

OPERATING SYSTEM LAB

ASSIGNMENT – 1

TITLE -:

Implement the following basic Commands used in LINUX, UNIX, OS (Also perform all the commands with their switches as assignment). **ls, man, pwd, who, whoami, date, cal, mkdir, rm, rmdir, cat, head, tail, more, less, cp, mv, echo.**

Submitted by -: **Priyanshu Vishwakarma**

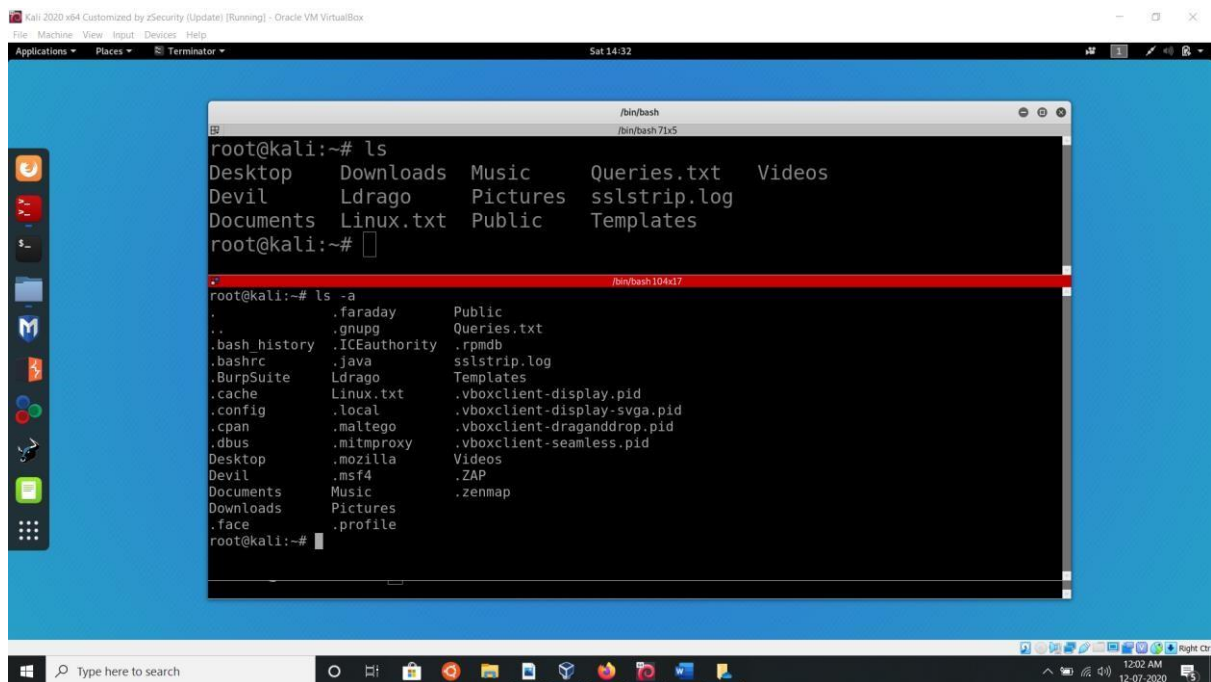
Subject -: **Operating System - LAB**

Submitted to -: **Ms. NIDHI**

ls -: The **ls** command will list the files and directories within the current working directory. There are a few options you can use with **ls**, and the format, or syntax of the command is....

SYNTAX -:

ls [options] [file]



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the output of the 'ls' and 'ls -a' commands. The 'ls' command lists the contents of the current directory, and the 'ls -a' command lists all files, including hidden ones.

```
root@kali:~# ls
Desktop  Downloads  Music      Queries.txt  Videos
Devil    Ldrago     Pictures   sslstrip.log
Documents Linux.txt   Public     Templates

root@kali:~#

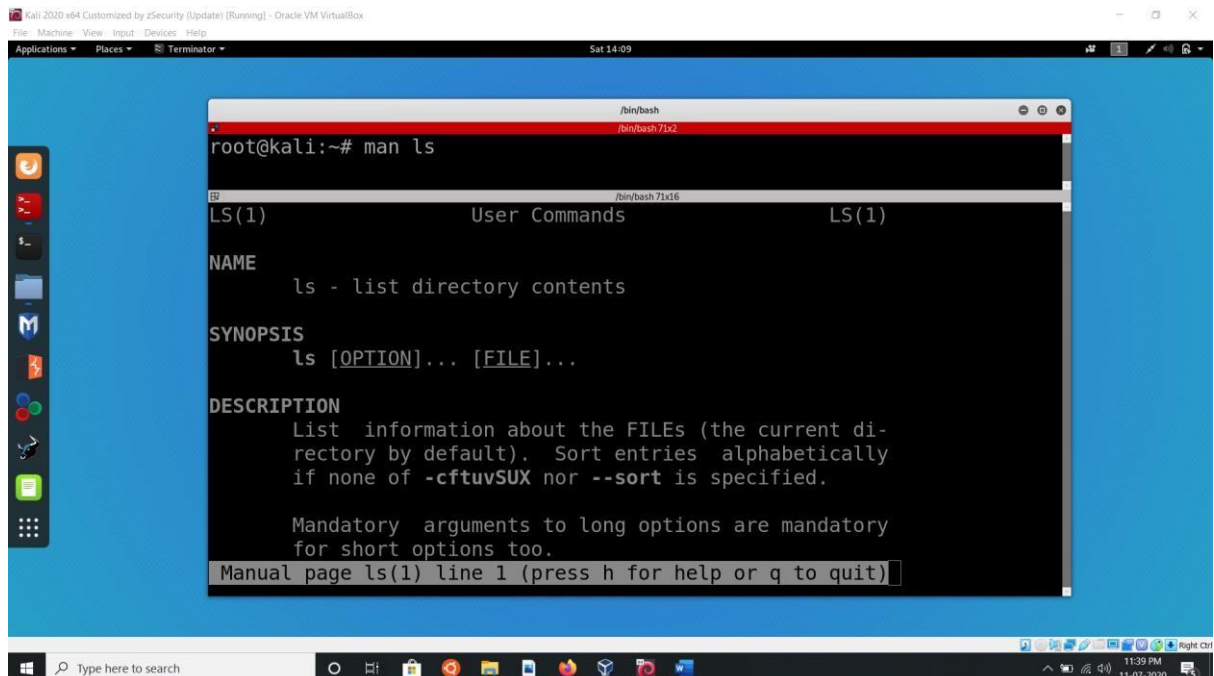
root@kali:~# ls -a
.          .faraday      Public
..         .gnupg        Queries.txt
.bash_history .ICEauthority .rpmdb
.bashrc     .java         sslstrip.log
.BurpSuite  Ldrago        Templates
.cache      Linux.txt     .vboxclient-display.pid
.config     .local        .vboxclient-display.svga.pid
.cpan       .maltego     .vboxclient-draganddrop.pid
.dbus       .mitmproxy   .vboxclient-seamless.pid
Desktop     .mozilla     Videos
Devil       .msf4        .ZAP
Documents   Music        .zenmap
Downloads   Pictures
.face       .profile

root@kali:~#
```

man -: **man** is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command which includes **Name, Synopsis, Description, Options, Exit, Status, Return Values, Errors, Files, Version, Examples.....etc.**

