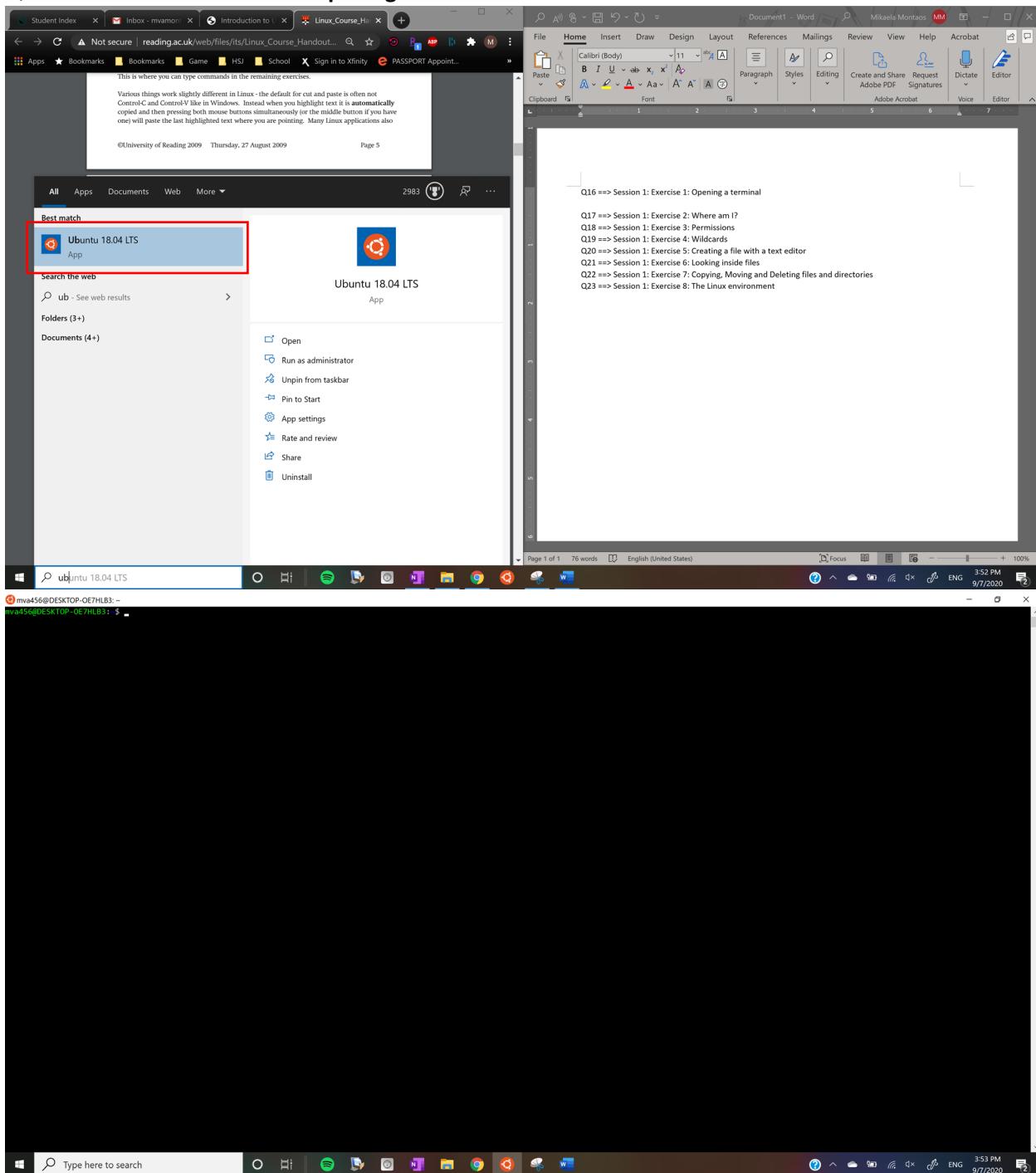


Q16 ==> Session 1: Exercise 1: Opening a terminal



In addition when you are typing in the terminal there is a useful feature called 'tabcompletion'. This means that if you type in the start of a command or filename and then press the tab key then (if it is the only allowable name starting with what you typed) it will complete the name for you.

```
mva456@DESKTOP-OE7HLB3: ~
mva456@DESKTOP-OE7HLB3: $ echo
```

After tab key:

```
mva456@DESKTOP-OE7HLB3: ~
mva456@DESKTOP-OE7HLB3: $ echo
```

Q17 ==> Session 1: Exercise 2: Where am I?

