

Lab 1

Title: Introduction of basic Linux commands.

ls: Displays the files and directories in the current directory.

ls -l: Shows detailed information about files, including permissions, owner, size, and modification date.

ls -a: Lists all files, including hidden ones (those that start with a dot).

ls -lt: Displays files sorted by modification time, with the most recently modified files at the top.

ls -R: Recursively lists files and directories, including contents of subdirectories.

```
kali@kali: ~  
File Actions Edit View Help  
❏ (kali@kali)-[~]  
❏ $ ls  
Desktop Downloads Patel Public Videos  
Documents Music Pictures Templates  
❏ (kali@kali)-[~]  
❏ $ ls -l  
total 36  
drwxr-xr-x 2 kali kali 4096 Jan 10 23:13 Desktop  
drwxr-xr-x 2 kali kali 4096 Jan 8 09:14 Documents  
drwxr-xr-x 2 kali kali 4096 Jan 8 09:14 Downloads  
drwxr-xr-x 2 kali kali 4096 Jan 8 09:14 Music  
drwxrwxr-x 3 kali kali 4096 Jan 10 23:26 Patel  
drwxr-xr-x 2 kali kali 4096 Jan 10 23:48 Pictures  
drwxr-xr-x 2 kali kali 4096 Jan 8 09:14 Public  
drwxr-xr-x 2 kali kali 4096 Jan 8 09:14 Templates  
drwxr-xr-x 2 kali kali 4096 Jan 8 09:14 Videos  
❏ (kali@kali)-[~]  
❏ $ ls -a  
.  
..  
.bash_logout  
.bashrc  
.bashrc.original  
.cache  
.config  
Desktop  
.dmrc  
Documents  
Downloads  
.face  
.face.icon  
.gnupg  
.ICEauthority  
.java  
.local  
.mozilla  
Music  
Patel  
Pictures  
.profile  
Public  
Templates  
.vboxclient-clipboard-tty7-control.pid  
.vboxclient-clipboard-tty7-service.pid  
.vboxclient-display-svga-x11-tty7-control.pid  
.vboxclient-display-svga-x11-tty7-service.pid  
.vboxclient-draganddrop-tty7-control.pid  
.vboxclient-draganddrop-tty7-service.pid  
.vboxclient-hostversion-tty7-control.pid  
.vboxclient-seamless-tty7-control.pid  
.vboxclient-seamless-tty7-service.pid  
.vboxclient-vmsvga-session-tty7-control.pid  
Videos  
.Xauthority  
.xsession-errors  
.xsession-errors.old  
.zprofile  
.zsh_history  
.zshrc  
❏ (kali@kali)-[~]  
❏ $ ls -h  
Desktop Downloads Patel Public Videos  
Documents Music Pictures Templates  
❏ (kali@kali)-[~]  
❏ $ ls -R  
.:  
Desktop Downloads Patel Public Videos  
Documents Music Pictures Templates
```

```
❏ (kali@kali)-[~]  
❏ $ ls -R  
.:  
Desktop Downloads Patel Public Videos  
Documents Music Pictures Templates  
./Desktop:  
./Documents:  
./Downloads:  
./Music:  
./Patel:  
P.txt  
./Patel/P.txt:  
P.txt  
./Pictures:  
./Public:  
./Templates:  
./Videos:  
❏ (kali@kali)-[~]  
❏ $ ls -t  
Pictures Desktop Downloads Public Videos  
Patel Documents Music Templates
```

cd /home: Changes the current directory to /home.

cd ..: Moves up one directory level (to the parent directory).

cd ~: Takes you to your home directory (shortcut for the user's home folder).

cd /var/log: Navigates to the /var/log directory.

cd -: Switches to the previous directory you were in before the last cd command.

A terminal window titled 'kali@kali: ~' showing a series of directory navigation commands and their outputs. The commands and outputs are: 'pwd' returns '/home/kali'; 'cd Patel' changes to '/~/Patel'; 'cd P.txt' changes to '/~/Patel/P.txt'; 'cd ..' changes to '/~/Patel'; 'cd /' changes to '/'; 'cd' (without arguments) changes to '/'; 'cd -' changes back to '/'; 'pwd' confirms the current path is '/'; 'cd kali' results in an error 'cd: no such file or directory: kali'; 'cd home' changes to '/home'; 'cd kali' changes to '/home/kali'; and a final 'pwd' confirms the path is '/home/kali'.

```
kali@kali: ~  
File Actions Edit View Help  
❏ (kali@kali)-[~]  
$ pwd  
/home/kali  
❏ (kali@kali)-[~]  
$ cd Patel  
❏ (kali@kali)-[~/Patel]  
$ cd P.txt  
❏ (kali@kali)-[~/Patel/P.txt]  
$ cd ..  
❏ (kali@kali)-[~/Patel]  
$ cd /  
❏ (kali@kali)-[/]  
$ cd  
❏ (kali@kali)-[~]  
$ cd -  
/  
❏ (kali@kali)-[/]  
$ pwd  
/  
❏ (kali@kali)-[/]  
$ cd kali  
cd: no such file or directory: kali  
❏ (kali@kali)-[/]  
$ cd home  
❏ (kali@kali)-[/home]  
$ cd kali  
❏ (kali@kali)-[~]  
$ pwd  
/home/kali
```

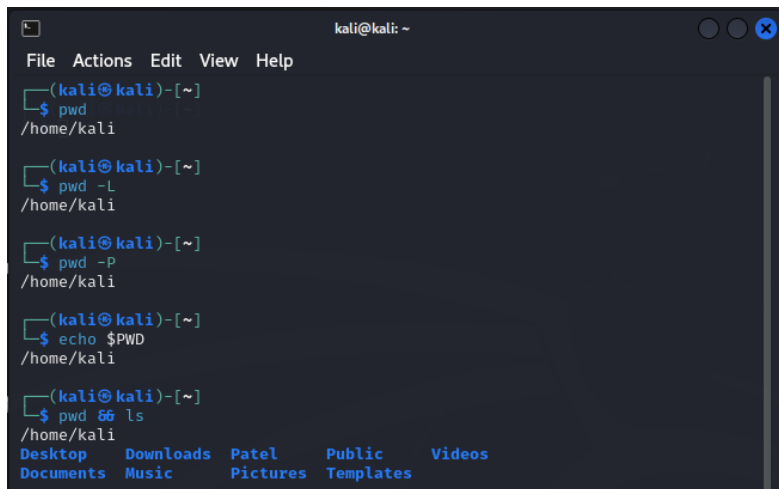
pwd: Displays the full path of the current working directory.

pwd -P: Shows the actual physical path of the current directory, resolving any symbolic links.

pwd --help: Displays help information about the pwd command.

pwd (inside a subdirectory): If you navigate to a subdirectory (e.g., /home/user/Documents), running pwd will display the full path to that subdirectory.

pwd (after using cd command): If you change directories using cd, running pwd confirms your current directory location.

