

Activity No. 11	
Command Line Skills	
Course Code: CPE 201A	Program:Computer Engineering
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1. Objective/s:	
This activity aims to execute basic commands using command line interface of Linux.	
2. Intended Learning Outcome/s:	
The students should be able to:	
2.1	Demonstrate how to use commands to explore BASH features.
2.2	Demonstrate how to use commands to display the values of Shell variables.
2.3	Demonstrate how to use quoting in Bash shells.
3. Discussion:	
Command Line Interface	
The Linux community promotes the CLI due to its power, speed and ability to accomplish a vast array of tasks with a single command line instruction. The CLI provides more precise control, greater speed and the ability to automate tasks more easily through scripting. By learning the CLI, a user can easily be productive almost instantly on ANY flavor or distribution of Linux.	
The Shell	
Once a user has entered a command , the terminal then accepts what the user has typed and passes to a shell. The shell is a program that enables text based communication between the operating system and the user. It is the command line interpreter that translates commands entered by a user into actions to be performed by the operating system. The Linux environment allows the use of many different shells.	
There are several different shells on Linux, these are just a few:	
<ul style="list-style-type: none"> • Bourne-again shell (Bash) • C shell (csh or tcsh, the enhanced csh) • Korn shell (ksh) • Z shell (zsh) 	
The most commonly used shell for Linux distributions is called the Bash shell. When using an interactive shell, the user inputs commands at a so-called prompt. For each Linux distribution, the default prompt may look a little different, but it usually follows this structure:	
<code>username@hostname current_directory shell_type</code>	
On Ubuntu or Debian GNU/Linux, the prompt for a regular user will likely look like this:	
<code>carol@mycomputer:~\$</code>	
The superuser's prompt will look like this:	
<code>root@mycomputer:~#</code>	
On CentOS or Red Hat Linux, the prompt for a regular user will instead look like this:	
<code>[dave@mycomputer ~]\$</code>	
And the superuser's prompt will look like this:	
<code>[root@mycomputer ~]#</code>	

Let's explain each component of the structure:

username

Name of the user that runs the shell

hostname

Name of the host on which the shell runs. There is also a command `hostname` , with which you can show or set the system's host name.

current_directory

The directory that the shell is currently in. A ~ means that the shell is in the current user's home directory.

shell_type

\$ indicates the shell is run by a regular user.

indicates the shell is run by the superuser root

4. Resources:

Personal Computer with installed Virtual Box

Ubuntu Server or Desktop virtual machine

5. Procedure:

1. Login using your username and password.
2. Use terminal emulator application (if you are using desktop version)
3. Execute the following commands. Copy a screenshot as output after you execute the given command. Create a brief explanation of the command.

Command	Screenshot	Explanation
1. ls -l	<pre>To run a command as administrator (user "root"), use "sudo <command>". See "man sudo_root" for details. v@v-VirtualBox:~\$ ls -l total 36 drwxr-xr-x 2 v v 4096 Oct 23 08:06 Desktop drwxr-xr-x 2 v v 4096 Oct 23 08:06 Documents drwxr-xr-x 2 v v 4096 Oct 23 08:06 Downloads drwxr-xr-x 2 v v 4096 Oct 23 08:06 Music drwxr-xr-x 3 v v 4096 Oct 23 08:13 Pictures drwxr-xr-x 2 v v 4096 Oct 23 08:06 Public drwx----- 3 v v 4096 Oct 23 08:06 snap drwxr-xr-x 2 v v 4096 Oct 23 08:06 Templates drwxr-xr-x 2 v v 4096 Oct 23 08:06 Videos v@v-VirtualBox:~\$ \ </pre>	The command shows the folders under the primary drive
2. ls -l ./Documents	<pre>v@v-VirtualBox:~\$ \ls -l ./Documents total 0 v@v-VirtualBox:~\$ \ </pre>	This command shows all the folders under Documents
3. whoami	<pre>v@v-VirtualBox:~\$ whoami v</pre>	This command shows the users name
4. uname	<pre>v@v-VirtualBox:~\$ uname Linux</pre>	This command shows the kernel's name
5. pwd	<pre>v@v-VirtualBox:~\$ pwd /home/v</pre>	This command shows the current directory used by the terminal

6. echo Hi	v@v-VirtualBox:~\$ echo hi hi		This command repeats all the text, in this case "hi", that you wrote after the echo command
7. history	v@v-VirtualBox:~\$ history 1 ls -l 2 \ls -l ./Documents 3 whoamI 4 whoami 5 Uname 6 uname 7 pwd 8 echo hi 9 history		This command shows all the past commands used in the terminal.
8. history 5	v@v-VirtualBox:~\$ history 5 6 uname 7 pwd 8 echo hi 9 history 10 history 5		This command shows the past 5 commands used in the terminal
9. !9	v@v-VirtualBox:~\$!9 history 1 ls -l 2 \ls -l ./Documents 3 whoamI 4 whoami 5 Uname 6 uname 7 pwd 8 echo hi 9 history 10 history 5 11 history		This command executes the 9 th command from the first in the history of commands.

