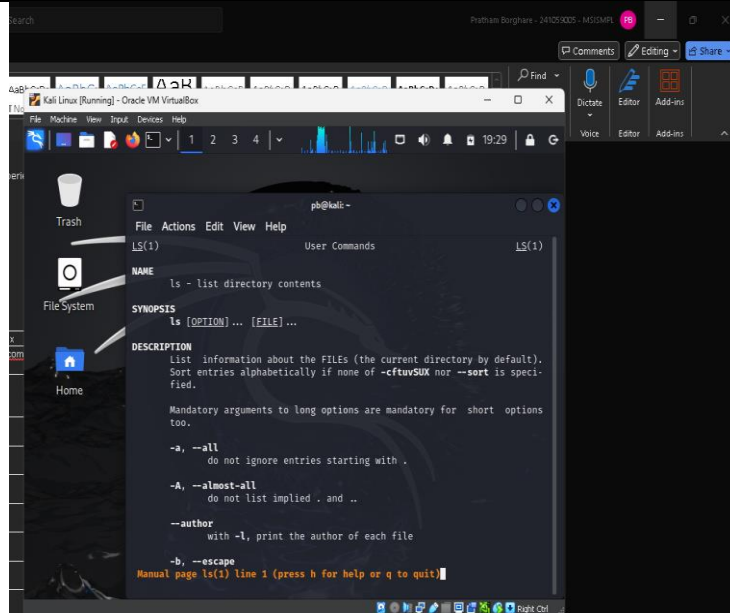


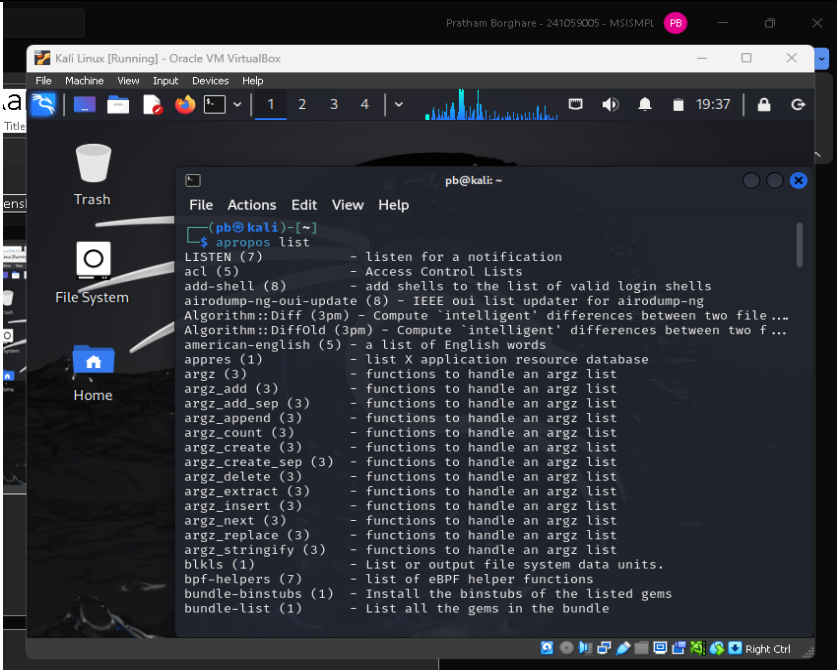
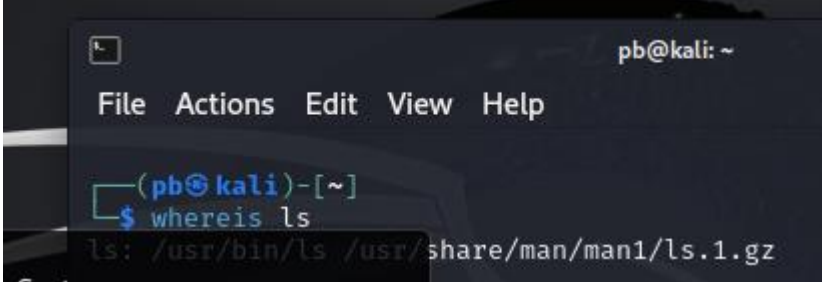
Topic Name:

