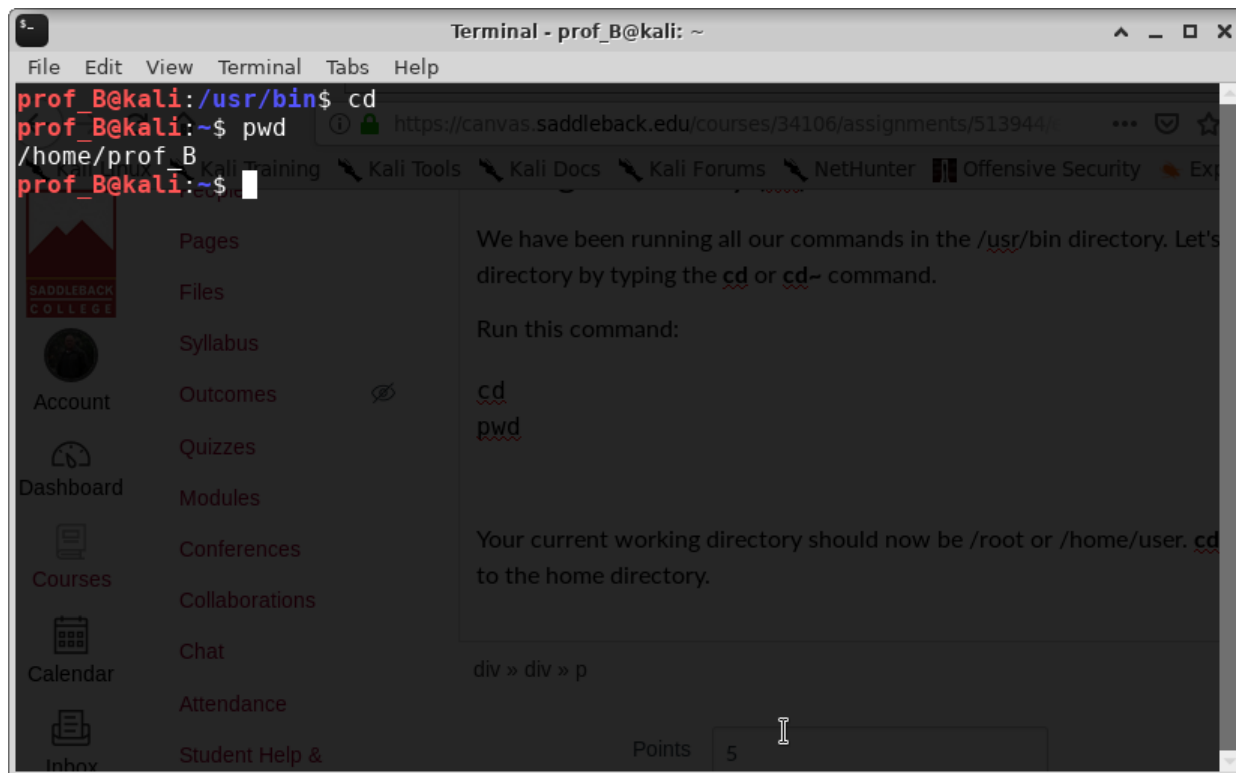
Change directory (cd)

We have been running all our commands in the /usr/bin directory. Let's move our current directory by typing the **cd** or **cd~** command.

Run this command:

```
cd
pwd
```





Your current working directory should now be `/home/user`. `cd ~` will also bring you to the home directory.



Step 8:

Auto-complete and Command History: The long way

Another important technique that will make you much faster is using the auto-complete or tab-complete function. It's really simple.