SYNTAX -:

man [command name]



The screenshot shows a terminal window titled "/bin/bash" with the command "man ls" entered. The output displays the manual page for "ls(1)", categorized as "User Commands". The manual page includes sections for NAME, SYNOPSIS, and DESCRIPTION. The NAME section states "ls - list directory contents". The SYNOPSIS section shows "ls [OPTION]... [FILE]...". The DESCRIPTION section explains that "ls" lists information about files in the current directory by default, sorting entries alphabetically unless specified otherwise with options like -cftuvSUX or --sort. It also notes that mandatory arguments to long options are mandatory for short options too. The bottom of the terminal shows "Manual page ls(1) line 1 (press h for help or q to quit)".

```
root@kali:~# man ls

LS(1)                                User Commands                                LS(1)

NAME
    ls - list directory contents

SYNOPSIS
    ls [OPTION]... [FILE]...

DESCRIPTION
    List information about the FILES (the current di-
    rectory by default). Sort entries alphabetically
    if none of -cftuvSUX nor --sort is specified.

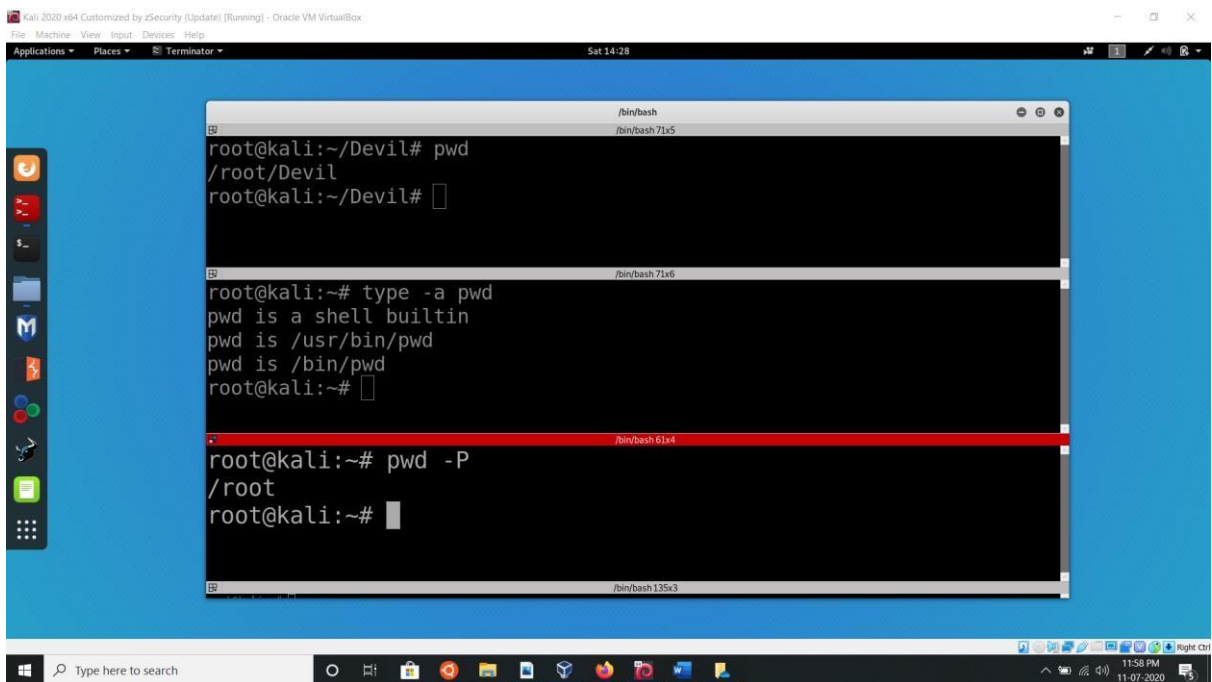
    Mandatory arguments to long options are mandatory
    for short options too.

Manual page ls(1) line 1 (press h for help or q to quit)
```

pwd -: **pwd** stands for Print Working Directory. It prints the full path of the working directory, starting from the root.

SYNTAX -:

pwd [OPTION]



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and their outputs:

```
root@kali:~/Devil# pwd
/root/Devil
root@kali:~/Devil#

root@kali:~# type -a pwd
pwd is a shell builtin
pwd is /usr/bin/pwd
pwd is /bin/pwd
root@kali:~#

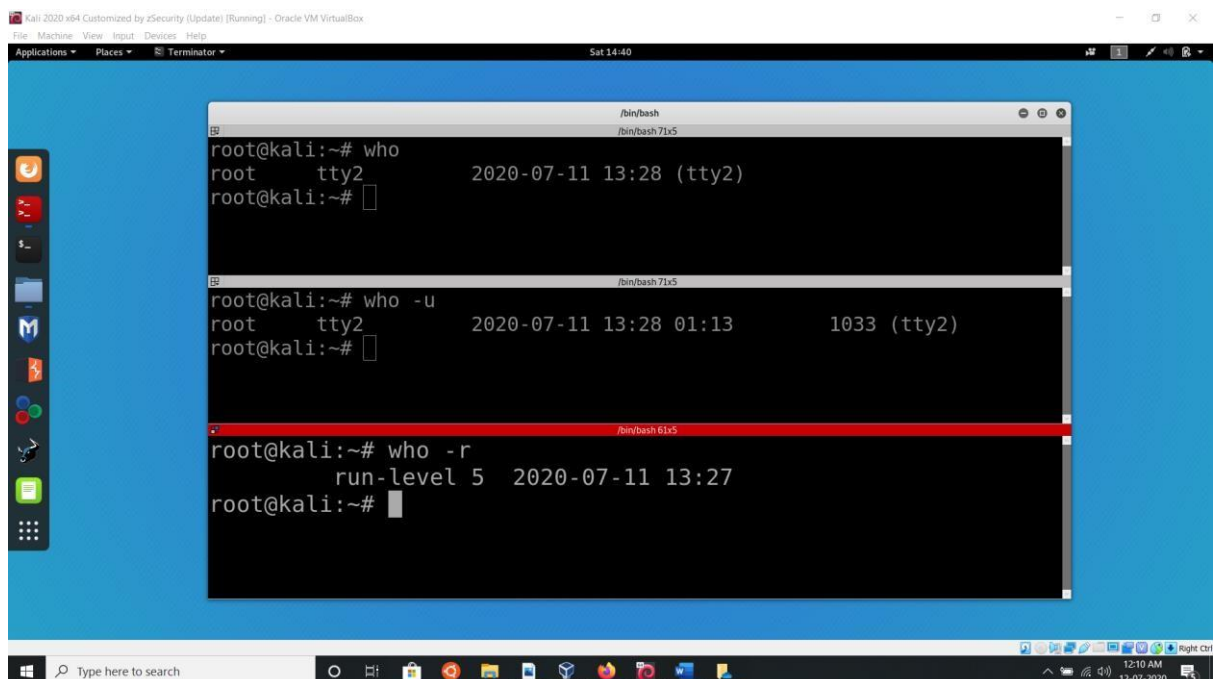
root@kali:~# pwd -P
/root
root@kali:~#
```

