

Activity No. 11	
Command Line Skills	
Course Code: CPE 201A	Program: Computer Engineering
Course Title: COMPUTER SYSTEM ADMINISTRATION AND TROUBLESHOOTING	Date Performed: October 23, 2025
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<b>1. Objective/s:</b>	
This activity aims to execute basic commands using command line interface of Linux.	
<b>2. Intended Learning Outcome/s:</b>	
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.
<b>3. Discussion:</b>	
<p><b>Command Line Interface</b></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><b>The Shell</b></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.</p> <p>There are several different shells on Linux, these are just a few:</p> <ul style="list-style-type: none"> <li>• Bourne-again shell (Bash)</li> <li>• C shell (csh or tcsh, the enhanced csh)</li> <li>• Korn shell (ksh)</li> <li>• Z shell (zsh)</li> </ul> <p>The most commonly used shell for Linux distributions is called the <b>Bash</b> 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> <pre>[root@mycomputer ~]#</pre>	

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 <code>ls -l</code>	<pre>ubuntu@ubuntu:~\$ ls -l total 0 drwxr-xr-x 2 ubuntu ubuntu 60 Oct 22 23:42 Desktop drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Documents drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Downloads drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Music drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Pictures drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Public drwx----- 4 ubuntu ubuntu 80 Oct 22 23:45 snap drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Templates drwxr-xr-x 2 ubuntu ubuntu 40 Oct 22 23:43 Videos</pre>	Lists information about files and its directories within the file system.
2. <code>ls -l ./Documents</code>	<pre>vboxuser@UbuntuMendoza:~\$ ls -l ./Documents Command 'ls' not found, but can be installed with: sudo apt install ironseed</pre>	Lists the files of a given directory. (Given not found as there are no files inside)
3. <code>whoami</code>	 <pre>ubuntu@ubuntu:~\$ whoami ubuntu</pre>	It tells which operating system is being used this displays the username of the effective user.

4. Uname	<pre>ubuntu@ubuntu:~\$ uname Linux</pre>	Displays user information.
5. pwd	<pre>ubuntu@ubuntu:~\$ pwd /home/ubuntu</pre>	Displays the path of current directory you are using within the terminal.
6. echo Hi	<pre>ubuntu@ubuntu:~\$ echo Hi Hi</pre>	Echo command is used to display/print a text or strings as the output.
7. history	<pre>ubuntu@ubuntu:~\$ history 1 username 2 username@MendozaNat 3 ls -I 4 ls -l 5 whoami</pre>	Provides the list of previously executed commands within the terminal.
8. history 5	<pre>ubuntu@ubuntu:~\$ history 5 9 echo Hi 10 ls -I 11 ls -l 12 history 13 history 5</pre>	Provides the list of a specific “x = numbers” input executed commands within the terminal.
9. !9	<pre>ubuntu@ubuntu:~\$ !9 echo Hi Hi</pre>	Sends a signal to the process and corresponds it.
10.echo Hello Student	<pre>ubuntu@ubuntu:~\$ echo Hello Student Hello Student</pre>	Echo command is used to display/print a text or strings as the output.
11.echo \$HISTSIZE	<pre>vboxuser@UbuntuMendoza:~\$ echo \$HISTSIZE 1000</pre>	Prints the number of lines/commands that are stored in memory in a history list while the terminal/bash is ongoing.
12.echo \$PATH	<pre>vboxuser@UbuntuMendoza:~\$ echo \$PATH /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin:/snap/bin</pre>	Displays one or more directory names separated by colon.
13. which date	<pre>vboxuser@UbuntuMendoza:~\$ which date /usr/bin/date</pre>	Displays the date directory
14. type cd	<pre>vboxuser@UbuntuMendoza:~\$ type cd cd is a shell builtin</pre>	Displays the current directory which is the shell
15. type ls	<pre>vboxuser@UbuntuMendoza:~\$ type ls ls is aliased to `ls --color=auto'</pre>	Simply list and displays the contents of current directory