When you get to `/etc/ser` press tab to autocomplete the string

Go ahead and read the `/etc/services` file by typing:

```
cat /etc/ser<tab>
```



```

Terminal - prof_B@kali: ~
File Edit View Terminal Tabs Help
amanda 10082/tcp # amanda backup services
amidxtape 10083/tcp # amanda backup services
smsqp 11201/tcp # Alamin SMS gateway
smsqp 11201/udp
xpilot 15345/tcp # XPilot Contact Port
xpilot 15345/udp
sgi-cmsd 17001/udp # Cluster membership services daemon
sgi-crsd 17002/udp
sgi-gcd 17003/udp # SGI Group membership daemon
sgi-cad 17004/tcp # Cluster Admin daemon
isdnlog 20011/tcp # isdn logging system
isdnlog 20011/udp
vboxd 20012/tcp # voice box system
vboxd 20012/udp
binkp 24554/tcp # binkp fidonet protocol
asp 27374/tcp # Address Search Protocol
asp 27374/udp
csync2 30865/tcp # cluster synchronization tool
dircproxy 57000/tcp # Detachable IRC Proxy
tfido 60177/tcp # fidonet EMSI over telnet
fido 60179/tcp # fidonet EMSI over TCP
# Local services
prof_B@kali:~$

```



Step 9:

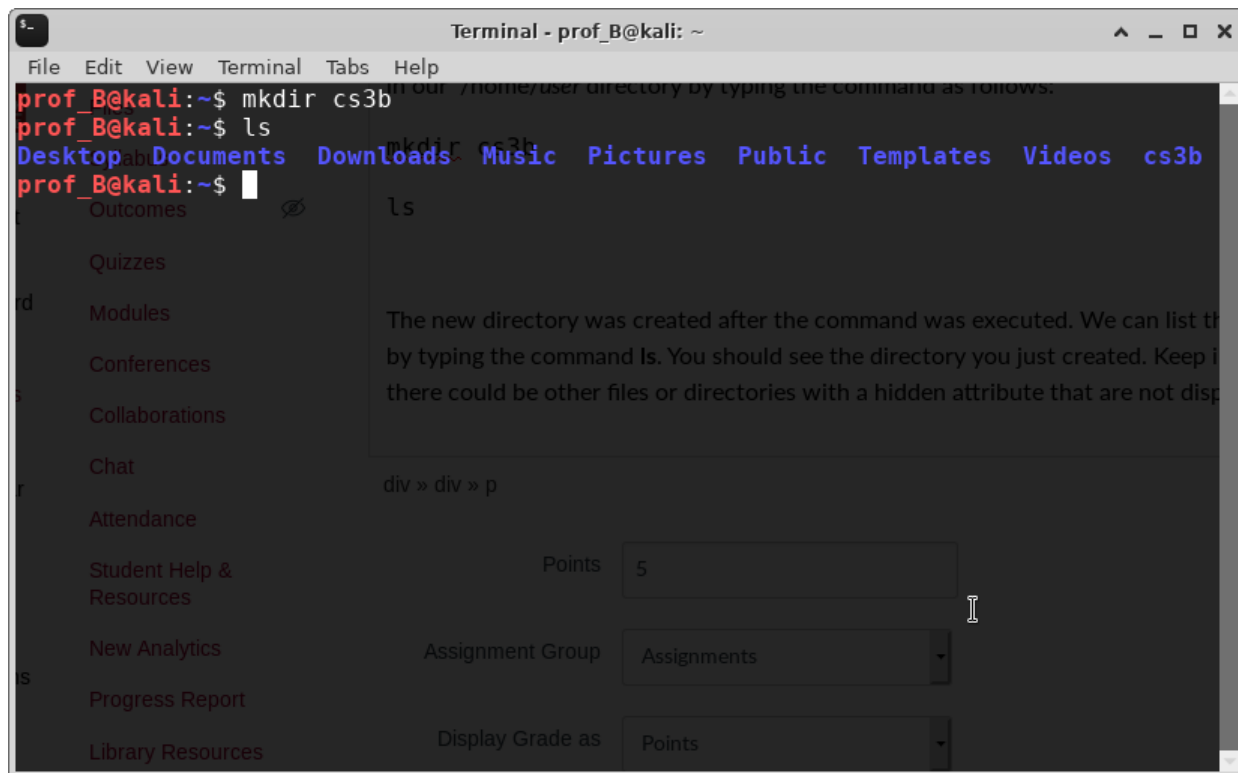
Create New Directory (mkdir)