The terminal window is titled "/bin/bash" and shows the current directory as "/root/Devil". The output of the `pwd` command is `/root/Devil`. The `type -a pwd` command shows that `pwd` is a shell builtin and also exists in `/usr/bin/pwd` and `/bin/pwd`. The `pwd -P` command shows the physical path `/root`.

who -: The standard Unix command who displays a list of users who are currently logged into the computer. The **who** command is related to the command w, which provides the same information but also displays additional data and statistics.

SYNTAX - :

who [options] [filename]



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the output of three 'who' commands:

```
root@kali:~# who
root    tty2      2020-07-11 13:28 (tty2)
root@kali:~#

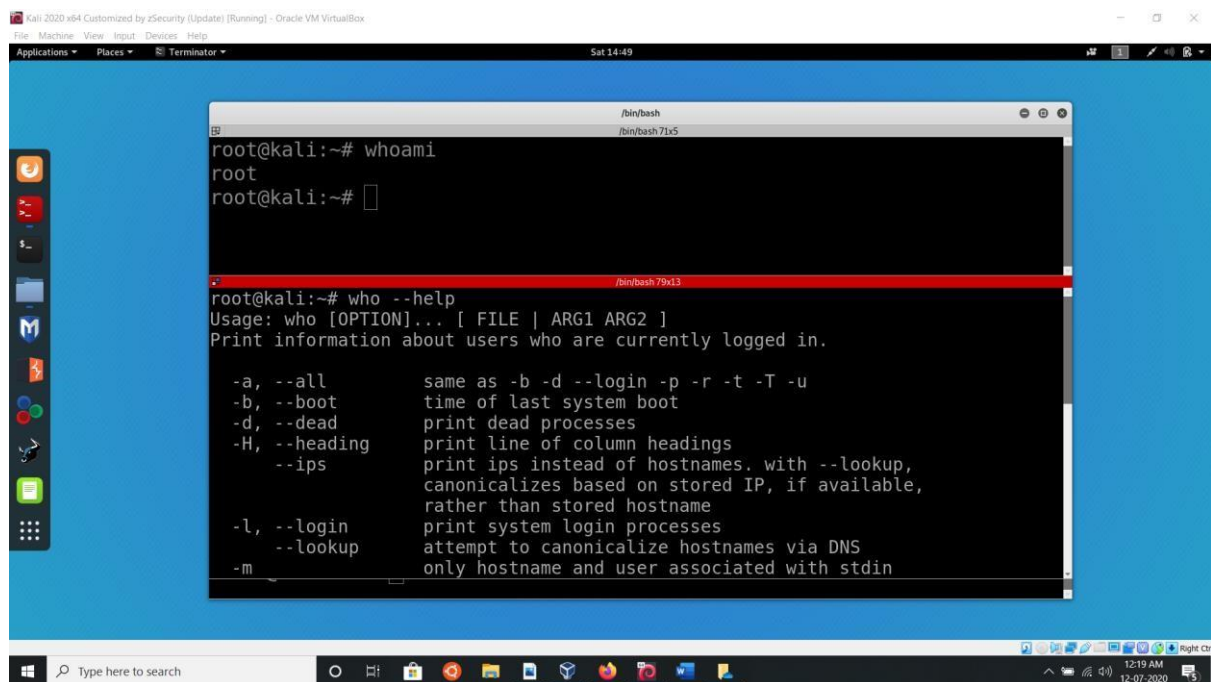
root@kali:~# who -u
root    tty2      2020-07-11 13:28 01:13      1033 (tty2)
root@kali:~#

root@kali:~# who -r
run-level 5  2020-07-11 13:27
root@kali:~#
```

whoami -: **whoami** command is used both in Unix Operating System and as well as in Windows Operating System. It is basically the concatenation of the strings “**who**”, “**am**”, “**i**” as whoami. It displays the username of the current user when this command is invoked.

SYNTAX - :

whoami [OPTION]



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and their outputs:

```
root@kali:~# whoami
root
root@kali:~#
```

Below this, the terminal shows the help text for the `who` command:

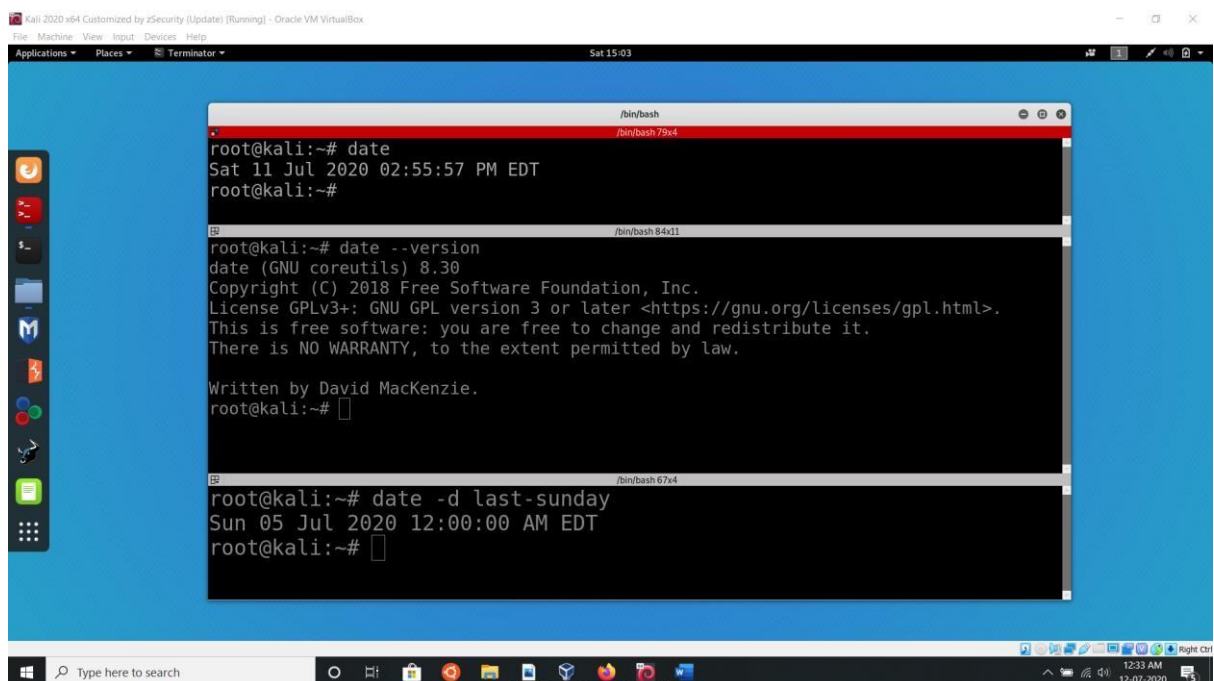
```
root@kali:~# who --help
Usage: who [OPTION]... [ FILE | ARG1 ARG2 ]
Print information about users who are currently logged in.

-a, --all           same as -b -d --login -p -r -t -T -u
-b, --boot          time of last system boot
-d, --dead          print dead processes
-H, --heading       print line of column headings
--ips              print ips instead of hostnames. with --lookup,
                  canonicalizes based on stored IP, if available,
                  rather than stored hostname
-l, --login         print system login processes
--lookup           attempt to canonicalize hostnames via DNS
-m                only hostname and user associated with stdin
```

date -: **date** command is used to display the system date and time. date command is also used to set date and time of the system. By default the date command displays the date in the time zone on which unix/linux operating system is configured.

SYNTAX - :

date [OPTION]... [+FORMAT]



```
Kali 2020 x64 Customized by zSecurity (Update) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminator Sat 15:03

root@kali:~# date
Sat 11 Jul 2020 02:55:57 PM EDT
root@kali:~#

root@kali:~# date --version
date (GNU coreutils) 8.30
Copyright (C) 2018 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

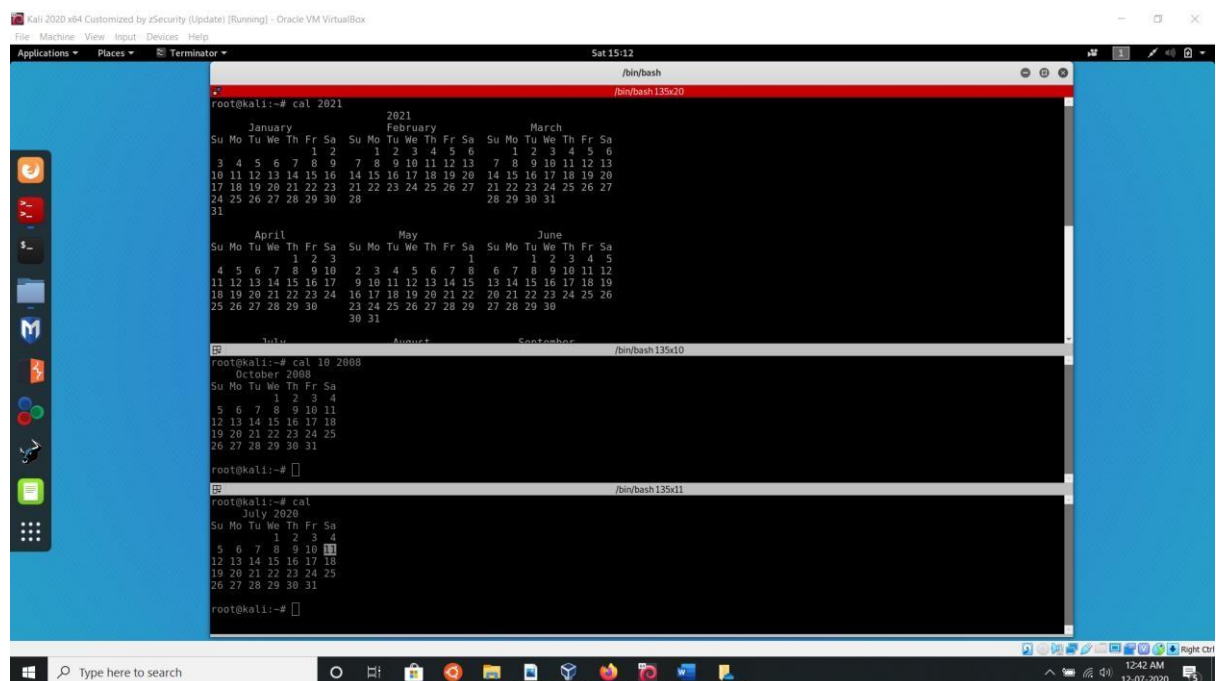
Written by David MacKenzie.
root@kali:~#

root@kali:~# date -d last-sunday
Sun 05 Jul 2020 12:00:00 AM EDT
root@kali:~#
```

cal -: **cal** command is a calendar command in Linux which is used to see the calendar of a specific month or a whole year.

SYNTAX - :