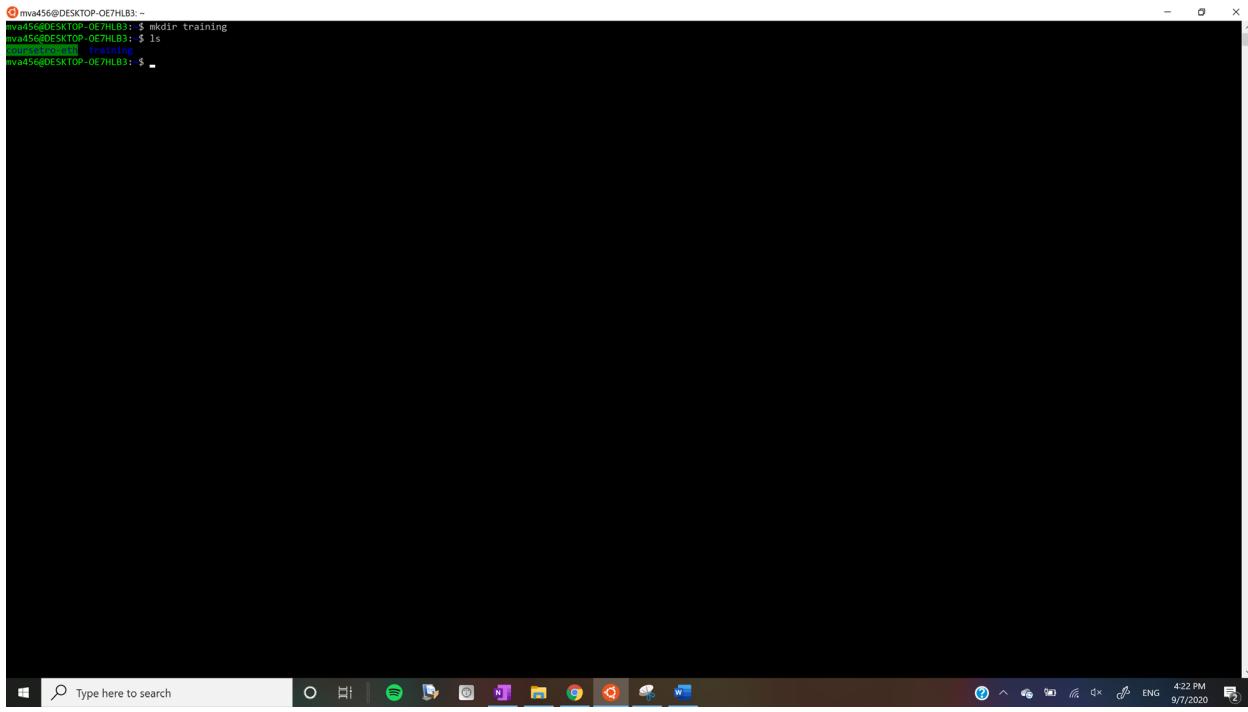
pwd

```
mva456@DESKTOP-OE7HLB3: ~  
mva456@DESKTOP-OE7HLB3: ~$ pwd  
/home/mva456  
mva456@DESKTOP-OE7HLB3: ~$
```

```
ls  
mva456@DESKTOP-OE7HLB3: ~  
mva456@DESKTOP-OE7HLB3: ~$ ls  
mva456@DESKTOP-OE7HLB3: ~$
```

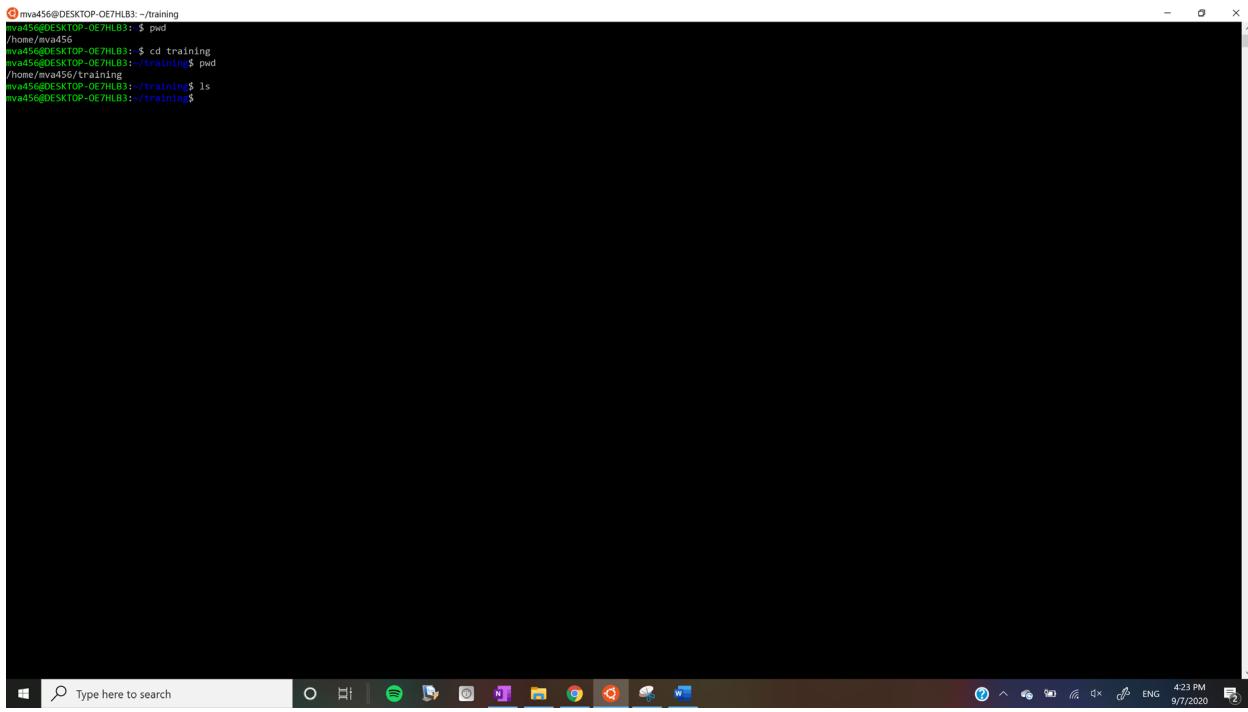
mkdir then ls

```
mva456@DESKTOP-OE7HLB3:~\n[mva456@DESKTOP-OE7HLB3:~]$ mkdir training\n[mva456@DESKTOP-OE7HLB3:~]$ ls\n[mva456@DESKTOP-OE7HLB3:~]$ ..
```



Move out of home directory and into the training directory

```
mva456@DESKTOP-OE7HLB3:~/training\n[mva456@DESKTOP-OE7HLB3:~/]$ pwd\n/home/mva456\n[mva456@DESKTOP-OE7HLB3:~/]$ cd training\n[mva456@DESKTOP-OE7HLB3:~/training]$ pwd\n/home/mva456/training\n[mva456@DESKTOP-OE7HLB3:~/training]$ ls\n[mva456@DESKTOP-OE7HLB3:~/training]$
```



cd ..

```
mva456@DESKTOP-OE7HLB3: ~
mva456@DESKTOP-OE7HLB3: ~/training$ cd ..
mva456@DESKTOP-OE7HLB3: ~$ pwd
/home/mva456
mva456@DESKTOP-OE7HLB3: ~$
```

Jump directly to any other part of the file system

```
mva456@DESKTOP-OE7HLB3: ~$ cd training/new_folder
mva456@DESKTOP-OE7HLB3: ~/training/new_folder$
```