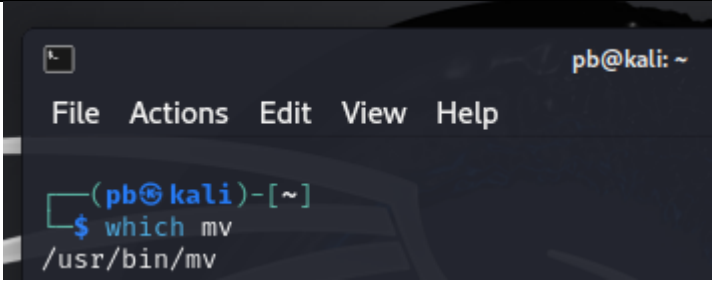
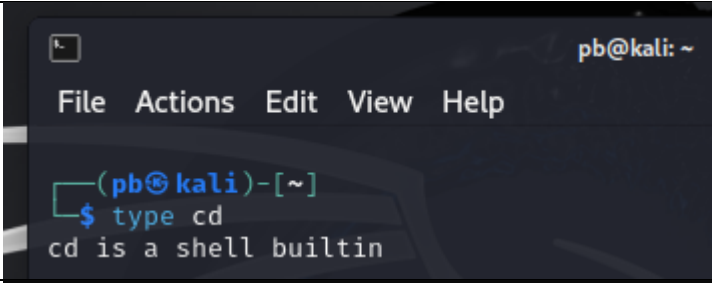
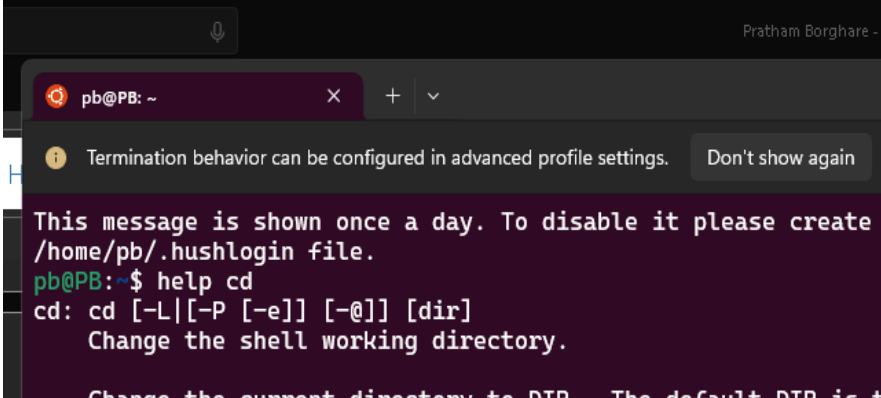
The main aim of this lab session is to provide hands-on experience on

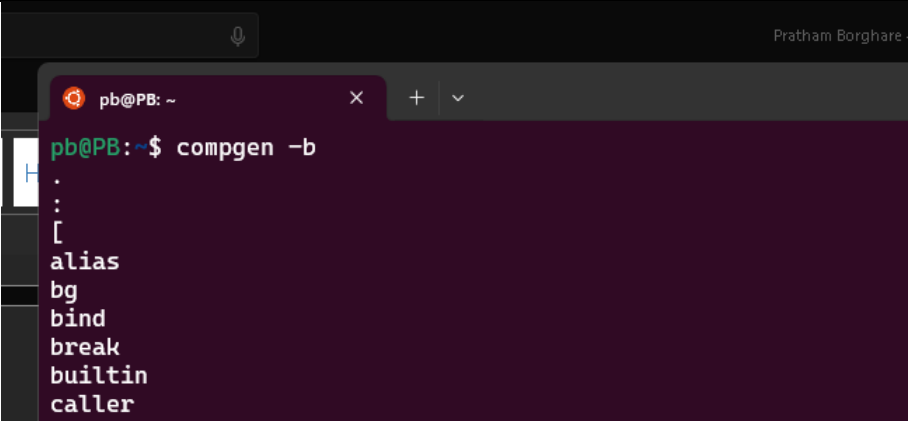
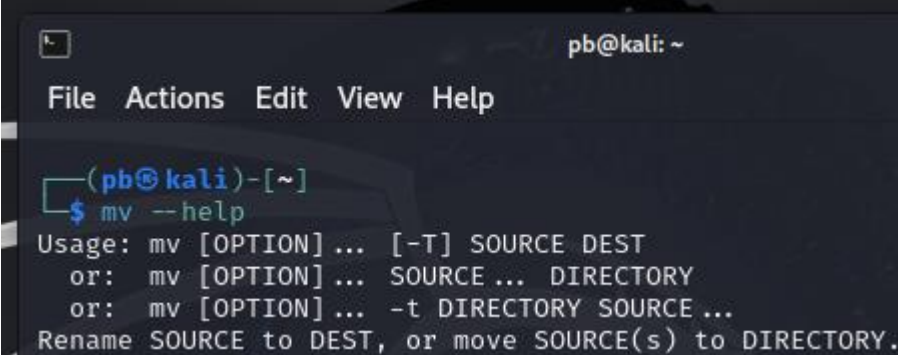
- Getting Help
- Basic Commands
- Navigation
- File System
- simple shell script

1. Getting Help

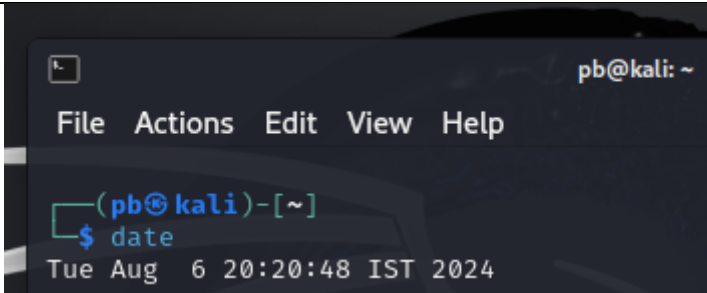
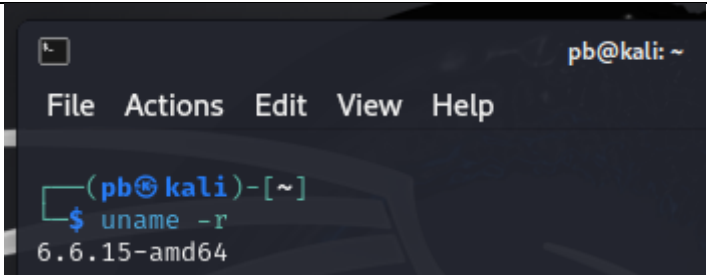
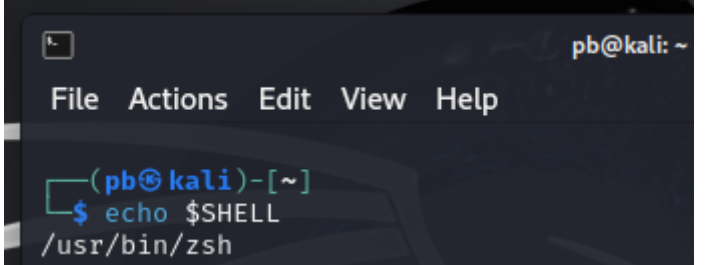
Task	Command Name	Syntax	Example	Screenshots
To get manual page for the known command	man	man command_name	man ls	 A screenshot of a terminal window running the 'man ls' command. The terminal shows the manual page for 'ls', including its synopsis, description, and various options like -a, -A, -author, and -b. The terminal is titled 'ph@kali:~' and the command prompt is 'ls(1)'. The background of the terminal has a dark theme with a subtle pattern.

