

Activity No. 11	
Command Line Skills	
Course Code: CPE 201A	Program: CPE
Course Title: COMPUTER SYSTEM ADMINISTRATION AND TROUBLESHOOTING	Date Performed: 10/23/25
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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:	
<p>Command Line Interface</p> <p>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.</p>	
<p>The Shell</p> <p>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:</p> <ul style="list-style-type: none"> • Bourne-again shell (Bash) • C shell (csh or tcsh, the enhanced csh) • Korn shell (ksh) • Z shell (zsh) <p>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:</p> <pre>username@hostname current_directory shell_type</pre> <p>On Ubuntu or Debian GNU/Linux, the prompt for a regular user will likely look like this:</p> <pre>carol@mycomputer:~\$</pre> <p>The superuser's prompt will look like this:</p> <pre>root@mycomputer:~#</pre> <p>On CentOS or Red Hat Linux, the prompt for a regular user will instead look like this:</p> <pre>[dave@mycomputer ~]\$</pre> <p>And the superuser's prompt will look like this:</p>	

```
[root@mycomputer ~]#
```

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

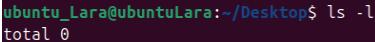
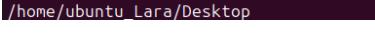
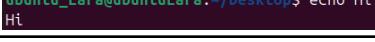
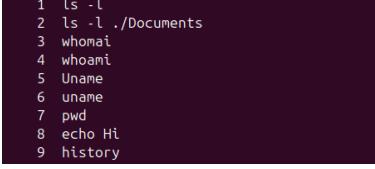
4. Resources:

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	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ ls -l total 0</code>	Lists files and directories inside the current directory using a long format with -l argument.
2. ls -l ./Documents	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ ls -l ./Documents ls: cannot access './Documents': No such file or directory</code>	Lists all the files and directories inside Documents. Uses long format using -l argument.
3. whoami	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ whoami ubuntu_Lara</code>	Prints the currently logged in username.
4. uname	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ uname Linux</code>	Prints OS kernel. Linux
5. pwd	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ pwd /home/ubuntu_Lara/Desktop</code>	Prints full path of current directory.
6. echo Hi	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ echo Hi Hi</code>	Prints Hi on the CLI.
7. history	 <code>ubuntu_Lara@ubuntuLara:~/Desktop\$ history 1 ls -l 2 ls -l ./Documents 3 whoname 4 whoami 5 Uname 6 uname 7 pwd 8 echo Hi 9 history</code>	Prints a numbered list of previously used commands.

