CYBR 1500 Assignment, Week 3

# Part I: Required Readings and Lecture Content

***NB****. You may read first, and watch lectures after; Or, watch the lectures, and read the text after--your choice.*

*If the videos reference any content with page numbers that you can’t locate in your textbook, please let me know. Since the 3rd edition of the textbook is used in the videos, when you use a different version of the textbook, the page numbers will be different.*

* Watch the videos here for the lectures.
* Video Lecture 1, Week 3 Update: <https://www.youtube.com/watch?v=qbXOHxsEbjo>
* Video Lecture 2, Chapter 4: <https://youtu.be/b-Apr_F9-_c>
* Video Lecture 3, Chapter 4: <https://youtu.be/APtF85OWrVc>
* Video Lecture 4, Chapter 5: <https://youtu.be/jTEwtoTrdc0>
* Read and be familiar with chapters 4-5 of Blum & Bresnahan
* Read the slides for Week 3

*NB. Unless otherwise specified, all commands/steps are to be performed at the command line.*

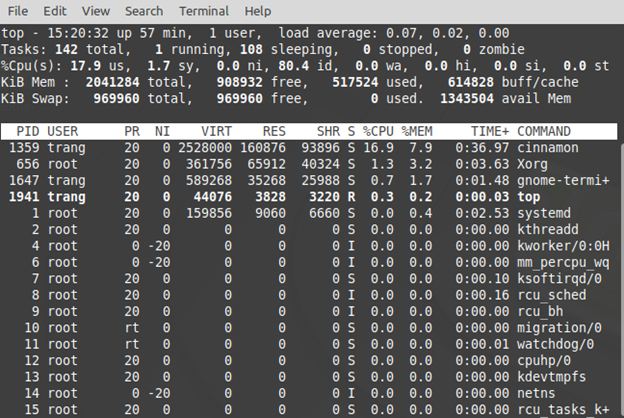
*NB. As in the assignment for week 2, you will perform some tasks on the command line and capture the interactions by copying and pasting the text from the terminal. In the GNOME terminal, you can easily do this by selecting Edit/Select All from the menu, then Edit/Copy; then, paste into this document.*

*NB. If you have this document open in a browser inside of Linux, copy and paste works similarly to Windows or other operating systems. If you have this open in your browser from within Windows, you’ll want to enable clipboard sharing in VirtualBox. From the VirtualBox menu, Devices/Shared Clipboard, select “bidirectional” for maximum flexibility.*

*NB. If copy-paste functionality between Linux and Windows does not work for you, and a solution is elusive, the easiest workaround is to just open a browser window in Linux (Firefox is installed already, and works fine)--then log into your campus Google and Blackboard accounts, and complete the assignment there.*

# Part 2: Chapter 4, More Bash Commands

1. Start a new terminal session.
2. Use the **ps** command to find what processes are running.
3. Use the top command to display real time process monitoring. It should look like this:



1. From your directory which should look like this /home/<your name> e.g. /home/trang (not root), run the command, **du -h**, to see how much disk space is being used in your home directory tree. Run the command again, adding the **-s** option (i.e., **du -h -s,** or **du -hs**). *NB. You will probably get a message that one or more directories are not readable because of permissions--that’s fine.*
2. Use the tar command to create a backup archive of your home directory contents. Call it backup.tar.

*ADDENDUM 1/25: leave off the v part of the options, because it results in a large amount of output. Also, it’s okay if tar reports some errors--some things can’t be accessed from your user account.*

1. Copy all the text in the terminal, paste it where indicated below, and change its font to Courier New, 10 point, for better display:

>>>>>Paste your terminal capture below this line >>>>>

**andrew@andrew-VirtualBox**:**~**$ ps

    PID TTY          TIME CMD

   2099 pts/0    00:00:00 bash

   2105 pts/0    00:00:00 ps

**andrew@andrew-VirtualBox**:**~**$ top

top - 15:42:12 up 12 min,  1 user,  load average: 0.08, 0.11, 0.11

Tasks: **149** total, **1** running, **148** sleeping, **0** stopped, **0** zombie