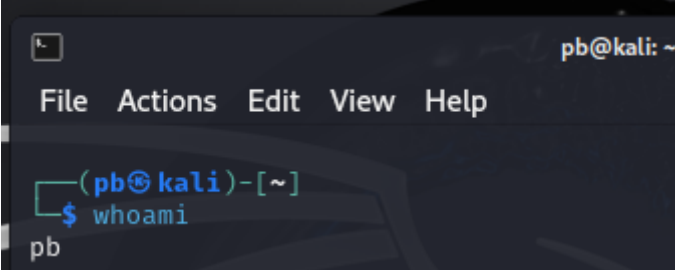
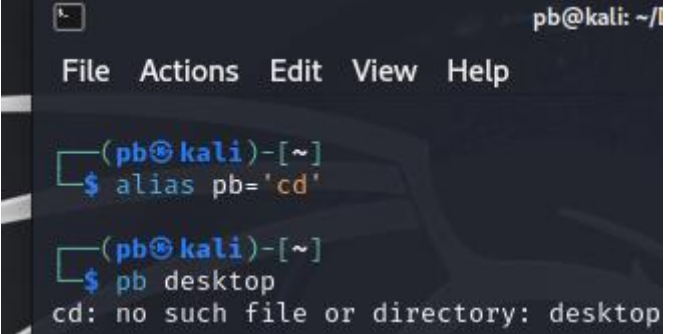
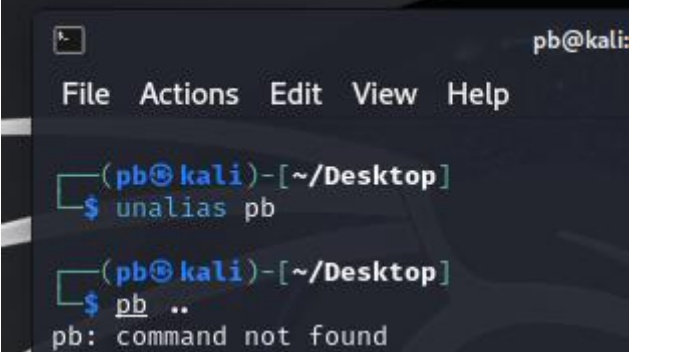
To get manual page for the unknown command	apropos	apropos keyword	apropos list	
To know the source file binary	whereis	whereis command_name	whereis ls	

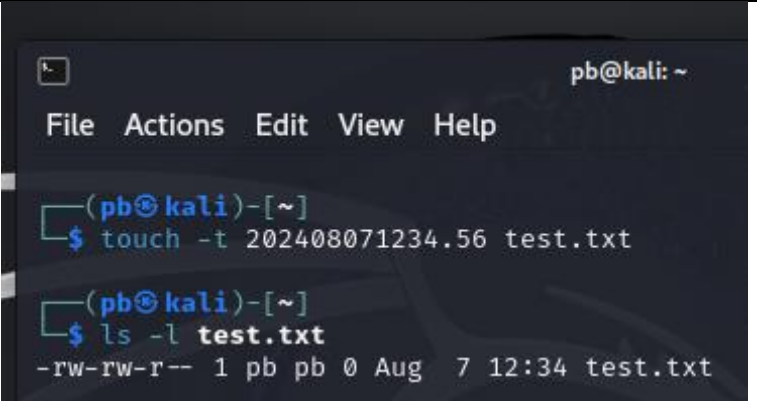
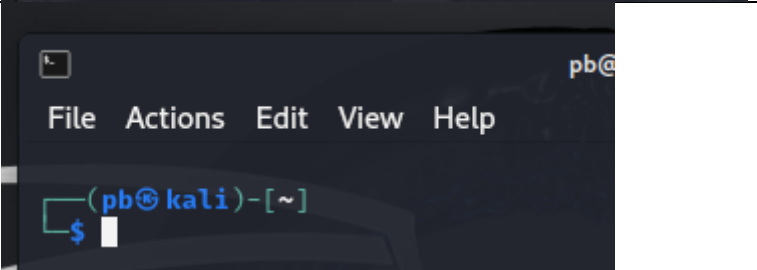
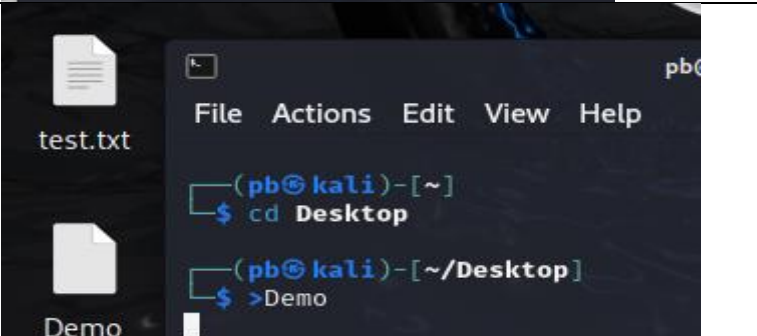
To know the path of the command	which	which <code>command_name</code>	which mv	 <pre> pb@kali: ~ File Actions Edit View Help (pb@kali)-[~] \$ which mv /usr/bin/mv </pre>
To know the command is external or internal	type	type <code>command_name</code>	type cd	 <pre> pb@kali: ~ File Actions Edit View Help (pb@kali)-[~] \$ type cd cd is a shell builtin </pre>
To get help for the internal command	help	help <code>command_name</code>	help cd	 <pre> pb@PB: ~ Termination behavior can be configured in advanced profile settings. Don't show again This message is shown once a day. To disable it please create /home/pb/.hushlogin file. pb@PB:~\$ help cd cd: cd [-L [-P [-e]] [-@]] [dir] Change the shell working directory. Change the current directory to DIR. The default DIR is the </pre>

