LINUX

Using the Linux Terminal

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LINUX

It's an OS developed by Linus Torvalds.

He started work on the Linux kernel in 1991.

The kernel is the software that interfaces between the computer's hardware and other software.

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DISTROS

A distribution or distro of Linux is a version built off the Linux kernel.

Some examples include: Ubuntu, Fedora, Linux Mint, Gentoo, Arch Linux and so on.

The Shell

The shell is a program that allows you to send commands to the Linux OS.

The Terminal or Console is basically the same thing.

Most Linux distros use the BASH(Bourne Again Shell) as the default

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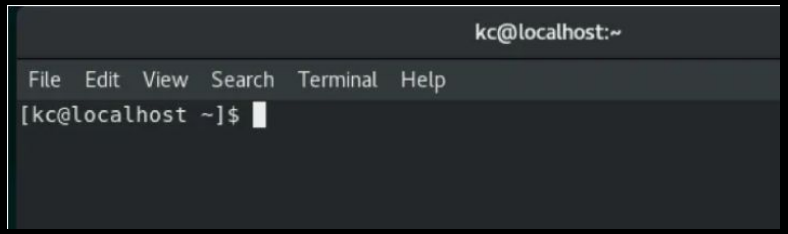
SHELL PROMPT



The shell prompt looks as follows:

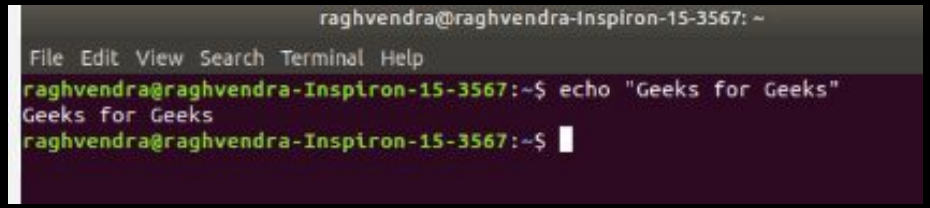
```
username@hostname:current_directory

pete@icebox:/home/pete $
```

You'll normally see $ at the end of the prompt which waits for your command.

SIMPLE COMMAND

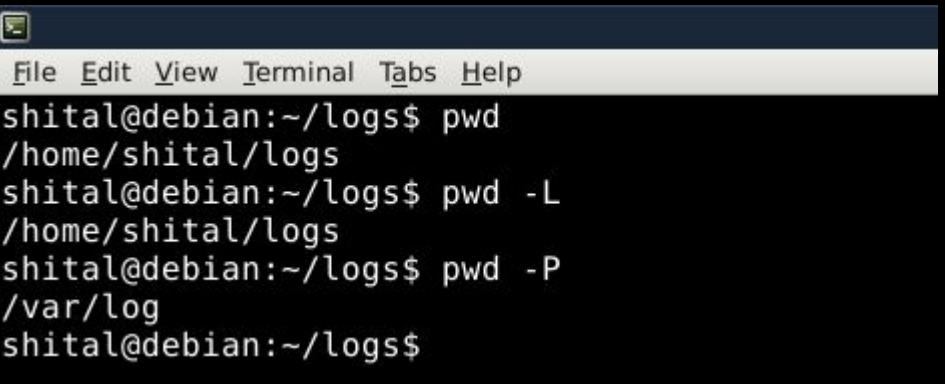
The echo command prints text to the display:




```
$ echo Hello World
```

PWD

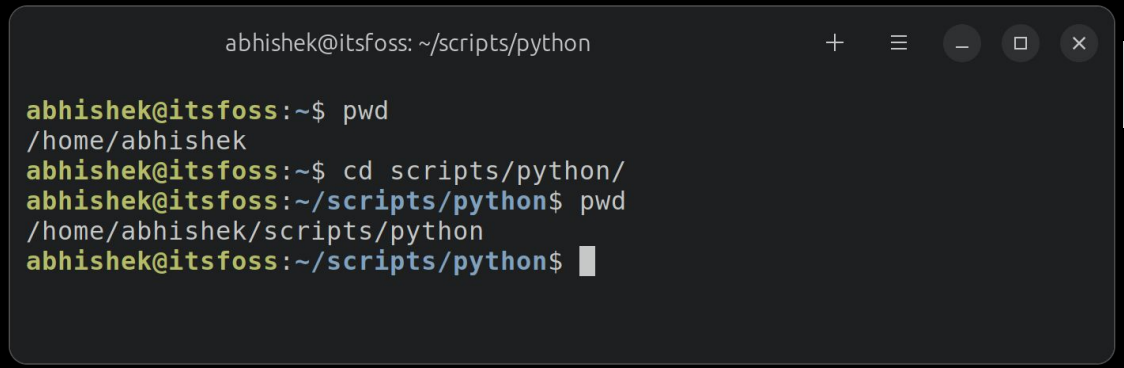
The pwd command prints your current working directory:




```
$ pwd
```

