

Lab 3 | Installing software and navigating the file system | Answers

Assignment description [Lab 3 - Instructions](#)

Question 1

1. Which command did you use to search for the themes and to install them?

```
To search for a new theme I used: apt search "gtk theme"  
To install the theme I used: sudo apt install breeze
```

2. Which commands did you use to find and install the web browser?

```
To find a web browser I used: apt search web browser  
To install the web browser I chose I used: sudo apt install
```

3.1 What is the name of the package? 3.2 What dependencies are needed in order to install the package? (you can either take a screenshot of the terminal or copy and paste from the terminal) 3.3 How much disk space will the package utilize after installation?

```
inoquendoosorio@CIS-106VM: ~
signon-plugin-oauth2 sonnet-plugins sshfs
Suggested packages:
python-nautilus fam kde-telepathy-send-file qt5-qmltooling-plugins voikko-fi hspell
The following NEW packages will be installed:
falkon kaccounts-providers kactivities-bin kactivitymanagerd kde-cli-tools kde-cli-tools-data
kdeconnect keditbookmarks kio kpackagelauncherqml kpackagetool5 kpeople-vcards kwayland-data
kwayland-integration libaccounts-qt5-1 libdbusmenu-qt5-2 libfakekey0 libfam0 libhfstospell10
libkaccounts1 libkf5activities5 libkf5archive5 libkf5attica5 libkf5auth-data libkf5auth5
libkf5authcore5 libkf5bluezqt-data libkf5bluezqt6 libkf5bookmarks-data libkf5bookmarks5
libkf5calendarevents5 libkf5codecs-data libkf5codecs5 libkf5completion-data libkf5completion5
libkf5config-bin libkf5config-data libkf5configcore5 libkf5configgui5 libkf5configwidgets-data
libkf5configwidgets5 libkf5contacts-data libkf5contacts5 libkf5coreaddons-data libkf5coreaddons5
libkf5crash5 libkf5dbusaddons-bin libkf5dbusaddons-data libkf5dbusaddons5 libkf5declarative-data
libkf5declarative5 libkf5doctools5 libkf5globalaccel-bin libkf5globalaccel-data libkf5globalaccel5
libkf5globalaccelprivate5 libkf5guiaddons5 libkf5i18n-data libkf5i18n5 libkf5iconthemes-bin
libkf5iconthemes-data libkf5iconthemes5 libkf5idle5 libkf5itemviews-data libkf5itemviews5
libkf5jobwidgets-data libkf5jobwidgets5 libkf5kcmutils-data libkf5kcmutils5 libkf5kiocore5
libkf5kiofilewidgets5 libkf5kiogui5 libkf5kiontlm5 libkf5kiowidgets5 libkf5kirigami2-5
libkf5notifications-data libkf5notifications5 libkf5package-data libkf5package5 libkf5parts-data
libkf5parts-plugins libkf5parts5 libkf5people-data libkf5people5 libkf5peoplebackend5
libkf5peoplewidgets5 libkf5plasma5 libkf5plasmaquick5 libkf5pty-data libkf5pty5 libkf5pulseaudioqt2
libkf5purpose-bin libkf5purpose5 libkf5quickaddons5 libkf5service-bin libkf5service-data
libkf5service5 libkf5solid5 libkf5solid5-data libkf5sonnet5-data libkf5sonnetcore5 libkf5sonnetui5
libkf5su-bin libkf5su-data libkf5su5 libkf5textwidgets-data libkf5textwidgets5 libkf5wallet-bin
libkf5wallet-data libkf5wallet5 libkf5waylandclient5 libkf5widgetsaddons-data libkf5widgetsaddons5
libkf5windowsystem-data libkf5windowsystem5 libkf5xmlgui-bin libkf5xmlgui-data libkf5xmlgui5
libkwalletbackend5-5 libkworkspace5-5 libminizip1 libpolkit-qt5-1-1 libqca-qt5-2 libqca-qt5-2-plugins
libqt5multimedia5 libqt5positioning5 libqt5printsupport5 libqt5qml5 libqt5quick5
libqt5quickcontrols2-5 libqt5quicktemplates2-5 libqt5quickwidgets5 libqt5sql5 libqt5sql5-sqlite
libqt5test5 libqt5texttospeech5 libqt5waylandclient5 libqt5waylandcompositor5 libqt5webchannel5
libqt5webengine-data libqt5webenginecore5 libqt5webenginewidgets5 libqt5xml5 libre2-5
libsignon-plugins-common1 libsignon-qt5-1 libvoikko1 libxcb-composite0 libxcb-damage0
plasma-framework qml-module-org-kde-bluezqt qml-module-org-kde-kconfig qml-module-org-kde-kirigami2
qml-module-org-kde-kquickcontrols qml-module-org-kde-kquickcontrolsaddons qml-module-org-kde-people
qml-module-org-kde-purpose qml-module-qtgraphicaleffects qml-module-qtqml-models2
qml-module-qtquick-controls qml-module-qtquick-controls2 qml-module-qtquick-dialogs
qml-module-qtquick-layouts qml-module-qtquick-privatewidgets qml-module-qtquick-templates2
qml-module-qtquick-window2 qml-module-qtquick2 qml-module-ubuntu-onlineaccounts qtwayland5
signon-plugin-oauth2 sonnet-plugins sshfs
0 upgraded, 172 newly installed, 0 to remove and 12 not upgraded.
Need to get 68.2 MB of archives.
After this operation, 302 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5qml5 amd64 5.12.8-0ubuntu1 [1,438 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5quick5 amd64 5.12.8-0ubuntu1 [1,335
```