10. echo Hello Student	v@v-VirtualBox:~\$ echo Hello Student Hello Student	This command reprints the “Hello Student” text after the command
11. echo \$HISTSIZE	v@v-VirtualBox:~\$ echo \$HISTSIZE 500	This command shows the number of lines that are stored in the memory of history list.
12. echo \$PATH	v@v-VirtualBox:~\$ echo \$PATH /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin:/snap/bin	This command shows the current value of the PATH variable
13. which date	v@v-VirtualBox:~\$ which date /usr/bin/date	This command locates and prints the full path to “date” executable file.
14. type cd	v@v-VirtualBox:~\$ type cd cd is a shell builtin	This command provides information on whether a command is shell built-in, external binary, function, or alias. In this case this shows that the cd

		command is a shell built-in command
15. type ls	v@v-VirtualBox:~\$ type ls ls is /usr/bin/ls	Similar to the function above, this shows information about the command after the “type” command. In this case, it seems to show its directory
16. alias	v@v-VirtualBox:~\$ alias	This command shows all the current aliases for commands. However, it does not show any because I have not aliased a command
17. type vi	v@v-VirtualBox:~\$ type vi vi is /usr/bin/vi	This shows information about the command. In this case, it seems to show its directory
18. cd /bin	v@v-VirtualBox:~\$ cd /bin v@v-VirtualBox:/bin\$	This command changes the path from the home to bin

19. type vlc	v@v-VirtualBox:~\$ type vlc bash: type: vlc: not found	This command provides information on whether a command is shell built-in, external binary, function, or alias. However, in this case vlc is not installed
20. cd	v@v-VirtualBox:~\$ cd	This command changes the current directory. However, since I did not put any parameters, it did not output anything.
21. echo Today is 'date'	v@v-VirtualBox:~\$ echo Today is 'date' Today is date	This command repeats the line after the echo command. The single quotation marks prevent the date from being a command and just a string
22. echo Today is \$(date)	v@v-VirtualBox:~\$ echo Today is \$(date) Today is Thu Oct 23 09:12:06 AM PST 2025	This command first prints the string

		"Today is " then concatenates the date using the value on the date command
23.echo This is the command "date"	v@v-VirtualBox:~\$ echo This is the command ''date'' This is the command date	This command reprints the string after the echo command but date seems to be just a string added to the first one
24.echo This is the command \'date\'	v@v-VirtualBox:~\$ echo This is the command \'date\' This is the command 'date'	This also reprints the string after the command. However, this time the date includes a single quotation marks.
25.echo This is the command "date"	v@v-VirtualBox:~\$ echo This is the command "'date'" This is the command 'date'	This also reprints the string after the command. However, this time the date includes a single quotation marks.

26. echo D*	v@v-VirtualBox:~\$ echo D* Desktop Documents Downloads	This command prints out all the folders in the current path that starts with the letter D
27. echo "D**"	v@v-VirtualBox:~\$ echo "D*" D*	This command prints out the whole "D*" string instead of running the command D* like the last one
28. echo Hello; echo Linux; echo Student	v@v-VirtualBox:~\$ echo Hello;echo Linux;echo Student Hello Linux Student	This line runs multiple echo commands within it separated by ",".
29. false; echo Not; echo Conditional	v@v-VirtualBox:~\$ false;echo Not;echo Conditional Not Conditional	The like the last command this runs multiple commands in one line. First is false which seem to do nothing but is used to return an exit status code ("1" by default) that indicates failure. However, in

		this direct sequence, it simply completes its execution and the shell proceeds to the next command. The next lines just print each strings after it, “Not” and “Conditional”.
30. echo Start && echo Going && echo Gone	v@v-VirtualBox:~\$ echo Start && echo Going && echo Gone Start Going Gone	This line runs multiple echo commands within it separated by “&&”.
31. echo Success && false && echo Bye	v@v-VirtualBox:~\$ echo Success && false && echo Bye Success	This command just prints out the first command which is echo success and the commands following the false command is exited
32. false echo Fail Or	v@v-VirtualBox:~\$ false echo Fail Or Fail Or	Since the false command always exits with a