cal [[month] year]



```
Kali 2020 x64 Customized by zSecurity (Update) [Running] - Oracle VM VirtualBox
root@kali:~# cal 2021
      2021
January February March
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
1 2 1 2 3 4 5 6 1 2 3 4 5 6
3 4 5 6 7 8 9 7 8 9 10 11 12 13 7 8 9 10 11 12 13
10 11 12 13 14 15 16 14 15 16 17 18 19 20 14 15 16 17 18 19 20
17 18 19 20 21 22 23 21 22 23 24 25 26 27 21 22 23 24 25 26 27
24 25 26 27 28 29 30 28 29 30 31
31

April May June
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
1 2 3 1 1 2 3 4 5
4 5 6 7 8 9 10 2 3 4 5 6 7 8 6 7 8 9 10 11 12
11 12 13 14 15 16 17 9 10 11 12 13 14 15 13 14 15 16 17 18 19
18 19 20 21 22 23 24 16 17 18 19 20 21 22 20 21 22 23 24 25 26
25 26 27 28 29 30 23 24 25 26 27 28 29 27 28 29 30

July August September
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa 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
19 20 21 22 23 24 25 26 27 28 29 30 27 28 29 30
26 27 28 29 30 31

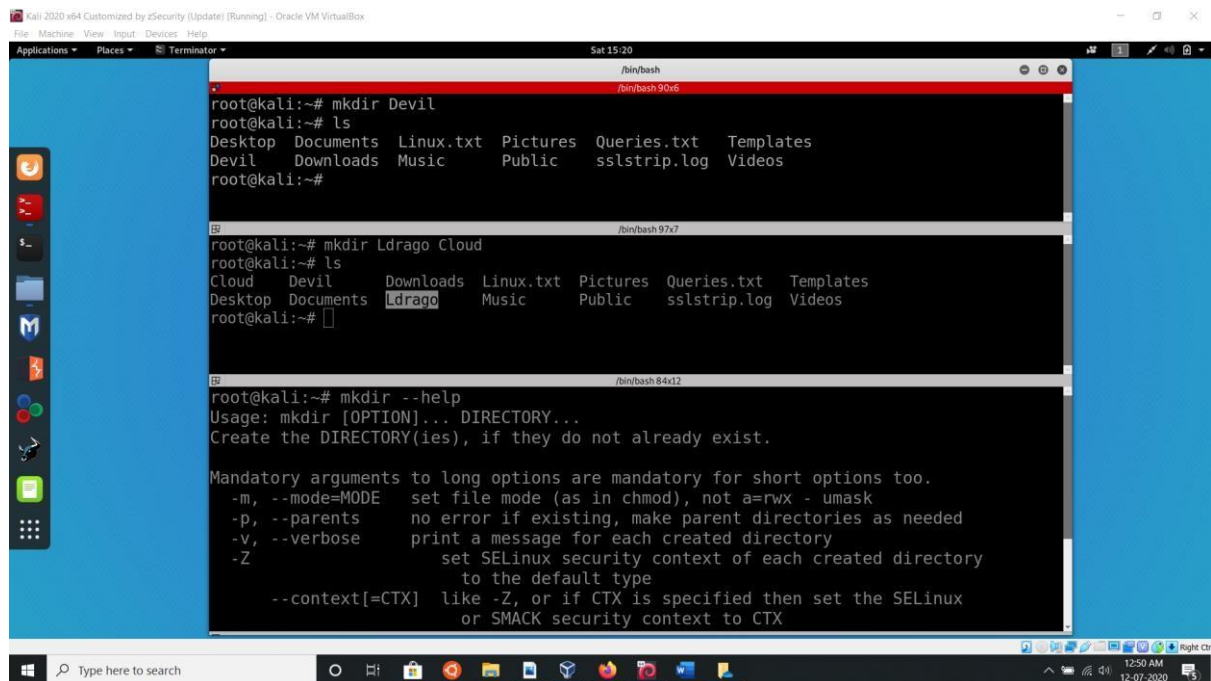
root@kali:~# cal
      July 2020
Su Mo Tu We Th Fr Sa
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

root@kali:~#
```


mkdir -: **mkdir** command in Linux allows the user to create directories This command can create multiple directories at once as well as set the permissions for the directories.

SYNTAX - :

mkdir [options...] [directories ...]



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# mkdir Devil
root@kali:~# ls
Desktop  Documents  Linux.txt  Pictures  Queries.txt  Templates
Devil    Downloads  Music     Public    sslstrip.log  Videos
root@kali:~#

root@kali:~# mkdir Ldrago Cloud
root@kali:~# ls
Cloud  Devil  Downloads  Linux.txt  Pictures  Queries.txt  Templates
Desktop Documents Ldrago    Music     Public    sslstrip.log  Videos
root@kali:~#

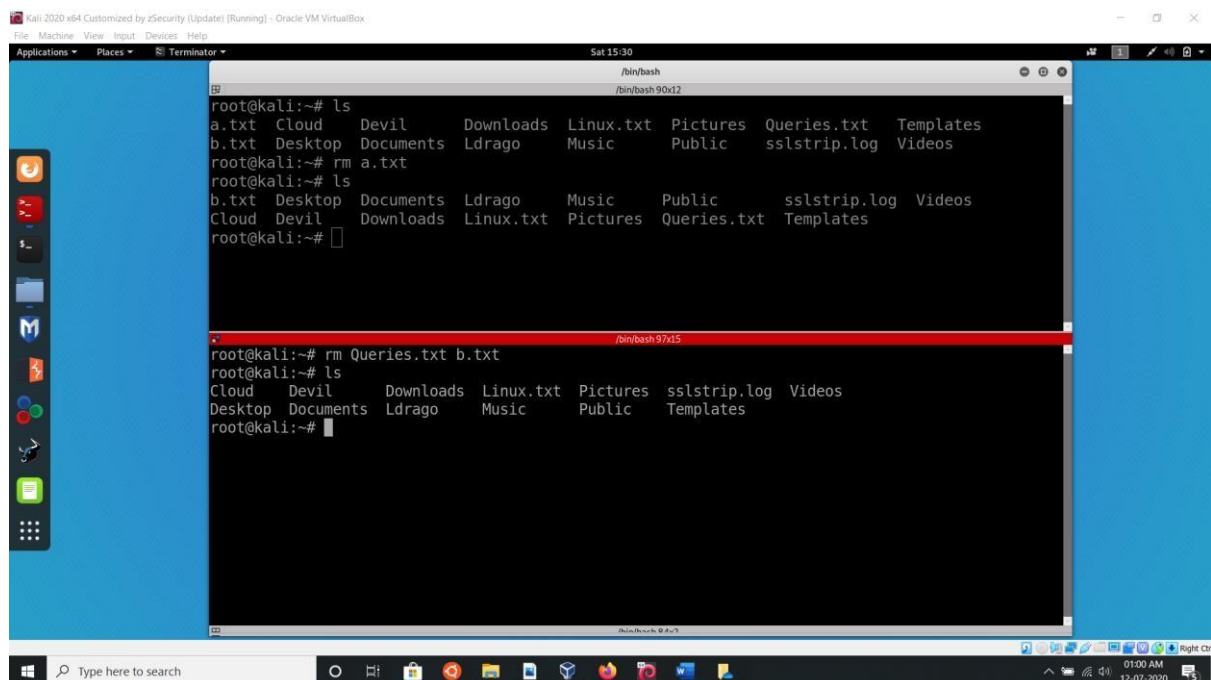
root@kali:~# mkdir --help
Usage: mkdir [OPTION]... DIRECTORY...
Create the DIRECTORY(ies), if they do not already exist.