A terminal window titled 'kali@kali: ~' with a menu bar (File, Actions, Edit, View, Help). The terminal shows the following commands and output:

```
(kali@kali)-[~]  
$ pwd  
/home/kali  
  
(kali@kali)-[~]  
$ pwd -L  
/home/kali  
  
(kali@kali)-[~]  
$ pwd -P  
/home/kali  
  
(kali@kali)-[~]  
$ echo $PWD  
/home/kali  
  
(kali@kali)-[~]  
$ pwd && ls  
/home/kali  
Desktop Downloads Patel Public Videos  
Documents Music Pictures Templates
```

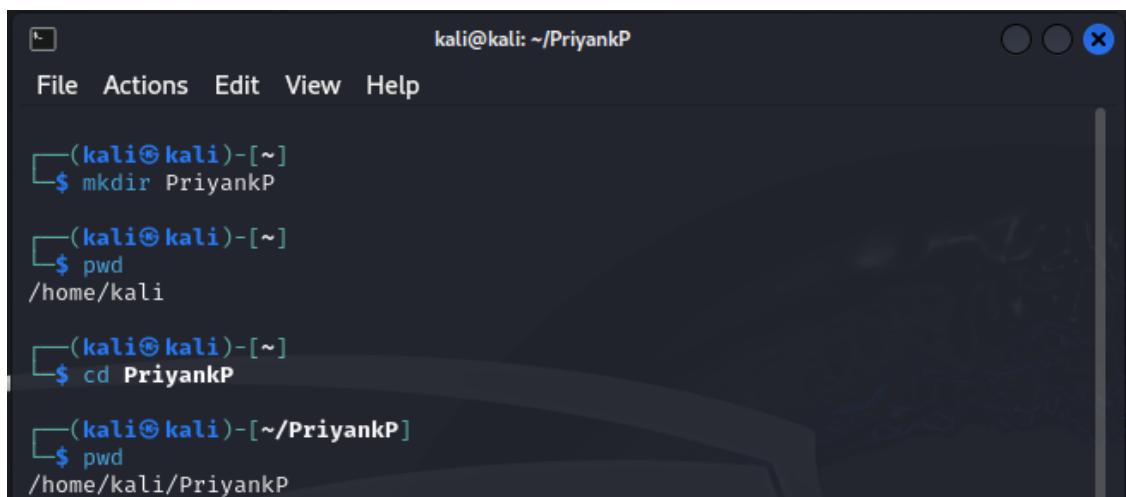
mkdir new_folder: Creates a directory named new_folder in the current directory.

mkdir -p parent/child: Creates a nested directory structure. If parent does not exist, it is created along with child.

mkdir dir1 dir2 dir3: Creates multiple directories (dir1, dir2, and dir3) in the current directory.

mkdir -v my_folder: Creates a directory named my_folder and displays a message confirming the creation.

mkdir -m 755 secure_folder: Creates a directory named secure_folder with specific permissions (755 means readable and executable by everyone, but writable only by the owner).

A terminal window titled 'kali@kali: ~/PriyankP' with a menu bar (File, Actions, Edit, View, Help). The terminal shows the following commands and output:

```
(kali@kali)-[~]  
$ mkdir PriyankP  
  
(kali@kali)-[~]  
$ pwd  
/home/kali  
  
(kali@kali)-[~]  
$ cd PriyankP  
  
(kali@kali)-[~/PriyankP]  
$ pwd  
/home/kali/PriyankP
```

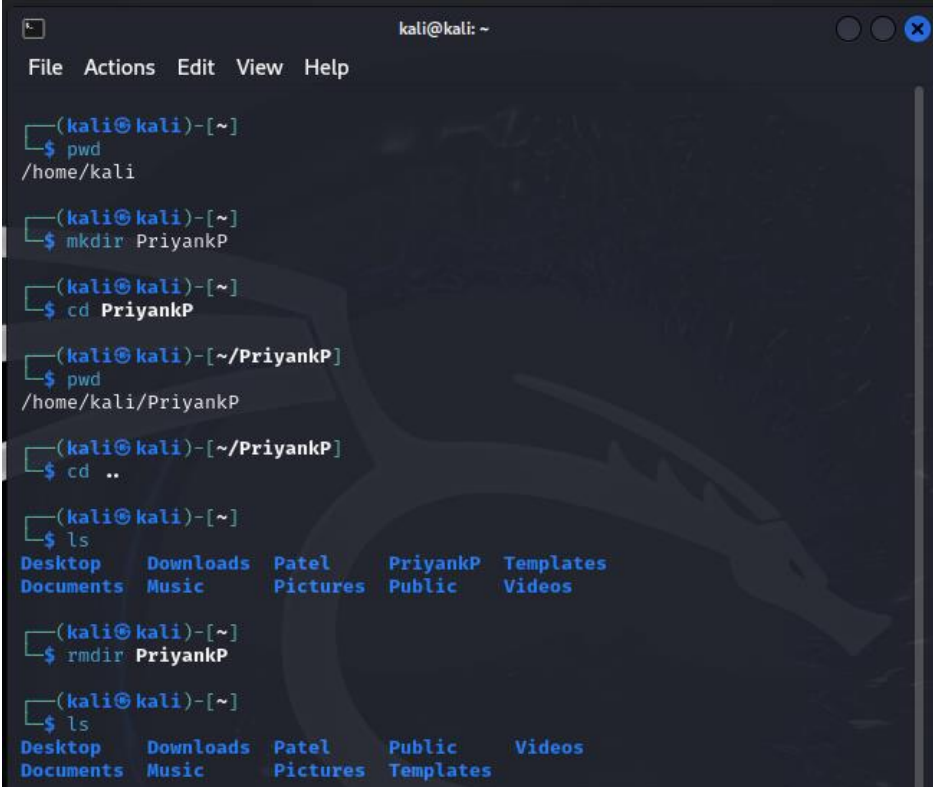
rmdir empty_folder: Removes the directory named empty_folder, but only if it is empty.

rmdir -p parent/child: Removes the child directory first, and then the parent directory, but only if both are empty.

rmdir folder1 folder2: Removes multiple directories (folder1 and folder2), provided they are all empty.

rmdir --ignore-fail-on-non-empty folder_name: Ignores the error message if folder_name is not empty but will not delete it.

rmdir --help: Displays the help information for the rmdir command, including available options.

A terminal window titled 'kali@kali: ~' with a menu bar (File, Actions, Edit, View, Help). The terminal shows a sequence of commands: 'pwd' returns '/home/kali'; 'mkdir PriyankP' creates the directory; 'cd PriyankP' changes the current directory to '/home/kali/PriyankP'; 'pwd' confirms the current directory; 'cd ..' returns to the home directory; 'ls' lists the contents of the home directory, showing 'Desktop', 'Downloads', 'Patel', 'PriyankP', 'Templates', 'Documents', 'Music', 'Pictures', 'Public', and 'Videos'; 'rmdir PriyankP' successfully removes the directory; a final 'ls' command shows that 'PriyankP' is no longer in the directory listing.

```
kali@kali: ~  
File Actions Edit View Help  
  
(kali@kali)-[~]  
$ pwd  
/home/kali  
  
(kali@kali)-[~]  
$ mkdir PriyankP  
  
(kali@kali)-[~]  
$ cd PriyankP  
  
(kali@kali)-[~/PriyankP]  
$ pwd  
/home/kali/PriyankP  
  
(kali@kali)-[~/PriyankP]  
$ cd ..  
  
(kali@kali)-[~]  
$ ls  
Desktop  Downloads  Patel      PriyankP  Templates  
Documents Music      Pictures   Public     Videos  
  
(kali@kali)-[~]  
$ rmdir PriyankP  
  
(kali@kali)-[~]  
$ ls  
Desktop  Downloads  Patel      Public     Videos  
Documents Music      Pictures   Templates
```