CD

The cd command allows you to change your current working directory using absolute and relative paths:




```
$ cd /home/pete/Pictures
```

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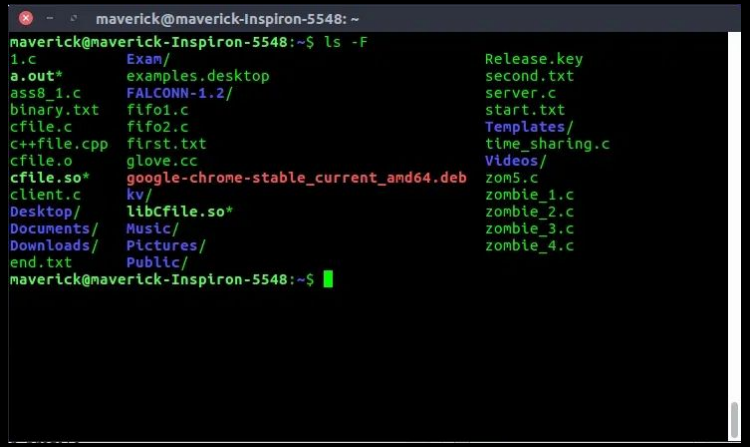
LS



The ls command lists the contents of the current working directory:

```
$ ls

$ ls /home/pete
```

FLAGS/SWITCHES

```
$ ls -a
```

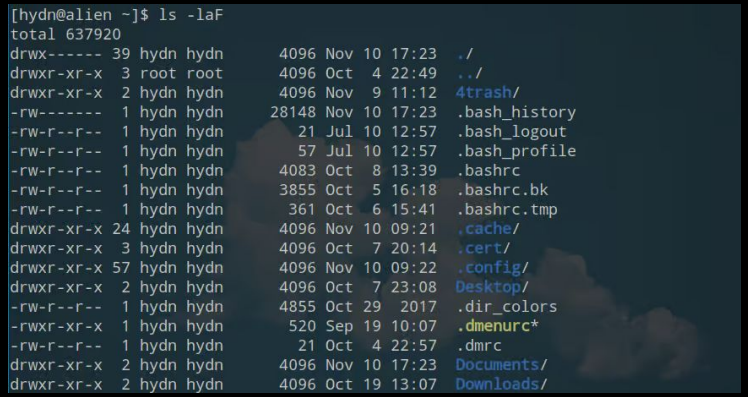
```
$ ls -l
```

```
$ ls -la
```

You can add optional info in the form of flags (there are other names for this) to the command.

Flags are usually preceded by a dash and can be grouped together.

LS -LA



The -l flag will show all details of the listed contents i.e. file size, timestamp etc. while the -a flag shows all hidden files (usually start their names with a .)

ls -la therefore shows the details of all files incldunig hidden ones

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TOUCH

Creates empty files.

```
$ touch mysuperduperfile
```

FILE

```
$ file banana.jpg
```

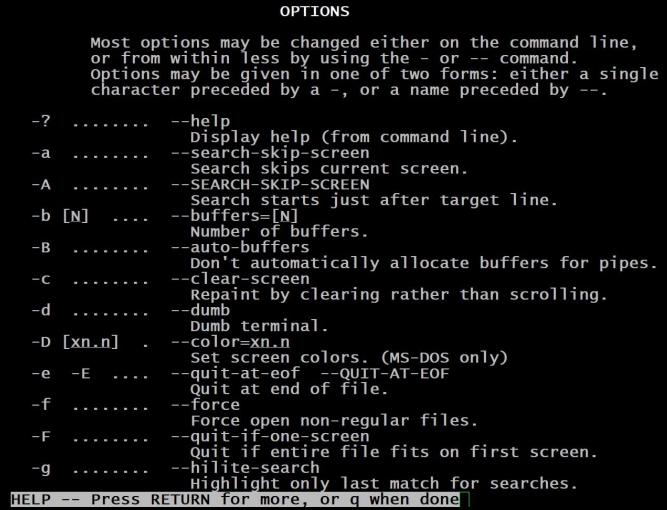
Since linux doesn't require file extensions to tell you what its contents are as in windows (i.e. ball.png contains an image, ball.txt contains text) we can use the file command to get this info.