To list out bash commands	compgen	compgen -b	compgen -b	 <pre> pb@PB: ~ pb@PB:~\$ compgen -b . : [alias bg bind break builtin caller </pre>
To know the usage of the command	--help	command_name --help	mv --help	 <pre> pb@kali: ~ File Actions Edit View Help (pb@kali)-[~] \$ mv --help Usage: mv [OPTION]... [-T] SOURCE DEST or: mv [OPTION]... SOURCE... DIRECTORY or: mv [OPTION]... -t DIRECTORY SOURCE... Rename SOURCE to DEST, or move SOURCE(s) to DIRECTORY. </pre>

2. Basic Commands

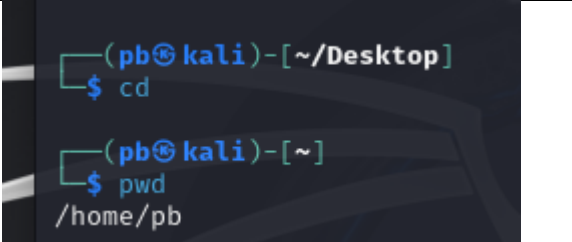
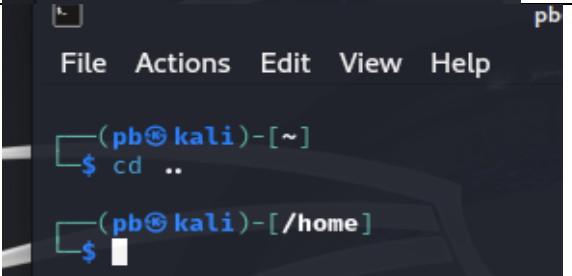
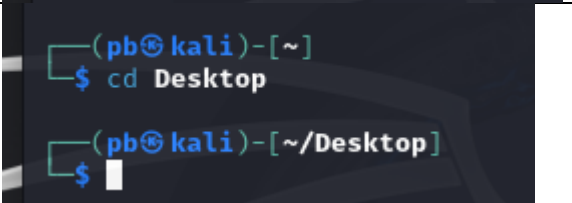
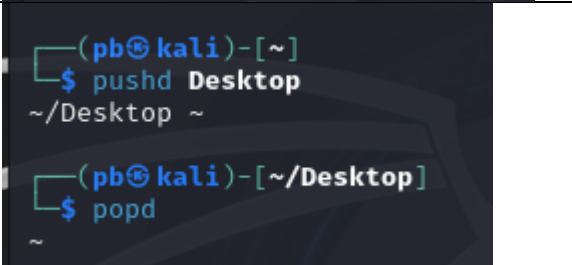
Task	Command Name	Syntax	Example	Screenshots
To know today's date	date	date	date	 A terminal window titled 'pb@kali: ~' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(pb@kali)-[~]' and the command '\$ date' has been entered. The output is 'Tue Aug 6 20:20:48 IST 2024'.
To print calendar	cal	cal	cal	
To print kernel version	uname	uname -r	uname -r	 A terminal window titled 'pb@kali: ~' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(pb@kali)-[~]' and the command '\$ uname -r' has been entered. The output is '6.6.15-amd64'.
To print default shell	echo	echo \$SHELL	echo \$SHELL	 A terminal window titled 'pb@kali: ~' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(pb@kali)-[~]' and the command '\$ echo \$SHELL' has been entered. The output is '/usr/bin/zsh'.