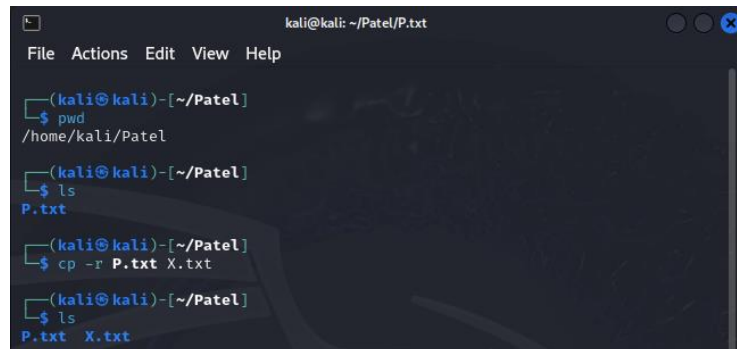
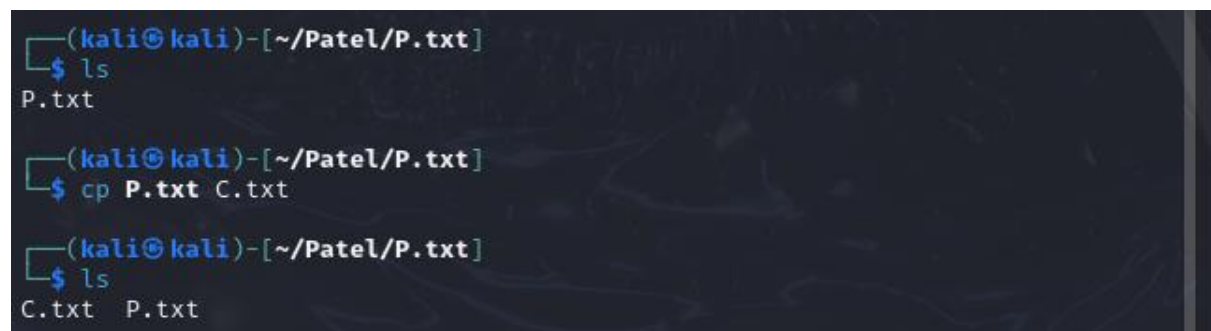
cp file1.txt file2.txt: Copies file1.txt to file2.txt in the same directory.

cp file.txt /path/to/destination/: Copies file.txt to the specified directory (/path/to/destination/).

cp -r folder1 folder2: Recursively copies the contents of folder1 (including subdirectories and files) into folder2. If folder2 doesn't exist, it will be created.

cp -i file1.txt file2.txt: Copies file1.txt to file2.txt but prompts for confirmation if file2.txt already exists.

cp *.txt /path/to/destination/: Copies all files with the .txt extension from the current directory to the specified destination directory.

A terminal window titled 'kali@kali: ~/Patel/P.txt' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(kali@kali)-[~/Patel]'. The user enters '\$ pwd' and the output is '/home/kali/Patel'. The user enters '\$ ls' and the output is 'P.txt'. The user enters '\$ cp -r P.txt X.txt'. The prompt changes to '(kali@kali)-[~/Patel]'. The user enters '\$ ls' and the output is 'P.txt X.txt'.A terminal window titled 'kali@kali: ~/Patel/P.txt' with a menu bar (File, Actions, Edit, View, Help). The prompt is '(kali@kali)-[~/Patel/P.txt]'. The user enters '\$ ls' and the output is 'P.txt'. The user enters '\$ cp P.txt C.txt'. The prompt changes to '(kali@kali)-[~/Patel/P.txt]'. The user enters '\$ ls' and the output is 'C.txt P.txt'.

mv file1.txt file2.txt: Renames file1.txt to file2.txt in the same directory.

mv file.txt /path/to/destination/: Moves file.txt to the specified directory (/path/to/destination/).

mv folder1 /path/to/destination/: Moves the entire directory folder1 to the specified destination directory.

mv -i file1.txt file2.txt: Prompts for confirmation before overwriting file2.txt if it already exists when renaming file1.txt to file2.txt.

mv *.txt /path/to/destination/: Moves all .txt files from the current directory to the specified destination directory.

```
kali@kali: ~/Patel/Priyank
File Actions Edit View Help

(kali@kali)-[~/Patel]
$ ls
X.txt

(kali@kali)-[~/Patel]
$ mkdir Priyank

(kali@kali)-[~/Patel]
$ ls
Priyank X.txt

(kali@kali)-[~/Patel]
$ mv X.txt Priyank

(kali@kali)-[~/Patel]
$ ls
Priyank

(kali@kali)-[~/Patel]
$ cd Priyank

(kali@kali)-[~/Patel/Priyank]
$ ls
X.txt
```

```
(kali@kali)-[~]
$ ls -R
.:
Desktop  Downloads  Patel  Public  Videos
Documents Music  Pictures Templates

./Desktop:
./Downloads:
./Music:
./Patel:
Patel/P.txt
Patel/P.txt:
P.txt

./Pictures:
./Public:
./Templates:
./Videos:

(kali@kali)-[~]
$ ls -t
Pictures Desktop Downloads Public Videos
Patel Documents Music Templates
```

touch file.txt: Creates an empty file named file.txt if it doesn't exist, or updates the file's access and modification timestamps if it does.

touch file1.txt file2.txt: Creates or updates multiple files (file1.txt and file2.txt) at once.

touch -c file.txt: Does not create a new file if file.txt doesn't exist, but updates the timestamp if the file already exists.

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~]
$ cd Patel

(kali@kali)-[~/Patel]
$ cd Priyank

(kali@kali)-[~/Patel/Priyank]
$ cd X.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$ touch XYZ.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$ touch -c XYZ.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$
```

cat file.txt: Displays the contents of file.txt on the terminal.

cat file1.txt file2.txt: Displays the contents of file1.txt followed by file2.txt in the terminal.

cat -n file.txt: Displays the contents of file.txt with line numbers before each line.

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~]
$ cd Patel

(kali@kali)-[~/Patel]
$ cd Priyank

(kali@kali)-[~/Patel/Priyank]
$ cd X.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$ cat P.txt
Hello Priyank

(kali@kali)-[~/Patel/Priyank/X.txt]
$ cat -n P.txt
1 Hello Priyank
```

nano file.txt: Opens the file file.txt in the nano text editor. If the file doesn't exist, it creates a new one.

nano -B file.txt: Opens file.txt in nano with backup files enabled. A backup file with the extension .bak will be created if changes are made.

nano -w file.txt: Opens file.txt in nano and disables wrapping of long lines. This is useful for editing files with long lines of text.

nano -m file.txt: Opens file.txt in nano and enables mouse support, allowing you to use the mouse for scrolling and selecting text.