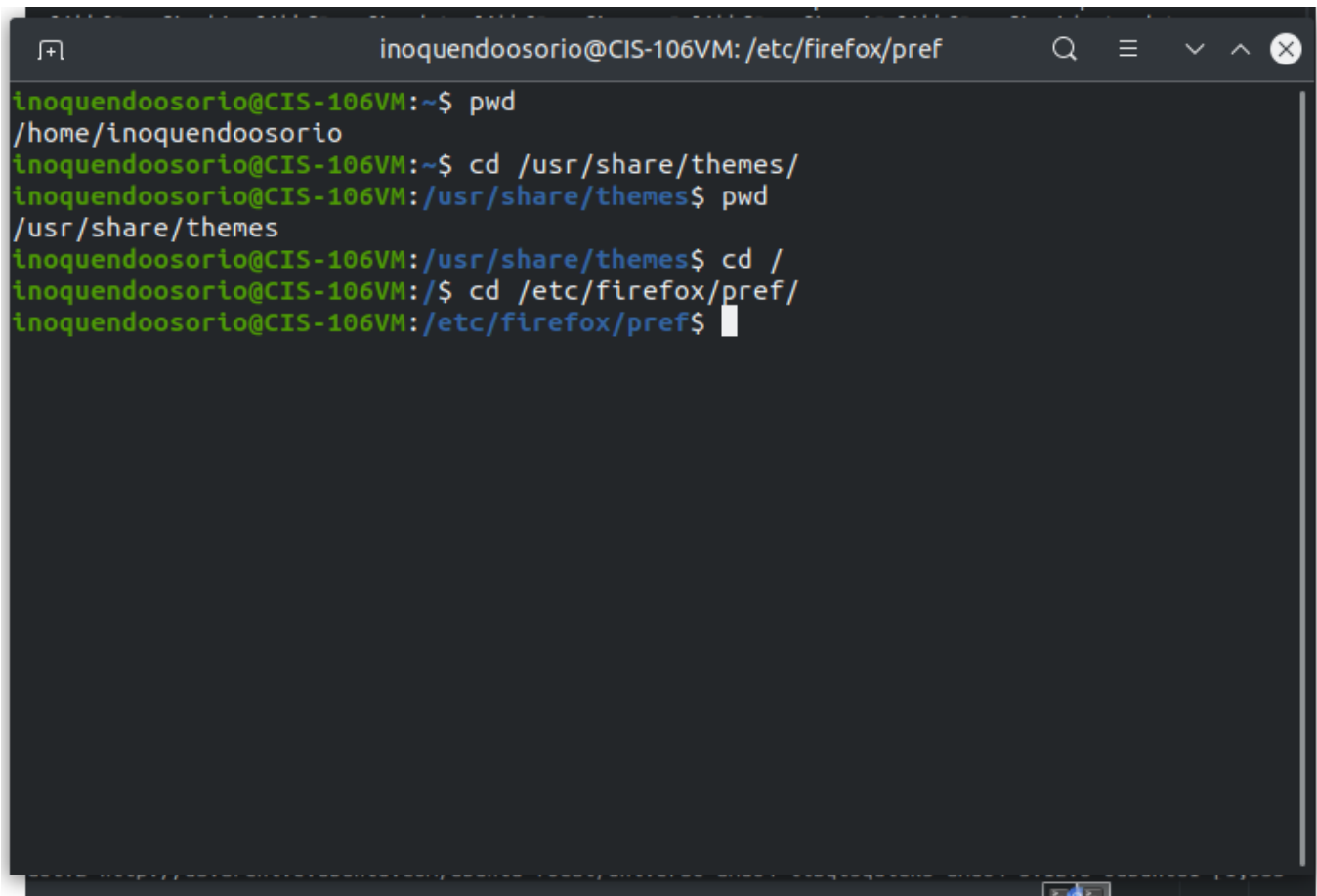
Question 2 | The pwd and cd command

- **pwd**: Print the full filename of the current working directory.
- **cd**: Change the shell working directory.

Using pwd and cd with absolute path (remember to use the bash autocompletion feature)

1. Start a terminal. What is your present working directory?
2. Change your present working directory to `/usr/share/themes`
3. What is your present working directory?
4. Change your present working directory to the root of the filesystem
5. Change your present working directory to `/etc/firefox/pref`

Take a screenshot of the terminal only. Your screenshot must show all the commands that you used to answer questions 1-5.