Mandatory arguments to long options are mandatory for short options too.
-m, --mode=MODE  set file mode (as in chmod), not a=rwx - umask
-p, --parents    no error if existing, make parent directories as needed
-v, --verbose    print a message for each created directory
-Z             set SELinux security context of each created directory
               to the default type
--context[=CTX] like -Z, or if CTX is specified then set the SELinux
               or SMACK security context to CTX
```

rm -: **rm** command is used to remove objects such as files, directories, symbolic links and so on from the file system like UNIX. We remove multiple files at once.

SYNTAX - :

rm [OPTION]... FILE...



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# ls
a.txt Cloud Devil Downloads Linux.txt Pictures Queries.txt Templates
b.txt Desktop Documents Ldrago Music Public sslstrip.log Videos
root@kali:~# rm a.txt
root@kali:~# ls
b.txt Desktop Documents Ldrago Music Public sslstrip.log Videos
Cloud Devil Downloads Linux.txt Pictures Queries.txt Templates
root@kali:~#
```

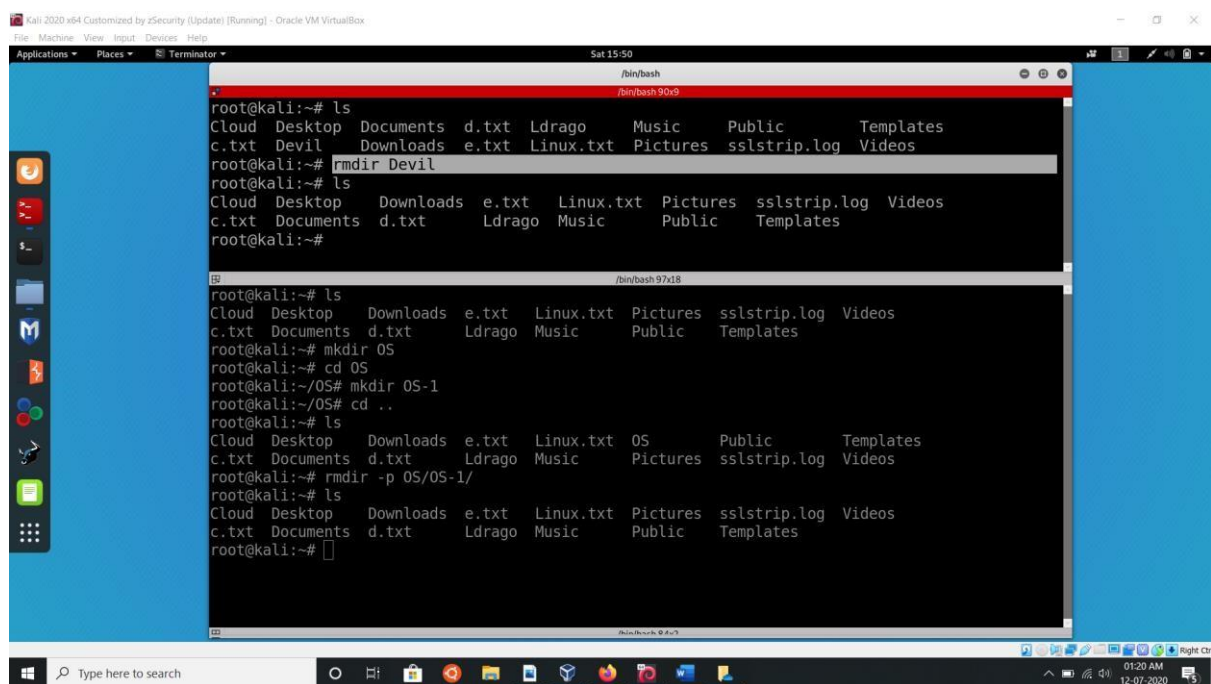
A second terminal window is also shown, displaying the command to remove multiple files:

```
root@kali:~# rm Queries.txt b.txt
root@kali:~# ls
Cloud Devil Downloads Linux.txt Pictures sslstrip.log Videos
Desktop Documents Ldrago Music Public Templates
root@kali:~#
```

rmdir -: **rmdir** command is used remove empty directories from the filesystem in Linux. The **rmdir** command removes each and every directory specified in the command line only if these directories are empty. So if the specified directory has some directories or files in it then this cannot be removed by **rmdir** command.

SYNTAX - :

rmdir [OPTION]...DIRECTORY...



```
Kali 2020 x64 Customized by zSecurity (Update) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminator Sat 15:50

root@kali:~# ls
Cloud Desktop Downloads e.txt Ldrago Music Public Templates
c.txt Devil Downloads e.txt Linux.txt Pictures sslstrip.log Videos
root@kali:~# rmdir Devil
root@kali:~# ls
Cloud Desktop Downloads e.txt Linux.txt Pictures sslstrip.log Videos
c.txt Documents d.txt Ldrago Music Public Templates
root@kali:~#

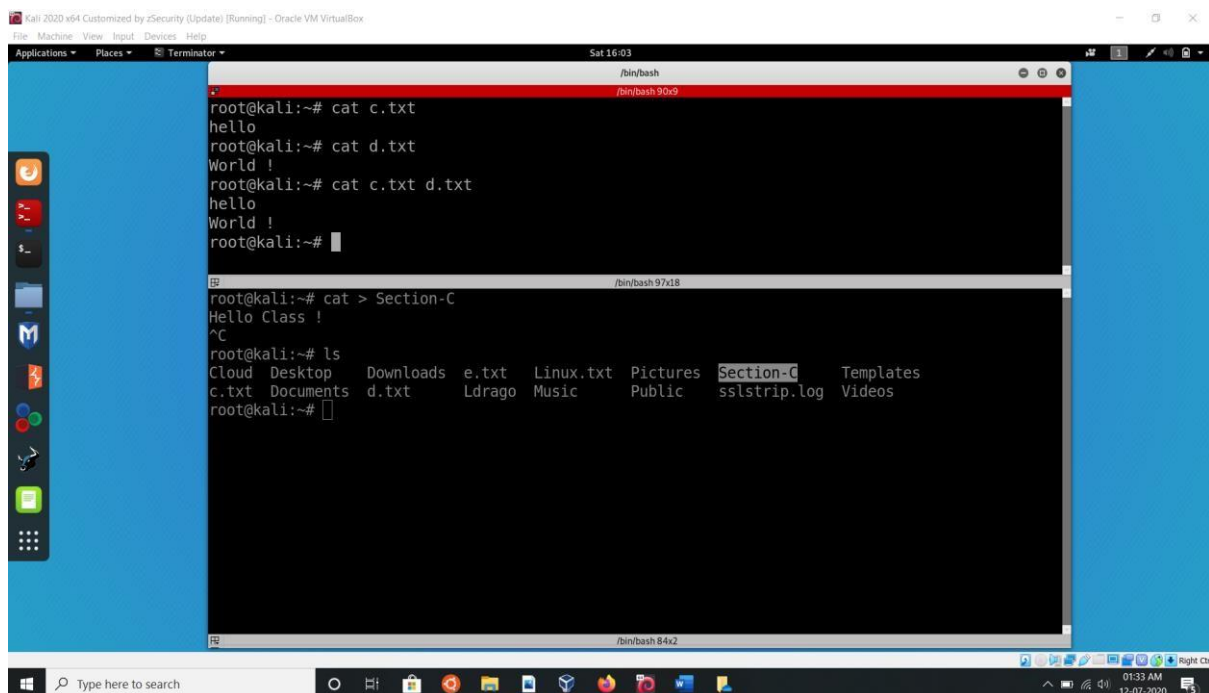
root@kali:~# ls
Cloud Desktop Downloads e.txt Linux.txt Pictures sslstrip.log Videos
c.txt Documents d.txt Ldrago Music Public Templates
root@kali:~# mkdir OS
root@kali:~# cd OS
root@kali:~/OS# mkdir OS-1
root@kali:~/OS# cd ..
root@kali:~# ls
Cloud Desktop Downloads e.txt Linux.txt OS Public Templates
c.txt Documents d.txt Ldrago Music Pictures sslstrip.log Videos
root@kali:~# rmdir -p OS/OS-1/
root@kali:~# ls
Cloud Desktop Downloads e.txt Linux.txt Pictures sslstrip.log Videos
c.txt Documents d.txt Ldrago Music Public Templates
root@kali:~#
```