%Cpu(s):**0.0** us,**7.1** sy,**0.0** ni, **92.9** id,**0.0** wa,**0.0** hi,**0.0** si,**0.0** st

MiB Mem : **7962.4** total, **6368.3** free,**638.0** used,**956.0** buff/cache

MiB Swap: **1401.6** total, **1401.6** free,**0.0** used. **7054.5** avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND

   1064 andrew    20   0 3324300 191348 115348 S   6.7   2.3   0:15.37 cinnamon

      1 root      20   0  101808  11492   8568 S   0.0   0.1   0:01.22 systemd

      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd

      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu\_gp

      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu\_par+

      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+

      7 root      20   0       0      0      0 I   0.0   0.0   0:00.12 kworker+

      8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm\_perc+

      9 root      20   0       0      0      0 S   0.0   0.0   0:00.85 ksoftir+

     10 root      20   0       0      0      0 I   0.0   0.0   0:00.12 rcu\_sch+

     11 root      rt   0       0      0      0 S   0.0   0.0   0:00.00 migrati+

     12 root     -51   0       0      0      0 S   0.0   0.0   0:00.00 idle\_in+

     14 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0

     15 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kdevtmp+

     16 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns

     17 root      20   0       0      0      0 S   0.0   0.0   0:00.00 rcu\_tas+

     18 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kauditd

**andrew@andrew-VirtualBox**:**~**$ cd /home/andrew/

**andrew@andrew-VirtualBox**:**~**$ du -h

4.0K ./Templates

4.0K ./Pictures

4.0K ./.mozilla/extensions

4.0K ./.mozilla/firefox/Pending Pings

996K ./.mozilla/firefox/ifai5usm.default-release/extensions

4.0K ./.mozilla/firefox/ifai5usm.default-release/saved-telemetry-pings

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/3870112724rsegmnoittet-es.files/journals

1.9M ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/3870112724rsegmnoittet-es.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/2823318777ntouromlalnodry--naod.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/1657114595AmcateirvtiSty.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/2918063365piupsah.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/3561288849sdhlie.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb/1451318868ntouromlalnodry--epcr.files

14M ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome/idb

14M ./.mozilla/firefox/ifai5usm.default-release/storage/permanent/chrome

14M ./.mozilla/firefox/ifai5usm.default-release/storage/permanent

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/temporary

16K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++accounts.google.com/ls

24K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++accounts.google.com

16K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/ls

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/295498498yCt7-%iCd7b%-UpurQeNf.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/2232182701SeesravbiacteaWDosrgk.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/2171031483YattIedMb.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/2581170943PCe7r%sCi7s%tUeunQtNE.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/1755483016yCt7-%iCt7-%rUeusQpNo.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/3211250388sbwdpsunsohintoatciif.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb/329412932LCo7g%sCD7a%tUaubQaNs.files

360K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/idb

48K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/cache/morgue/21

8.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/cache/morgue/213

60K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/cache/morgue

148K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com/cache

532K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.youtube.com

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/moz-extension+++c1d0555e-e517-4c0f-bf1d-44f60963c401^userContextId=4294967295/idb/3647222921wleabcEoxlt-eengsairo.files

52K ./.mozilla/firefox/ifai5usm.default-release/storage/default/moz-extension+++c1d0555e-e517-4c0f-bf1d-44f60963c401^userContextId=4294967295/idb

60K ./.mozilla/firefox/ifai5usm.default-release/storage/default/moz-extension+++c1d0555e-e517-4c0f-bf1d-44f60963c401^userContextId=4294967295

16K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++drive.google.com/ls

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++drive.google.com/idb/548905059db.files

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++drive.google.com/idb/4041069256GsoDoegvlierD.files