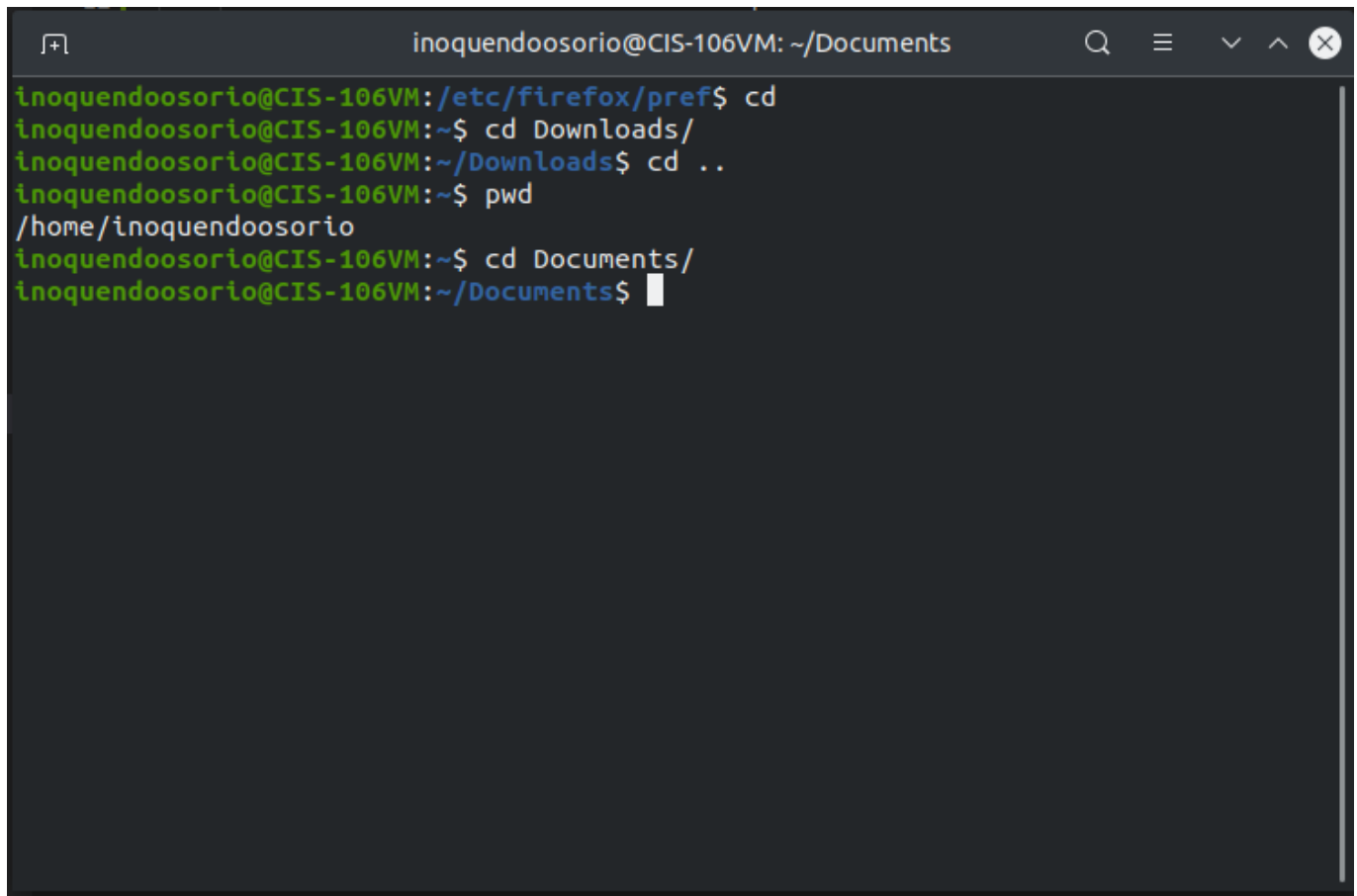
A terminal window titled 'inoquendoosorio@CIS-106VM: /etc/firefox/pref' with standard window controls. The terminal shows a series of commands and their outputs: 'pwd' returns '/home/inoquendoosorio', 'cd /usr/share/themes/' changes the directory, 'pwd' returns '/usr/share/themes', 'cd /' changes to the root directory, and 'cd /etc/firefox/pref/' changes to the current directory. The prompt changes from '~\$' to '/usr/share/themes\$' and then to '/etc/firefox/pref\$'.

```
inoquendoosorio@CIS-106VM:~$ pwd
/home/inoquendoosorio
inoquendoosorio@CIS-106VM:~$ cd /usr/share/themes/
inoquendoosorio@CIS-106VM:/usr/share/themes$ pwd
/usr/share/themes
inoquendoosorio@CIS-106VM:/usr/share/themes$ cd /
inoquendoosorio@CIS-106VM:/$ cd /etc/firefox/pref/
inoquendoosorio@CIS-106VM:/etc/firefox/pref$
```

Using pwd and cd with a relative path (remember to use the bash autocompletion feature)

6. Clear your terminal window. Change the working directory to *YOUR* home directory.
7. Change the working directory to the Downloads directory.
8. Go back 2 directories.
9. Where are you now?.
10. Change the working directory to the Documents directory.

Take a screenshot of the terminal only. Your screenshot must show all the commands that you used to answer questions 6-10.

A terminal window with a dark background and light green text. The title bar at the top reads 'inoquendoosorio@CIS-106VM: ~/Documents'. The terminal shows a sequence of commands and their outputs: 'cd' from '/etc/firefox/pref\$' to '~\$'; 'cd Downloads/' from '~\$' to '~/Downloads\$'; 'cd ..' from '~/Downloads\$' to '~\$'; 'pwd' from '~\$' outputting '/home/inoquendoosorio'; 'cd Documents/' from '~\$' to '~/Documents\$'; and finally a prompt at '~/Documents\$' with a cursor.

```
inoquendoosorio@CIS-106VM:/etc/firefox/pref$ cd
inoquendoosorio@CIS-106VM:~$ cd Downloads/
inoquendoosorio@CIS-106VM:~/Downloads$ cd ..
inoquendoosorio@CIS-106VM:~$ pwd
/home/inoquendoosorio
inoquendoosorio@CIS-106VM:~$ cd Documents/
inoquendoosorio@CIS-106VM:~/Documents$
```