To create a new directory use the **mkdir** command. Let's create a new directory named **cs3b** in our **/home/user** directory by typing the command as follows:

```
mkdir cs3b
```

```
ls
```





The screenshot shows a terminal window titled "Terminal - prof_B@kali: ~". The user has executed the following commands:

```
prof_B@kali:~$ mkdir cs3b
prof_B@kali:~$ ls
```

The output of the `ls` command shows the following directories: Desktop, Documents, Downloads, Music, Pictures, Public, Templates, Videos, and cs3b. The terminal also displays a message: "The new directory was created after the command was executed. We can list the directory by typing the command `ls`. You should see the directory you just created. Keep in mind that there could be other files or directories with a hidden attribute that are not displayed."

The new directory was created after the command was executed. We can list the directory by typing the command **ls**. You should see the directory you just created. Keep in mind that there could be other files or directories with a hidden attribute that are not displayed.



Step 10:

ls with modifier (ls -la)

Using the previous command, we can list all the directories in the `/home/user` directory. The **ls** command is very powerful utility, we can see hidden files and directories by typing the command:

```
ls -la
```



```

Terminal - prof_B@kali: ~
File Edit View Terminal Tabs Help
prof_B@kali:~$ ls -la
.  .bash_logout  .gnupg  .xsession-errors  Pictures
.. Files        .local  Desktop          Public
.ICEauthority .bashrc     .mozilla Documents         Templates
.Xauthority   .cache     .profile Downloads        Videos
.bash_history .config    .xsession-errors cs3b
prof_B@kali:~$ ls -la
.  .bash_logout  .gnupg  .xsession-errors  Pictures
.. Files        .local  Desktop          Public
.ICEauthority .bashrc     .mozilla Documents         Templates
.Xauthority   .cache     .profile Downloads        Videos
.bash_history .config    .xsession-errors cs3b
prof_B@kali:~$

```

From the output, we can see that there are many hidden files in our home directory. You should notice files such as: .bash_history, .bash_logout, .bash_profile, .bashrc and etc.



Step 11:

Create a sub directory(mkdir)

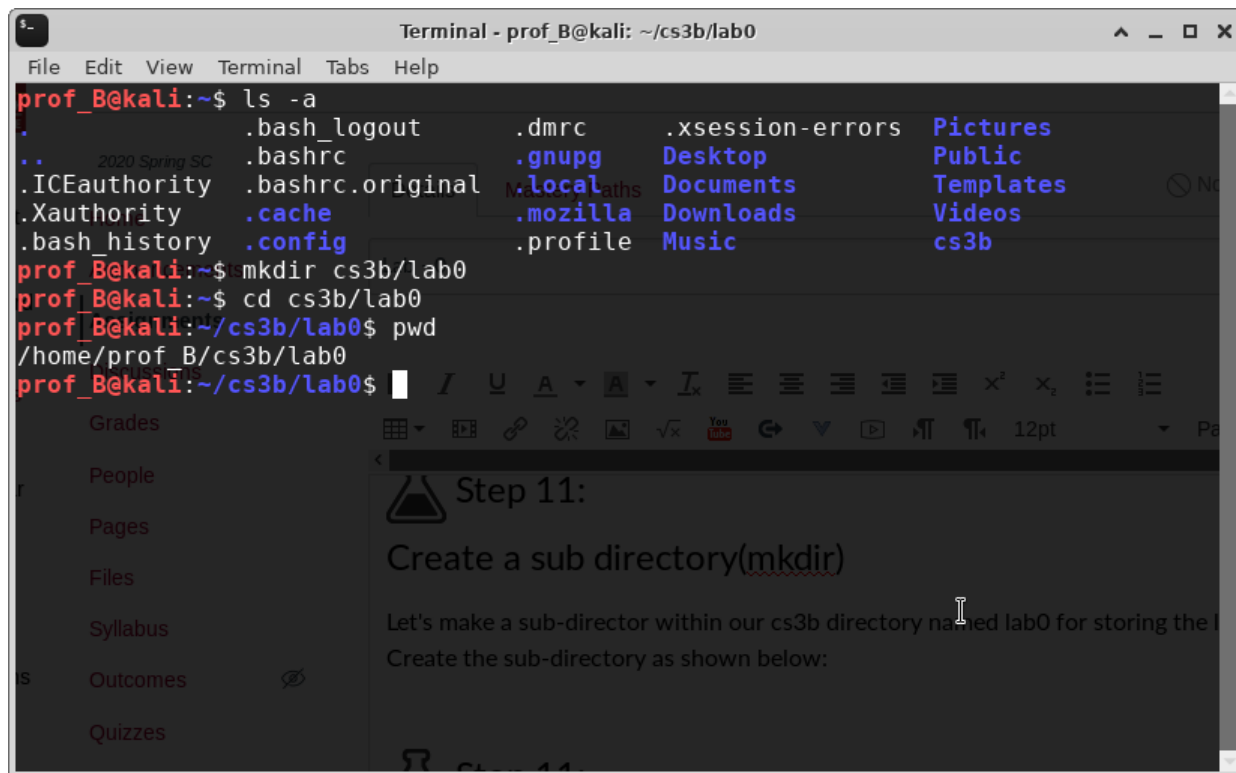
Let's make a sub-directory within our cs3b directory named lab0 for storing your lab0 submission ([lab0.jpg](#)). Create the sub-directory, navigate to it using cd, and finally show its contents as shown below:

```

mkdir cs3b/lab0
cd cs3b/lab0
pwd