CAT

The cat command displays the contents of a file as well as concatenate or combine several for viewing.

```
$ cat dogfile birdfile
```

LESS



Less is like cat. It displays large files one page at a time so that you can navigate through the data. There are keys you press to help with navigation i.e Page Up, Page Down etc.

```
$ less /home/pete/Documents/text1
```

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HISTORY and CLEAR

```
$ history
```

```
$ clear
```

The history command shows you a history of the commands you already used.

The clear command clears the screen.

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CP

This command copies files from one place to another/ In the example mycoolfile is copied to the cooldocs folder.

```
$ cp mycoolfile /home/pete/Documents/cooldocs
```

MV

```
$ mv oldfile newfile
```

This command is used to move files while also renaming them. You can also move multiple files.

```
$ mv file2 /home/pete/Documents
```

```
$ mv file_1 file_2 /somedirectory
```

MKDIR

```
$ mkdir books paintings
```

This is used to make directories. Using the -p flag helps to make parent directories. You can make multiple ones as well by using the -p flag.

```
$ mkdir -p books/hemmingway/favorites
```

RM

```
$ rm file1
```

```
$ rm -r directory
```

This is used to remove files or directories. Use the -r flag to remove a directory and all of its contents.

FIND

```
$ find /home -name puppies.jpg
```

This is used to find files. With this command you have to specify where to look and how to look for it. You can also specify that you're only looking for directories. The -type d flag specifies we're looking for directories.

```
$ find /home -type d -name MyFolder
```

HELP

```
$ help echo
```

```
$ echo --help
```

This helps you find info on a command. You can normally use it in one of two ways.

MAN

```
$ man ls
```

Similar to help. The man command shows you the manual of a command and provides you with a great deal of info on all of its options.

WHATIS

```
$ whatis cat
```

This command gives you a brief description of what a command does.

ALIAS

```
$ alias foobar='ls -la'
```

This command allows you to assign a new name to a command to make things simpler to write, especially for often used commands. In the example we use foobar as a command to replace ls -la.

EXIT

```
$ exit
```

```
$ logout
```

This exits the shell. You can also use the logout command.

QUESTIONS AND EXERCISES

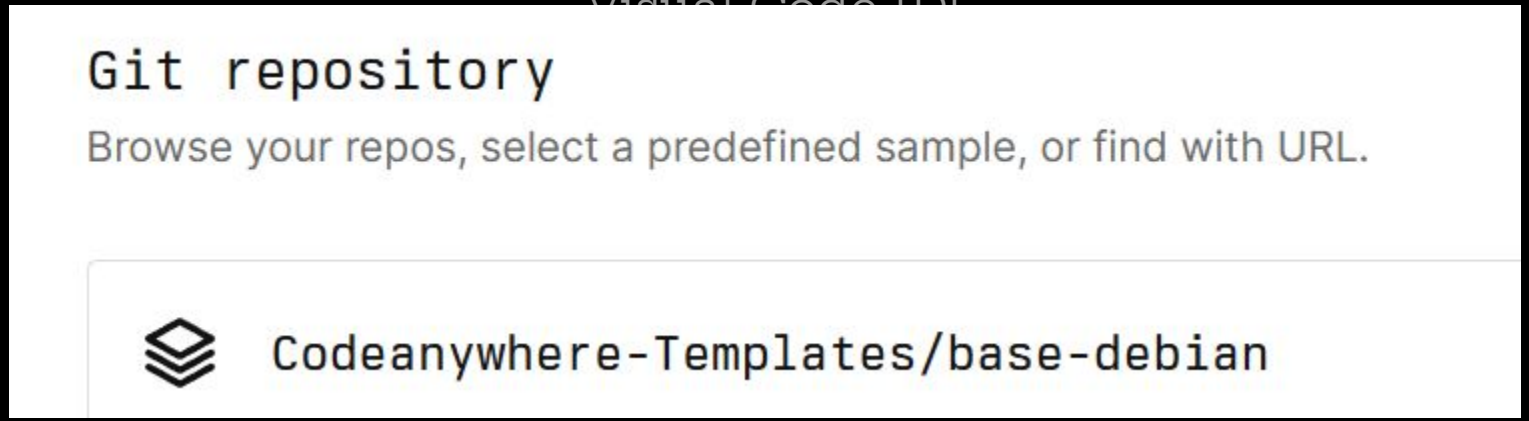
The values you pace after a command are also referred to as arguments. Using the man command, list at least three arguments for 3 different commands covered in this slideshow.