Question 3 | The ls command

- For this question we are going to use relative path only.
 - Clear your terminal.
 - Download 3 files from the internet (pictures, audio, document, or anything else).
 - Make sure that the files you downloaded are stored in your Downloads directory.
 - Make sure that your working directory is your home directory.
1. List all the files in your Downloads directory.
 2. List all the files in your Downloads directory including hidden files.
 3. Long list all the files in your Downloads directory including hidden files.
 4. Long list all the files in your Downloads directory including hidden files and human readable file sizes.
 5. Long list all the files in your Downloads directory excluding hidden files, file owner and group, and including human readable file sizes.

Take a screenshot of the terminal only. Your screenshot must show all the commands that you used to answer questions 1-5.

```
inoquendoosorio@CIS-106VM: ~  
inoquendoosorio@CIS-106VM:~$ ls Downloads/  
lab3-question-3-pic1.png lab3-question-3-pic2.png lab3-question-3-pic3.png  
inoquendoosorio@CIS-106VM:~$ ls -a Downloads/  
. lab3-question-3-pic1.png lab3-question-3-pic3.png  
.. lab3-question-3-pic2.png  
inoquendoosorio@CIS-106VM:~$ ls -al Downloads/  
total 720  
drwxr-xr-x  2 inoquendoosorio inoquendoosorio  4096 Oct 19 15:49 .  
drwxr-xr-x 20 inoquendoosorio inoquendoosorio  4096 Oct 13 20:15 ..  
-rw-rw-r--  1 inoquendoosorio inoquendoosorio 361582 Oct 19 15:46 lab3-question-  
3-pic1.png  
-rw-rw-r--  1 inoquendoosorio inoquendoosorio  99116 Oct 19 15:47 lab3-question-  
3-pic2.png  
-rw-rw-r--  1 inoquendoosorio inoquendoosorio 261915 Oct 19 15:48 lab3-question-  
3-pic3.png  
inoquendoosorio@CIS-106VM:~$ ls -alh Downloads/  
total 720K  
drwxr-xr-x  2 inoquendoosorio inoquendoosorio  4.0K Oct 19 15:49 .  
drwxr-xr-x 20 inoquendoosorio inoquendoosorio  4.0K Oct 13 20:15 ..  
-rw-rw-r--  1 inoquendoosorio inoquendoosorio 354K Oct 19 15:46 lab3-question-3-  
pic1.png  
-rw-rw-r--  1 inoquendoosorio inoquendoosorio  97K Oct 19 15:47 lab3-question-3-  
pic2.png  
-rw-rw-r--  1 inoquendoosorio inoquendoosorio 256K Oct 19 15:48 lab3-question-3-  
pic3.png  
inoquendoosorio@CIS-106VM:~$ ls -lAgGh Downloads/  
total 712K  
-rw-rw-r--  1 354K Oct 19 15:46 lab3-question-3-pic1.png  
-rw-rw-r--  1  97K Oct 19 15:47 lab3-question-3-pic2.png  
-rw-rw-r--  1 256K Oct 19 15:48 lab3-question-3-pic3.png  
inoquendoosorio@CIS-106VM:~$
```

Question 4 | The tree command

- For this question we are going to use Absolute path only.
 - Clear your terminal screen.
1. List all the files inside the `Downloads` directory.
 2. List all the files inside the `Downloads` directory showing the permissions(protectations), file owner, group owner, and human readable file size.
 3. List all the files inside the `Downloads` directory showing the date of last modified and sorted by modification time.
 4. List all the files inside the `Downloads` directory in HTML format
 5. List all the files inside the `Downloads` directory in HTML format and save it to a file.