```





```
Terminal - prof_B@kali: ~/cs3b/lab0
File Edit View Terminal Tabs Help
prof_B@kali:~$ ls -a
.          .bash_logout  .dmrc      .xsession-errors Pictures
..         .bashrc       .gnupg     Desktop      Public
2020 Spring SC .ICEauthority .bashrc.original .local PATHS  Documents
.Xauthority .cache        .mozilla   Downloads    Videos
.bash_history .config       .profile   Music        cs3b
prof_B@kali:~$ mkdir cs3b/lab0
prof_B@kali:~$ cd cs3b/lab0
prof_B@kali:~/cs3b/lab0$ pwd
/home/prof_B/cs3b/lab0
prof_B@kali:~/cs3b/lab0$
```

The terminal window shows the user navigating to the directory `~/cs3b/lab0`. A sidebar on the left contains links to Grades, People, Pages, Files, Syllabus, Outcomes, and Quizzes. A document viewer is open, displaying 'Step 11: Create a sub directory(mkdir)' with instructions to create a sub-directory named lab0.



Step 12:

Change to Root directory (cd)

Let's change from the home directory to the Root directory. Move to the root directory by using the forward slash character as shown below:

```
cd /
```

Let's check our current working directory by using the **pwd** command. We are now inside the root directory.

```
pwd
```



```
prof_B@kali:~/cs3b/lab0$ cd /
prof_B@kali:/$ pwd
/
prof_B@kali:/$
```

Let's change from the home directory to the root directory. Move to the root directory using the forward slash character as shown below:

```
cd /
```

Let's check our current working directory by using the `pwd` command. We are now in the root directory.



Step 13:

Change directory to Parent directory (cd)

Let's navigate to the `/var` directory using the command `cd /var`.

```
cd /var
```

We are now in the `/var` directory. Next, let's move to its parent directory. Go one directory up, to the parent directory, by using two periods as shown below:

```
cd ..
```

We are now in the root directory. To see the current working directory use the `pwd` command. We can move backward from any directory by typing the `cd ..` command.



```
prof_B@kali:/$ cd /var
prof_B@kali:/var$ cd ..
prof_B@kali:/$ pwd
/
prof_B@kali:/$
```

cd /var

We are now in the /var directory. Next, let's move to its parent directory. Go one level up, to the parent directory, by using two periods as shown below:

```
cd ..
```

pwd

We are now in the root directory. To see the current working directory use the **pwd** command. We can move backward from any directory by typing the **cd** command followed by two periods.