352K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++drive.google.com/idb

376K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++drive.google.com

16K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++docs.google.com/ls

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++docs.google.com/idb/548905059db.files

52K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++docs.google.com/idb

76K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++docs.google.com

20K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.google.com/ls

4.0K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.google.com/idb/548905059db.files

52K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.google.com/idb

80K ./.mozilla/firefox/ifai5usm.default-release/storage/default/https+++www.google.com

1.2M ./.mozilla/firefox/ifai5usm.default-release/storage/default

16M ./.mozilla/firefox/ifai5usm.default-release/storage

4.0K ./.mozilla/firefox/ifai5usm.default-release/bookmarkbackups

1.4M ./.mozilla/firefox/ifai5usm.default-release/gmp-gmpopenh264/1.8.1.1

1.4M ./.mozilla/firefox/ifai5usm.default-release/gmp-gmpopenh264

76K ./.mozilla/firefox/ifai5usm.default-release/datareporting/archived/2022-01

80K ./.mozilla/firefox/ifai5usm.default-release/datareporting/archived

4.0K ./.mozilla/firefox/ifai5usm.default-release/datareporting/glean/pending\_pings

4.0K ./.mozilla/firefox/ifai5usm.default-release/datareporting/glean/events

4.0K ./.mozilla/firefox/ifai5usm.default-release/datareporting/glean/tmp

8.0K ./.mozilla/firefox/ifai5usm.default-release/datareporting/glean/db

24K ./.mozilla/firefox/ifai5usm.default-release/datareporting/glean

116K ./.mozilla/firefox/ifai5usm.default-release/datareporting

4.0K ./.mozilla/firefox/ifai5usm.default-release/crashes/events

12K ./.mozilla/firefox/ifai5usm.default-release/crashes

4.0K ./.mozilla/firefox/ifai5usm.default-release/minidumps

3.5M ./.mozilla/firefox/ifai5usm.default-release/security\_state

20K ./.mozilla/firefox/ifai5usm.default-release/sessionstore-backups

33M ./.mozilla/firefox/ifai5usm.default-release

4.0K ./.mozilla/firefox/Crash Reports/events

12K ./.mozilla/firefox/Crash Reports

8.0K ./.mozilla/firefox/4spvhaim.default

33M ./.mozilla/firefox

33M ./.mozilla

4.0K ./Videos

496K ./.cinnamon/spices.cache/desklet

1.8M ./.cinnamon/spices.cache/applet

62M ./.cinnamon/spices.cache/theme

184K ./.cinnamon/spices.cache/extension

64M ./.cinnamon/spices.cache

8.0K ./.cinnamon/configs/sound@cinnamon.org

16K ./.cinnamon/configs/menu@cinnamon.org

8.0K ./.cinnamon/configs/printers@cinnamon.org

8.0K ./.cinnamon/configs/show-desktop@cinnamon.org

8.0K ./.cinnamon/configs/notifications@cinnamon.org

8.0K ./.cinnamon/configs/power@cinnamon.org

8.0K ./.cinnamon/configs/favorites@cinnamon.org