cat -: **cat** command is very frequently used in Linux.

It reads data from the file and gives their content as output. It helps us to create, view, concatenate files. So let us see some frequently used **cat** commands. And also **cat** command can be used to join multiple files together and print the result on screen.

SYNTAX - :

cat [OPTION]... [FILE]...



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# cat c.txt
hello
root@kali:~# cat d.txt
World !
root@kali:~# cat c.txt d.txt
hello
World !
root@kali:~#

root@kali:~# cat > Section-C
Hello Class !
^C
root@kali:~# ls
Cloud Desktop  Downloads  e.txt  Linux.txt  Pictures  Section-C  Templates
c.txt Documents  d.txt    Ldrago    Music     Public     sslstrip.log  Videos
root@kali:~#
```

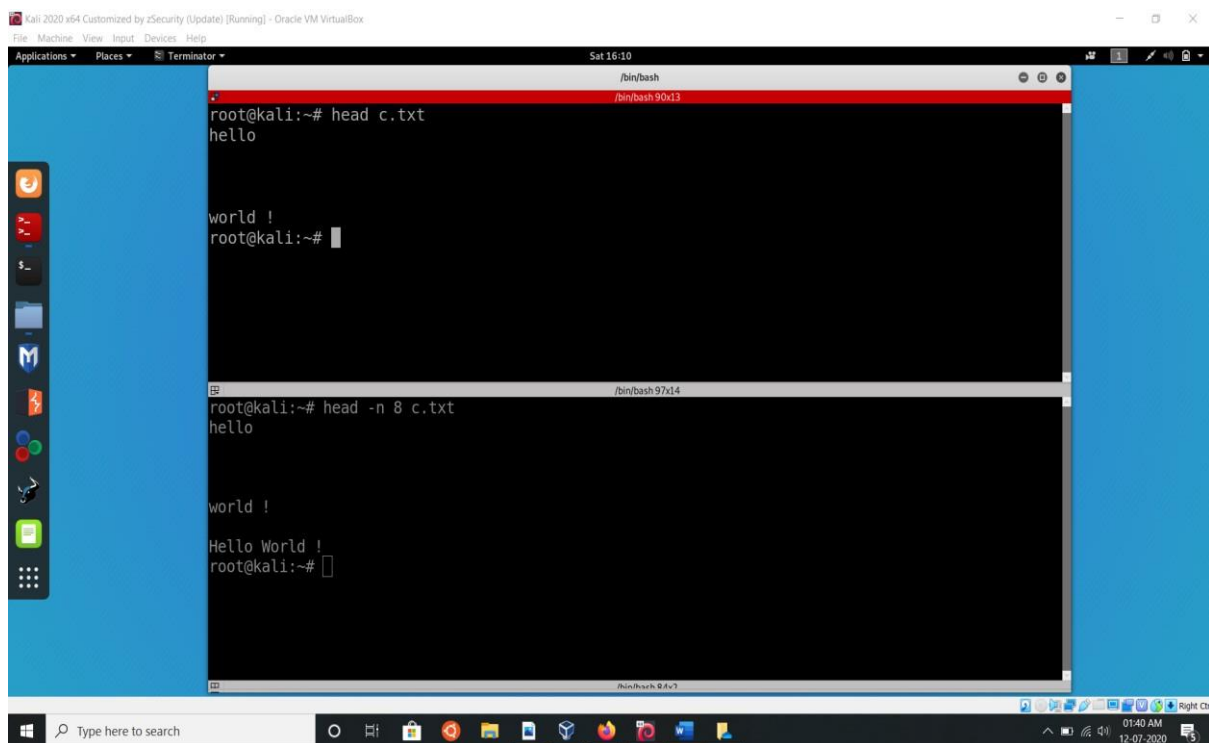
The terminal window is titled "Sat 16:03" and shows the output of the `cat` command for files `c.txt` and `d.txt`, and the output of the `cat > Section-C` command. The `ls` command output shows the contents of the current directory, including `Section-C`.

head -: It is the complementary of Tail command.

The **head** command, as the name implies, print the top N number of data of the given input. By default, it prints the first 10 lines of the specified files. If more than one file name is provided then data from each file is preceded by its file name.

SYNTAX - :

head [OPTION]... [FILE]...



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# head c.txt
hello

world !
root@kali:~#
```