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~]
$ cd Patel

(kali@kali)-[~/Patel]
$ cd Priyank

(kali@kali)-[~/Patel/Priyank]
$ cd X.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$ nano ABC.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$ cat ABC.txt
Hello Priyank
```

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help
GNU nano 2.9.2 ABC.txt *
Hello Priyank

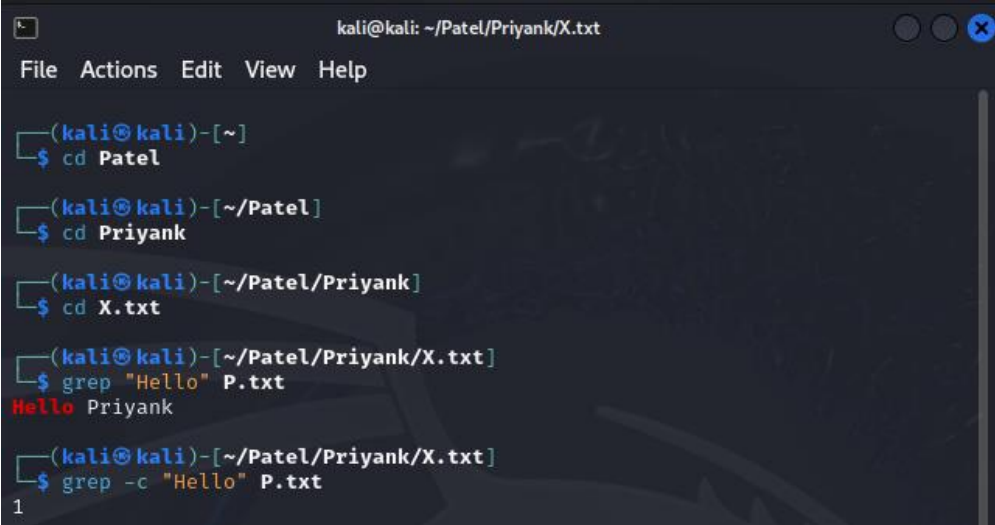
[New File]
[Where Is]
[Write Out]
[Read File]
[Replace]
[Cut]
[Paste]
[Execute]
[Justify]
[Exit]
```


grep 'pattern' file.txt: Searches for the word "pattern" in file.txt and displays the lines that contain it.

grep -i 'pattern' file.txt: Searches for the word "pattern" in file.txt case-insensitively (ignores whether it's uppercase or lowercase).

grep -r 'pattern' /path/to/directory/: Searches for the word "pattern" recursively in all files within the specified directory.

grep -v 'pattern' file.txt: Displays all lines in file.txt that do **not** contain the word "pattern".



```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~]
$ cd Patel

(kali@kali)-[~/Patel]
$ cd Priyank

(kali@kali)-[~/Patel/Priyank]
$ cd X.txt

(kali@kali)-[~/Patel/Priyank/X.txt]
$ grep "Hello" P.txt
Hello Priyank

(kali@kali)-[~/Patel/Priyank/X.txt]
$ grep -c "Hello" P.txt
1
```

sudo command: Executes the specified command with superuser (root) privileges. For example, `sudo ls` will list the contents of a directory with elevated permissions.

sudo apt update: Updates the package lists for upgrades of all installed packages on a system using apt (for Debian-based distributions like Ubuntu).

sudo shutdown -h now: Immediately shuts down the system with root privileges. The `-h` option indicates to halt the system, and `now` specifies the time to shut down.


```
kali@kali: ~  
File Actions Edit View Help  
  
(kali@kali)~  
$ sudo -h  
sudo - execute a command as another user  
  
usage: sudo -h | -K | -k | -V  
usage: sudo -v [-ABkNnS] [-g group] [-h host] [-p prompt] [-u user]  
usage: sudo -l [-ABkNnS] [-g group] [-h host] [-p prompt] [-U user]  
       [-u user] [command [arg ...]]  
usage: sudo [-ABbEHknPS] [-r role] [-t type] [-C num] [-D directory]  
       [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]  
       [-u user] [VAR=value] [-i | -s] [command [arg ...]]  
usage: sudo -e [-ABkNnS] [-r role] [-t type] [-C num] [-D directory]  
       [-g group] [-h host] [-p prompt] [-R directory] [-T timeout]  
       [-u user] file ...
```

```
kali@kali: ~/Patel/Priyank/X.txt  
File Actions Edit View Help  
  
(kali@kali)~  
$ cd Patel  
  
(kali@kali)~/Patel  
$ cd Priyank  
  
(kali@kali)~/Patel/Priyank  
$ cd X.txt  
  
(kali@kali)~/Patel/Priyank/X.txt  
$ sudo nano P.txt  
[sudo] password for kali:
```

apt-get update:

Updates the list of available packages and their versions from the repositories.

apt-get upgrade:

Upgrades all installed packages to their latest versions based on the updated package list.

apt-get install package_name:

Installs the specified package (replace package_name with the actual package name).

dpkg -l:

Lists all installed packages on the system.

dpkg -i package_file.deb:

Installs a .deb package from the specified file (package_file.deb).

dpkg -r package_name:

Removes the specified package but keeps its configuration files.

dpkg --purge package_name:

Completely removes the specified package along with its configuration files.

chown user:group filename:

Changes the owner of the specified file (filename) to the specified user and group.

chown user filename:

Changes the owner of the specified file (filename) to the specified user while keeping the group unchanged.

chown :group filename:

Changes the group of the specified file (filename) to the specified group while keeping the owner unchanged.

tar -xvf archive.tar:

Extracts the contents of the archive.tar file into the current directory. The -x option extracts the archive, -v shows the extraction process, and -f specifies the archive file.

tar -tvf archive.tar:

Lists the contents of the archive.tar file without extracting them. The -t option displays the file list, -v makes it verbose, and -f specifies the archive file.

uname:

Displays the name of the operating system (kernel). For example, it might show Linux or Darwin depending on the OS.

uname -s:

Displays the kernel name (same as the default uname output). For example, it may output Linux, Darwin, or other kernel names.

uname -n:

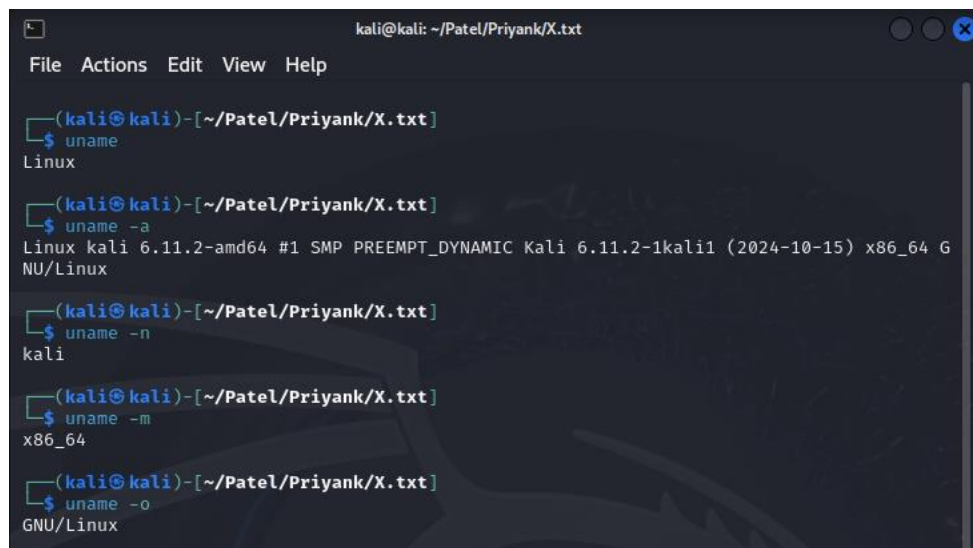
Displays the network node hostname of the system, which is the name assigned to the machine in a network.

uname -r:

Displays the kernel version (e.g., 5.4.0-42-generic), which includes the kernel release number.

uname -v:

Displays the kernel version information, including the build date and time of the kernel.