8.0K ./.cinnamon/configs/network@cinnamon.org

16K ./.cinnamon/configs/grouped-window-list@cinnamon.org

8.0K ./.cinnamon/configs/calendar@cinnamon.org

100K ./.cinnamon/configs

64M ./.cinnamon

4.0K ./Downloads

4.0K ./.local/share/keyrings

4.0K ./.local/share/evolution/calendar/system

4.0K ./.local/share/evolution/calendar/trash

12K ./.local/share/evolution/calendar

4.0K ./.local/share/evolution/memos/trash

8.0K ./.local/share/evolution/memos

4.0K ./.local/share/evolution/tasks/system

4.0K ./.local/share/evolution/tasks/trash

12K ./.local/share/evolution/tasks

4.0K ./.local/share/evolution/addressbook/system/photos

92K ./.local/share/evolution/addressbook/system

4.0K ./.local/share/evolution/addressbook/trash

100K ./.local/share/evolution/addressbook

4.0K ./.local/share/evolution/mail/trash

8.0K ./.local/share/evolution/mail

144K ./.local/share/evolution

4.0K ./.local/share/applications

40K ./.local/share/gvfs-metadata

4.0K ./.local/share/icc

4.0K ./.local/share/nemo/actions

4.0K ./.local/share/nemo/scripts

12K ./.local/share/nemo

4.0K ./.local/share/cinnamon/desklets

4.0K ./.local/share/cinnamon/extensions

4.0K ./.local/share/cinnamon/search\_providers

4.0K ./.local/share/cinnamon/applets

20K ./.local/share/cinnamon

236K ./.local/share

240K ./.local

4.0K ./.gnupg/private-keys-v1.d

8.0K ./.gnupg

4.0K ./Documents/week2/links

8.0K ./Documents/week2

12K ./Documents

8.0K ./.linuxmint/mintupdate

12K ./.linuxmint

4.0K ./Music

8.0K ./.config/evolution/sources

12K ./.config/evolution

8.0K ./.config/caja

84K ./.config/pulse

8.0K ./.config/gtk-3.0

4.0K ./.config/autostart

8.0K ./.config/qt5ct

4.0K ./.config/cinnamon-session/saved-session

8.0K ./.config/cinnamon-session

8.0K ./.config/nemo

4.0K ./.config/goa-1.0

4.0K ./.config/menus/applications-merged

8.0K ./.config/menus

4.0K ./.config/procps

8.0K ./.config/dconf

20K ./.config/hexchat

196K ./.config

4.0K ./.cache/obexd

4.0K ./.cache/evolution/calendar/trash

8.0K ./.cache/evolution/calendar

4.0K ./.cache/evolution/memos/trash

8.0K ./.cache/evolution/memos

4.0K ./.cache/evolution/tasks/trash

8.0K ./.cache/evolution/tasks

4.0K ./.cache/evolution/addressbook/trash

8.0K ./.cache/evolution/addressbook

4.0K ./.cache/evolution/mail/trash

8.0K ./.cache/evolution/mail

4.0K ./.cache/evolution/sources/trash

8.0K ./.cache/evolution/sources

52K ./.cache/evolution

12K ./.cache/fontconfig

144K ./.cache/mozilla/firefox/ifai5usm.default-release/settings/main/quicksuggest

12K ./.cache/mozilla/firefox/ifai5usm.default-release/settings/main/ms-language-packs/browser/newtab

16K ./.cache/mozilla/firefox/ifai5usm.default-release/settings/main/ms-language-packs/browser

20K ./.cache/mozilla/firefox/ifai5usm.default-release/settings/main/ms-language-packs