Take a screenshot of the terminal only. Your screenshot must show all the commands that you used to answer questions 1-5.


```

inoquendoosorio@CIS-106VM: ~
inoquendoosorio@CIS-106VM:~$ ls ~/Downloads/
lab3-question-3-pic1.png lab3-question-3-pic2.png lab3-question-3-pic3.png
inoquendoosorio@CIS-106VM:~$ tree ~/Downloads/
/home/inoquendoosorio/Downloads/
├── lab3-question-3-pic1.png
├── lab3-question-3-pic2.png
└── lab3-question-3-pic3.png

0 directories, 3 files
inoquendoosorio@CIS-106VM:~$ tree -pug ~/Downloads/
/home/inoquendoosorio/Downloads/
├── [-rw-rw-r-- inoquendoosorio inoquendoosorio] lab3-question-3-pic1.png
├── [-rw-rw-r-- inoquendoosorio inoquendoosorio] lab3-question-3-pic2.png
└── [-rw-rw-r-- inoquendoosorio inoquendoosorio] lab3-question-3-pic3.png

0 directories, 3 files
inoquendoosorio@CIS-106VM:~$ tree -pugh ~/Downloads/
/home/inoquendoosorio/Downloads/
├── [-rw-rw-r-- inoquendoosorio inoquendoosorio 353K] lab3-question-3-pic1.png
├── [-rw-rw-r-- inoquendoosorio inoquendoosorio 97K] lab3-question-3-pic2.png
└── [-rw-rw-r-- inoquendoosorio inoquendoosorio 256K] lab3-question-3-pic3.png

0 directories, 3 files
inoquendoosorio@CIS-106VM:~$ tree -Dt ~/Downloads/
/home/inoquendoosorio/Downloads/
├── [Oct 19 15:46] lab3-question-3-pic1.png
├── [Oct 19 15:47] lab3-question-3-pic2.png
└── [Oct 19 15:48] lab3-question-3-pic3.png

0 directories, 3 files

```

```

inoquendoosorio@CIS-106VM: ~
inoquendoosorio@CIS-106VM:~$ tree -H ~/Downloads/
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<meta name="Author" content="Made by 'tree'">
<meta name="GENERATOR" content="$Version: $ tree v1.8.0 (c) 1996 - 2018 by Steve Baker, Thomas Moore, Francesc Rocher, Florian Sesser, Kyosuke Tokoro $">
<title>Directory Tree</title>
<style type="text/css">
<!--
BODY { font-family : ariel, monospace, sans-serif; }
P { font-weight: normal; font-family : ariel, monospace, sans-serif; color: black; background-color: transparent;}
B { font-weight: normal; color: black; background-color: transparent;}
A:visited { font-weight : normal; text-decoration : none; background-color : transparent; margin : 0px 0px 0px 0px; padding : 0px 0px 0px 0px; display: inline; }
A:link { font-weight : normal; text-decoration : none; margin : 0px 0px 0px 0px; padding : 0px 0px 0px 0px; display: inline; }
A:hover { color : #000000; font-weight : normal; text-decoration : underline; background-color : yellow; margin : 0px 0px 0px 0px; padding : 0px 0px 0px 0px; display: inline; }
A:active { color : #000000; font-weight: normal; background-color : transparent; margin : 0px 0px 0px 0px; padding : 0px 0px 0px 0px; display: inline; }
.VERSION { font-size: small; font-family : arial, sans-serif; }
.NORM { color: black; background-color: transparent;}
.FIFO { color: purple; background-color: transparent;}

```

```

.FIFO { color: purple; background-color: transparent;}
.CHAR { color: yellow; background-color: transparent;}
.DIR  { color: blue; background-color: transparent;}