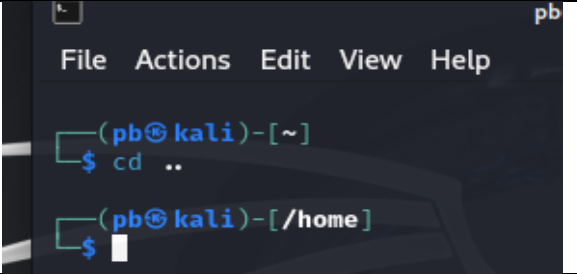
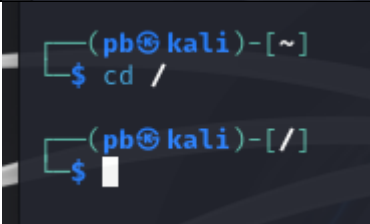
To print currently logged in user	whoami	whoami	whoami	 <pre> pb@kali: ~ File Actions Edit View Help (pb@kali)-[~] \$ whoami pb </pre>
To create shortcut for command	alias	alias shortcut='command'	alias pb='cd'	 <pre> pb@kali: ~/ File Actions Edit View Help (pb@kali)-[~] \$ alias pb='cd' (pb@kali)-[~] \$ pb desktop cd: no such file or directory: desktop </pre>
To delete shortcut	unalias	unalias shortcut_name	unalias pb	 <pre> pb@kali: File Actions Edit View Help (pb@kali)-[~/Desktop] \$ unalias pb (pb@kali)-[~/Desktop] \$ pb .. pb: command not found </pre>

To change the timestamp of the file	touch	touch -t YYYYMMDDHHMM.SS filename	touch -t 202408071234.56 filename	 <pre> pb@kali: ~ File Actions Edit View Help (pb@kali)-[~] \$ touch -t 202408071234.56 test.txt (pb@kali)-[~] \$ ls -l test.txt -rw-rw-r-- 1 pb pb 0 Aug 7 12:34 test.txt </pre>
To clear the screen	clear	clear	clear	 <pre> pb@ File Actions Edit View Help (pb@kali)-[~] \$ </pre>
To create empty files	redirection '>'	> filename	>demo	 <pre> pb@ File Actions Edit View Help (pb@kali)-[~] \$ cd Desktop (pb@kali)-[~/Desktop] \$ >Demo </pre>

To know disk usage	du	du	du	 <pre>(pb@kali)-[~] \$ du 4 ./Templates 4 ./Downloads 8 ~/.java/.userPrefs/burp 12 ~/.java/.userPrefs 16 ~/.java</pre>
To know free space in the system	df	df-h	df-h	 <pre>(pb@kali)-[~] \$ df -h Filesystem Size Used Avail Use% Mounted on udev 948M 0 948M 0% /dev tmpfs 198M 1004K 197M 1% /tmp /dev/sda1 24G 14G 9.3G 59% / tmpfs 989M 0 989M 0% /tmp tmpfs 5.0M 0 5.0M 0% /tmp tmpfs 198M 128K 198M 1% /tmp</pre>
To know about the Linux release	lsb_release	lsb_release -a	lsb_release -a	 <pre>pb@PB: ~ pb@PB:~\$ lsb_release -a No LSB modules are available. Distributor ID: Ubuntu Description: Ubuntu 22.04.3 LTS Release: 22.04 Codename: jammy</pre>

3. Navigation

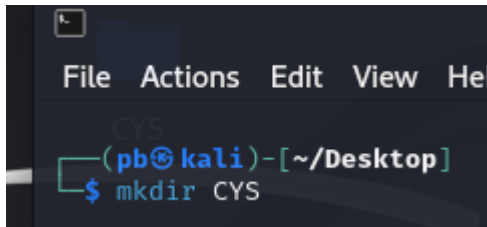
Task	Syntax	Command	Screenshots
To navigate home directory	cd	cd	 <pre> (pb@kali)-[~/Desktop] \$ cd (pb@kali)-[~] \$ pwd /home/pb </pre>
To navigate to the parent directory	cd ..	cd ..	 <pre> (pb@kali)-[~] \$ cd .. (pb@kali)-[/home] \$ </pre>
To navigate to the child directory	cd child_directory_name	cd Desktop	 <pre> (pb@kali)-[~] \$ cd Desktop (pb@kali)-[~/Desktop] \$ </pre>
Alternate command to cd	pushd file_name & popd		 <pre> (pb@kali)-[~] \$ pushd Desktop ~/Desktop ~ (pb@kali)-[~/Desktop] \$ popd ~ </pre>

To go back to the previous directory	cd ..	cd ..	 <p>A terminal window titled 'pb' with a menu bar (File, Actions, Edit, View, Help). It shows two prompts: the first is '(pb@kali)-[~]' followed by '\$ cd ..', and the second is '(pb@kali)-[/home]' followed by '\$' and a cursor.</p>
To go to the root directory	cd /	cd /	 <p>A terminal window titled 'pb' with a menu bar (File, Actions, Edit, View, Help). It shows two prompts: the first is '(pb@kali)-[~]' followed by '\$ cd /', and the second is '(pb@kali)-[/]' followed by '\$' and a cursor.</p>

4. File System

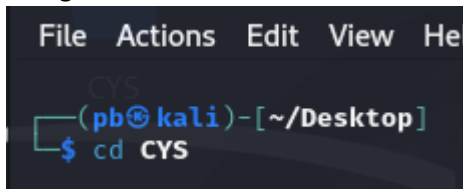
Task	Syntax	Command
How to identify the file system	mount	mount

- a. Create Folder "CYS"



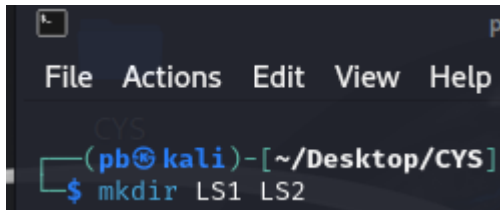
```
File Actions Edit View Help
CYS
(pb@kali)-[~/Desktop]
$ mkdir CYS
```

