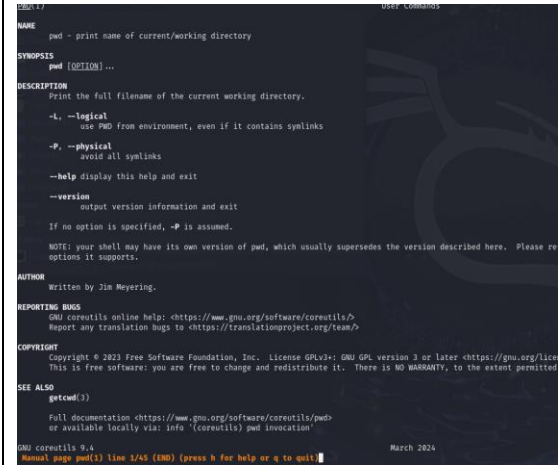


Topic Name:

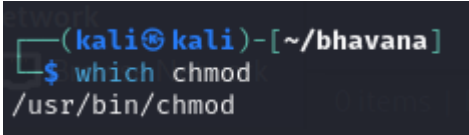
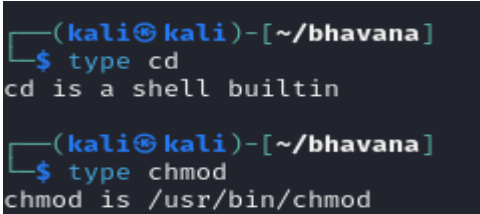
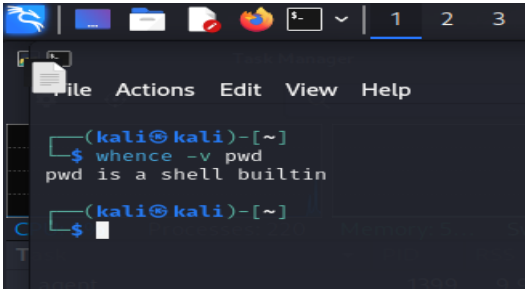
The main aim of this lab session is to provide hands-on experience on

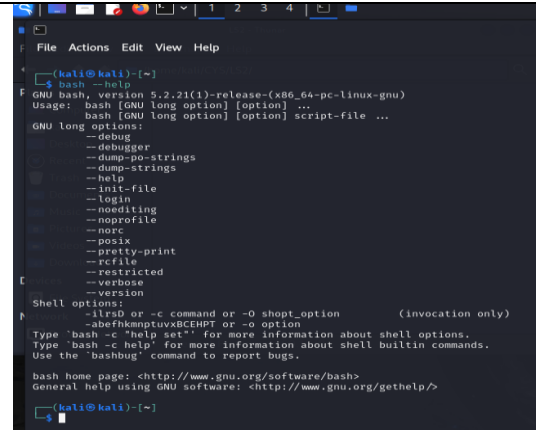
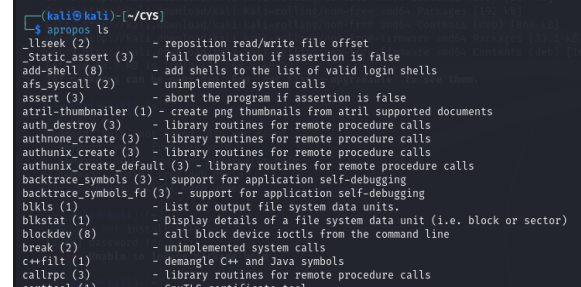
- Getting Help
- Basic Commands
- Navigation
- File System
- simple shell script

1. Getting Help

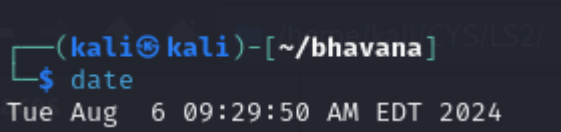
Task	Command Name	Syntax	Example	Screenshots
To get manual page for the known command	man	man <command>	man pwd	

To get manual page for the unknown command	man	man <command>	man gle	 <pre> (kali@kali)-[~/bhavana] \$ man gle No manual entry for gle </pre>
To know the source file binary	whatis whereis	whatis whereis	whatis whereis	 <pre> (kali@kali)-[~] \$ whatis whereis whereis (1) - locate the binary, source, and manual page files for a command </pre>

To know the path of the command	which	which <command>	which chmod	 <pre> (kali@kali)-[~/bhavana] \$ which chmod /usr/bin/chmod </pre>
To know the command is external or internal	type	type <command>	type cd type chmod	 <pre> (kali@kali)-[~/bhavana] \$ type cd cd is a shell builtin (kali@kali)-[~/bhavana] \$ type chmod chmod is /usr/bin/chmod </pre>
To get help for the internal command	whence	whence <command>	whence -v pwd	 <pre> (kali@kali)-[~] \$ whence -v pwd pwd is a shell builtin (kali@kali)-[~] \$ </pre>