QUESTIONS AND EXERCISES

To practice using linux we would normally using the terminal window but often times this isn't practical. Sign up for an account at https://cocalc.com/doc/linux.html?ref=itsfoss.com and then look for the Linux Terminal link. Use this to practice at home or when you can't get enough access time at the computer in class. Try and get to the linux terminal to practice a few commands.

QUESTIONS AND EXERCISES

Create an account at https://codeanywhere.com/?ref=itsfoss . When creating a new project choose the following from the Git repository list and then access the Terminal from the menu option of the online Visual Code IDE



QUESTIONS AND EXERCISES

Issue the following Linux command: pwd

The output from this Linux command basically shows your current location in the computer. This represents a directory pathname to your home directory. We will discuss *pathnames* later in this course.

```
vscode ➜ /workspaces/base-debian (main) $ pwd
/workspaces/base-debian
vscode ➜ /workspaces/base-debi
```

QUESTIONS AND EXERCISES

Issue the following Linux command: ls

What do you notice?

If there were any files in your home directory, just their file names would be displayed.

```
$ ls
Documents  Downloads  Music  Pictures  Videos
```

QUESTIONS AND EXERCISES

Issue the following Linux command: cd /bin

```
$ cd /bin
```

QUESTIONS AND EXERCISES

Issue the following Linux command to confirm your current location: pwd

```
$ pwd
/bin
```

QUESTIONS AND EXERCISES

1. Issue the following Linux command: ls

```
$ ls
bash  cat  chmod  cp  date  echo  grep  ls  mv  pwd  rm  sh  touch
```

QUESTIONS AND EXERCISES

Issue the following Linux command using an option: ls -l

What do you notice? The -l option with the ls command provides a detailed ("*long*") listing of files providing more information on a separate line for each file.

```
mint@mint:/bin$ ls -l
total 162143
-rwxr-xr-x 1 root root         39 Aug  9  2019 7z
-rwxr-xr-x 1 root root         40 Aug  9  2019 7za
-rwxr-xr-x 1 root root         40 Aug  9  2019 7zr
lrwxrwxrwx 1 root root         11 Nov 29  2019 GET -> lwp-request
lrwxrwxrwx 1 root root         11 Nov 29  2019 HEAD -> lwp-request
lrwxrwxrwx 1 root root         11 Nov 29  2019 POST -> lwp-request
-rwxr-xr-x 1 root root         62 Aug 15  2010 Thunar-daemon
lrwxrwxrwx 1 root root          4 Apr  8  2021 X -> Xorg
lrwxrwxrwx 1 root root          1 Feb  8  2020 X11 -> .
-rwxr-xr-x 1 root root    2434568 Apr  8  2021 Xephyr
-rwxr-xr-x 1 root root        274 Apr  8  2021 Xorg
-rwxr-xr-x 1 root root    2324456 Apr  8  2021 Xwayland
-rwxr-xr-x 1 root root      59736 Sep  5  2019 '['
-rwxr-xr-x 1 root root      31248 May 19  2020 aa-enabled
-rwxr-xr-x 1 root root      35344 May 19  2020 aa-exec
-rwxr-xr-x 1 root root      22912 Apr 14  2021 aconnect
-rwxr-xr-x 1 root root      19016 Nov 28  2019 acpi_listen
-rwxr-xr-x 1 root root       1068 May 15  2019 add-apt-repository
```

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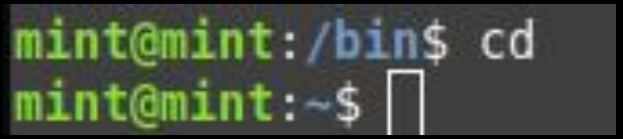
QUESTIONS AND EXERCISES