168K ./.cache/mozilla/firefox/ifai5usm.default-release/settings/main

172K ./.cache/mozilla/firefox/ifai5usm.default-release/settings

12M ./.cache/mozilla/firefox/ifai5usm.default-release/safebrowsing/google4

14M ./.cache/mozilla/firefox/ifai5usm.default-release/safebrowsing

22M ./.cache/mozilla/firefox/ifai5usm.default-release/startupCache

4.0K ./.cache/mozilla/firefox/ifai5usm.default-release/thumbnails

4.0K ./.cache/mozilla/firefox/ifai5usm.default-release/cache2/doomed

80M ./.cache/mozilla/firefox/ifai5usm.default-release/cache2/entries

80M ./.cache/mozilla/firefox/ifai5usm.default-release/cache2

115M ./.cache/mozilla/firefox/ifai5usm.default-release

4.0K ./.cache/mozilla/firefox/4spvhaim.default

115M ./.cache/mozilla/firefox

115M ./.cache/mozilla

4.0K ./.cache/gnome-screenshot

8.0K ./.cache/mesa\_shader\_cache/35

8.0K ./.cache/mesa\_shader\_cache/9f

8.0K ./.cache/mesa\_shader\_cache/54

4.0K ./.cache/mesa\_shader\_cache/aa

8.0K ./.cache/mesa\_shader\_cache/c4

8.0K ./.cache/mesa\_shader\_cache/2f

8.0K ./.cache/mesa\_shader\_cache/cc

8.0K ./.cache/mesa\_shader\_cache/30

8.0K ./.cache/mesa\_shader\_cache/4e

4.0K ./.cache/mesa\_shader\_cache/64

8.0K ./.cache/mesa\_shader\_cache/d7

8.0K ./.cache/mesa\_shader\_cache/1f

8.0K ./.cache/mesa\_shader\_cache/c0

8.0K ./.cache/mesa\_shader\_cache/2d

8.0K ./.cache/mesa\_shader\_cache/77

8.0K ./.cache/mesa\_shader\_cache/d2

12K ./.cache/mesa\_shader\_cache/6b

8.0K ./.cache/mesa\_shader\_cache/6f

8.0K ./.cache/mesa\_shader\_cache/38

8.0K ./.cache/mesa\_shader\_cache/c6

8.0K ./.cache/mesa\_shader\_cache/98

8.0K ./.cache/mesa\_shader\_cache/29

8.0K ./.cache/mesa\_shader\_cache/0f

8.0K ./.cache/mesa\_shader\_cache/6e

8.0K ./.cache/mesa\_shader\_cache/b0

8.0K ./.cache/mesa\_shader\_cache/0c

8.0K ./.cache/mesa\_shader\_cache/04

12K ./.cache/mesa\_shader\_cache/70

8.0K ./.cache/mesa\_shader\_cache/4f

8.0K ./.cache/mesa\_shader\_cache/fa

8.0K ./.cache/mesa\_shader\_cache/3c

8.0K ./.cache/mesa\_shader\_cache/7c

8.0K ./.cache/mesa\_shader\_cache/2a

8.0K ./.cache/mesa\_shader\_cache/ad

8.0K ./.cache/mesa\_shader\_cache/55

8.0K ./.cache/mesa\_shader\_cache/89

8.0K ./.cache/mesa\_shader\_cache/13

12K ./.cache/mesa\_shader\_cache/16

8.0K ./.cache/mesa\_shader\_cache/5b

8.0K ./.cache/mesa\_shader\_cache/75

8.0K ./.cache/mesa\_shader\_cache/a1

12K ./.cache/mesa\_shader\_cache/03

8.0K ./.cache/mesa\_shader\_cache/59

8.0K ./.cache/mesa\_shader\_cache/8d

408K ./.cache/mesa\_shader\_cache

436K ./.cache/samba

140K ./.cache/wallpaper

116M ./.cache

4.0K ./.themes

4.0K ./Desktop

4.0K ./Public

213M .

**andrew@andrew-VirtualBox**:**~**$ du -h -s

213M .

**andrew@andrew-VirtualBox**:**~**$ tar -cf backup.tar /home/andrew/

tar: Removing leading `/' from member names

tar: Removing leading `/' from hard link targets

tar: /home/andrew/backup.tar: file is the archive; not dumped

**andrew@andrew-VirtualBox**:**~**$

<<<<< Paste your terminal capture above this line <<<<<

# Part 3: Chapter 5, The Shell

1. Use the **cat** command from last week to view the contents of the **/etc/passwd** file. Observe which shell is set as your user default shell. This should be the **bash** shell. If not, you should start the **bash** shell by typing **/bin/bash**, if it’s currently available on your system.

*NB. In the future we will be writing shell scripts for the* ***bash*** *shell, so you will want that to be accessible on the system you’re using. If you are using Mint, Ubuntu, or most other Debian-based distributions,* ***bash*** *should be the default user shell.*

1. Start a **bash** subshell (by just typing **bash**), and from within the subshell, launch another **bash** subshell.
2. Use the **ps** command with the **--forest** option to see the relationship of running processes.
3. Terminate the current subshell by typing **exit**; and execute the last step again to show the relationships between the active processes.