- b. Navigate to CYS



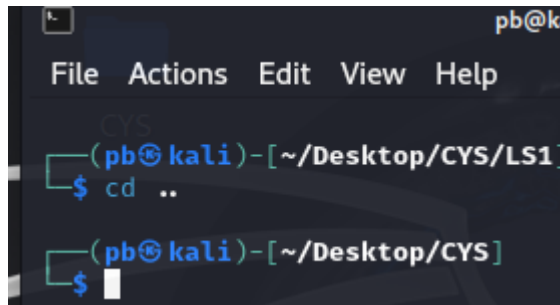
```
File Actions Edit View Help
CYS
(pb@kali)-[~/Desktop]
$ cd CYS
```

- c. Create folder LS1 and LS2 under CYS



```
File Actions Edit View Help
CYS
(pb@kali)-[~/Desktop/CYS]
$ mkdir LS1 LS2
```

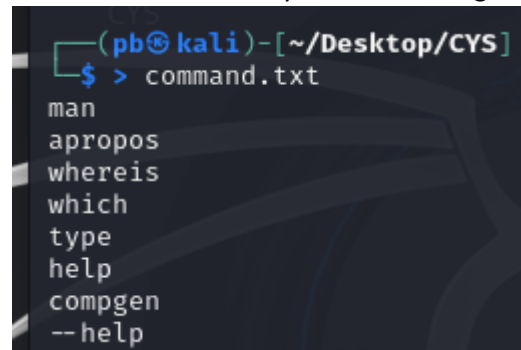
- d. Go back to CYS



```
pb@kali
File Actions Edit View Help
CYS
(pb@kali)-[~/Desktop/CYS/LS1]
$ cd ..
(pb@kali)-[~/Desktop/CYS]
$
```

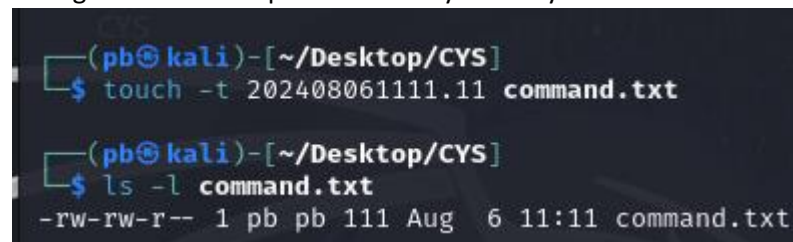
- e. Working with Files

- i. Add commands which you learnt during lab session in the file `commands.txt`



```
(pb@kali)-[~/Desktop/CYS]
$ cat command.txt
man
apropos
whereis
which
type
help
compgen
--help
```

- ii. Change the timestamp of the file to yesterday



```
(pb@kali)-[~/Desktop/CYS]
$ touch -t 202408061111.11 command.txt

(pb@kali)-[~/Desktop/CYS]
$ ls -l command.txt
-rw-rw-r-- 1 pb pb 111 Aug  6 11:11 command.txt
```

- iii. Copy the contents from the file `commands.txt` to `commands_demo.txt`

```
pb@kali: ~/Desktop/
File Actions Edit View Help
(pb@kali)-[~/Desktop/CYS]
$ cat command.txt > command_demo.txt
```

- iv. Rename the file `commands_demo.txt` to `duplicate`

```
(pb@kali)-[~/Desktop/CYS]
$ mv command_demo.txt duplicate
```

- v. Rename all `.html` to `.hldd`

```
(pb@kali)-[~/Desktop/CYS]
$ for file in *.html; do
for> mv "$file" "${file%.html}.hldd"
for> done

(pb@kali)-[~/Desktop/CYS]
$ ls
1.hldd 2.hldd 3.hldd LS1 LS2 cat
```

- vi. Delete the file `duplicate`

```
(pb@kali)-[~/Desktop/CYS]
$ rm duplicate
```

- vii. Copy the contents `commands.txt` to `unit4` and `unit5` (using relative path)

```
(pb@kali)-[~/Desktop/CYS]
$ cp command.txt unit4

(pb@kali)-[~/Desktop/CYS]
$ cp command.txt unit5
```

- viii. Delete the contents from unit5 (using absolute path)

```
pb@kali:~$ rm -r Desktop/CYS/unit5
```

- ix. Navigate to root

```
pb@kali:~$ cd /
pb@kali:/$
```

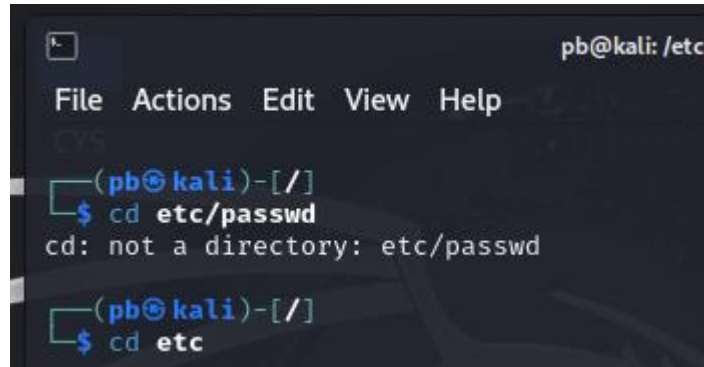
- x. List all the files under root

```
pb@kali:/$ ls -a
.      boot  initrd.img  lib64  opt  sbin  usr
..     dev   initrd.img.old  lost+found  proc  srv  var
.cache etc    lib         media  root  sys  vmlinuz
bin    home  lib32       mnt    run   tmp  vmlinuz.old
```