Go back to home directory

```
mva456@DESKTOP-OE7HLB3: ~\n[1] mva456@DESKTOP-OE7HLB3: ~\n[mva456@DESKTOP-OE7HLB3: ~]$
```

cd ~/training

```
mva456@DESKTOP-OE7HLB3: ~/training\n[1] mva456@DESKTOP-OE7HLB3: ~\n[mva456@DESKTOP-OE7HLB3: ~/training]$
```

Q18 ==> Session 1: Exercise 3: Permissions

ls -l /etc

```
mva56@DESKTOP-OE7HLB3:~  
mva56@DESKTOP-OE7HLB3:~$ ls -l /etc  
  
drwxr-xr-x 1 root root 512 Apr 2 18:10 python2.7  
drwxr-xr-x 1 root root 512 Mar 2020 python3  
drwxr-xr-x 1 root root 512 Mar 4 2020 python3.6  
drwxr-xr-x 1 root root 512 Mar 4 2020 python3.7  
drwxr-xr-x 1 root root 512 Mar 4 2020 rc1.d  
drwxr-xr-x 1 root root 512 Mar 4 2020 rc2.d  
drwxr-xr-x 1 root root 512 Mar 4 2020 rc3.d  
drwxr-xr-x 1 root root 512 Mar 4 2020 rc4.d  
drwxr-xr-x 1 root root 512 Mar 4 2020 rc5.d  
drwxr-xr-x 1 root root 512 Mar 4 2020 rc6.d  
drwxr-xr-x 1 root root 512 Mar 4 2020 rcs.d  
-rw-r--r-- 1 root root 197 Sep 7 15:53 resolv.conf  
-rw-r--r-- 1 root root 268 Jul 21 2017 rpc  
-rw-r--r-- 1 root root 88 Dec 25 2017 rsync  
-rw-r--r-- 1 root root 1358 Mar 30 2018 rsyslog.conf  
drwxr-xr-x 1 root root 512 Mar 4 2020 rsync.d  
-rw-r--r-- 1 root root 3663 Jun 9 2015 screenrc  
-rw-r--r-- 1 root root 4141 Jan 25 2018 security  
drwxr-xr-x 1 root root 512 Mar 4 2020 security  

```

man ls

```
mva456@DESKTOP-OE7HLB3:~  
mva456@DESKTOP-OE7HLB3:~ $ man ls  
  
ls(1)                                         User Commands                                         ls(1)  
  
NAME  
    ls - list directory contents  
  
SYNOPSIS  
    ls [OPTION]... [FILE]...  
  
DESCRIPTION  
    List information about the FILEs (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.  
    Mandatory arguments to long options are mandatory for short options too.  
-a, --all  
        do not ignore entries starting with .  
-A, --almost-all  
        do not list implied . and ..  
--author  
        with -l, print the author of each file  
-b, --escape  
        print C-style escapes for nongraphic characters  
--block-size=SIZE  
        scale sizes by SIZE before printing them; e.g., '--block-size=M' prints sizes in units of 1,048,576 bytes; see SIZE format below  
-B, --ignore-backups  
        do not list implied entries ending with ~  
-c      with -lt: sort by, and show, ctime (time of last modification of file status information); with -l: show ctime and sort by name; otherwise: sort by ctime, newest first  
-C      list entries by columns  
--color[=WHEN]  
        colorize the output; WHEN can be 'always' (default if omitted), 'auto', or 'never'; more info below  
-d, --directory  
        list directories themselves, not their contents  
-D, --dired  
        generate output designed for Emacs' dired mode  
-f      do not sort, enable -aU, disable -ls --color  
-F, --classify  
        append indicator (one of */=>|) to entries  
--file-type  
        likewise, except do not append '*'.  
--format=WORD  
        across -x, commas -m, horizontal -x, long -l, single-column -1, verbose -l, vertical -C  
Manual page ls(1) line 1 (press h for help or q to quit)  
mva456@DESKTOP-OE7HLB3:~ $
```

```
mkdir /etc/wibble
```

```
mva456@DESKTOP-OE7HLB3:~  
mva456@DESKTOP-OE7HLB3:~$ mkdir /etc/wibble  
mkdir: cannot create directory '/etc/wibble': Permission denied  
mva456@DESKTOP-OE7HLB3:~$
```