A terminal window titled 'kali@kali: ~/Patel/Priyank/X.txt' with a menu bar (File, Actions, Edit, View, Help). It shows the following commands and outputs:

```
(kali@kali)~-[~/Patel/Priyank/X.txt]
$ uname
Linux

(kali@kali)~-[~/Patel/Priyank/X.txt]
$ uname -a
Linux kali 6.11.2-amd64 #1 SMP PREEMPT_DYNAMIC Kali 6.11.2-1kali1 (2024-10-15) x86_64 GNU/Linux

(kali@kali)~-[~/Patel/Priyank/X.txt]
$ uname -n
kali

(kali@kali)~-[~/Patel/Priyank/X.txt]
$ uname -m
x86_64

(kali@kali)~-[~/Patel/Priyank/X.txt]
$ uname -o
GNU/Linux
```

date:

Displays the current date and time in the default format.

date "+%Y-%m-%d %H:%M:%S":

Displays the current date and time in a custom format (YYYY-MM-DD HH:MM:SS).

date -u:

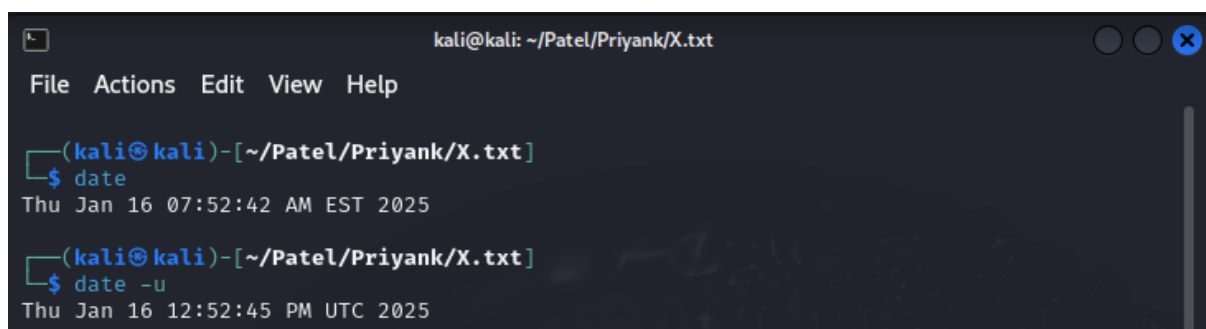
Displays the current date and time in UTC (Coordinated Universal Time).

date "+%A, %B %d, %Y":

Displays the current date in a more readable format (e.g., Tuesday, January 16, 2025).

date --date="2 days ago":

Displays the date and time for two days ago from the current date.

A terminal window titled 'kali@kali: ~/Patel/Priyank/X.txt' with a menu bar (File, Actions, Edit, View, Help). It shows the following commands and outputs:

```
(kali@kali)~-[~/Patel/Priyank/X.txt]
$ date
Thu Jan 16 07:52:42 AM EST 2025

(kali@kali)~-[~/Patel/Priyank/X.txt]
$ date -u
Thu Jan 16 12:52:45 PM UTC 2025
```

ps:

Displays a snapshot of the current processes running in the current terminal session.

ps -e or ps -A:

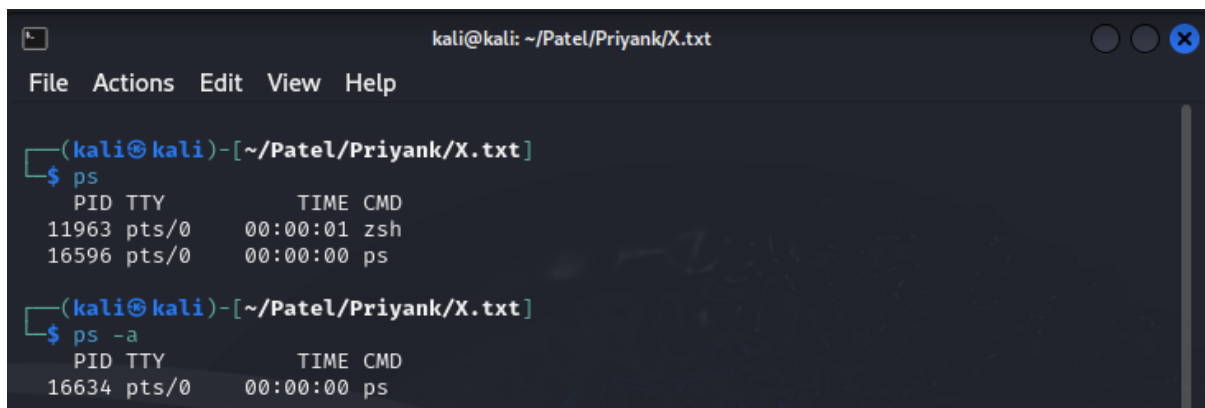
Displays a list of all processes running on the system, including those not attached to the current terminal.

ps -f:

Displays additional information about each process, such as the parent process ID (PPID), start time, and terminal.

ps -aux:

Displays a detailed list of all processes running on the system. The -a shows processes for all users, -u displays the user associated with each process, and -x shows processes not attached to a terminal.



```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~/Patel/Priyank/X.txt]
$ ps
  PID TTY          TIME CMD
 11963 pts/0        00:00:01 zsh
 16596 pts/0        00:00:00 ps

(kali@kali)-[~/Patel/Priyank/X.txt]
$ ps -a
  PID TTY          TIME CMD
 16634 pts/0        00:00:00 ps
```

top:

Displays a dynamic, real-time view of the system's processes, showing information about CPU usage, memory usage, and running processes.

top -u username:

Displays the processes running for the specified user (username), filtering the process list accordingly.