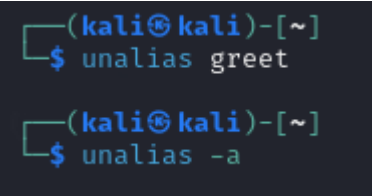
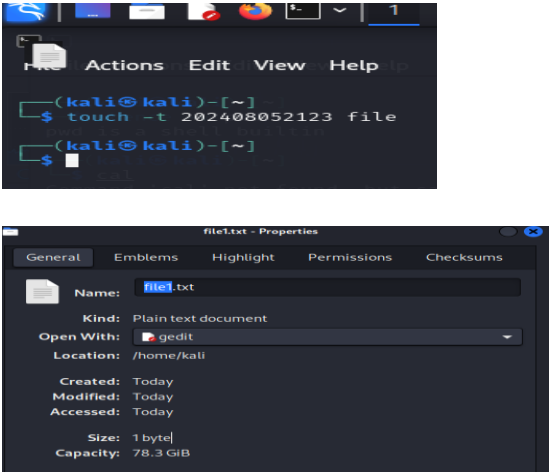
To list out bash commands	help	bash --help	bash --help	 <pre> (kali@kali)-[~] └─\$ bash --help GNU bash, version 5.2.21(1)-release (x86_64-pc-linux-gnu) Usage: bash [GNU long option] [option] ... bash [GNU long option] [option] script-file ... GNU long options: --debug --debugger --dump-po-strings --dump-strings --help --init-file --login --nondot --noprofile --norc --posix --pretty-print --rcfile --restricted --verbose --version Shell options: -lirsD or -c command or -O shopt_option (invocation only) -abefhkmnptuvxBCEHPT or -o option Type 'bash -c "help set"' for more information about shell options. Type 'bash -c help' for more information about shell builtin commands. Use the 'bashbug' command to report bugs. bash home page: <http://www.gnu.org/software/bash> General help using GNU software: <http://www.gnu.org/gethelp/> (kali@kali)-[~] └─\$ </pre>
To know the usage of the command	apropos	apropos <command>	apropos ls	 <pre> (kali@kali)-[~/cvs] └─\$ apropos ls _llseek (2) - reposition read/write file offset _Static_assert (3) - fail compilation if assertion is false add-shell (8) - add shells to the list of valid login shells afs_syscall (2) - unimplemented system calls assert (3) - abort the program if assertion is false atril-thumbnailer (1) - create png thumbnails from atril supported documents auth_destroy (3) - library routines for remote procedure calls authnone_create (3) - library routines for remote procedure calls authunix_create (3) - library routines for remote procedure calls authunix_create_default (3) - library routines for remote procedure calls backtrace_symbols (3) - support for application self-debugging backtrace_symbols_fd (3) - support for application self-debugging blkid (2) - list or output file system data units. blkstat (1) - Display details of a file system data unit (i.e. block or sector) blockdev (8) - call block device ioctls from the command line break (2) - unimplemented system calls c++filt (1) - demangle C++ and Java symbols callrpc (3) - library routines for remote procedure calls cat (1) - concatenate and display text files </pre>

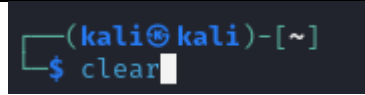
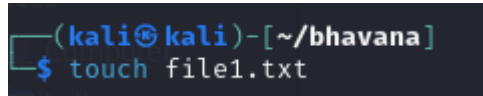
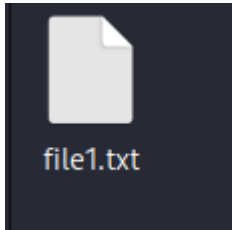
2. Basic Commands

Task	Command Name	Syntax	Example	Screenshots
To know today's date	date	date	date	 A terminal window with a dark background. The prompt is '(kali㉿kali)-[~/bhavana]'. The user enters '\$ date' and the output is 'Tue Aug 6 09:29:50 AM EDT 2024'.

To print calendar	cal	ncal	ncal 2024	<pre>(kali㉿kali)-[~/bhavana] \$ cal August 2024 Su Mo Tu We Th Fr Sa 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</pre>
To print kernel version	uname -r or cat /proc/version	uname -r or cat /proc/version	uname -r	<pre>(kali㉿kali)-[~/bhavana] \$ uname -r 6.6.15-amd64</pre>
To print default shell	echo \$SHELL	echo \$SHELL	echo \$SHELL	<pre>(kali㉿kali)-[~/bhavana] \$ echo \$SHELL /usr/bin/zsh</pre>

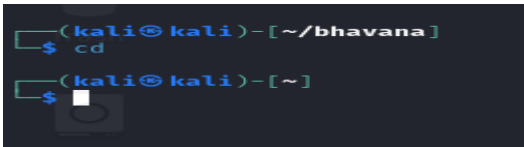
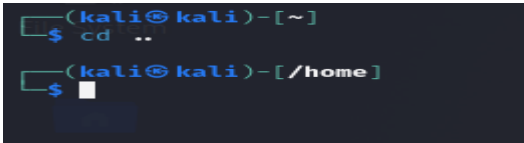
To print currently logged in user	whoami	whoami	whoami	 <pre> (kali@kali)-[~/bhavana] \$ whoami kali@kali:~\$ </pre>
To create shortcut for command	alias	alias shortcut_name=command	alias greet = 'echo Hello, anusha s patil'	 <pre> (kali@kali)-[~] \$ alias greet='echo hi,ge!' (kali@kali)-[~] \$ greet hi,ge! </pre>

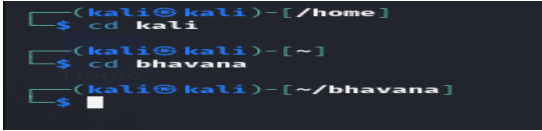
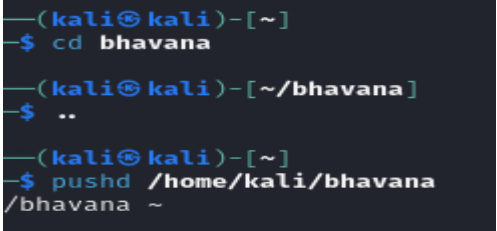
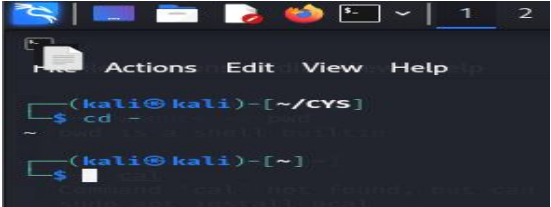
To delete shortcut	unalias	unalias shortcut_name	unalias greet unalias -a	 <pre> (kali@kali)-[~] \$ unalias greet (kali@kali)-[~] \$ unalias -a </pre>
To change the timestamp of the file	touch	touch -t <yearmonthdaytime>	touch -t 202308052223 d1	 <p>The image shows two screenshots. The top one is a terminal window with the command <code>touch -t 202408052123 file</code> being executed. The bottom one is a 'file1.txt - Properties' dialog box showing the file's details: Name: file1.txt, Kind: Plain text document, Open With: gedit, Location: /home/kali, Created: Today, Modified: Today, Accessed: Today, Size: 1 byte, and Capacity: 78.3 GiB.</p>