Q19 ==> Session 1: Exercise 4: Wildcards

ls /etc

ls /etc/a*

```
mva456@DESKTOP-OE7HLB3: ~
mva456@DESKTOP-OE7HLB3: $ ls /etc/a*
/etc/adduser.conf  /etc/at.deny

/etc/acpi:
events

/etc/alternatives:
README      ex-fr.1.gz  ftp.1.gz      jsonschema  lzdiff.1.gz  lzless.1.gz  nawk.1.gz   nodejs.1.gz  pinentry.1.gz  rsh.1.gz      unlzma     vi.ja.1.gz  view.pl.1.gz  write.1.gz
awk         ex.lt.1.gz  gnome-text-editor  locate     lzgrep     lzma      nc       pager      rcp      rview      unlzma.1.gz  vi.pl.1.gz  view_ru.1.gz  www-browser
awk.1.gz    ex.ja.1.gz  gnome-text-editor.1.gz locate.1.gz  lzgrep.1.gz  lzma.1.gz  nc.1.gz   pager.1.gz  rcp.1.gz   rview.1.gz  updatedb  vi.ru.1.gz  vim        x-cursor-theme
builtins.7.gz ex.pl.1.gz  infobrowser    lzcatt   lzfgrep   lzmore    netcat   pftp      rlogin    telnet     updatedb.8.gz  view      vimdiff    x-www-browser
editor     ex.ru.1.gz  infobrowser.1.gz   lzcatt.1.gz  lzfgrep.1.gz  lzmore.1.gz  netcat.1.gz  pftp.1.gz  rlogin.1.gz  telnet.1.gz  vi        view.1.gz   vtrgb
editor.1.gz from      jsondiff      lzcmp     lzgrep     mt       netrc.5.gz  pico      rmt      text.plymouth  vi.1.gz    view.fr.1.gz  w
ex        from.1.gz  jsonpatch     lzcmp.1.gz  lzgrep.1.gz  mt.1.gz   newt-palette  pico.1.gz  rmt.8.gz   traceroute  vi.fr.1.gz  view.it.1.gz  w.1.gz
ex.1.gz   ftp      jsonpointer    lzdiff    lzless    nawk     nodejs    pinentry   rsh      traceroute.8.gz  vi.it.1.gz  view.ja.1.gz  write

/etc/apm:
event.d

/etc/apparmor:
init_parser.conf  subdomain.conf

/etc/apparmor.d:
abstractions  cache disable  force-complain  local  lxc  lxc-containers  sbin.dhclient  tunables  usr.bin.lxc-start  usr.bin.man  usr.lib.snapd.snap-confine.real  usr.sbin.rsyslogd  usr.sbin.tcpdump

/etc/appport:
blocklist.d  crashdb.conf

/etc/apt:
apt.conf.d  auth.conf.d  preferences.d  sources.list  sources.list.d  trusted.gpg  trusted.gpg.d

mva456@DESKTOP-OE7HLB3: $
```

```
ls /etc/A*
```

```
mva456@DESKTOP-OE7HLB3: ~
mva456@DESKTOP-OE7HLB3: $ ls /etc/A*
ls: cannot access '/etc/A*': No such file or directory
mva456@DESKTOP-OE7HLB3: $
```

```
ls /etc/*a*
```

```
mva456@DESKTOP-OE7HLB3: ~$ ls /etc/*a*
mva456@DESKTOP-OE7HLB3: ~$ 

mva456@DESKTOP-OE7HLB3: ~$ Type here to search  O  H  S  D  G  M  A  C  E  F  W  ENG  5:34 PM