Step 14:

Showing the terminal file (tty)

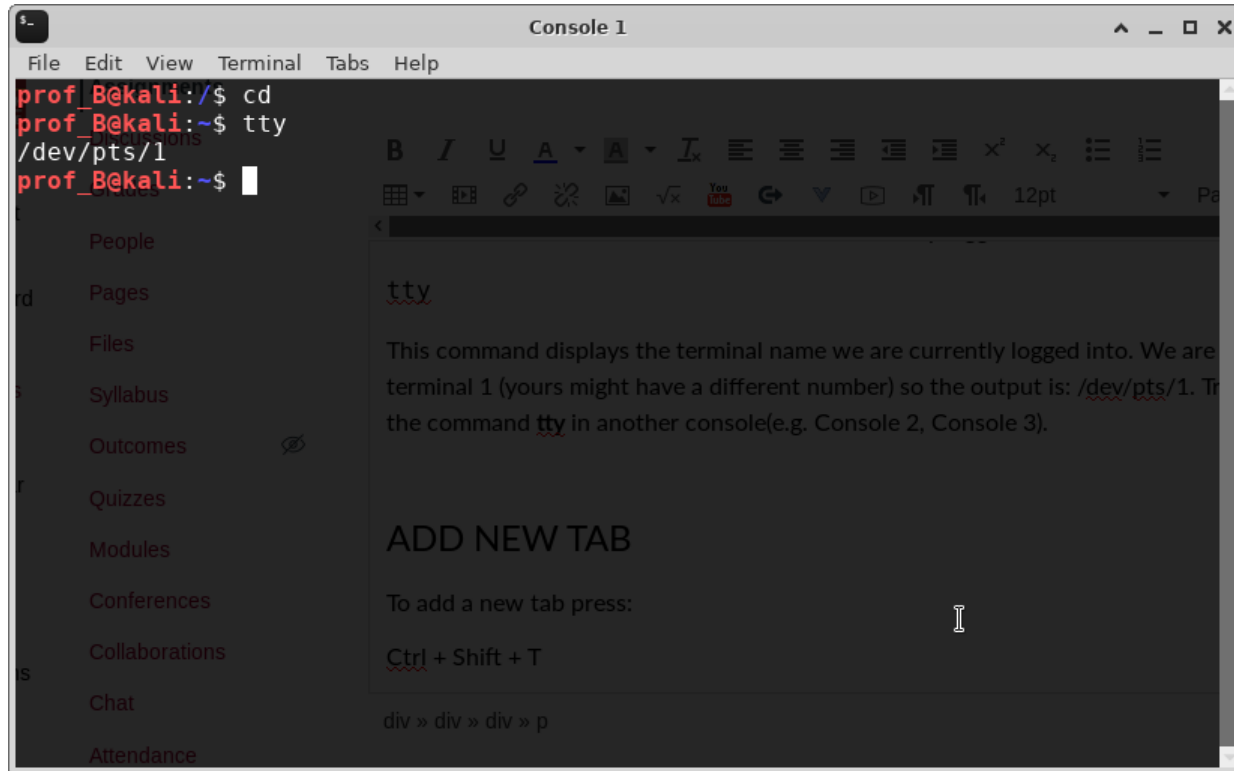
First, make sure that you are currently in the `/home/user` directory by typing the **pwd** command. If we are not in this directory just use the **cd** command.

```
cd
```

So far we learned commands to change directory and list files. Now, let's check the terminal name we are currently logged into. Use the command:

```
tty
```

This command displays the terminal name we are currently logged into. We are right now in terminal 1 (yours might have a different number) so the output is: `/dev/pts/1`. Try executing the command **tty** in another console (e.g. Console 2, Console 3). You will notice that I changed my console name to "Console 1" by double clicking on the header and editing the name. This makes it easier to keep up with multiple consoles. Also notice that this is not a bash shell and doesn't have the nice colors.



```
prof_Bekali:/$ cd
prof_Bekali:~$ tty
/dev/pts/1
prof_Bekali:~$
```

tty

This command displays the terminal name we are currently logged into. We are terminal 1 (yours might have a different number) so the output is: `/dev/pts/1`. Try the command `tty` in another console(e.g. Console 2, Console 3).