Issue the following Linux command to return to your home directory: cd



QUESTIONS AND EXERCISES

Issue the following Linux command to confirm your current location: pwd

```
mint@mint:~$ pwd
/home/mint
```

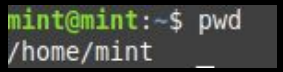
QUESTIONS AND EXERCISES

Issue the following Linux command: ls /bin

```
mint@mint:/bin$ ls
 7z
 7za
 7zr
 GET
 HEAD
 POST
 Thunar-daemon
 X
 X11
 Xephyr
 Xorg
 Xwayland
'['
```

QUESTIONS AND EXERCISES

Issue the following Linux command to confirm your current location: pwd

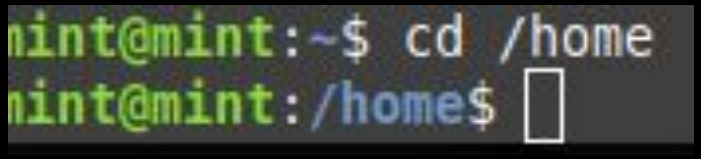


What do you notice? The pwd command confirms that you're now in your home directory (/home/your-username). This matches what we expected after running cd ~

What makes this command with that argument useful if you are currently located in your home directory? It verifies your location and is helpful when working with multiple directories.

QUESTIONS AND EXERCISES

Issue a Linux command that you have already learned to change to your home directory and to confirm that you have returned to your home directory.

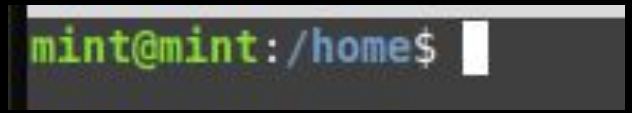


QUESTIONS AND EXERCISES

Issue the following Linux command: clear

What do you notice? How would this command be helpful?FYI: The short-cut keys to clear the screen for the Bash shell is: ctrl-l

This command clears the terminal screen, removing all previous output. It helps keep the terminal organized and makes it easier to focus on new commands.

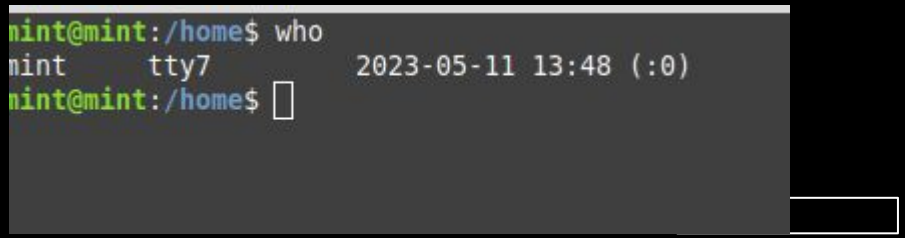


QUESTIONS AND EXERCISES

Issue the following Linux command: who

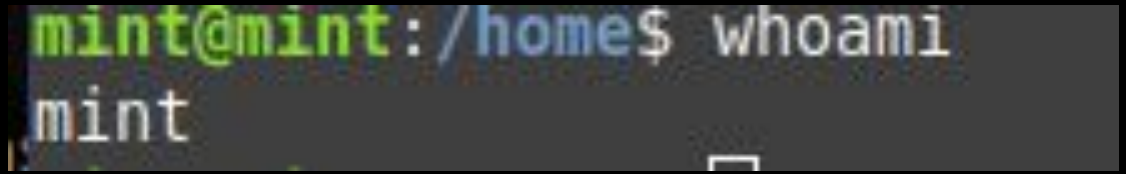
What information does this command show?

Username – The account name of the logged-in user.
Terminal – The terminal session they are using (e.g., tty1, pts/0).
Login time – The timestamp when they logged in.



QUESTIONS AND EXERCISES

Issue the following Linux command: whoami
What does this command display? What do you think is the purpose of this command? Tells you the users name

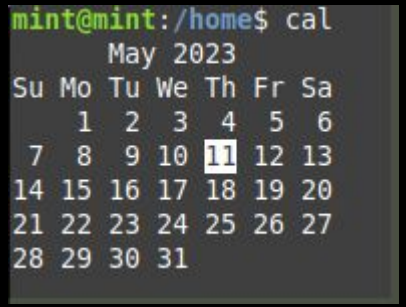


QUESTIONS AND EXERCISES

Issue the following Linux command: cal

What is the purpose of this command?