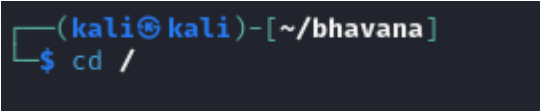
To clear the screen	clear	clear	clear	
To create empty files	touch	touch.filename	touch file1.txt	 

To know disk usage	df	df	df	<pre>(kali㉿kali)-[~/bhavana] \$ df Filesystem 1K-blocks Used Available Use% Mounted on udev 965308 0 965308 0% /dev tmpfs 201516 1296 200220 1% /run /dev/sda1 82083148 14882496 62985104 20% / tmpfs 1007572 0 1007572 0% /dev/shm tmpfs 5120 0 5120 0% /run/lock tmpfs 201512 128 201384 1% /run/user/1000</pre>
To know free space in the system	df	df	df	<pre>(kali㉿kali)-[~/bhavana] \$ df Filesystem 1K-blocks Used Available Use% Mounted on udev 965308 0 965308 0% /dev tmpfs 201516 1296 200220 1% /run /dev/sda1 82083148 14882496 62985104 20% / tmpfs 1007572 0 1007572 0% /dev/shm tmpfs 5120 0 5120 0% /run/lock tmpfs 201512 128 201384 1% /run/user/1000</pre>
To know about the linux release	lsb_release -a	lsb_release -a	lsb_release -a	<pre>(kali㉿kali)-[~/bhavana] \$ lsb_release -a No LSB modules are available. Distributor ID: Kali Description: Kali GNU/Linux Rolling Release: 2024.2 Codename: kali-rolling</pre>

3. Navigation

Task	Command	Syntax	Screenshots
To navigate home directory	cd	cd	 <pre>(kali@kali)-[~/bhavana] \$ cd (kali@kali)-[~]</pre>
To navigate to the parent directory	cd ..	cd ..	 <pre>(kali@kali)-[~] \$ cd .. (kali@kali)-[/home]</pre>

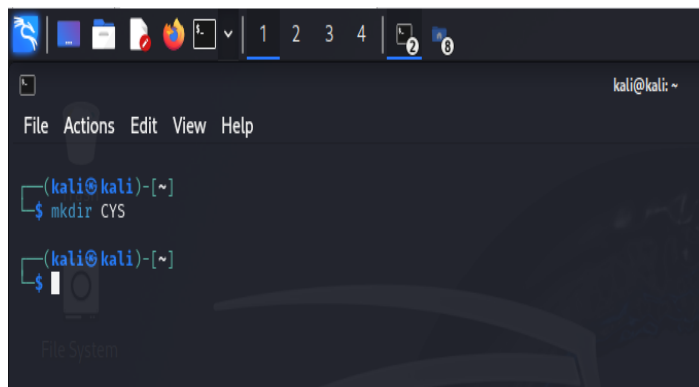
To navigate to the child directory	cd <directory_name>	cd <directory_name>	 <pre> (kali@kali)-[/home] \$ cd kali (kali@kali)-[~] \$ cd bhavana (kali@kali)-[~/bhavana] \$ </pre>
Alternate command to cd	pushd	pushd <directory_name>	 <pre> (kali@kali)-[~] \$ cd bhavana (kali@kali)-[~/bhavana] \$.. (kali@kali)-[~] \$ pushd /home/kali/bhavana /bhavana ~ </pre>
To go back to the previous directory	cd -	cd -	 <pre> (kali@kali)-[~/CYS] \$ cd - (kali@kali)-[~] \$ </pre>

To go to the root directory	cd /	cd /	 <pre>(kali㉿kali)-[~/bhavana] \$ cd /</pre>
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4. File System

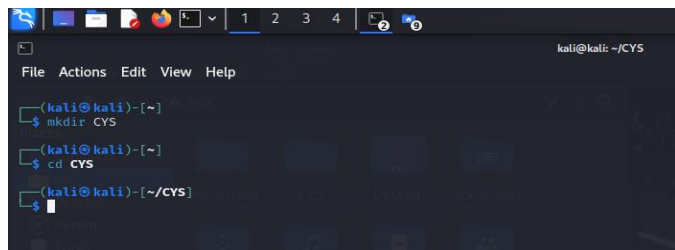
Task	Syntax	Command
How to identify the file system		

- a. Create Folder “CYS”



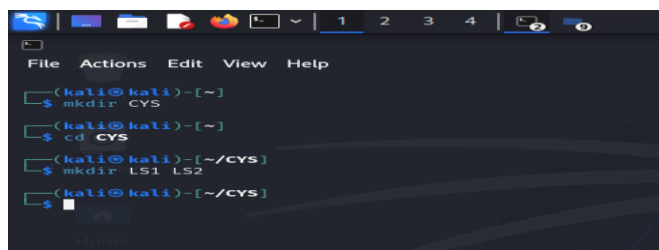
```
kali@kali: ~
File Actions Edit View Help
(kali㉿kali)-[~]
$ mkdir CYS
(kali㉿kali)-[~]
$
```

b. Navigate to CYS

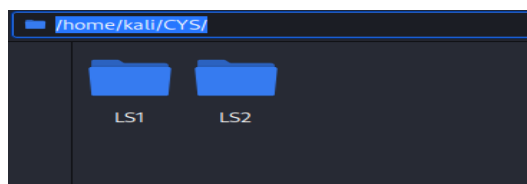
A terminal window with a dark background and light blue text. The prompt is '(kali@kali)-[~]'. The user enters '\$ mkdir CYS', then '\$ cd CYS', and finally '\$' with a cursor. The window title bar shows 'kali@kali: ~/CYS'.

```
(kali@kali)-[~]  
$ mkdir CYS  
(kali@kali)-[~]  
$ cd CYS  
(kali@kali)-[~/CYS]  
$
```