		"failure" status (1), the logical OR operator () ensures that the command on its right-hand side will always be executed.
33. true echo Nothing to see here	v@v-VirtualBox:~\$ true Nothing to see here	When you use true command, the shell first evaluates the true command. Since true always succeeds, it returns an exit status of 0. Because the left side of the operator is successful, the command on the right

		side is not executed.
34. printenv	<pre>v@v-VirtualBox:~\$ printenv SHELL=/bin/bash SESSION_MANAGER=local/v-VirtualBox:@tmp/.ICE-unix/2089,unix/v-VirtualBox:/tmp/.ICE-unix/2089 QT_ACCESSIBILITY=1 COLORTERM=truecolor XDG_CONFIG_DIRS=/etc/xdg/xdg-ubuntu:/etc/xdg XDG_MENU_PREFIX=gnome- GNOME_DESKTOP_SESSION_ID=this-is-deprecated GNOME_SHELL_SESSION_MODE=ubuntu SSH_AUTH_SOCK=/run/user/1000/keyring/ssh MEMORY_PRESSURE_WRITE=c29tZSAyMDAwMDAgMjAwMDAwMAA= XMODIFIERS=@im=ibus DESKTOP_SESSION=ubuntu GTK_MODULES=gail:atk-bridge PWD=/home/v LOGNAME=v XDG_SESSION_DESKTOP=ubuntu XDG_SESSION_TYPE=wayland SYSTEMD_EXEC_PID=2125 XAUTHORITY=/run/user/1000/.mutter-Xwaylandauth.CX30E3 HOME=/home/v USER=v USERNAME=v IM_CONFIG_PHASE=1 LANG=en_US.UTF-8 XDG_CURRENT_DESKTOP=ubuntu:GNOME MEMORY_PRESSURE_WATCH=/sys/fs/cgroup/user.slice/user@1000.service/session.slice/org.gnome.Shell@wayland.service/memory.pressure VTE_VERSION=7600 WAYLAND_DISPLAY=wayland-0 GNOME_TERMINAL_SCREEN=org/gnome/Terminal/screen/e98b2812_1020_489d_b432_b533d00e45a0 GNOME_SETUP_DISPLAY=:1 XDG_SESSION_CLASS=user TERM=xterm-256color USER=v GNOME_TERMINAL_SERVICE=:1.121 CLUTTER_DISABLE_MIPMAPPED_TEXT=1 DISPLAY=:0 SHLVL=1 GSM_SKIP_SSH_AGENT_WORKAROUND=true QT_IM_MODULE=ibus XDG_RUNTIME_DIR=/run/user/1000 DEBUGINFOD_URLS=https://debuginfod.ubuntu.com XDG_DATA_DIRS=/usr/share/ubuntu:/usr/share/gnome:/usr/local/share:/var/lib/snapd/desktop PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/bin:/usr/games:/usr/local/games:/snap/bin:/snap/bin GDMSESSION=ubuntu DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus =/usr/bin/printenv</pre>	This command is used to display environment variables. When run without arguments, it prints all environment variables with their values, one per line in a name=value format.
35. printenv TERM	<pre>v@v-VirtualBox:~\$ printenv TERM xterm-256color</pre>	The printenv command displays the values of environment variables for TERM. xterm-256color is a value for the environment variable that indicates the terminal is capable to display 256 colors.
36. echo \$TERM	<pre>v@v-VirtualBox:~\$ echo \$TERM xterm-256color</pre>	The echo is used to print the value of \$TERM