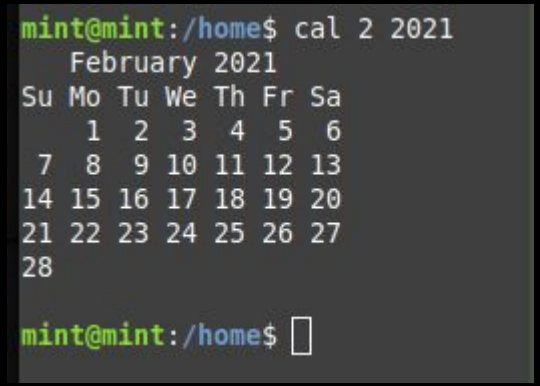
displays a simple calendar for the current month. It helps users quickly check dates without opening a separate application.



QUESTIONS AND EXERCISES

Issue the following Linux command: cal 2 2021

What is the purpose of this command using those two numbers as arguments? The first num is the month, second is year



QUESTIONS AND EXERCISES

In your command line enter ls -la and then experiment with the following command line navigation keys:

Shortcut Key(s)	Purpose
<ctrl><l>	Clear Screen
<ctrl><u>	Clear Command Line
<Up Arrow> ,<Down Arrow>	Scroll Up / Down Command History
<backspace> ,<ctrl><backspace> ,<ctrl><h>	Delete character before the cursor
<ctrl><w>	Delete word before the cursor
<ctrl><a>	Move cursor to beginning of command line
<ctrl><e>	Move cursor to end of command line
<alt>f/<alt>b (Mac: OPTION+Right/Left-Arrow)	Move Forward/Backward one word

QUESTIONS AND EXERCISES

Execute one command from the slideshow that you haven't tested so far and include a screenshot:

```
$ touch myNewFile
```

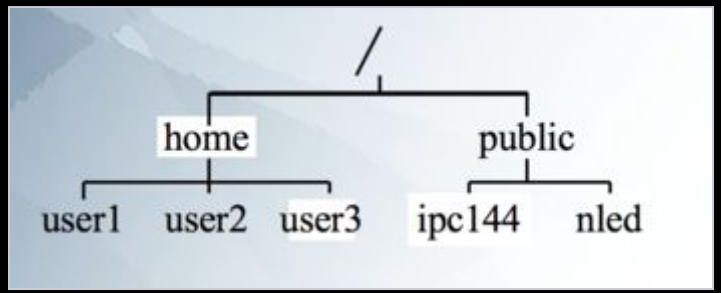
QUESTIONS AND EXERCISES

Make sure you practice using every command in the slideshow. You do not however have to include screenshots of each.

QUESTIONS AND EXERCISES

Write the absolute path to user3:

/home/user3



QUESTIONS AND EXERCISES

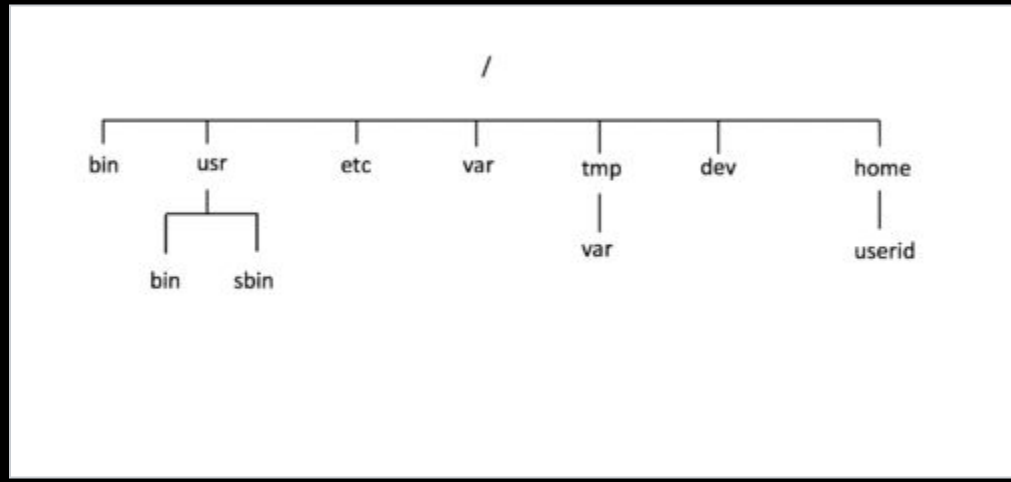
What is the root? /

What is your home directory?