9/7/2020

mva456@DESKTOP-OE7HLB3: ~$ 
mva456@DESKTOP-OE7HLB3: ~$ Type here to search  O  H  S  D  G  M  A  C  E  F  W  ENG  5:34 PM
9/7/2020

mva456@DESKTOP-OE7HLB3: ~$ /etc/default:
apport apidt bsdmainutils console-setup cron cryptdisks dbus ebttables grub.d irqbalance keyboard locale mdadm motd-news networkd-dispatcher nss open-iscsi pollinate rsync syslog ssh ufw useradd

mva456@DESKTOP-OE7HLB3: ~$ /etc/dictionaries-common:
ispell-default

mva456@DESKTOP-OE7HLB3: ~$ /etc/dnsmasq.d:
lxd

mva456@DESKTOP-OE7HLB3: ~$ /etc/dnsmasq.d-available:
lxd

mva456@DESKTOP-OE7HLB3: ~$ /etc/emacs:
site-start.d site-start.el

mva456@DESKTOP-OE7HLB3: ~$ /etc/initramfs-tools:
comit.d hooks initramfs.conf modules scripts update-initramfs.conf

mva456@DESKTOP-OE7HLB3: ~$ /etc/landscape:

mva456@DESKTOP-OE7HLB3: ~$ /etc/ldap:
ldap.conf

mva456@DESKTOP-OE7HLB3: ~$ /etc/logrotate.d:
alternatives apport apt dpkg lxd rsyslog ufw unattended-upgrades

mva456@DESKTOP-OE7HLB3: ~$ /etc/mdadm:
mdadm.conf

mva456@DESKTOP-OE7HLB3: ~$ /etc/modules-load.d:
modules.conf

mva456@DESKTOP-OE7HLB3: ~$ /etc/netplan:
netplan.yaml

mva456@DESKTOP-OE7HLB3: ~$ /etc/networkd-dispatcher:
networkd.no_carrier.d off.d routable.d

mva456@DESKTOP-OE7HLB3: ~$ /etc/pam.d:
atd chpasswd common-account common-password common-session-noninteractive login other polkit-1 runuser-1 su systemd-user
chfn chsh common-auth common-session cron newusers passwd runuser sshd sudo vmtoolsd

mva456@DESKTOP-OE7HLB3: ~$ /etc/pollinate:
entropy.ubuntu.com.pem

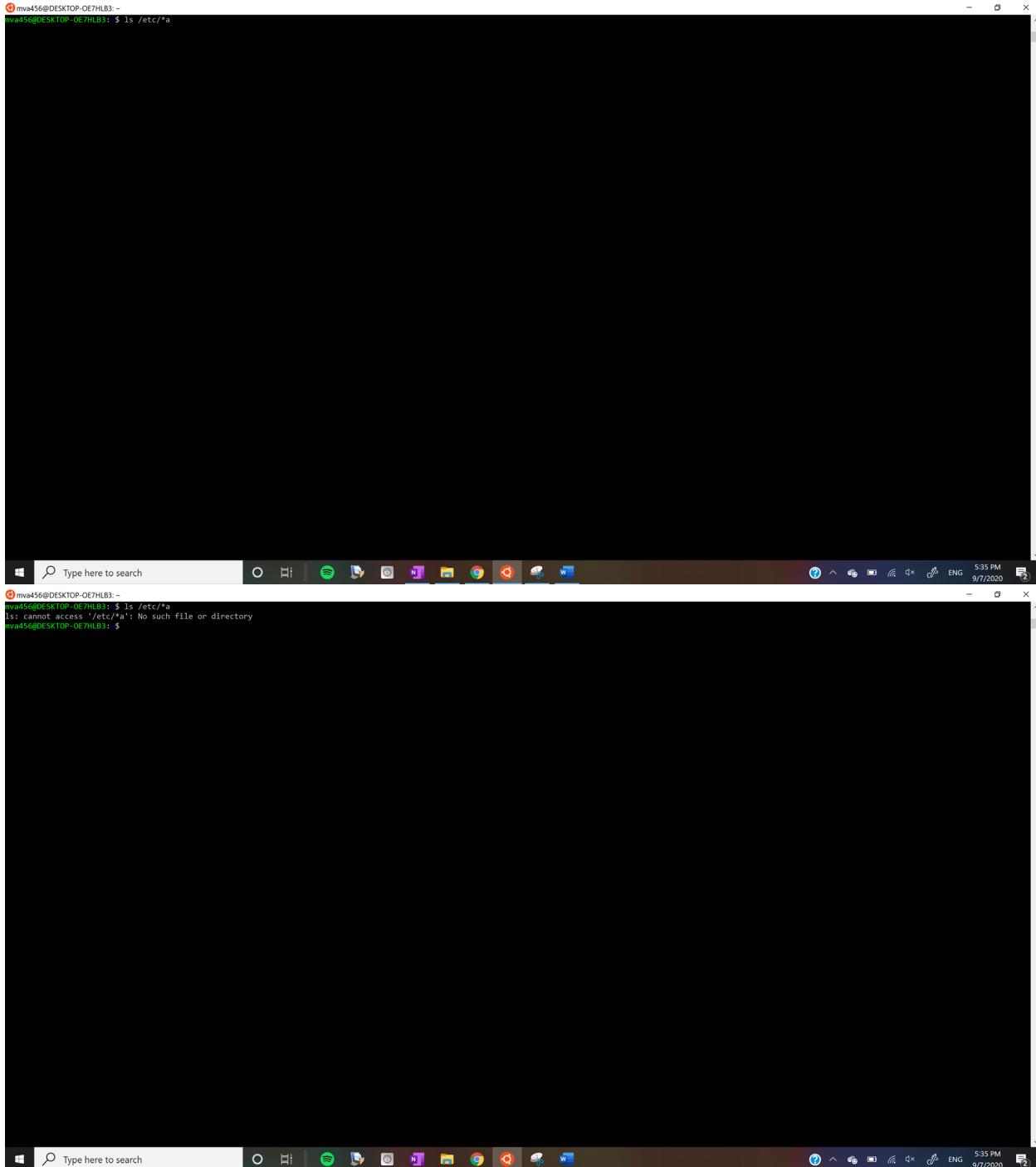
mva456@DESKTOP-OE7HLB3: ~$ /etc/update-manager:
meta-release release-upgrades release-upgrades.d

mva456@DESKTOP-OE7HLB3: ~$ /etc/update-motd.d:
00-header 10-help_text 50-landscape-sysinfo 50-motd-news 80-esm 80-livepatch 90-updates-available 91-release-upgrade 92-unattended-upgrades 95-hwe-eol 97-overlayroot 98-fsck-at-reboot 98-reboot-required

mva456@DESKTOP-OE7HLB3: ~$ /etc/vmware-tools:
poweroff-vm-default poweron-vm-default resume-vm-default scripts statechange.subr suspend-vm-default tools.conf tools.conf.example vgauth vgauth.conf vm-support

mva456@DESKTOP-OE7HLB3: ~$ Type here to search  O  H  S  D  G  M  A  C  E  F  W  ENG  5:34 PM
9/7/2020
```