8. history 5	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ history 5 6 uname 7 pwd 8 echo Hi 9 history 10 history 5</pre>	Prints the recent or last 5 commands used.
9. !9	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$!9 history 1 ls -l 2 ls -l ./Documents 3 whomai 4 whoami 5 Uname 6 uname 7 pwd 8 echo Hi 9 history 10 history 5 11 history</pre>	executes the 9th command from the history.
10. echo Hello Student	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ echo Hello Student Hello Student</pre>	Prints Hello Student in the terminal.
11. echo \$HISTSIZE	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ echo \$HISTSIZE 1000</pre>	Prints the highest number of commands the terminal can remember.
12. echo \$PATH	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ echo \$PATH /usr/local/sbin:/usr/local/bin:/usr/lib/x86_64-linux-gnu:/usr/bin:/bin:/usr/games:/usr/local/games:/snap/bin:/snap/bin</pre>	Prints directories the shell reads when looking for commands.
13. which date	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ which date /usr/bin/date</pre>	Prints the path of executable date.
14. type cd	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ type cd cd is a shell builtin</pre>	Prints the type of command cd as shell builtin.
15. type ls	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ type ls ls is aliased to `ls --color=auto'</pre>	Prints the type of command ls as external binary. In this instance, it's aliased to ls --color=auto
16. alias	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ alias alias alert='notify-send --urgency=low -i "\$([\$((\$? == 0)) && echo terminal echo error)" "\$*"'" alias l='ls -CF' alias la='ls -A' alias ll='ls -alF' alias ls='ls --color=auto' alias grep='grep --color=auto' alias fgrep='fgrep --color=auto' alias egrep='egrep --color=auto' alias vi='/usr/bin/vi' alias vim='/usr/bin/vim' alias less='less -R' alias more='more -R' alias xterm='xterm --color=auto'</pre>	Prints the list of aliased commands or shortcuts in the terminal.
17. type vi	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ type vi vi is /usr/bin/vi</pre>	Prints the type of command vi as executable. In this instance, it prints the path of the executable.
18. cd /bin	<pre>ubuntu_Lara@ubuntuLara:~/Desktop\$ cd /bin ubuntu_Lara@ubuntuLara:/bin\$</pre>	Changes directory to /bin, a system files directory.
19. type vlc	<pre>ubuntu_Lara@ubuntuLara:/bin\$ type vlc bash: type: vlc: not found</pre>	Prints the type of command vlc as executable. In this instance, vlc is not installed, so it prints "vlc not found".
20. cd	<pre>ubuntu_Lara@ubuntuLara:/bin\$ cd ubuntu_Lara@ubuntuLara:~\$</pre>	Changes directory.
21. echo Today is `date`	<pre>ubuntu_Lara@ubuntuLara: ~\$ echo Today is `date` Today is Thu Oct 23 01:55:42 AM UTC 2025</pre>	Echo prints a today message. date command prints the current date data.

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

```
ubuntu_Lara@ubuntuLara:~$ alias greet='echo Today is $(date); echo Hello Student ; echo Welcome to Linux!'; greet
alias greet='echo Today is $(date); echo Hello Student; echo Welcome to Linux!';
ubuntu_Lara@ubuntuLara:~$ greet
Today is Thu Oct 23 02:11:33 AM UTC 2025
Hello Student
Welcome to Linux!
```

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.

```
ubuntu_Lara@ubuntuLara:~$ mkdir ~/Documents/CPE_201A_Lara
ubuntu_Lara@ubuntuLara:~$ touch ~/Documents/CPE_201A_Lara/sample1_Lara.txt

ubuntu_Lara@ubuntuLara:~$ ls -l ~/Documents/CPE_201A_Lara
total 0
-rw-rw-r-- 1 ubuntu_Lara ubuntu_Lara 0 Oct 23 02:13 sample1_Lara.txt
```

3. Execute a command to display the working shell.

```
ubuntu_Lara@ubuntuLara:~$ echo $SHELL
/bin/bash
ubuntu_Lara@ubuntuLara:~$
```

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?

```
ubuntu_Lara@ubuntuLara:~$ printenv | grep ^P
PWD=/home/ubuntu_Lara
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
```

7. Conclusion:

Concluding this activity, I learned the basics of the user interface of a Linux terminal and how its commands interact with the OS and its core linux kernel. The CLI provides important information to the user, such as an indicator of privilege like using the \$ sign for a regular user and the # sign for root or admin. In Linux, this form of a CLI or terminal is called a shell, which uses bash based on the command echo \$SHELL, which outputs /bin/bash, indicating that the bash shell is used. Looking at the directory, the /bin/ directory is the path of binaries used in Linux, containing the necessary prerequisites and

binaries needed for commands and programs to run in the OS. I also learned the use of semicolons to place multiple commands and arguments in one input and execution. This is similar to how it ends commands in the C++ language used by the CPE 007 course. When writing multiple long commands in the CLI and running them again, it takes much longer to write them all over again for another run, instead writing them to an alias allows this to be assigned into one command and allow the user to just write the alias name to run the desired commands. Overall, the Linux terminal shares similarities to the Windows command prompt and PowerShell, its commands allows for more powerful applications, such as automating, scripting, and instant readout of data without the constraints of the UI as long as the user knows how to read and write commands inside the terminal.

8. Assessment (Rubric for Laboratory Performance):