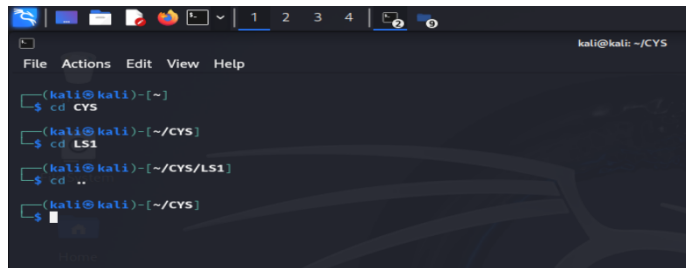
c. Create folder LS1 and LS2 under CYS

A terminal window with a dark background and light blue text. The prompt is '(kali@kali)-[~]'. The user enters '\$ mkdir CYS', then '\$ cd CYS', then '\$ mkdir LS1 LS2', and finally '\$' with a cursor. The window title bar shows 'kali@kali: ~/CYS'.

```
(kali@kali)-[~]  
$ mkdir CYS  
(kali@kali)-[~]  
$ cd CYS  
(kali@kali)-[~/CYS]  
$ mkdir LS1 LS2  
(kali@kali)-[~/CYS]  
$
```



d. Go back to CYS

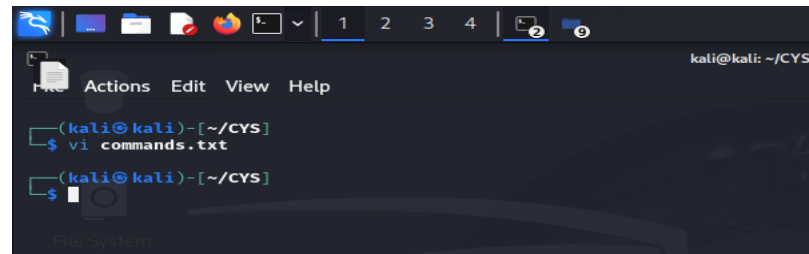


```
kali@kali: ~/CYS
File Actions Edit View Help

(kali@kali)~$ cd CYS
(kali@kali)~/CYS$ cd LS1
(kali@kali)~/CYS/LS1$ cd ..
(kali@kali)~/CYS$
```

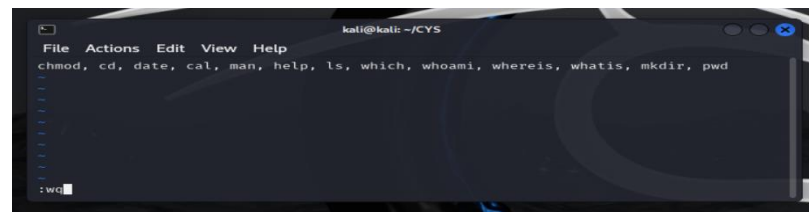
e. Working with Files

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



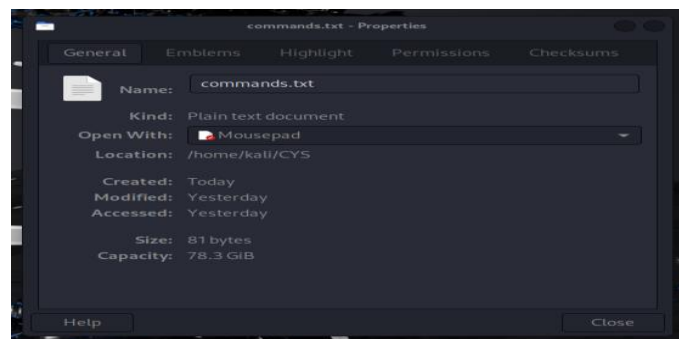
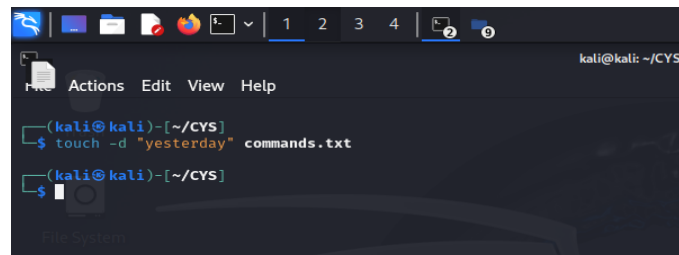
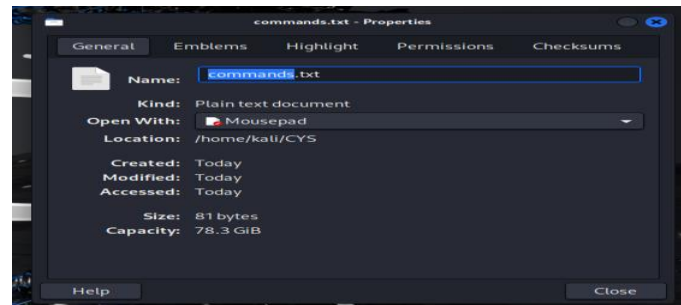
```
kali@kali: ~/CYS
File Actions Edit View Help

(kali@kali)~/CYS$ vi commands.txt
(kali@kali)~/CYS$
```