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help
top - 07:54:27 up 32 min, 2 users, load average: 0.16, 0.12, 0.04
Tasks: 183 total, 1 running, 182 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.3 us, 0.3 sy, 0.0 ni, 99.2 id, 0.1 wa, 0.0 hi, 0.1 si, 0.0 st
MiB Mem : 1973.6 total, 923.9 free, 736.0 used, 476.3 buff/cache
MiB Swap: 1024.0 total, 1024.0 free, 0.0 used, 1237.5 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
  733 root        20   0 507956 158788 74244 S   1.3   7.9   0:38.14 Xorg
11960 kali        20   0 462008 102968 88228 S   0.7   5.1   0:01.48 qterminal
  994 kali        20   0 215548   3080  2684 S   0.3   0.2   0:01.33 VBoxClient
 1123 kali        20   0 300712  61704 19300 S   0.3   3.1   0:04.08 panel-13-cpugra
1125 kali        20   0 338100  27608 20656 S   0.3   1.4   0:02.89 panel-15-genmon
    1 root        20   0  22984  14368 10124 S   0.0   0.7   0:00.88 systemd
    2 root        20   0      0      0      0 S   0.0   0.0   0:00.01 kthreadd
    3 root        20   0      0      0      0 S   0.0   0.0   0:00.00 pool_workqueue+
    4 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_+
    5 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-sync+
    6 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-slub+
    7 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
    8 root        20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/0:0-in+
    9 root        20   0      0      0      0 I   0.0   0.0   0:00.25 kworker/0:1-mm+
   10 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-e+
   11 root        20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/u16:0-+
   12 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-mm_p+
   13 root        20   0      0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_kthr+
   14 root        20   0      0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_rude+
   15 root        20   0      0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_trac+
   16 root        20   0      0      0      0 S   0.0   0.0   0:00.03 ksoftirqd/0
   17 root        20   0      0      0      0 I   0.0   0.0   0:00.61 rcu_preempt
   18 root        20   0      0      0      0 S   0.0   0.0   0:00.00 rcu_exp_par_gp+
   19 root        20   0      0      0      0 S   0.0   0.0   0:00.04 rcu_exp_gp_kth+
   20 root        rt   0      0      0      0 S   0.0   0.0   0:00.04 migration/0
   21 root       -51   0      0      0      0 S   0.0   0.0   0:00.00 idle_inject/0
   22 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
   23 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
   24 root       -51   0      0      0      0 S   0.0   0.0   0:00.00 idle_inject/1
   25 root        rt   0      0      0      0 S   0.0   0.0   0:00.16 migration/1
   26 root        20   0      0      0      0 S   0.0   0.0   0:00.04 ksoftirqd/1
   28 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-e+
   29 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/2
   30 root       -51   0      0      0      0 S   0.0   0.0   0:00.00 idle_inject/2
   31 root        rt   0      0      0      0 S   0.0   0.0   0:00.20 migration/2
   32 root        20   0      0      0      0 S   0.0   0.0   0:00.03 ksoftirqd/2
   35 root        20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/3
   36 root       -51   0      0      0      0 S   0.0   0.0   0:00.00 idle_inject/3
   37 root        rt   0      0      0      0 S   0.0   0.0   0:00.22 migration/3
   38 root        20   0      0      0      0 S   0.0   0.0   0:00.03 ksoftirqd/3
   40 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/3:0H-e+
   41 root        20   0      0      0      0 I   0.0   0.0   0:01.19 kworker/u17:0-+
   42 root        20   0      0      0      0 I   0.0   0.0   0:00.07 kworker/u18:0-+
   47 root        20   0      0      0      0 S   0.0   0.0   0:00.01 kdevtmpfs
   48 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-inet+
   49 root        20   0      0      0      0 I   0.0   0.0   0:00.02 kworker/u17:1-+
   50 root        20   0      0      0      0 S   0.0   0.0   0:00.00 kauditd
   51 root        20   0      0      0      0 S   0.0   0.0   0:00.00 khungtaskd
   52 root        20   0      0      0      0 S   0.0   0.0   0:00.00 oom_reaper
   54 root        0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-writ+
   55 root        20   0      0      0      0 S   0.0   0.0   0:00.18 kcompactd0
   56 root        25   5      0      0      0 S   0.0   0.0   0:00.00 ksmd
   57 root        39  19      0      0      0 S   0.0   0.0   0:00.33 khugepaged
```

du:

Displays the disk usage of the current directory and its subdirectories in a human-readable format, showing the size of each directory.

du -h:

Displays the disk usage of the current directory in a human-readable format (e.g., KB, MB, GB).

du -sh:

Displays the total disk usage of the current directory (sum of all files and subdirectories) in a human-readable format, without listing individual subdirectories.

du -a:

Displays the disk usage of all files and directories recursively, rather than just directories.

```
kali@kali: ~  
File Actions Edit View Help  
$ du  
4 ./Desktop  
8 ./java/.userPrefs/burp  
12 ./java/.userPrefs  
16 ./java  
4 ./Templates  
4 ./Public  
4 ./Music  
4 ./mozilla/firefox/Pending Pings  
4 ./mozilla/firefox/26cd90b4.default  
4 ./mozilla/firefox/Crash Reports/events  
12 ./mozilla/firefox/Crash Reports  
4 ./mozilla/firefox/6y4i524b.default-esr/minidumps  
4 ./mozilla/firefox/6y4i524b.default-esr/extension-store-menus  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/temporary  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3870112724  
rsegmnoittet-es.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1451318868  
ntouromlalnody--eprc.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2918063365  
piupsah.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2823318777  
ntouromlalnody--naod.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3561288849  
sdhlie.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1657114595  
AmcateirvtiSty.files  
1184 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb  
1192 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome  
1196 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/default  
1336 ./mozilla/firefox/6y4i524b.default-esr/storage  
4 ./mozilla/firefox/6y4i524b.default-esr/settings  
4 ./mozilla/firefox/6y4i524b.default-esr/security.state  
4 ./mozilla/firefox/6y4i524b.default-esr/extension-store  
4 ./mozilla/firefox/6y4i524b.default-esr/crashes/events  
12 ./mozilla/firefox/6y4i524b.default-esr/crashes  
4 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean/db  
4 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean/events  
4 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean/pending_pings  
20 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean  
32 ./mozilla/firefox/6y4i524b.default-esr/datareporting  
4 ./mozilla/firefox/6y4i524b.default-esr/sessionstore-backups  
4 ./mozilla/firefox/6y4i524b.default-esr/bookmarkbackups  
13220 ./mozilla/firefox/6y4i524b.default-esr  
13256 ./mozilla/firefox  
4 ./mozilla/extensions  
13264 ./mozilla  
4 ./Downloads  
4 ./local/share/icc  
8 ./local/share/nautilus/scripts  
12 ./local/share/nautilus  
4 ./local/share/Trash/files  
4 ./local/share/Trash/info  
16 ./local/share/Trash/expunged  
4 ./local/share/Trash  
76 ./local/share/Mousepad  
4 ./local/share/gvfs-metadata  
4 ./local/share/nano
```