*NB. Be sure not to type exit at the original parent shell--if you type it one too many times, you’ll terminate the terminal session, and won’t be able to copy the text for submission later.*

1. Skim the **man** pages for the **sleep** and **kill** programs.
2. Create a new background process by executing the sleep program with the parameter 2000, like this: **sleep 2000 &**

*NB. What does this do? How long does it take? No need to answer these questions in the homework, just think them through, based on your reading of the man page.*

1. Send the **TERM** (terminate) signal to the sleep process that you created.
2. Run **ps** to see that the process has terminated.
3. Determine if **type** is a shell built-in command or an external command (no need to write the answer, just run a command on the command line that makes it obvious).
4. Determine what aliases are available to you in **bash** by default. Do any of those seem helpful to you? Try one of the aliased variations of **ls**.
5. Create your own alias for the **ps** command, adding some options that appeal to you (at least one). Run the command using your alias.
6. Copy all the text in the terminal, paste it where indicated below, and change its font to Courier New, 10 point, for better display:

>>>>>Paste your terminal capture below this line >>>>>

**andrew@andrew-VirtualBox**:**~**$ cat /etc/passwd

root:x:0:0:root:/root:/bin/bash

daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin

bin:x:2:2:bin:/bin:/usr/sbin/nologin

sys:x:3:3:sys:/dev:/usr/sbin/nologin

sync:x:4:65534:sync:/bin:/bin/sync

games:x:5:60:games:/usr/games:/usr/sbin/nologin

man:x:6:12:man:/var/cache/man:/usr/sbin/nologin

lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin

mail:x:8:8:mail:/var/mail:/usr/sbin/nologin

news:x:9:9:news:/var/spool/news:/usr/sbin/nologin

uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin

proxy:x:13:13:proxy:/bin:/usr/sbin/nologin

www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin

backup:x:34:34:backup:/var/backups:/usr/sbin/nologin

list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin

irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin

gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin

nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin

systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin

systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin

systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin

messagebus:x:103:106::/nonexistent:/usr/sbin/nologin

syslog:x:104:110::/home/syslog:/usr/sbin/nologin

\_apt:x:105:65534::/nonexistent:/usr/sbin/nologin

tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false

rtkit:x:107:112:RealtimeKit,,,:/proc:/usr/sbin/nologin

systemd-coredump:x:108:113:systemd Core Dumper,,,:/run/systemd:/usr/sbin/nologin

kernoops:x:109:65534:Kernel Oops Tracking Daemon,,,:/:/usr/sbin/nologin

uuidd:x:110:118::/run/uuidd:/usr/sbin/nologin

cups-pk-helper:x:111:114:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin

tcpdump:x:112:120::/nonexistent:/usr/sbin/nologin

geoclue:x:113:122::/var/lib/geoclue:/usr/sbin/nologin

avahi-autoipd:x:114:123:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin

usbmux:x:115:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin

lightdm:x:116:124:Light Display Manager:/var/lib/lightdm:/bin/false

dnsmasq:x:117:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin

\_flatpak:x:118:127:Flatpak system-wide installation helper,,,:/nonexistent:/usr/sbin/nologin

avahi:x:119:128:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin

saned:x:120:129::/var/lib/saned:/usr/sbin/nologin

colord:x:121:130:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin

pulse:x:122:131:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin

speech-dispatcher:x:123:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false