16. alias	<pre>vboxuser@UbuntuMendoza:~\$ alias alias alert='notify-send --urgency=low -i "\$( [ \$? = 0 ] &amp;&amp; echo terminal    echo error)" "\$(history tail -n1 sed -e '\''s/^ \s*[0-9]\ +\s*//;s/[;&amp; ]\s*alert\$//'\'' )" alias egrep='egrep --color=auto' alias fgrep='fgrep --color=auto' alias grep='grep --color=auto' alias l='ls -CF' alias la='ls -A' alias ll='ls -alF' alias ls='ls --color=auto'</pre>	Instead of it displaying a very long command it shortcuts as an alternative so that it substituted to a more complex command before its execution
17. type vi	<pre>vboxuser@UbuntuMendoza:~\$ type vi vi is /usr/bin/vi</pre>	Displays the path for Visual Editor
18. cd /bin	<pre>vboxuser@UbuntuMendoza:~\$ cd /bin vboxuser@UbuntuMendoza:/bin\$ cd vboxuser@UbuntuMendoza:~\$</pre>	It changes its directory to bin .
19. type vlc	<pre>vboxuser@UbuntuMendoza:~\$ vlc Command 'vlc' not found, but can be installed with: sudo apt install vlc-bin</pre>	Gives the path of vlc to the media files / mp4.
20. cd	<pre>vboxuser@UbuntuMendoza:~\$ cd vboxuser@UbuntuMendoza:~\$</pre>	Displays / change the current drive and directory
21. echo Today is `date`	<pre>vboxuser@UbuntuMendoza:~\$ echo Today is `date` Today is Thu Oct 23 12:17:02 AM UTC 2025</pre>	Prints the date in different form with the usage of different special characters
22. echo Today is \$(date)	<pre>vboxuser@UbuntuMendoza:~\$ echo today is \$(date) today is Thu Oct 23 12:16:25 AM UTC 2025</pre>	Prints the date in different form with the usage of different special characters
23. echo This is the command "date"	<pre>vboxuser@UbuntuMendoza:~\$ echo This is the command 'date' &gt; &gt; October 23 &gt; 2025</pre>	Command allows user input
24. echo This is the command \'date\'	<pre>vboxuser@UbuntuMendoza:~\$ echo This is the command \'date\' This is the command 'date'</pre>	Prints both text displayed instead of the "date" printing its date.
25. echo This is the command "date"	<pre>vboxuser@UbuntuMendoza:~\$ echo This is the command "'date'" This is the command Thu Oct 23 12:20:49 AM UTC 2025</pre>	Prints the text and displays the date.
26. echo D*	<pre>vboxuser@UbuntuMendoza:~\$ echo D* Desktop Documents Downloads</pre>	Lists all the file types in the current working directory
27. echo "D*"	<pre>vboxuser@UbuntuMendoza:~\$ echo "D*" D*</pre>	It prints D* instead of listing all its file types is because it used "".

28. echo Hello; echo Linux; echo Student	<pre>vboxuser@UbuntuMendoza:~\$ echo Hello; echo Linux; echo Student Hello Linux Student</pre>	Echo command is used to display/print a text or strings as the output. But this one, when you type a new echo it sets as a new line.
29. false; echo Not; echo Conditional	<pre>vboxuser@UbuntuMendoza:~\$ false; echo Not; echo Conditional Not Conditional</pre>	If it was set as false the command will not print, and echo is used to display/print a text or strings as its output.
30. echo Start && echo Going && echo Gone	<pre>vboxuser@UbuntuMendoza:~\$ echo start &amp;&amp; echo Going &amp;&amp; echo Gone start Going Gone</pre>	This prints if both are true as it used a logical operators and also with the use of echo it will set as a new line.
31. echo Success && false && echo Bye	<pre>vboxuser@UbuntuMendoza:~\$ echo Success &amp;&amp; false &amp;&amp; echo Bye Success</pre>	It prints success and since there is a false function related to the next print which is bye it will not be part of the output.
32. false    echo Fail Or	<pre>vboxuser@UbuntuMendoza:~\$ false    echo Fail Or Fail Or</pre>	It used a logical or operators it printed even if it was false because by its definition it returns true if any of the statemen is true.
33. true    echo Nothing to see here	<pre>vboxuser@UbuntuMendoza:~\$ true    echo Nothing to see here vboxuser@UbuntuMendoza:~\$</pre>	It didn't print because with the use of logic or operators since both are true, it will return as false so it didn't print.