```
kali@kali: ~  
File Actions Edit View Help  
$ du -a  
4 ./Desktop  
4 ./vboxclient-seamless-tty7-service.pid  
4 ./vboxclient-vmvga-session-tty7-control.pid  
4 ./zshrc  
4 ./java/.userPrefs/burp/prefs.xml  
8 ./java/.userPrefs/burp  
12 ./java/.userPrefs  
16 ./java  
4 ./zsh_history  
4 ./Templates  
4 ./Public  
4 ./Music  
8 ./xsession-errors.old  
4 ./zprofile  
8 ./bashrc  
4 ./vboxclient-seamless-tty7-control.pid  
4 ./dmrc  
8 ./xsession-errors  
4 ./vboxclient-clipboard-tty7-control.pid  
4 ./bashrc.original  
4 ./mozilla/firefox/Pending Pings  
4 ./mozilla/firefox/26cd90b4.default/times.json  
8 ./mozilla/firefox/26cd90b4.default  
4 ./mozilla/firefox/26cd90b4.default/InstallTime20241021193311  
4 ./mozilla/firefox/Crash Reports/events  
12 ./mozilla/firefox/Crash Reports  
4 ./mozilla/firefox/profiles.ini  
4 ./mozilla/firefox/6y4i524b.default-esr/storage.sqlite  
4 ./mozilla/firefox/6y4i524b.default-esr/minidumps  
96 ./mozilla/firefox/6y4i524b.default-esr/bounce-tracking-protection.sqlite  
4 ./mozilla/firefox/6y4i524b.default-esr/extension-store-menus  
4 ./mozilla/firefox/6y4i524b.default-esr/addons.json  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/temporary  
128 ./mozilla/firefox/6y4i524b.default-esr/storage/ls-archive.sqlite  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/.metadata-v2  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3870112724  
rsegmnoittet-es.files  
916 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3870112724  
rsegmnoittet-es.sqlite  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1451318868  
ntouromlalnody--eprc.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2823318777  
ntouromlalnody--naod.sqlite  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2918063365  
piupsah.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2918063365  
piupsah.sqlite  
48 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1657114595  
AmcateirvtiSty.sqlite  
0 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2918063365  
piupsah.sqlite-wal  
0 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3561288849  
sdhlie.sqlite-wal  
0 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1657114595  
AmcateirvtiSty.sqlite-wal  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2823318777  
ntouromlalnody--naod.files
```

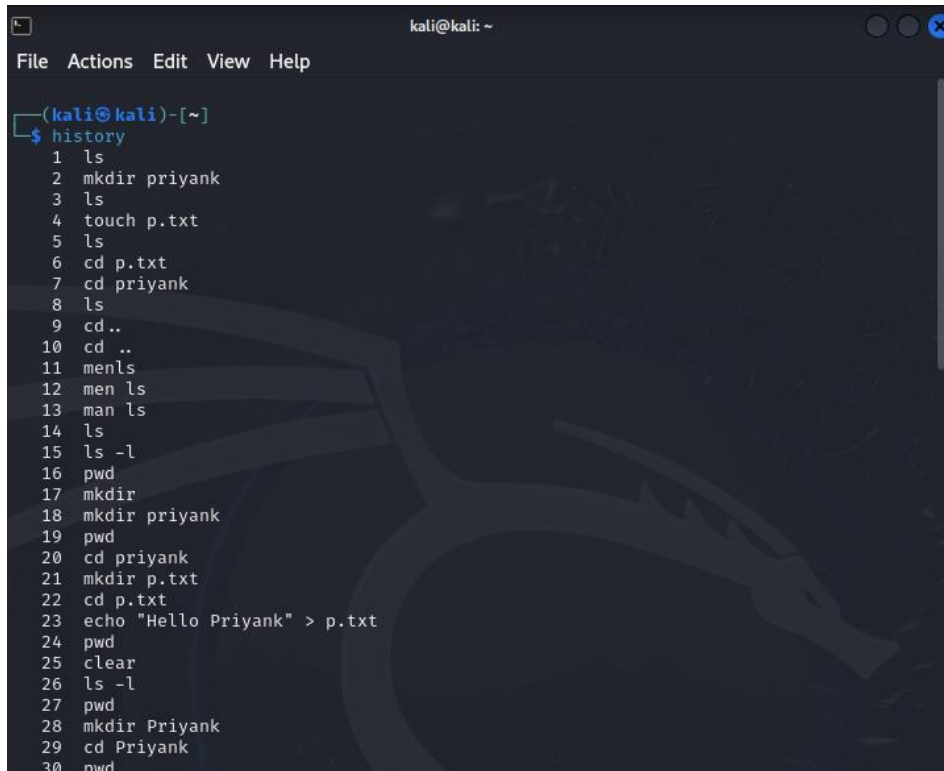
```
kali@kali: ~  
File Actions Edit View Help  
$ du -c  
4 ./Desktop  
8 ./java/.userPrefs/burp  
12 ./java/.userPrefs  
16 ./java  
4 ./Templates  
4 ./Public  
4 ./Music  
4 ./mozilla/firefox/Pending Pings  
4 ./mozilla/firefox/26cd90b4.default  
4 ./mozilla/firefox/Crash Reports/events  
12 ./mozilla/firefox/Crash Reports  
4 ./mozilla/firefox/6y4i524b.default-esr/minidumps  
4 ./mozilla/firefox/6y4i524b.default-esr/extension-store-menus  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/temporary  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3870112724  
rsegmnoittet-es.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1451318868  
ntouromlalnody--eprc.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2918063365  
piupsah.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/2823318777  
ntouromlalnody--naod.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/3561288849  
sdhlie.files  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb/1657114595  
AmcateirvtiSty.files  
1184 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome/ldb  
1192 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent/chrome  
1196 ./mozilla/firefox/6y4i524b.default-esr/storage/permanent  
4 ./mozilla/firefox/6y4i524b.default-esr/storage/default  
1336 ./mozilla/firefox/6y4i524b.default-esr/storage  
4 ./mozilla/firefox/6y4i524b.default-esr/settings  
4 ./mozilla/firefox/6y4i524b.default-esr/security.state  
4 ./mozilla/firefox/6y4i524b.default-esr/extension-store  
4 ./mozilla/firefox/6y4i524b.default-esr/crashes/events  
12 ./mozilla/firefox/6y4i524b.default-esr/crashes  
4 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean/db  
4 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean/events  
4 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean/pending_pings  
20 ./mozilla/firefox/6y4i524b.default-esr/datareporting/glean  
32 ./mozilla/firefox/6y4i524b.default-esr/datareporting  
12 ./mozilla/firefox/6y4i524b.default-esr/sessionstore-backups  
4 ./mozilla/firefox/6y4i524b.default-esr/bookmarkbackups  
13220 ./mozilla/firefox/6y4i524b.default-esr  
13256 ./mozilla/firefox  
4 ./mozilla/extensions  
13264 ./mozilla  
4 ./Downloads  
4 ./local/share/icc  
8 ./local/share/nautilus/scripts  
12 ./local/share/nautilus  
4 ./local/share/Trash/files  
4 ./local/share/Trash/info  
16 ./local/share/Trash/expunged  
4 ./local/share/Trash  
76 ./local/share/Mousepad  
4 ./local/share/gvfs-metadata
```

history:

Displays the list of previously executed commands in the current shell session, showing their command numbers.

history N:

Displays the last N commands from the history. For example, history 10 shows the last 10 commands.



```
kali@kali: ~  
File Actions Edit View Help  
  
(kali@kali)-[~]  
$ history  
1  ls  
2  mkdir priyank  
3  ls  
4  touch p.txt  
5  ls  
6  cd p.txt  
7  cd priyank  
8  ls  
9  cd ..  
10 cd ..  
11 menls  
12 men ls  
13 man ls  
14 ls  
15 ls -l  
16 pwd  
17 mkdir  
18 mkdir priyank  
19 pwd  
20 cd priyank  
21 mkdir p.txt  
22 cd p.txt  
23 echo "Hello Priyank" > p.txt  
24 pwd  
25 clear  
26 ls -l  
27 pwd  
28 mkdir Priyank  
29 cd Priyank  
30 pwd
```

df:

Displays the disk space usage for all mounted filesystems, showing the total space, used space, available space, and mount points.

df -h:

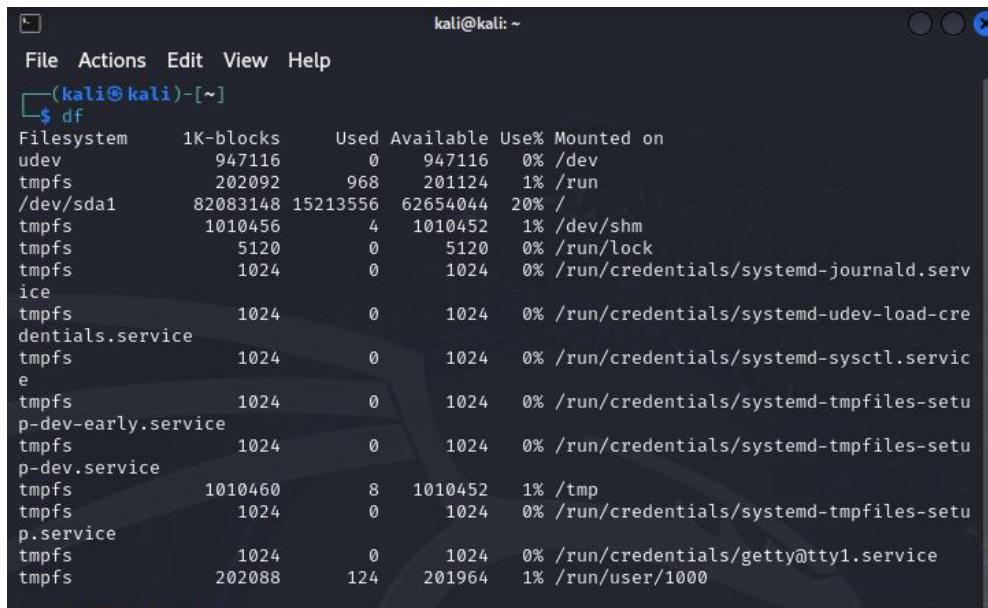
Displays the disk space usage in a human-readable format (e.g., KB, MB, GB), making it easier to understand the sizes.

df -a:

Displays disk space usage for all filesystems, including those with 0 blocks (e.g., virtual filesystems).

df -T:

Displays the type of each filesystem along with its usage information (e.g., ext4, xfs, etc.).