ADD NEW TAB

To add a new tab press:

`Ctrl + Shift + T`

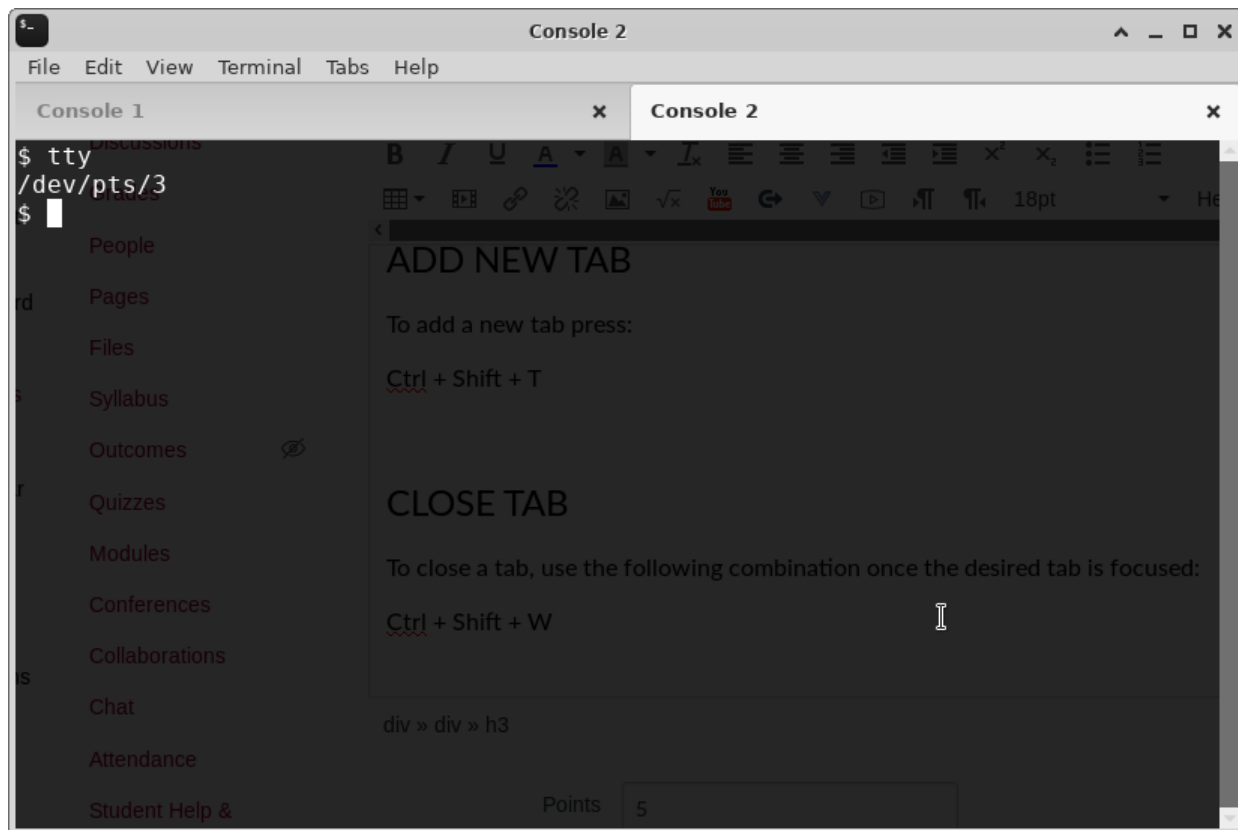
div » div » div » p

ADD NEW TAB

To add a new tab press:

Ctrl + Shift + T





CLOSE TAB

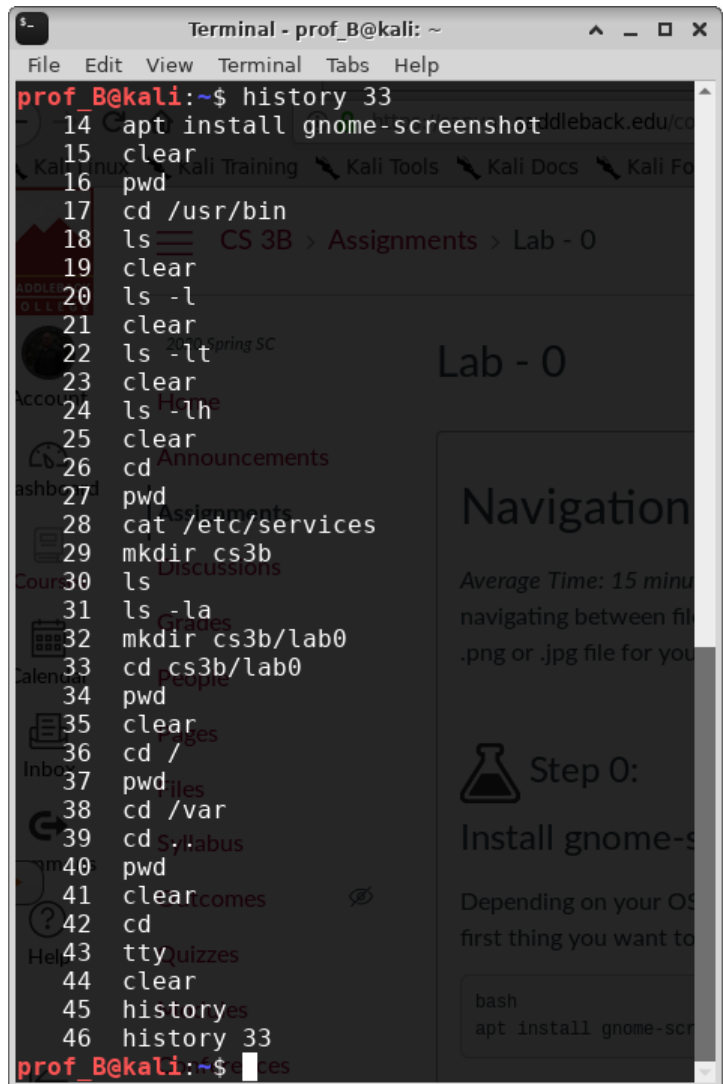
To close a tab, use the following combination once the desired tab is focused:

Ctrl + Shift + W

So far in this Lab, we familiarized with many file and directory basics.

This completes the Linux Navigation lab. Once you've finished all 14 steps, you are to enter the following command and submit a clipped screenshot of the result displayed by your terminal. Only show the windowed terminal and not the desktop named [lab0.png](#) or [lab0.jpg](#). Save this your your lab0 subdirectory. Ensure that it shows the entire history beginning with step 1. You'll also notice that I excluded the first 13 lines of my history as they were commands I executed for other things not related to this lab. I actually entered history 33 to show the last 33 lines of my history.





```
Terminal - prof_B@kali: ~
File Edit View Terminal Tabs Help
prof_B@kali:~$ history 33
14 apt install gnome-screenshot
15 clear
16 pwd
17 cd /usr/bin
18 ls
19 clear
20 ls -l
21 clear
22 ls -lt
23 clear
24 ls -lh
25 clear
26 cd
27 pwd
28 cat /etc/services
29 mkdir cs3b
30 ls
31 ls -la
32 mkdir cs3b/lab0
33 cd cs3b/lab0
34 pwd
35 clear
36 cd /
37 pwd
38 cd /var
39 cd /var
40 pwd
41 clear
42 cd
43 tty
44 clear
45 history
46 history 33
prof_B@kali:~$
```

Extra credit 1 pt: Upload a second .png that proves you saved your lab0 screenshot to the cs3b/lab0 directory.