- xi. Explore all the folders (Do not delete any folder)

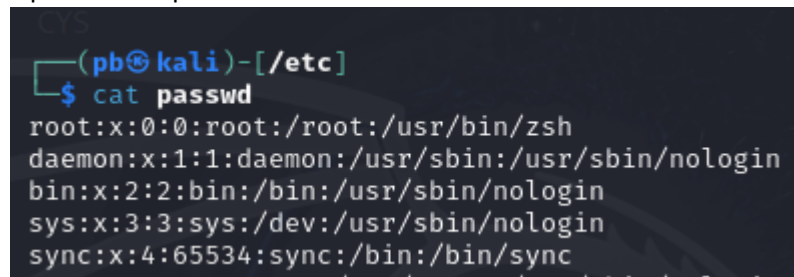
```
pb@kali: /
File Actions Edit View Help
├── crontabs [error opening dir]
├── mail → ../mail
├── rwho
├── tmp
├── systemd-private-0cda1ebd2d0641a1b2f
vice-9LOP9R [error opening dir]
├── systemd-private-0cda1ebd2d0641a1b2f
Y9Zee [error opening dir]
├── systemd-private-0cda1ebd2d0641a1b2f
CV9Sb5 [error opening dir]
├── systemd-private-0cda1ebd2d0641a1b2f
YJ3Mg [error opening dir]
├── systemd-private-0cda1ebd2d0641a1b2f
ervice-g1NXcf [error opening dir]
├── systemd-private-0cda1ebd2d0641a1b2f
dlwfn [error opening dir]
├── www
├── html
│   ├── index.html
│   └── index.nginx-debian.html
├── vmlinuz → boot/vmlinuz-6.6.15-amd64
├── vmlinuz.old → boot/vmlinuz-6.6.15-amd64
48159 directories, 503155 files
```

- xii. Navigate to /etc/passwd

A terminal window titled 'pb@kali: /etc' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(pb@kali)-[/]'. The user enters 'cd etc/passwd' and receives the error 'cd: not a directory: etc/passwd'. The user then enters 'cd etc' and the prompt changes to '(pb@kali)-[/etc]'.

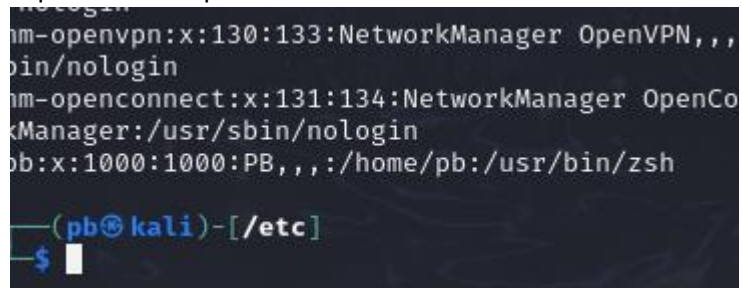
```
pb@kali: /etc
File Actions Edit View Help
(pb@kali)-[/]
$ cd etc/passwd
cd: not a directory: etc/passwd
(pb@kali)-[/]
$ cd etc
```

- xiii. Open the file passwd

A terminal window with the prompt '(pb@kali)-[/etc]'. The user enters 'cat passwd' and the output shows the first five lines of the /etc/passwd file.

```
(pb@kali)-[/etc]
$ cat passwd
root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
```

- xiv. Explore the file passwd

A terminal window with the prompt '(pb@kali)-[/etc]'. The user enters a command to view more of the /etc/passwd file, showing entries for network managers and the user 'pb'.

```
(pb@kali)-[/etc]
$ cat passwd
nm-openvpn:x:130:133:NetworkManager OpenVPN,,,:/usr/sbin/nologin
nm-openconnect:x:131:134:NetworkManager OpenConnectManager:/usr/sbin/nologin
pb:x:1000:1000:PB,,,:/home/pb:/usr/bin/zsh
(pb@kali)-[/etc]
$
```


- xv. Navigate to /etc/group and explore

A terminal window with a dark background. The prompt is (pb@kali)-[/home]. The user enters the command cd /etc/group. The terminal output is cd: not a directory: /etc/group. The prompt returns to (pb@kali)-[/home].

```
(pb@kali)-[/home]
$ cd /etc/group
cd: not a directory: /etc/group
(pb@kali)-[/home]
$
```

f. Difference between

- i. GUI vs. CLI

GUI (Graphical User Interface):

- **Definition:** A visual interface where users interact with the system through graphical elements like windows, icons, and buttons.
- **User Interaction:** Click, drag, drop, and point.
- **Ease of Use:** More user-friendly, especially for beginners.
- **Efficiency:** Generally slower for performing repetitive tasks but easier for complex operations.
- **Flexibility:** Limited to the options presented by the graphical elements.
- **Examples:** Windows, macOS, GNOME, KDE.