34. printenv	<pre>vboxuser@UbuntuMendoza:~\$ printenv SHELL=/bin/bash SESSION_MANAGER=local/UbuntuMendoza:@/tmp/.ICE-unix/2396,unix/UbuntuMendoza:/tmp/.ICE-unix/2396 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/vboxuser LOGNAME=vboxuser XDG_SESSION_DESKTOP=ubuntu XDG_SESSION_TYPE=wayland SYSTEMD_EXEC_PID=2437 XAUTHORITY=/run/user/1000/.mutter-Xwaylandauth.YIHRE3 HOME=/home/vboxuser USERNAME=vboxuser IM_CONFIG_PHASE=1 LANG=en_US.UTF-8 LS_COLORS=rs=0:di=0;34:ln=0;31:36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01 30;43:ca=00:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj *.lzh=01;31:*.lz4=01;31:*.lzo=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:*.tz=01;31:*.zi gz=01;31:*.lrz=01;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01; 2=01;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;3 =01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.win=01;31:*.swm=01;31 =01:35:*.inn=01:35:*.minc=01:35:*.minen=01:35:*.nif=01:35:*.hm=01:35:*.nhm=01:35:*</pre>	Prints all environmental variables without an argument or an action.
35. printenv TERM	<pre>vboxuser@UbuntuMendoza:~\$ printenv TERM xterm-256color</pre>	Prints what kind of screen you are currently using.
36. echo \$TERM	<pre>vboxuser@UbuntuMendoza:~\$ echo \$TERM xterm-256color</pre>	Displays the screen type of you are currently using.

37. env	<pre>vboxuser@UbuntuMendoza:~\$ env SHELL=/bin/bash SESSION_MANAGER=local:UbuntuMendoza:@/tmp/.ICE-unix/2396,unix/UbuntuMendoza:/tmp/.ICE-unix/2396 QT_ACCESSIBILITY=1 COLORTERM=truecolor XDG_CONFIG_DIRS=/etc/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/vboxuser LOGNAME=vboxuser XDG_SESSION_DESKTOP=ubuntu XDG_SESSION_TYPE=wayland SYSTEMD_EXEC_PID=2437 XAUTHORITY=/run/user/1000/.mutter-Xwaylandauth.YLHRE3 HOME=/home/vboxuser USERNAME=vboxuser IM_CONFIG_PHASE=1 LANG=en_US.UTF-8 LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01 38;43:ca=00:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj *:lz4=01;31:*.lzha=01;31:*.lzma=01;31:*.lz=01;31:*.txz=01;31:*.tzo=01;31:*.t7z=01;31:*.zi gz=01;31:*.rz=01;31:*.lz=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01; 2=01;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;3 =01:31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.cah=01;31:*.wim=01;31:*.swm=01;31</pre>	Runs the program in a modified environment and displays its current environments. Basically, this displays all the list of environmental variables
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## 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.

```
vboxuser@UbuntuMendoza:~$ alias lll='ls -lh /usr/local/bin'  
vboxuser@UbuntuMendoza:~$ ls -alh --color=auto  
total 76K  
drwxr-x--- 15 vboxuser vboxuser 4.0K Oct 23 00:19 .  
drwxr-xr-x  3 root    root   4.0K Oct 23 00:05 ..  
-rw-----  1 vboxuser vboxuser  772 Oct 23 01:15 .bash_history  
-rw-r--r--  1 vboxuser vboxuser 220 Mar 31 2024 .bash_logout  
-rw-r--r--  1 vboxuser vboxuser 3.7K Mar 31 2024 .bashrc  
drwx----- 10 vboxuser vboxuser 4.0K Oct 23 00:14 .cache  
drwx----- 11 vboxuser vboxuser 4.0K Oct 23 00:42 .config  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Desktop  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Documents  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Downloads  
drwx-----  4 vboxuser vboxuser 4.0K Oct 23 00:05 .local  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Music  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Pictures  
-rw-r--r--  1 vboxuser vboxuser 807 Mar 31 2024 .profile  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Public  
drwx-----  3 vboxuser vboxuser 4.0K Oct 23 00:05 snap  
drwx-----  2 vboxuser vboxuser 4.0K Oct 23 00:05 .ssh  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Templates  
drwxr-xr-x  2 vboxuser vboxuser 4.0K Oct 23 00:05 Videos  
vboxuser@UbuntuMendoza:~$ echo "alias ;;='alh --color=auto'">> ~/.bashrc  
vboxuser@UbuntuMendoza:~$ source ~/.bashrc  
bash: /home/vboxuser/.bashrc: line 118: syntax error near unexpected token `;  
bash: /home/vboxuser/.bashrc: line 118: `alias ;;='alh --color=auto'  
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.
```

```
vboxuser@UbuntuMendoza:~$ cd ~/Documents  
vboxuser@UbuntuMendoza:~/Documents$ mkdir CPE11S1_Mendoza  
vboxuser@UbuntuMendoza:~/Documents$ cd CPE11S1_Mendoza  
vboxuser@UbuntuMendoza:~/Documents/CPE11S1_Mendoza$ touch sample1_Mendoza  
vboxuser@UbuntuMendoza:~/Documents/CPE11S1_Mendoza$ ls ~/Documents/CPE11S1_Mendoza  
sample1_Mendoza
```