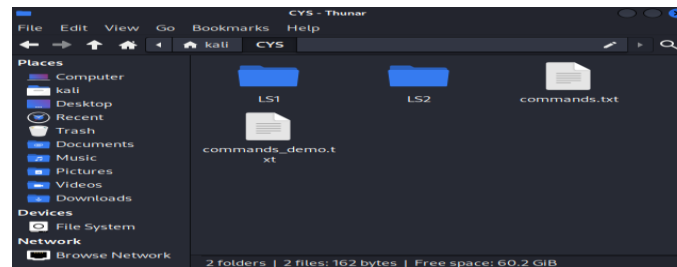


```
kali@kali: ~/CYS
File Actions Edit View Help
chmod, cd, date, cal, man, help, ls, which, whoami, whereis, whatis, mkdir, pwd
:WQ
```

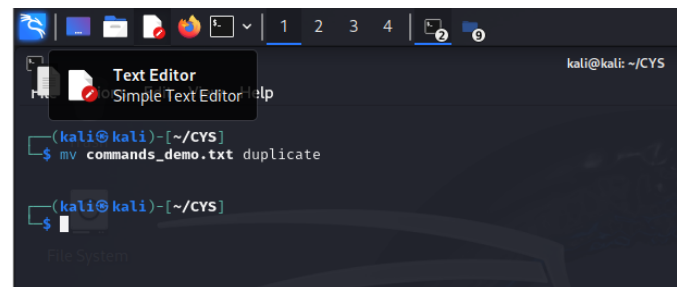
- ii. Change the timestamp of the file to yesterday

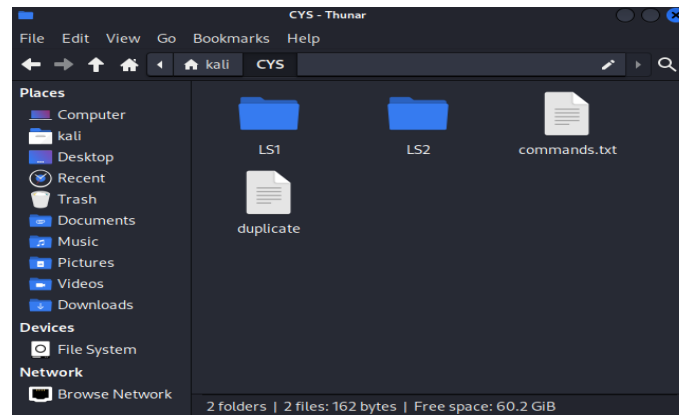


- iii. Copy the contents from the file `commands.txt` to `commands_demo.txt`

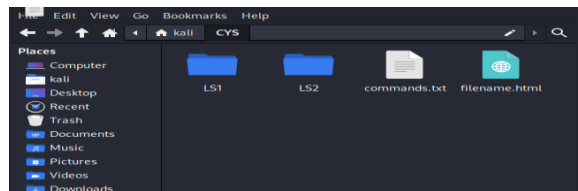
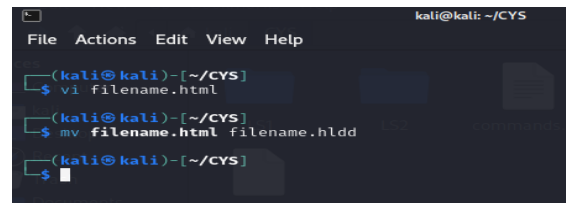


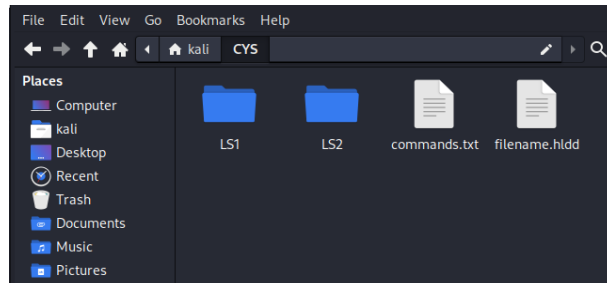
- iv. Rename the file `commands_demo.txt` to `duplicate`



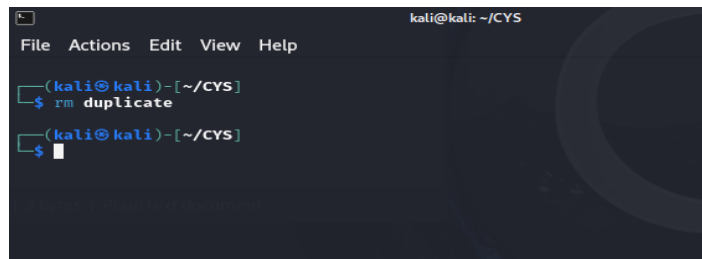


v. Rename all .html to .hldd

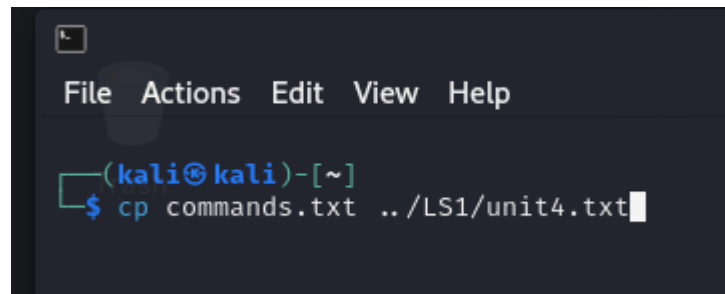




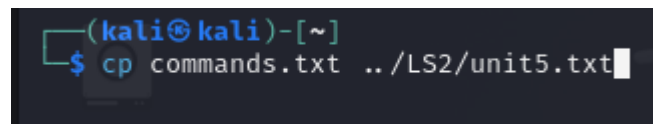
vi. Delete the file duplicate



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

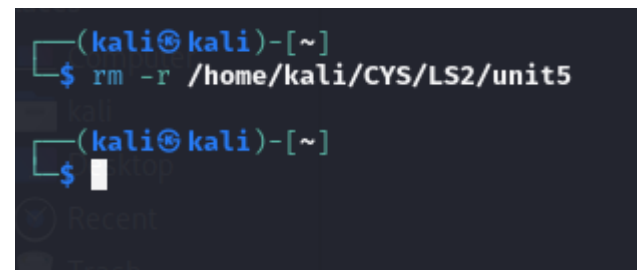


```
(kali㉿kali)-[~]  
$ cp commands.txt ../LS1/unit4.txt
```