```

```

inoquendoosorio@CIS-106VM: ~
</p>
<hr>
<p class="VERSION">
    tree v1.8.0 © 1996 - 2018 by Steve Baker and Thomas Moore <br>
    HTML output hacked and copyleft © 1998 by Francesc Rocher <br>
    JSON output hacked and copyleft © 2014 by Florian Sesser <br>
    Charsets / OS/2 support © 2001 by Kyosuke Tokoro
</p>
</body>
</html>
inoquendoosorio@CIS-106VM:~$ tree -Ho ~/Downloads/ website.html
inoquendoosorio@CIS-106VM:~$ ls
cis106-fall21  Documents  Music      Public  Templates  website.html
Desktop        Downloads  Pictures   snap    Videos
inoquendoosorio@CIS-106VM:~$ xdg-
xdg-dbus-proxy          xdg-icon-resource      xdg-settings
xdg-desktop-icon        xdg-mime                xdg-user-dir
xdg-desktop-menu        xdg-open                xdg-user-dirs-gtk-update
xdg-email               xdg-screensaver         xdg-user-dirs-update
inoquendoosorio@CIS-106VM:~$ xdg-open website.html
inoquendoosorio@CIS-106VM:~$ [50477:50568:1019/164218.330205:ERROR:object_proxy.
cc(642)] Failed to call method: org.freedesktop.DBus.ListActivatableNames: objec
t_path= /org/freedesktop/DBus: org.freedesktop.DBus.Error.AccessDenied: An AppAr
mor policy prevents this sender from sending this message to this recipient; typ
e="method_call", sender=":1.668" (uid=1000 pid=50477 comm="/snap/chromium/1781/u
sr/lib/chromium-browser/chrom" label="snap.chromium.chromium (enforce)") interfa
ce="org.freedesktop.DBus" member="ListActivatableNames" error name="(unset)" req
uested_reply="0" destination="org.freedesktop.DBus" (bus)
Opening in existing browser session.
inoquendoosorio@CIS-106VM:~$

```

Question 5 | Bringing it all together

Utilities like `ls` are a bit old and many developers are starting to write replacements for these tools. One example, is the program `exa`. As per the project's website:

`exa` is an improved file lister with more features and better defaults. It uses colours to distinguish file types and metadata. It knows about symlinks, extended attributes, and Git. And it's small, fast, and just one single binary.

Unfortunately, `exa` is not available via the default repositories in Ubuntu 20.04. However, this package is available for Ubuntu 20.10 and further releases. This however, does not mean that we cannot install the program. As you saw during the presentation, we can also install software using `.deb` files. To download the `.deb` file for `exa` use this command:

- `wget http://archive.ubuntu.com/ubuntu/pool/universe/r/rust-exa/exa_0.9.0-4_amd64.deb`
- To install the `.deb` file we can use `apt`: `sudo apt install ./exa_0.9.0-4_amd64.deb`
- Once we have installed the package we do not need the `.deb` file so lets delete it with: `rm exa_0.9.0-4_amd64.deb`

- Open a second terminal and use the command `exa --help` to see all the options of the `exa` command. Using these options as a reference, answer the following questions:
 1. Long list all the files in your Downloads directory.
 2. Long list all the files in your Downloads directory with a header and modified by timestamps.

Another command that is also very useful is `tree`. This program allows you to list files in a tree like format which is very useful when you are working with multiple sub directories.

3. Install the `tree` program. Open another terminal and use the `tree --help` command to list all (or most) of the options of the `tree` command
4. Use `tree` to list all the files in your home directory including the file owner and group.
5. Use `tree` to list all the files in your home directory including their file size and in human readable format.