ls /etc/*a



```
mva456@DESKTOP-OE7HLB:~  
mva456@DESKTOP-OE7HLB:~ $ ls /etc/*a  
  
mva456@DESKTOP-OE7HLB:~ $ ls /etc/*a  
ls: cannot access '/etc/*a': No such file or directory  
mva456@DESKTOP-OE7HLB:~ $  
  
mva456@DESKTOP-OE7HLB:~ $ ls /etc/[a-c]*
```

ls /etc/[a-c]*

```
mva456@DESKTOP-OE7HLB3:~$ ls /etc/[a-c] -
```

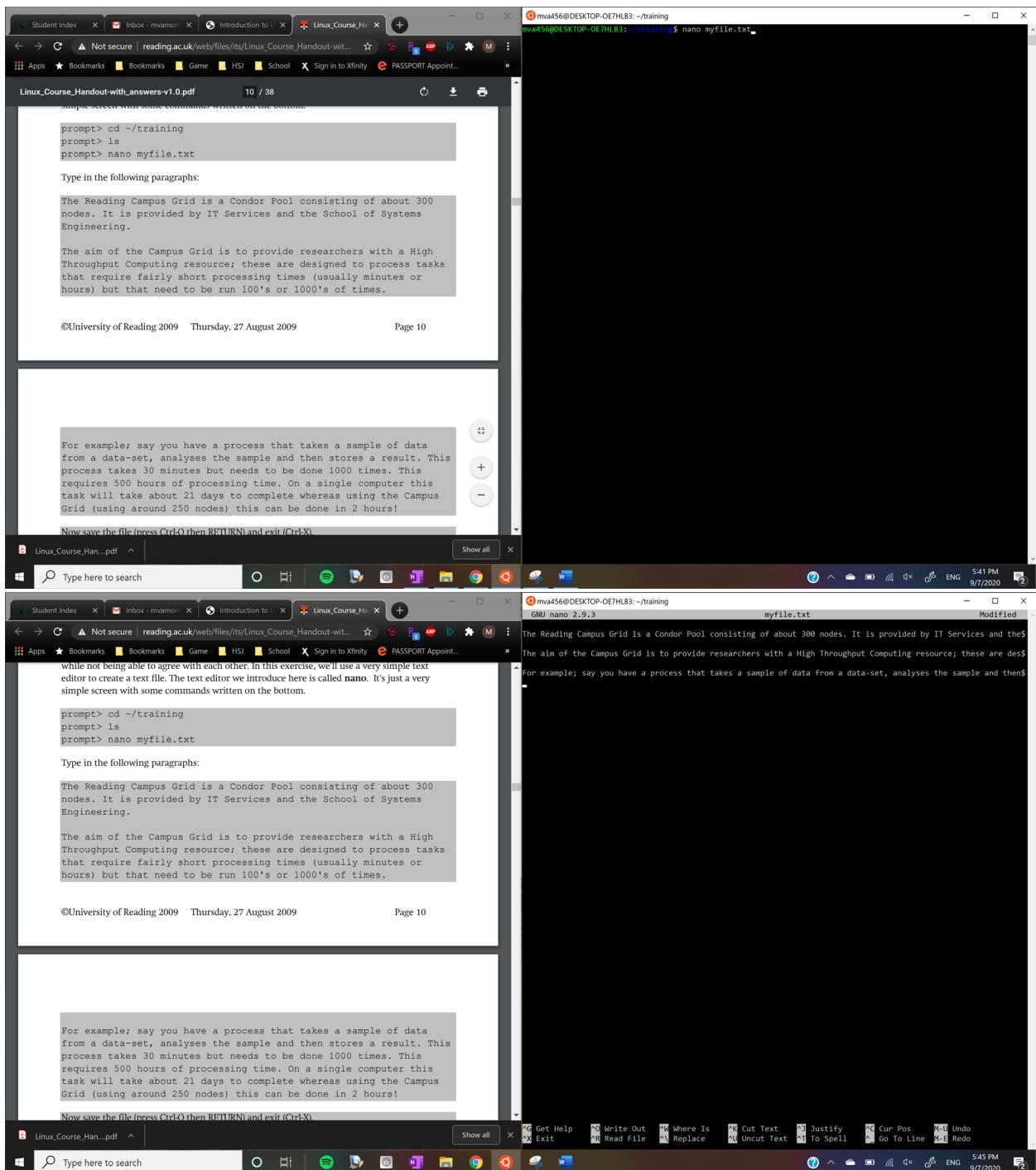
```
Type here to search
```

```
ls /etc/*[0-9]*
```

```
mva456@DESKTOP-OE7HLB3:~  
/vad56@DESKTOP-OE7HLB3:~$ ls /etc/*[0-9]*  
/etc/et2_version /etc/mke2fs.conf /etc/sensors3.conf  
  
/etc/X11:  
Xreset Xresources Xsession Xsession.d Xsession.options app-defaults rgb.txt xkb  
  
/etc/dbus-1:  
session.d system.d  
  
/etc/gtk-3.0:  
im-multipress.conf settings.ini  
  
/etc/iplroute2:  
bpf_pinning ematch_map group nl_protos rt_dsfIELD rt_protos.d rt_realms rt_scopes rt_tables rt_tables.d  
  
/etc/polkit-1:  
localauthority.localauthority.conf.d nullbackend.conf.d  
  
/etc/python2.7:  
sitecustomize.py  
  
/etc/python3:  
debian_config  
  
/etc/python3.6:  
sitecustomize.py  
  
/etc/r0c0.d:  
K01atd K01cryptisks-early K01lrbalance K01lvmetad K01lxefs K01mdadm K01open-iscsi K01plymouth K01unattended-upgrades  
K01cryptisks K01ebtables K01liscsid K01lvmetad K01lxd K01mdadm-waitidle K01open-vm-tools K01rsyslog K01uidd  
  
/etc/r0c1.d:  
K01atd K01ebtables K01lrbalance K01liscsid K01lvmetad K01lvmetad K01lxefs K01lxd K01mdadm K01open-iscsi K01open-vm-tools K01rsyslog K01uafw K01uidd  
  
/etc/r0c2.d:  
S01acpid S01atd S01cron S01lrbalance S01lvmetad S01lxefs S01lxd S01mdadm S01open-vm-tools S01rsync S01ssh S01uidd  
S01apport S01console-setup.sh S01ibus S01lvmetad S01lxefs S01lxd S01mdadm S01plymouth S01rsyslog S01unattended-upgrades  
  
/etc/r0c3.d:  
S01acpid S01atd S01cron S01lrbalance S01lvmetad S01lxefs S01lxd S01mdadm S01open-vm-tools S01rsync S01ssh S01uidd  
S01apport S01console-setup.sh S01ibus S01lvmetad S01lxefs S01lxd S01mdadm S01plymouth S01rsyslog S01unattended-upgrades  
  
/etc/r0c4.d:  
S01acpid S01atd S01cron S01lrbalance S01lvmetad S01lxefs S01lxd S01mdadm S01open-vm-tools S01rsync S01ssh S01uidd  
S01apport S01console-setup.sh S01ibus S01lvmetad S01lxefs S01lxd S01mdadm S01plymouth S01rsyslog S01unattended-upgrades  
  
/etc/r0c5.d:  
S01acpid S01atd S01cron S01lrbalance S01lvmetad S01lxefs S01lxd S01mdadm S01open-vm-tools S01rsync S01ssh S01uidd  
S01apport S01console-setup.sh S01ibus S01lvmetad S01lxefs S01lxd S01mdadm S01plymouth S01rsyslog S01unattended-upgrades  
  
/etc/r0c6.d:  
K01atd K01cryptisks-early K01lrbalance K01lvmetad K01lxefs K01mdadm K01open-iscsi K01plymouth K01unattended-upgrades  
K01cryptisks K01ebtables K01liscsid K01lvmetad K01lxd K01mdadm-waitidle K01open-vm-tools K01rsyslog K01uidd  
mva456@DESKTOP-OE7HLB3:~$
```

Q20 ==> Session 1: Exercise 5: Creating a file with a text editor

Create myfile.txt under training directory, type and save content



Ctrl+O then Enter to save. Ctrl+X to exit.

The screenshot shows a Microsoft Edge browser window with several tabs open. The active tab displays a text box containing instructions about using a campus grid for processing data. Below the text box is a command-line interface where the user has entered 'prompt> ls' and received a response. The status bar at the bottom indicates the file 'myfile.txt' has been written.

For example; say you have a process that takes a sample of data from a data-set, analyses the sample and then stores a result. This process takes 30 minutes but needs to be done 1000 times. This requires 500 hours of processing time. On a single computer this task will take about 21 days to complete whereas using the Campus Grid (using around 250 nodes) this can be done in 2 hours!

Now save the file (press Ctrl+O then RETURN) and exit (Ctrl+X).

prompt> ls

You should have a new file called "myfile.txt".