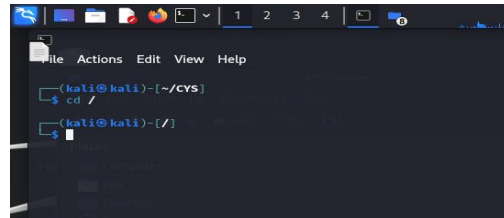
```
(kali㉿kali)-[~]  
$ cp commands.txt ../LS2/unit5.txt
```

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



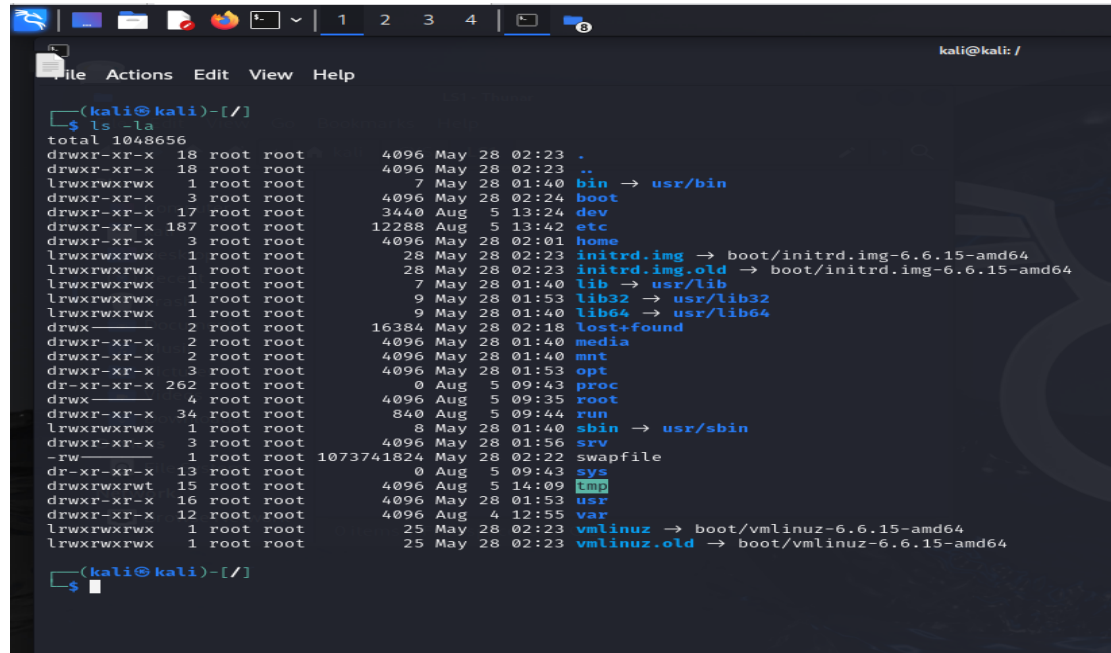
```
(kali㉿kali)-[~]  
$ rm -r /home/kali/CYS/LS2/unit5  
  
(kali㉿kali)-[~]  
$
```

- ix. Navigate to root



```
(kali@kali)-[~/CYS]
$ cd /
(kali@kali)-[/]
$
```

- x. List all the files under root



```
(kali@kali)-[/]
$ ls -la
total 1048656
drwxr-xr-x 18 root root 4096 May 28 02:23 .
drwxr-xr-x 18 root root 4096 May 28 02:23 ..
lrwxrwxrwx 1 root root 7 May 28 01:40 bin -> usr/bin
drwxr-xr-x 3 root root 4096 May 28 02:24 boot
drwxr-xr-x 17 root root 3440 Aug 5 13:24 dev
drwxr-xr-x 187 root root 12288 Aug 5 13:42 etc
drwxr-xr-x 3 root root 4096 May 28 02:01 home
lrwxrwxrwx 1 root root 28 May 28 02:23 initrd.img -> boot/initrd.img-6.6.15-amd64
lrwxrwxrwx 1 root root 28 May 28 02:23 initrd.img.old -> boot/initrd.img-6.6.15-amd64
lrwxrwxrwx 1 root root 7 May 28 01:40 lib -> usr/lib
lrwxrwxrwx 1 root root 9 May 28 01:53 lib32 -> usr/lib32
lrwxrwxrwx 1 root root 9 May 28 01:40 lib64 -> usr/lib64
drwx 2 root root 16384 May 28 02:18 lost+found
drwxr-xr-x 2 root root 4096 May 28 01:40 media
drwxr-xr-x 2 root root 4096 May 28 01:40 mnt
drwxr-xr-x 3 root root 4096 May 28 01:53 opt
dr-xr-xr-x 262 root root 0 Aug 5 09:43 proc
drwx 4 root root 4096 Aug 5 09:35 root
drwxr-xr-x 34 root root 840 Aug 5 09:44 run
lrwxrwxrwx 1 root root 8 May 28 01:40 sbin -> usr/sbin
drwxr-xr-x 3 root root 4096 May 28 01:56 srv
-rw 1 root root 1073741824 May 28 02:22 swapfile
dr-xr-xr-x 13 root root 0 Aug 5 09:43 sys
drwxrwxrwt 15 root root 4096 Aug 5 14:09 tmp
drwxr-xr-x 16 root root 4096 May 28 01:53 usr
drwxr-xr-x 12 root root 4096 Aug 4 12:55 var
lrwxrwxrwx 1 root root 25 May 28 02:23 vmlinuz -> boot/vmlinuz-6.6.15-amd64
lrwxrwxrwx 1 root root 25 May 28 02:23 vmlinuz.old -> boot/vmlinuz-6.6.15-amd64
(kali@kali)-[/]
$
```