3. Execute a command to display the working shell.

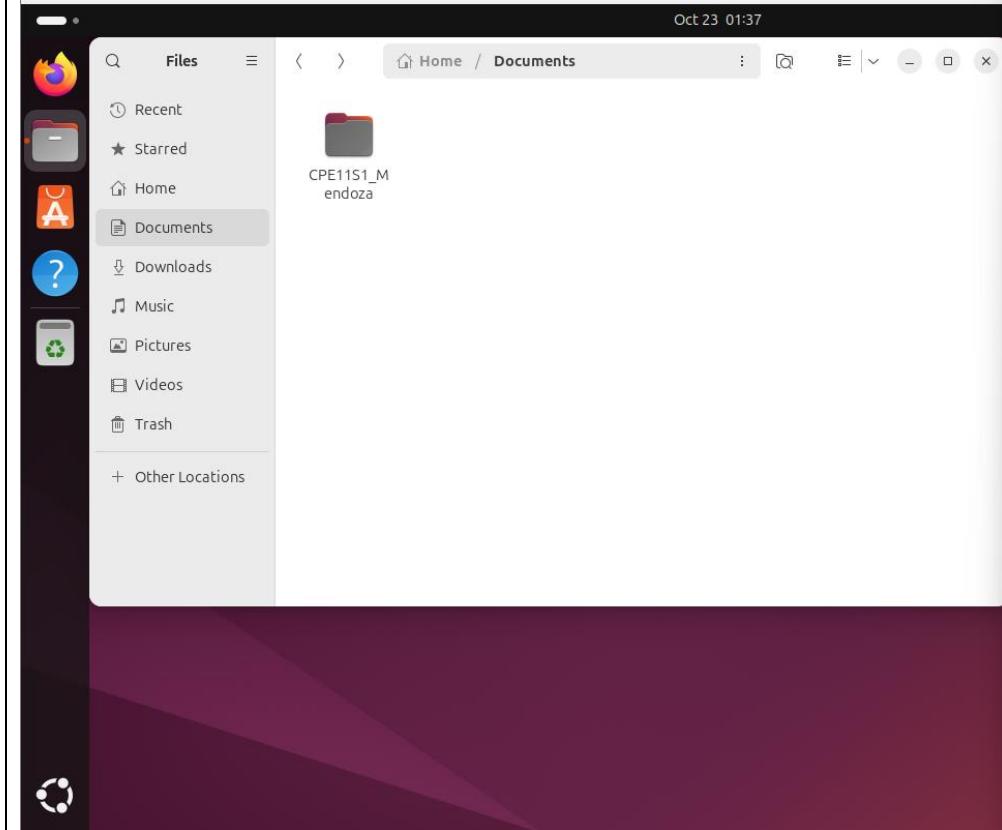
```
vboxuser@UbuntuMendoza:~/Documents/CPE11S1_Mendoza$ echo $SHELL  
/bin/bash
```

print

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?

```
vboxuser@UbuntuMendoza:~$ env | grep ^P  
PWD=/home/vboxuser  
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/u  
r/local/games:/snap/bin:/snap/bin
```

### Documentation / Proof :



```
vboxuser@UbuntuMendoza:~/Documents$ mkdir CPE11S1_Mendoza
mkdir: cannot create directory 'CPE11S1_Mendoza': File exists
```

## 7. Conclusion:

After performing the activity, I found out that there are some similarities between the commands on Linux and Windows as there are related commands that works the same as the other one. My main conclusion is that Linux commands are easier based off my performance but there are commands/functions that is sometimes hard to understand or wouldn't understand its function even after typing its action. But I found it flexible as it can do simpler management and navigation so that it can be efficient for experiences users and its command line is very helpful as it consists of different text colors that makes it efficient and easier for the users on using its command line if it were to be comparing on the windows command prompt. Therefore, I can say that it is more user friendly than windows command line as I see it because it sort of looks like for experiences and mastered users only. Although it consists of "similar" commands but some are harder to navigate/understand through. To conclude, the reason why windows is hard is that its for general use while Linux is mainly for system administration and automation. Finally, I was able to apply appropriate techniques and requires skills with the use of communication and research purposes to perform a specific task which is necessary as a Computer Engineer.

## 8. Assessment (Rubric for Laboratory Performance):