CLI (Command-Line Interface):

- **Definition:** A text-based interface where users interact with the system by typing commands into a terminal.
- **User Interaction:** Typing commands and scripts.
- **Ease of Use:** Steeper learning curve but more powerful once mastered.
- **Efficiency:** Faster for repetitive tasks and automation through scripting.
- **Flexibility:** Highly flexible, allowing for complex and custom commands.
- **Examples:** Bash, PowerShell, Zsh.

ii. man vs info

man (Manual Pages):

- **Purpose:** Provides detailed documentation on commands, system calls, configuration files, and other aspects of the system.
- **Structure:** Usually organized into sections like Name, Synopsis, Description, Options, Examples, and See Also.
- **Interface:** Simple and straightforward, accessed via the man command followed by the topic (e.g., man ls).
- **Usage:** Best for quick reference to learn about command syntax and options.
- **Navigation:** Uses less as the pager, navigated with basic keyboard commands (e.g., space to scroll, q to quit).

info:

- **Purpose:** Provides more detailed and structured documentation, often including tutorials, examples, and hypertext links.
- **Structure:** Organized into nodes with hyperlinks, allowing for navigation between different parts of the documentation.
- **Interface:** Accessed via the info command followed by the topic (e.g., info ls).
- **Usage:** Better for in-depth learning and exploring related topics.
- **Navigation:** More complex, with options to follow links, go back, and move between sections.

iii. which vs. whereis

which:

- **Purpose:** Locates the path of an executable that would be run if the command were entered in the terminal.
- **Output:** Returns the path of the command found in the directories listed in the \$PATH environment variable.
- **Usage:** Useful to determine which version of a command is being used (e.g., which python).

whereis:

- **Purpose:** Locates the binary, source, and manual page files for a command.
- **Output:** Provides paths to the binary, source code, and man pages of the command.
- **Usage:** More comprehensive than which, useful for finding not just the executable but also related files (e.g., whereis ls).

iv. Terminal vs shell

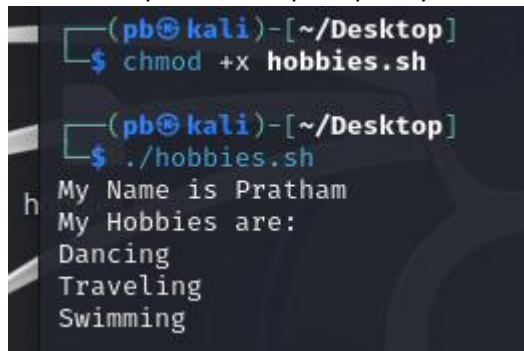
Terminal:

- **Definition:** A software application that provides a text-based interface for interacting with the shell.
- **Role:** Acts as an interface to access the shell, displaying text input and output.
- **Usage:** Can run multiple shells or other command-line programs.
- **Examples:** GNOME Terminal, xterm, PuTTY.

Shell:

- **Definition:** A command interpreter that executes commands typed by the user or read from a script.
- **Role:** The shell processes commands, executes programs, and handles command-line operations.
- **Usage:** Provides the command-line interface and scripting environment.
- **Examples:** Bash, Zsh, Fish, PowerShell.

g. Write a simple shell script to print your name and your hobbies!

A screenshot of a terminal window with a dark background. The prompt is '(pb@kali)-[~/Desktop]'. The first command entered is '\$ chmod +x hobbies.sh'. The second command is '\$./hobbies.sh'. The output of the script is: 'My Name is Pratham', 'My Hobbies are:', 'Dancing', 'Traveling', and 'Swimming' on separate lines.

```
(pb@kali)-[~/Desktop]
$ chmod +x hobbies.sh

(pb@kali)-[~/Desktop]
$ ./hobbies.sh
My Name is Pratham
My Hobbies are:
Dancing
Traveling
Swimming
```

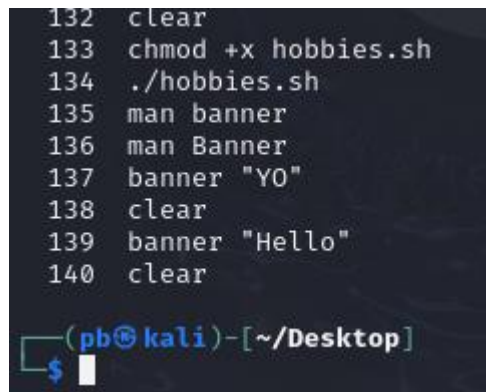
Interesting commands to Explore

Banner

A terminal window with a dark background. The prompt is `(pb@kali)-[~/Desktop]`. The command `$ banner "Hello"` has been entered. The output is a banner for the word "Hello" created using the `banner` command. The banner consists of several lines of text where each character of "Hello" is represented by a column of hash symbols (`#`).

```
(pb@kali)-[~/Desktop]
$ banner "Hello"
#      #
#      # ##### #      #      #####
#      # #      #      #      #      #
##### ##### #      #      #      #
#      # #      #      #      #      #
#      # #      #      #      #      #
#      # ##### ##### ##### #####
```

History

A terminal window showing a list of commands from a history file. The commands are numbered from 132 to 140. At the bottom, the terminal prompt `(pb@kali)-[~/Desktop]` is visible with a cursor.

```
132 clear
133 chmod +x hobbies.sh
134 ./hobbies.sh
135 man banner
136 man Banner
137 banner "Y0"
138 clear
139 banner "Hello"
140 clear

(pb@kali)-[~/Desktop]
$
```

Note: Include your screenshots

Evaluation :

Marks : 10 (Deadline : 4 – Originality :3 – Completeness :3)

Deadline: 06.08.2024

“All our dreams can come true if we have the courage to pursue them.”

- Walt Disney