Take a screenshot of the terminal only. Your screenshot must show all the commands that you used to answer questions 1,2,4 and 5.


```

inoquendoosorio@CIS-106VM: ~
inoquendoosorio@CIS-106VM:~$ wget http://archive.ubuntu.com/ubuntu/pool/universe/r/rust-exa/exa_0.9.0-4_amd64.deb
--2021-10-19 16:54:24-- http://archive.ubuntu.com/ubuntu/pool/universe/r/rust-exa/exa_0.9.0-4_amd64.deb
Resolving archive.ubuntu.com (archive.ubuntu.com)... 91.189.88.152, 91.189.88.142, 2001:67c:1360:8001::24, ...
Connecting to archive.ubuntu.com (archive.ubuntu.com)|91.189.88.152|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 301592 (295K) [application/x-debian-package]
Saving to: 'exa_0.9.0-4_amd64.deb'

exa_0.9.0-4_amd64.d 100%[=====>] 294.52K 473KB/s in 0.6s

2021-10-19 16:54:25 (473 KB/s) - 'exa_0.9.0-4_amd64.deb' saved [301592/301592]

inoquendoosorio@CIS-106VM:~$ sudo apt install ./exa_0.9.0-4_amd64.deb
[sudo] password for inoquendoosorio:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'exa' instead of './exa_0.9.0-4_amd64.deb'
The following packages were automatically installed and are no longer required:
  apport-symptoms quile-2.2-libs libgc1c2 libgnome-games-support-1-3

Setting up exa (0.9.0-4) ...
Processing triggers for man-db (2.9.1-1) ...
inoquendoosorio@CIS-106VM:~$ exa -l Downloads/
.rw-rw-r-- 361k inoquendoosorio 19 Oct 15:46 lab3-question-3-pic1.png
.rw-rw-r-- 99k inoquendoosorio 19 Oct 15:47 lab3-question-3-pic2.png
.rw-rw-r-- 261k inoquendoosorio 19 Oct 15:48 lab3-question-3-pic3.png
inoquendoosorio@CIS-106VM:~$ exa -lhm Downloads/
Permissions Size User Date Modified Name
.rw-rw-r-- 361k inoquendoosorio 19 Oct 15:46 lab3-question-3-pic1.png
.rw-rw-r-- 99k inoquendoosorio 19 Oct 15:47 lab3-question-3-pic2.png
.rw-rw-r-- 261k inoquendoosorio 19 Oct 15:48 lab3-question-3-pic3.png
inoquendoosorio@CIS-106VM:~$ tree -gu
.
├── [inoquendoosorio inoquendoosorio] cis106-fall21
│   ├── [inoquendoosorio inoquendoosorio] final-project
│   │   ├── [inoquendoosorio inoquendoosorio] deliverable1.md
│   │   └── [inoquendoosorio inoquendoosorio] deliverable2.md
│   └── [inoquendoosorio inoquendoosorio] images
│       ├── [inoquendoosorio inoquendoosorio] elementaryOS-startingWindowVM.png
│       ├── [inoquendoosorio inoquendoosorio] elementaryOS-stoppingWindowVM.png
│       ├── [inoquendoosorio inoquendoosorio] lab3-question-1-sub-3.png
│       ├── [inoquendoosorio inoquendoosorio] lab3-question-2-sub-1.png
│       ├── [inoquendoosorio inoquendoosorio] lab3-question-2-sub-2.png
│       └── [inoquendoosorio inoquendoosorio] lab3-question-3.png
└──

```

```
inoquendoosorio@CIS-106VM: ~  
140 directories, 2928 files  
inoquendoosorio@CIS-106VM:~$ tree -sh  
.  
├── [4.0K] cis106-fall21  
│   ├── [4.0K] final-project  
│   │   ├── [ 571] deliverable1.md  
│   │   └── [  0] deliverable2.md  
│   └── [4.0K] images  
│       ├── [ 92K] elementaryOS-startingWindowVM.png  
│       ├── [ 84K] elementaryOS-stoppingWindowVM.png  
│       ├── [186K] lab3-question-1-sub-3.png  
│       ├── [ 50K] lab3-question-2-sub-1.png  
│       ├── [ 41K] lab3-question-2-sub-2.png  
│       ├── [126K] lab3-question-3.png  
│       ├── [111K] lab3-question-4-part1.png  
│       ├── [115K] lab3-question-4-part2.png  
│       ├── [124K] lab3-question-4-part3.png  
│       ├── [126K] question2.png  
│       ├── [ 61K] question3.png  
│       ├── [504K] question4.png  
│       ├── [111K] question5.png  
│       └── [208K] uname-a screenshot-elementaryOS.png  
└── [4.0K] labs  
    ├── [5.7K] lab-1.md  
    └── [ 302] lab-2.md
```