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

```
(kali@kali)-[/]
$ ls -la
total 1048656
drwxr-xr-x 18 root root      4096 May 28 02:23 .
drwxr-xr-x 18 root root      4096 May 28 02:23 ..
lrwxrwxrwx 1 root root         7 May 28 01:40 bin -> usr/bin
drwxr-xr-x 3 root root      4096 May 28 02:24 boot
drwxr-xr-x 17 root root    3440 Aug  5 13:24 dev
drwxr-xr-x 187 root root   12288 Aug  5 13:42 etc
drwxr-xr-x 3 root root      4096 May 28 02:01 home
lrwxrwxrwx 1 root root      28 May 28 02:23 initrd.img -> boot/initrd.img-6.6.15-amd64
lrwxrwxrwx 1 root root      28 May 28 02:23 initrd.img.old -> boot/initrd.img-6.6.15-amd64
lrwxrwxrwx 1 root root         7 May 28 01:40 lib -> usr/lib
lrwxrwxrwx 1 root root         9 May 28 01:53 lib32 -> usr/lib32
lrwxrwxrwx 1 root root         9 May 28 01:40 lib64 -> usr/lib64
drwx 2 root root    16384 May 28 02:18 lost+found
drwxr-xr-x 2 root root      4096 May 28 01:40 media
drwxr-xr-x 3 root root      4096 May 28 01:40 mnt
dr-xr-xr-x 262 root root      0 Aug  5 09:43 proc
drwx 4 root root      4096 Aug  5 09:35 root
drwxr-xr-x 34 root root      840 Aug  5 09:44 run
lrwxrwxrwx 1 root root         8 May 28 01:40 sbin -> usr/sbin
drwxr-xr-x 3 root root      4096 May 28 01:56 srv
-rw 1 root root 1073741824 May 28 02:22 swapfile
dr-xr-xr-x 13 root root         0 Aug  5 09:43 sys
drwxrwxrwt 15 root root      4096 Aug  5 14:09 tmp
drwxr-xr-x 16 root root      4096 May 28 01:53 usr
drwxr-xr-x 12 root root      4096 Aug  4 12:55 var
lrwxrwxrwx 1 root root      25 May 28 02:23 vmlinuz -> boot/vmlinuz-6.6.15-amd64
lrwxrwxrwx 1 root root      25 May 28 02:23 vmlinuz.old -> boot/vmlinuz-6.6.15-amd64

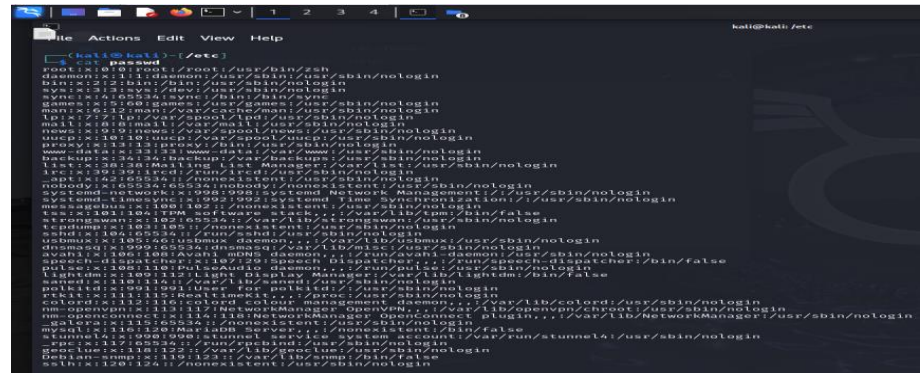
(kali@kali)-[/]
$
```

xii. Navigate to /etc/passwd

```
(kali@kali)-[/etc]
$ cd /etc

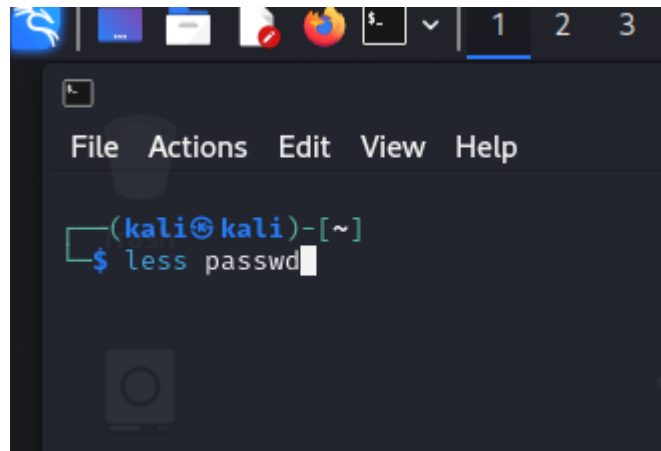
(kali@kali)-[/etc]
$
```