```
kali@kali: ~  
File Actions Edit View Help  
~(kali@kali)-[~]  
$ df  
Filesystem      1K-blocks    Used Available Use% Mounted on  
udev            947116         0    947116   0% /dev  
tmpfs           202092         968    201124   1% /run  
/dev/sda1       82083148 15213556 62654044 20% /  
tmpfs           1010456         4    1010452   1% /dev/shm  
tmpfs            5120         0      5120   0% /run/lock  
tmpfs           1024         0       1024   0% /run/credentials/systemd-journald.serv  
ice  
tmpfs           1024         0       1024   0% /run/credentials/systemd-udev-load-cre  
dentials.service  
tmpfs           1024         0       1024   0% /run/credentials/systemd-sysctl.servic  
e  
tmpfs           1024         0       1024   0% /run/credentials/systemd-tmpfiles-setu  
p-dev-early.service  
tmpfs           1024         0       1024   0% /run/credentials/systemd-tmpfiles-setu  
p-dev.service  
tmpfs           1010460         8    1010452   1% /tmp  
tmpfs           1024         0       1024   0% /run/credentials/systemd-tmpfiles-setu  
p.service  
tmpfs           1024         0       1024   0% /run/credentials/getty@tty1.service  
tmpfs           202088        124    201964   1% /run/user/1000
```

clear:

Clears the terminal screen, removing all previous commands and output, giving you a clean workspace.

shutdown:

Initiates a system shutdown after a default delay (usually one minute). The system will start the process of turning off.

ifconfig:

Displays the network interfaces on the system, along with details like the IP address, netmask, broadcast address, and MAC address for each active interface.

ifconfig -a:

Displays all network interfaces, including inactive ones. This is useful for seeing all interfaces even if they are not currently up.

```
kali@kali: ~  
File Actions Edit View Help  
  
(kali@kali)-[~]  
$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::a3c0:49a5:4961:2a37 prefixlen 64 scopeid 0x20<link>  
    inet6 fd00::4e91:8ba2:5361:d9d5 prefixlen 64 scopeid 0x0<global>  
    ether 08:00:27:6e:13:6e txqueuelen 1000 (Ethernet)  
    RX packets 8 bytes 3006 (2.9 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 32 bytes 4635 (4.5 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0x10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 8 bytes 480 (480.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 8 bytes 480 (480.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

echo "Hello, World!":

Prints the text Hello, World! to the terminal. echo is commonly used to display simple strings.

echo \$HOME:

Displays the value of the environment variable HOME, which contains the path to the current user's home directory.

echo \$PATH:

Displays the current system PATH variable, which shows the directories where executable files are located.

echo -n "Hello, World!":

Prints Hello, World! without a trailing newline. Normally, echo adds a newline after the output, but -n prevents this.

echo "This is a line" >> file.txt:

Appends the text This is a line to a file named file.txt. The >> operator appends, while > would overwrite the file.

```
kali@kali: ~/Patel/Priyank/X.txt  
File Actions Edit View Help  
  
(kali@kali)-[~]  
$ cd Patel  
  
(kali@kali)-[~/Patel]  
$ cd Priyank  
  
(kali@kali)-[~/Patel/Priyank]  
$ cd X.txt  
  
(kali@kali)-[~/Patel/Priyank/X.txt]  
$ echo "Hii Priyank"  
Hii Priyank
```

cal:

Displays the current month's calendar.

cal 2025:

Displays the calendar for the year 2025.

cal 12 2025:

Displays the calendar for December 2025. You can specify any month and year in the format month year.

cal -3:

Displays a three-month calendar: the previous month, the current month, and the next month.

cal -j:

Displays the calendar with Julian dates (the day of the year) included. For example, the first day of the year is 001, the second day is 002, etc.

```
(kali@kali)-[~/Patel/Priyank/X.txt]
$ cal
Command 'cal' not found, but can be installed with:
sudo apt install ncal
Do you want to install it? (N/y)y
sudo apt install ncal
Error: Unable to locate package ncal
```

passwd:

Changes the password for the current user. The system will prompt you to enter a new password and confirm it.

passwd username:

Changes the password for the specified user (username). This command must be run with superuser (root) privileges to change another user's password.

passwd -l username:

Locks the specified user's account, preventing them from logging in. The user will not be able to authenticate until the account is unlocked.

passwd -u username:

Unlocks a previously locked user account, allowing the user to log in again.

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~/Patel/Priyank/X.txt]
$ passwd
Changing password for kali.
Current password:
passwd: Authentication token manipulation error
passwd: password unchanged
```

free:

Displays the total, used, free, and available memory in the system, showing both physical RAM and swap space.

free -h:

Displays the memory usage in a human-readable format (e.g., KB, MB, GB), making it easier to understand the memory statistics.

free -m:

Displays the memory usage in megabytes (MB), providing more precise memory usage details in a unit that's easier to read than the default kilobytes (KB).

free -g:

Displays the memory usage in gigabytes (GB).

```
kali@kali: ~/Patel/Priyank/X.txt
File Actions Edit View Help

(kali@kali)-[~/Patel/Priyank/X.txt]
$ free
              total        used        free      shared  buff/cache   available
Mem:      2020916       768344       923948        22616        495420       1252572
Swap:      1048572           0       1048572
```

comm file1.txt file2.txt:

Compares two sorted files (file1.txt and file2.txt) line by line and outputs three columns:

- Lines only in file1.txt
- Lines only in file2.txt

- Lines that are common to both files

comm -1 file1.txt file2.txt:

Suppresses the first column (lines only in file1.txt), displaying only the common lines and lines from file2.txt.

comm -2 file1.txt file2.txt:

Suppresses the second column (lines only in file2.txt), showing only the common lines and lines from file1.txt.

```
(kali㉿kali)-[~/Patel/Priyank/X.txt]
$ comm P.txt ABC.txt
      Hello Priyank
```

groups:

Displays the groups that the current user is a member of.

groups username:

Displays the groups that a specific user (username) is a member of.

groups -v:

Displays verbose group information, showing not only the groups but also the group IDs (GIDs).

groups user1 user2:

Displays the groups for multiple users (user1 and user2) at once.

groups username | cut -d ' ' -f 1:

Displays only the first group from the list of groups for a specific user (username).

```
(kali㉿kali)-[~/Patel/Priyank/X.txt]
$ groups
kali adm dialout cdrom floppy sudo audio dip video plugdev users netdev bluetooth scanner lpadmin wireshark kaboxer vboxsf

(kali㉿kali)-[~/Patel/Priyank/X.txt]
$ groups root
root : root
```