nm-openvpn:x:124:133:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin

hplip:x:125:7:HPLIP system user,,,:/run/hplip:/bin/false

andrew:x:1000:1000:Andrew,,,:/home/andrew:/bin/bash

**andrew@andrew-VirtualBox**:**~**$ bash

**andrew@andrew-VirtualBox**:**~**$ bash

**andrew@andrew-VirtualBox**:**~**$ ps --forest

    PID TTY          TIME CMD

   3009 pts/0    00:00:00 bash

   3020 pts/0    00:00:00  \\_ bash

   3026 pts/0    00:00:00      \\_ bash

   3032 pts/0    00:00:00          \\_ ps

**andrew@andrew-VirtualBox**:**~**$ exit

exit

**andrew@andrew-VirtualBox**:**~**$ ps --forest

    PID TTY          TIME CMD

   3009 pts/0    00:00:00 bash

   3020 pts/0    00:00:00  \\_ bash

   3033 pts/0    00:00:00      \\_ ps

**andrew@andrew-VirtualBox**:**~**$ exit

exit

**andrew@andrew-VirtualBox**:**~**$ sleep 2000 &

[1] 3041

**andrew@andrew-VirtualBox**:**~**$ kill 3041

**andrew@andrew-VirtualBox**:**~**$ ps

    PID TTY          TIME CMD

   3009 pts/0    00:00:00 bash

   3055 pts/0    00:00:00 ps

[1]+  Terminated              sleep 2000

**andrew@andrew-VirtualBox**:**~**$ type type

type is a shell builtin

**andrew@andrew-VirtualBox**:**~**$ alias ll="ls -lhA"

**andrew@andrew-VirtualBox**:**~**$ ll

total 214M

-rw-rw-r--  1 andrew andrew 214M Jan 31 16:32 **backup.tar**

-rw-------  1 andrew andrew  762 Jan 31 16:48 .bash\_history

-rw-r--r--  1 andrew andrew  220 Jan 18 04:24 .bash\_logout

-rw-r--r--  1 andrew andrew 3.7K Jan 18 04:24 .bashrc

drwx------ 10 andrew andrew 4.0K Jan 18 04:32 **.cache**

drwxrwxr-x  4 andrew andrew 4.0K Jan 18 04:27 **.cinnamon**

drwxr-xr-x 15 andrew andrew 4.0K Jan 31 15:33 **.config**

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Desktop**

drwxr-xr-x  3 andrew andrew 4.0K Jan 24 13:42 **Documents**

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Downloads**

drwx------  3 andrew andrew 4.0K Jan 18 04:27 **.gnupg**

-rw-r--r--  1 andrew andrew   22 Jan 18 04:24 .gtkrc-2.0

-rw-r--r--  1 andrew andrew  516 Jan 18 04:24 .gtkrc-xfce

drwxrwxrwx  3 andrew andrew 4.0K Jan 24 13:24 .linuxmint

drwxrwxr-x  3 andrew andrew 4.0K Jan 18 04:27 **.local**

drwx------  4 andrew andrew 4.0K Jan 18 04:27 **.mozilla**

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Music**

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Pictures**

-rw-r--r--  1 andrew andrew  807 Jan 18 04:24 .profile

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Public**

-rw-r--r--  1 andrew andrew    0 Jan 31 15:40 .sudo\_as\_admin\_successful

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Templates**

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **.themes**

drwxr-xr-x  2 andrew andrew 4.0K Jan 18 04:27 **Videos**

-rw-------  1 andrew andrew   62 Jan 31 15:30 .Xauthority

-rw-------  1 andrew andrew 8.4K Jan 31 16:15 .xsession-errors

-rw-------  1 andrew andrew 8.2K Jan 24 13:14 .xsession-errors.old

**andrew@andrew-VirtualBox**:**~**$ alias running="ps -a"

**andrew@andrew-VirtualBox**:**~**$ running

    PID TTY          TIME CMD

   3066 pts/0    00:00:00 ps

**andrew@andrew-VirtualBox**:**~**$

<<<<< Paste your terminal capture above this line <<<<<

# Part 4: Submit your assignment to Blackboard

***NB. Don’t forget to take the weekly quiz!***

# Rubric

* Part 2, Chapter 4, 15 points. Maximum deduction of 2.5 points per numbered instruction.
* Part 3, Chapter 5, 15 points. Maximum deduction of 1.25 points per numbered instruction.