Exercise 6: Looking inside files

Introduces the commands `cat`, `less`, `grep`

You can use a text editor to look inside a file without changing anything of course but there are quicker (and it turns out, more useful) ways of looking inside text files. To see what's inside a text file:

prompt> cat myfile.txt

(`cat` is short for concatenate). The problem with `cat` is that big files rapidly scroll off the top of the terminal screen. A more powerful command is called `more` but that alas been supplanted by an even more powerful command named `less`:

prompt> less myfile.txt

Wrote 6 lines

Linux_Course_Han.pdf ^ Show all X Get Help X Exit X Write Out X Where Is X Cut Text X Justify X Cur Pos M-U Undo

Type here to search

Check new txt file

A screenshot of a Windows desktop environment. At the top, there's a taskbar with various pinned icons including File Explorer, Microsoft Edge, and other system utilities. The main area of the screen is occupied by a terminal window with a black background and white text. The terminal session shows the following command-line interaction:

```
mva456@DESKTOP-OE7HLB3:~/training$ ls  
myfile.txt new_folder  
mva456@DESKTOP-OE7HLB3:~/training$
```

The terminal window has a standard window title bar at the top.

Q21 ==> Session 1: Exercise 6: Looking inside files

cat

mva456@DESKTOP-OE7HLB3: ~\training
mva456@SKY-DE7HLB3: ~\training\$ cat myfile.txt
The Reading Campus Grid is a Condor Pool consisting of about 300 nodes. It is provided by IT Services and the School of Systems Engineering.
The aim of the Campus Grid is to provide researchers with a High Throughput Computing resource; these are designed to process tasks that require fairly short processing times (usually minutes or hours) but that need to be run 100's or 1000's of times.
For example; say you have a process that takes a sample of data from a data-set, analyses the sample and then stores a result. This process takes 30 minutes but needs to be done 1000 times. This requires 500 hours of processing time. On a single computer this task will take about 21 days to complete whereas using the Campus Grid (using around 250 nodes) this can be done in 2 hours!
mva456@DESKTOP-OE7HLB3: ~\training\$

less

```
mva456@DESKTOP-OE7HLB3:~/training
mva456@DESKTOP-OE7HLB3:~/training$ less myfile.txt
```



```
mva456@DESKTOP-OE7HLB3:~/training
The Reading Campus Grid is a Condor Pool consisting of about 300 nodes. It is provided by IT Services and the School of Systems Engineering.
The aim of the Campus Grid is to provide researchers with a High Throughput Computing resource; these are designed to process tasks that require fairly short processing times (usually minutes or hours) but that need to be run 100's or 1000's of times.
For example: say you have a process that takes a sample of data from a data-set, analyses the sample and then stores a result. This process takes 30 minutes but needs to be done 1000 times. This requires 500 hours of processing time. On a single computer this task will take about 21 days to complete whereas using the Campus Grid (using around 250 nodes) this can be done in 2 hours!
myfile.txt (END)
```



```
mva456@DESKTOP-OE7HLB3:~/training
mva456@DESKTOP-OE7HLB3:~/training$ less myfile.txt
```

Search for the word example by typing /example

A screenshot of a Windows desktop environment. At the top, there is a terminal window with a black background containing white text. The text starts with a command prompt: "mva456@DESKTOP-OF7HLB3: ~\training". Below this, there is a large block of explanatory text about processing data sets. At the bottom of the terminal window, the word "(END)" is visible. The desktop background is entirely black. Along the bottom edge, there is a standard Windows taskbar. From left to right, it includes: a search bar with the placeholder "Type here to search"; several pinned icons for applications like Spotify, File Explorer, and a browser; and the Windows Start button. On the far right of the taskbar, there are system status icons for battery level, signal strength, and volume, along with the text "ENG 5:50 PM 9/7/2020".

Search for the word process by typing /process. Exit by typing q

A screenshot of a terminal window on a Windows operating system. The title bar indicates the user is 'mva456' and the session is at 'DESKTOP-0F7HLB2' in the '~\training' directory. The main window content is a block of text explaining a 'process' task: 'For example; say you have a process that takes a sample of data from a data-set, analyses the sample and then stores a result. This process takes 30 minutes but needs to be done 1000 times. This requires 500 hours of processing time. On a single computer this task will take about 21 days to complete whereas using the Campus Grid (using around 250 nodes) this can be done in 2 hours!' At the bottom of the screen, the Windows taskbar is visible, featuring a search bar, pinned application icons for File Explorer, Edge, and others, and standard system icons for battery, signal, and volume.

Use grep to search for the word engineering

```
mva456@DESKTOP-OE7HLB3: ~\training
[mva456@DESKTOP-OE7HLB3: ~\training]$ grep Engineering myfile.txt
The Research Campus Grid is a Cluster Pool consisting of about 300 nodes. It is provided by IT Services and the School of Systems Engineering.
mva456@DESKTOP-OE7HLB3: ~\training$
```

Q22 ==> Session 1: Exercise 7: Copying, Moving and Deleting files and directories

cp

```
mva456@DESKTOP-OE7HLB3: ~\training
[mva456@DESKTOP-OE7HLB3: ~\training]$ cp myfile.txt myjunk.txt
mva456@DESKTOP-OE7HLB3: ~\training$ ls
myfile.txt myjunk.txt new-folder
mva456@DESKTOP-OE7HLB3: ~\training$
```

mv

```
mva456@DESKTOP-OE7HLB3:~/training$ mv myjunk.txt myold.txt
mv: cannot move 'myjunk.txt' to destination 'myold.txt': No such file or directory
mva456@DESKTOP-OE7HLB3:~/training$ ls
myfile.txt  myold.txt  new_folder
mva456@DESKTOP-OE7HLB3:~/training$
```

1. Copy myfile.txt to another file with the name ,myfile2.txt`.

```
mva456@DESKTOP-OE7HLB3:~/training$ cp myfile.txt myfile2.txt
cp: overwrite 'myfile2.txt'? y
mva456@DESKTOP-OE7HLB3:~/training$ ls
myfile.txt  myfile2.txt  myold.txt  new_folder
mva456@DESKTOP-OE7HLB3:~/training$
```

2. Edit the second file with nano and change some text at random.

mva456@DESKTOP-OE7HLB3:~/training
mva456@DESKTOP-OE7HLB3:~/training\$ nano myfile2.txt

The screenshot shows a Windows desktop environment. A terminal window titled 'myfile2.txt' is open, displaying the following text:

```
GNU nano 2.9.3
The Reading Campus Grid is a Condor Pool consisting of about 300 nodes. It is provided by IT Services and the School of Systems Engineering.
The aim of the Campus Grid is to provide researchers with a High Throughput Computing resource; these are designed to process tasks that require fairly short processing times (usually minutes or hours) but that need to be $.
For example; 'abcdefg' say you have a process that takes a sample of data from a data-set, analyses the sample and then stores a result. This process takes 30 minutes but needs to be done 1000 times. This requires 500 hour$.
```

The taskbar at the bottom of the screen shows various icons for applications like Spotify, Microsoft Edge, and File Explorer. The system tray indicates the date and time as 9/7/2020, 6:04 PM, and shows battery status.