xiii. Open the file passwd



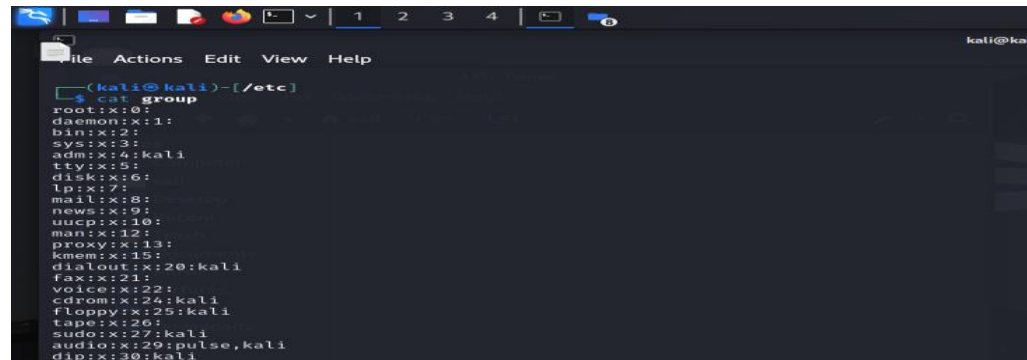
```
(kali@kali)-[/etc]
$ cat passwd
root:x:0:0:root:/root:/usr/bin/sh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/usr/sbin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucpi:/usr/sbin/nologin
proxy:x:11:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:MailManager:/var/list:/usr/sbin/nologin
irc:x:39:39:irc:/usr/sbin/nologin
_apt:x:42:65534:/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-networkd:x:999:999:systemd Network Management:/usr/sbin/nologin
systemd-timesyncd:x:992:992:systemd Time Synchronization:/usr/sbin/nologin
messagebus:x:100:102:/nonexistent:/usr/sbin/nologin
tss:x:101:104:TPM software stack:./:/var/lib/tpm:/bin/false
strimspot:x:102:10536:./:/var/lib/strimspot:/bin/false
tcpdump:x:103:100:/nonexistent:/usr/sbin/nologin
sshd:x:104:65536:./:/usr/sbin:/usr/sbin/nologin
dbus:x:105:105:dbus:./:/usr/lib/dbus:/usr/sbin/nologin
dnsmasq:x:1099:65534:dnsmasq:/var/lib/misc:/usr/sbin/nologin
avahi:x:100:100:avahi:./:/usr/lib/avahi:/usr/sbin/nologin
speech-dispatcher:x:107:20:speech-dispatcher:./:/run/speech-dispatcher:/bin/false
pulse:x:100:100:pulseAudio:./:/usr/bin/pulse:/usr/sbin/nologin
lightdm:x:100:102:lightdm:./:/usr/lib/lightdm:/bin/false
smbd:x:110:114:./:/usr/lib/smbd:/usr/sbin/nologin
nfsd:x:111:111:/usr/sbin/nfsd:./:/usr/sbin/nologin
rtkit:x:111:115:RealtimeKit:./:/proc:/usr/sbin/nologin
colord:x:112:116:colord:./:/usr/lib/colord:/usr/sbin/nologin
nm-openvpn:x:113:11:/NetworkManager OpenVPN:./:/usr/lib/openvpn/chrout:/usr/sbin/nologin
nm-openvpn:x:114:11:/NetworkManager OpenVPN:./:/usr/lib/openvpn/chrout:/usr/sbin/nologin
smbd:x:115:65536:/nonexistent:/usr/sbin/nologin
mshd:x:116:120:Mosh daemon:./:/usr/bin/mosh:/bin/false
stunnel:x:100:100:stunnel:./:/usr/bin/stunnel:/usr/sbin/nologin
rpd:x:117:65536:./:/usr/bin/rpd:/usr/sbin/nologin
gnome-smp:x:119:123:./:/usr/lib/gnome-smp:/bin/false
sbl:x:120:120:/nonexistent:/usr/sbin/nologin
```

xiv. Explore the file passwd



```
(kali@kali)-[~]
$ less passwd
```

xv. Navigate to /etc/group and explore



```
(kali@kali)-[/etc]
└─$ cat group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:kali
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:kali
fax:x:21:
voice:x:22:
cdrom:x:24:kali
floppy:x:25:kali
tape:x:26:
sudo:x:27:kali
audio:x:29:pulse,kali
dip:x:30:kali
```

f. Difference between

i. GUI vs. CLI

GUI	CLI
User interact with the system with graphical elements such as icons, menus, images, etc.	Users interact with the system using various commands in the command prompt window.
GUI requires various input devices to interact with the system, such as a keyboard, mouse, etc	CLI requires only a keyboard to enter commands.
GUI consumes more RAM and processing power.	CLI consumes less RAM and processing power.

ii. man vs info

man	info
Typically provides detailed information on command usage, options, examples, and related commands.	Often provides more comprehensive and narrative-style documentation than man pages, with the ability to include more context, cross-references, and hierarchical structuring.
Displays the manual page for a command or function.	Displays more extensive documentation formatted using the Tex info system.
Syntax: man <command> Ex: man ls	Syntax: info <command> Ex: info ls

iii. which vs. whereis

which	whereis
Identifies the location of executables in the user's path.	'whereis' searches predefined directories and can find binaries, sources, and man pages.
Syntax: which <command> Ex: which ls	Syntax: whereis <command> Ex: whereis ls

iv. Terminal vs shell

terminal	shell
A terminal is an interface that allows users to interact with the computer.	A shell is an interface between the kernel and the software.
Focuses on providing a user interface for text input and output.	Executes commands entered by user, manages the execution of programs, and provides scripting capabilities.
Ex: GNOME Terminal, Windows Terminal	Ex: bash(Bourne Again Shell)

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

```
(kali㉿kali)-[~]  
$ vi 10.bash  
  
(kali㉿kali)-[~]  
$ bash 10.bash  
bhavana  
reading books,watching movies,gardening  
  
(kali㉿kali)-[~]  
$
```