home

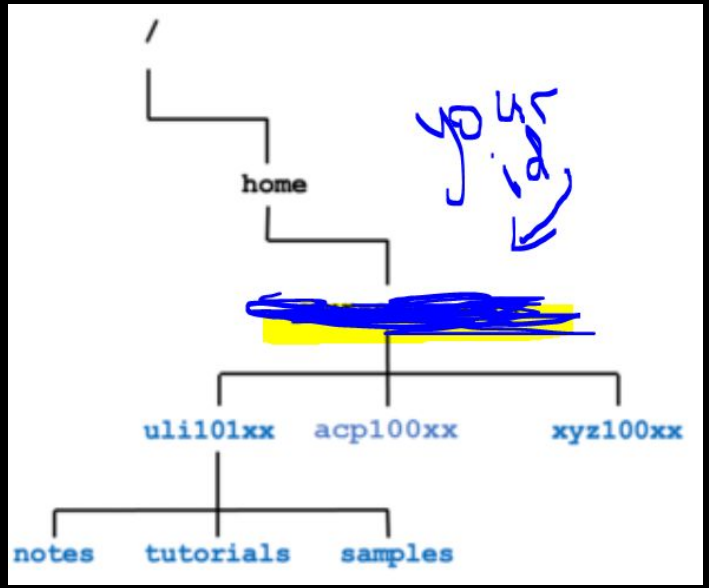
You're in sbin. What's the relative path to var?

../../var



QUESTIONS AND EXERCISES

Create the following directory tree in your home directory. ‘Your id’ will be the name of your home folder. It’s named after your user id.
For example, if your user id was mkhan then you would see /home/mkhan if you were in your home directory and typed pwd.



QUESTIONS AND EXERCISES

Issue the following Linux command: ls /home/your-id/uli101xx

```
$ ls /home/your-id/uli101xx
```

There are no contents that are contained in this newly-created directory; therefore, no contents appear. A useful option -d can be used to confirm that the actual directory has been created as opposed to viewing the contents of the directory.

QUESTIONS AND EXERCISES

Issue the following Linux command: ls -d /home/your-id/uli101xx [screenshot]
You should now see just the directory listed. You can also combine the -d and -l options to provide more detail regarding the newly-created directory.

```
$ ls -d /home/your-id/uli101xx
/home/your-id/uli101xx
```

QUESTIONS AND EXERCISES

Issue the following Linux command: ls -d -l /home/your-id/uli101xx

How can you confirm from the output of this command that the file uli101xx is a directory?

```
drwxr-xr-x 2 your-id your-group 4096 Mar 20 10:00 /home/your-id/uli101xx
```

In the output of the ls -l command, you can confirm that uli101xx is a directory by looking at the very first character of the line

QUESTIONS AND EXERCISES

Issue the following Linux command to confirm that those directories have been created:
ls -ld /home/your-id/acp100xx /home/your-id/xyz100xx

```
drwxr-xr-x 2 your-id your-group 4096 Mar 20 10:00 /home/your-id/acp100xx
drwxr-xr-x 2 your-id your-group 4096 Mar 20 10:05 /home/your-id/xyz100xx
```

Using a FULL pathname starting from the root directory (i.e. /) requires a LOT of typing!.

QUESTIONS AND EXERCISES

Issue the following Linux command to return to your home directory: cd

```
$ cd
```

QUESTIONS AND EXERCISES

Issue a Linux command to confirm that you are now located in your home directory.

```
$ pwd

/home/your-id
```

QUESTIONS AND EXERCISES

Issue the following Linux command to remove all of the directories that you have created:
rm -r uli101xx acp100xx xyz100xx

```
$ rm -r uli101xx acp100xx xyz100xx
```

QUESTIONS AND EXERCISES

Issue the following single Linux command to create the entire directory structure:
mkdir -p uli101xx/notes uli101xx/tutorials uli101xx/samples acp100xx xyz100xx

```
$ mkdir -p uli101xx/notes uli101xx/tutorials uli101xx/samples acp100xx xyz100xx
```