3. Come up with a single command using wildcards which searches both files for a particular word

```
mva456@DESKTOP-OE7HLB3:~/training$ grep Eng myfile.txt myfile2.txt
mva456@DESKTOP-OE7HLB3:~/training$ grep Eng myfile.txt myfile2.txt
The Reading Campus Grid is a Condor Pool consisting of about 300 nodes. It is provided by IT Services and the School of Systems Engineering.
myfile2.txt:The Reading Campus Grid is a Condor Pool consisting of about 300 nodes. It is provided by IT Services and the School of Systems Engineering.
mva456@DESKTOP-OE7HLB3:~/training$
```

4. Make a directory and try to copy it – what happens

```
③ Select mva456@DESKTOP-OE7HLB3:~/training
mva456@DESKTOP-OE7HLB3:~/training$ mkdir test
mva456@DESKTOP-OE7HLB3:~/training$ cp -r test test2
mva456@DESKTOP-OE7HLB3:~/training$ mv test2 test3
mva456@DESKTOP-OE7HLB3:~/training$ ls
myfile.txt myfile2.txt myold.txt new_folder test test3
mva456@DESKTOP-OE7HLB3:~/training$
```

rm

```
mva456@DESKTOP-OE7HLB3: ~\training  
myfile.txt myfile2.txt new-folder test test3  
mva456@DESKTOP-OE7HLB3: ~\training$ rm myold.txt  
mva456@DESKTOP-OE7HLB3: ~\training$ ls  
myfile.txt myfile2.txt new-folder test test3  
mva456@DESKTOP-OE7HLB3: ~\training$
```

Q23 ==> Session 1: Exercise 8: The Linux environment

echo \$PATH

```
mva456@DESKTOP-OE7HLB3: ~  
mva456@DESKTOP-OE7HLB3: ~$ echo $PATH  
/usr/local/sbin:/usr/local/bin:/usr/bin:/bin:/usr/games:/usr/local/games:/mnt/c/Program Files/Java/jdk-13.0.2/bin:/mnt/c/Program Files (x86)/Common Files/Oracle/Java/javapath:/mnt/c/ProgramData/Oracle/Java/javapath:/mnt/c/WindowsPowerShell/v1.0:/mnt/c/Windows/System32/OpenSSH:/mnt/c/Program Files (x86)/NVIDIA Corporation/PhysX/PhysXCoreCommon:/mnt/c/Program Files/NVIDIA NVDISK:/mnt/c/cygwin64/bin:/mnt/c/Program Files/Geth:/mnt/c/Program Files/nftex-2.9/miktex/bin/x64:/mnt/c/Program Files/nodejs:/mnt/c/Program Files/dotnet:/mnt/c/WindowsPowerShell:/mnt/c/Windows:/mnt/c/Windows/System32/WindowsPowerShell/V1.0:/mnt/c/Windows/System32/OpenSSH:/mnt/c/Users/mvamo/Appdata/Local/Programs/AdoptOpenJDK/bin:/mnt/c/Users/mvamo/Appdata/Local/Microsoft/WindowsApps:/mnt/c/Users/mvamo/Appdata/Local/Programs/microsoft/VS Code/bin:/mnt/c/Program Files/nodejs:/mnt/c/Users/mvamo/Appdata/Roaming/npm:/mnt/c/Windows/System32/snap/bin  
mva456@DESKTOP-OE7HLB3: ~$ .
```

export then echo

```
mva456@DESKTOP-OE7HLB3: ~  
mva456@DESKTOP-OE7HLB3: $ export mva456=mva456  
mva456@DESKTOP-OE7HLB3: $ echo $mva456  
mva456  
mva456@DESKTOP-OE7HLB3: $ echo ${mva456}  
mva456  
mva456@DESKTOP-OE7HLB3: $ -
```

env

set

```
mva456@DESKTOP-OE7HLB3: ~
mva456@DESKTOP-OE7HLB3: ~$ set_
f1;
return 1
}xfunc ()
{
    set -- "$@";
    local srcfile=$1;
    shift;
    declare -F $1 > /dev/null || {
        _load_completion "$srcfile"
    };
    "$@"
}
xinetd_services ()
{
    local xinetddir=/etc/xinetd.d;
    if [[ -d $xinetddir ]]; then
        local IFS=
        reset=$(shopt -p nullglob);
        shopt -s nullglob;
        local -a svcs=(${ printf '%s\n' $xinetddir/!(${_backup_glob}) });
        preset=
        COMPREPLY=(${( compgen -W ${svcs[@]}#xinetddir/) -- "$cur" });
    fi
}
command_not_found_handle ()
{
    if [ -x /usr/lib/command-not-found ]; then
        /usr/lib/command-not-found -- "$1";
        return $?;
    else
        if [ -x /usr/share/command-not-found/command-not-found ]; then
            /usr/share/command-not-found/command-not-found -- "$1";
        else
            printf "%s: command not found\n" "$1" 1>&2;
            return 127;
        fi;
    fi;
}
dequote_()
{
    eval printf %s "$1" 2> /dev/null
}
quote_()
{
    local quoted=${1//\'/\\\'\\\'\\\'};
    printf "%s" "$quoted"
}
quote_readline_()
{
    local quoted;
    _quote_readline_by_ref "$1" ret;
    printf %s "$ret"
}
mva456@DESKTOP-OE7HLB3: ~
```