		which is xterm-256color
37. env	v@v-VirtualBox:~\$ env SHELL=/bin/bash SESSION_MANAGER=local/v-VirtualBox:@/tmp/.ICE-unix/2089,unix/v-VirtualBox:/tmp/.ICE-unix/2089 QT_ACCESSIBILITY=1 COLORTERM=truecolor XDG_CONFIG_DIRS=/etc/xdg/xdg-ubuntu:/etc/xdg XDG_MENU_PREFIX=gnome- GNOME_DESKTOP_SESSION_ID=this-is-deprecated GNOME_SHELL_SESSION_MODE=ubuntu SSH_AUTH_SOCK=/run/user/1000/keyring/ssh MEMORY_PRESSURE_WRITE=c29tZSAyMDAwMDAgMjAwMDAwMAA= XMODIFIERS=@im:ibus DESKTOP_SESSION=ubuntu GTK_MODULES=gail:atk-bridge PWD=/home/v LOGNAME=v XDG_SESSION_DESKTOP=ubuntu XDG_SESSION_TYPE=wayland SYSTEMD_EXEC_PID=2125 XAUTHORITY=/run/user/1000/.mutter-Xwaylandauth.CX30E3 HOME=/home/v USERNAME=v IM_CONFIG_PHASE=1 LANG=en_US.UTF-8 XDG_CURRENT_DESKTOP=ubuntu:GNOME MEMORY_PRESSURE_WATCH=/sys/fs/cgroup/user.slice/user@1000.slice/user@1000.service/session.slice/org.gnome.Shell@wayland.service/memory.pressure VTE_VERSION=7600 WAYLAND_DISPLAY=wayland-0 GNOME_TERMINAL_SCREEN=/org/gnome/Terminal/screen/e98b2812_1020_489d_b432_b533d00e45a0 GNOME_SETUP_DISPLAY=1 XDG_SESSION_CLASS=user USER=v GNOME_TERMINAL_SERVICE=:1.121 CLUTTER_DISABLE_MIPMAPPED_TEXT=1 DISPLAY=:0 SHLVL=1 GSM_SKIP_SSH_AGENT_WORKAROUND=true QT_IM_MODULE=ibus XDG_RUNTIME_DIR=/run/user/1000 DEBUGINFO_URL=https://debuginfo.ubuntu.com XDG_DATA_DIRS=/usr/share/ubuntu:/usr/share/gnome:/usr/local/share/:/var/lib/snapd/desktop PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/bin:/usr/games:/usr/local/games:/snap/bin:/snap/bin GDMSESSION=ubuntu DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus .=~/bin/env	The primary function of the 'env' command is to display environment variables or run commands within a modified environment. Without any arguments it prints out of the list of the environment variables

6. Supplementary Activity:

Copy screen shot(s) of the following tasks:

1. An alias can be used to map longer commands to shorter key sequences. Use an alias to represent a very long command.

```
v@v-VirtualBox:~$ alias saymyname='echo Heisenburg'  
v@v-VirtualBox:~$ saymyname  
Heisenburg
```

2. Create a new directory in the Documents directory. Rename the directory as CPE_201A_(lastname). Create a new file inside the CPE_201A_(lastname) directory. Rename the file as sample1_lastname.txt. Display the content of the CPE_201A_(lastname) directory by executing one line of command only.

```
v@v-VirtualBox:~$ cd Documents  
v@v-VirtualBox:~/Documents$ mkdir new  
v@v-VirtualBox:~/Documents$ mv new CPE_201A_CONDINO  
v@v-VirtualBox:~/Documents$ cd CPE_201A_CONDINO  
v@v-VirtualBox:~/Documents/CPE_201A_CONDINO$ touch newfile.txt  
v@v-VirtualBox:~/Documents/CPE_201A_CONDINO$ mv newfile.txt sample1_condino.txt  
v@v-VirtualBox:~/Documents/CPE_201A_CONDINO$ ls  
sample1_condino.txt
```

3. Execute a command to display the working shell.

```
v@v-VirtualBox:~$ echo $SHELL  
/bin/bash
```

4. Shell variables, called environment variables, have the string data type and typically are named with capital letters and the _ (underline) character. Names are case sensitive. The env command will list all the environment variables. The printenv command will list all or will list only the names on its command line. List all environment variables. Which start with P?

```
v@v-VirtualBox:~$ printenv | grep '^P'  
PWD=/home/v  
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin:/snap/bin
```

7. Conclusion:

From this activity, I learned to use different command in linux. From ls, echo, alias,etc. ,There are many commands that can be useful in using this operating system. For me I like to stick on GUI instead of CLI because it is more user-friendly unlike cli which needs you to know many commands. I think if I switch into Ubuntu operating system, learning this will be much useful but for now, I think I will stick to using its GUI instead of CLI when operating files. Overall, I learned many commands that can be used in the ubuntu system that can be used to accomplish different kinds of tasks and I think having prior knowledge on this topic will be useful in the future

8. Assessment (Rubric for Laboratory Performance):