Below this, another terminal window is shown with the command:

```
root@kali:~# head -n 8 c.txt
hello

world !

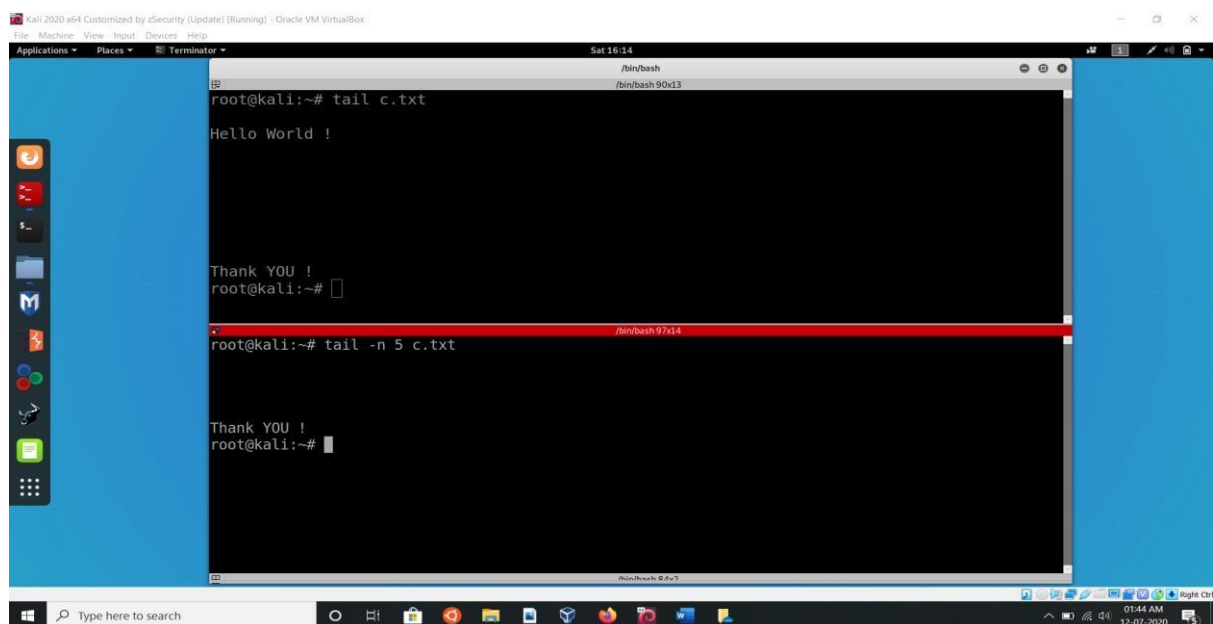
Hello World !
root@kali:~#
```

The terminal windows are titled "Sat 16:10" and "Terminator". The desktop background is blue, and the taskbar at the bottom shows various application icons and the system clock indicating 01:40 AM on 12-07-2020.

tail -: It is the complementary of head command. The **tail** command, as the name implies, print the last N number of data of the given input. By default it prints the last 10 lines of the specified files. If more than one file name is provided then data from each file is precedes by its file name.

SYNTAX - :

tail [OPTION]... [FILE]...



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# tail c.txt
Hello World !

Thank YOU !
root@kali:~#

root@kali:~# tail -n 5 c.txt

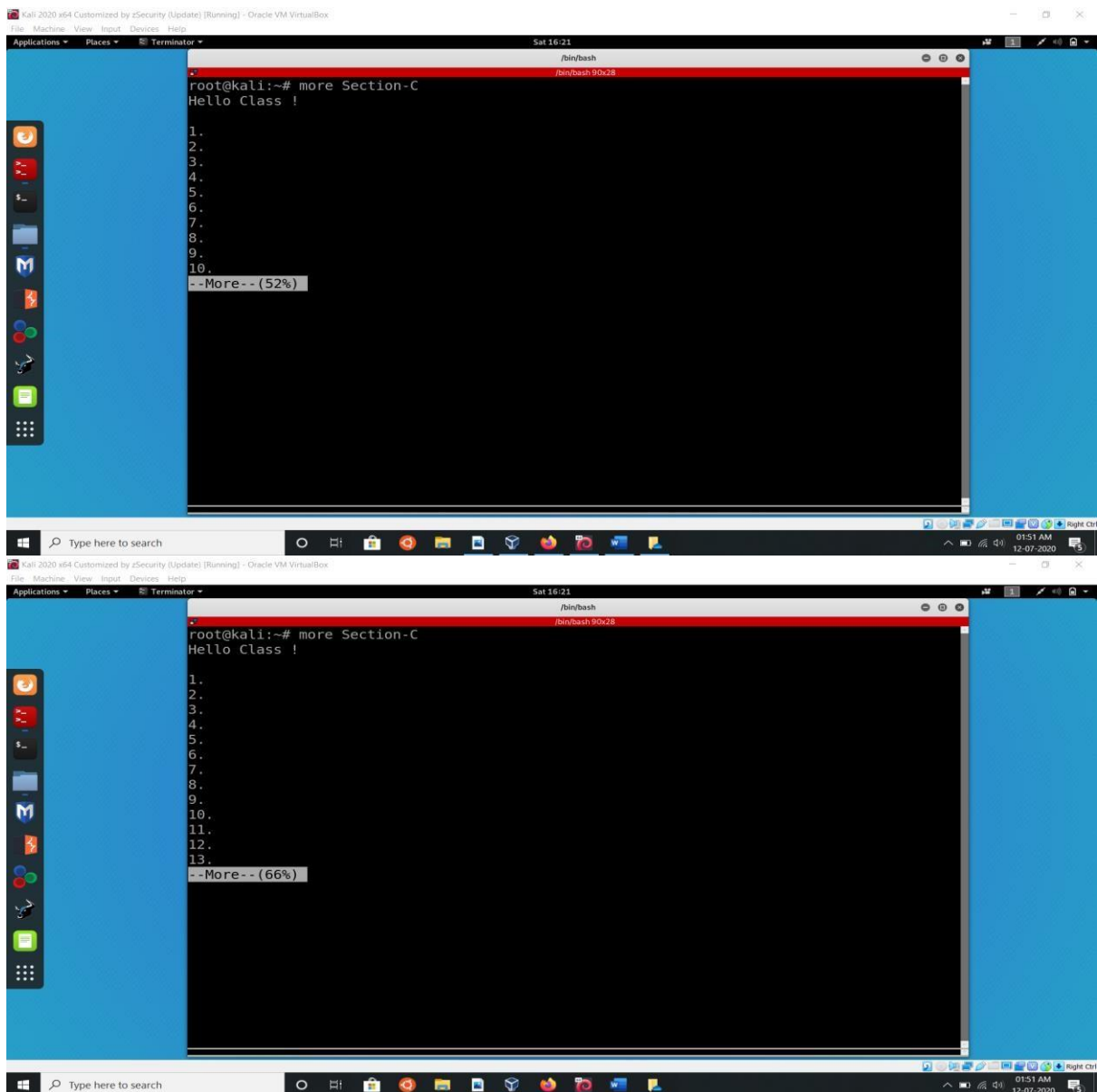
Thank YOU !
root@kali:~#
```

The terminal window has a title bar that reads "Sat 16:14" and "Terminator". The desktop background is blue, and the taskbar at the bottom shows various application icons and the system clock indicating 01:44 AM on 12-07-2020.

more -: **more** command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large. the more command also allows the user to scroll up and down through the page.

SYNTAX - :

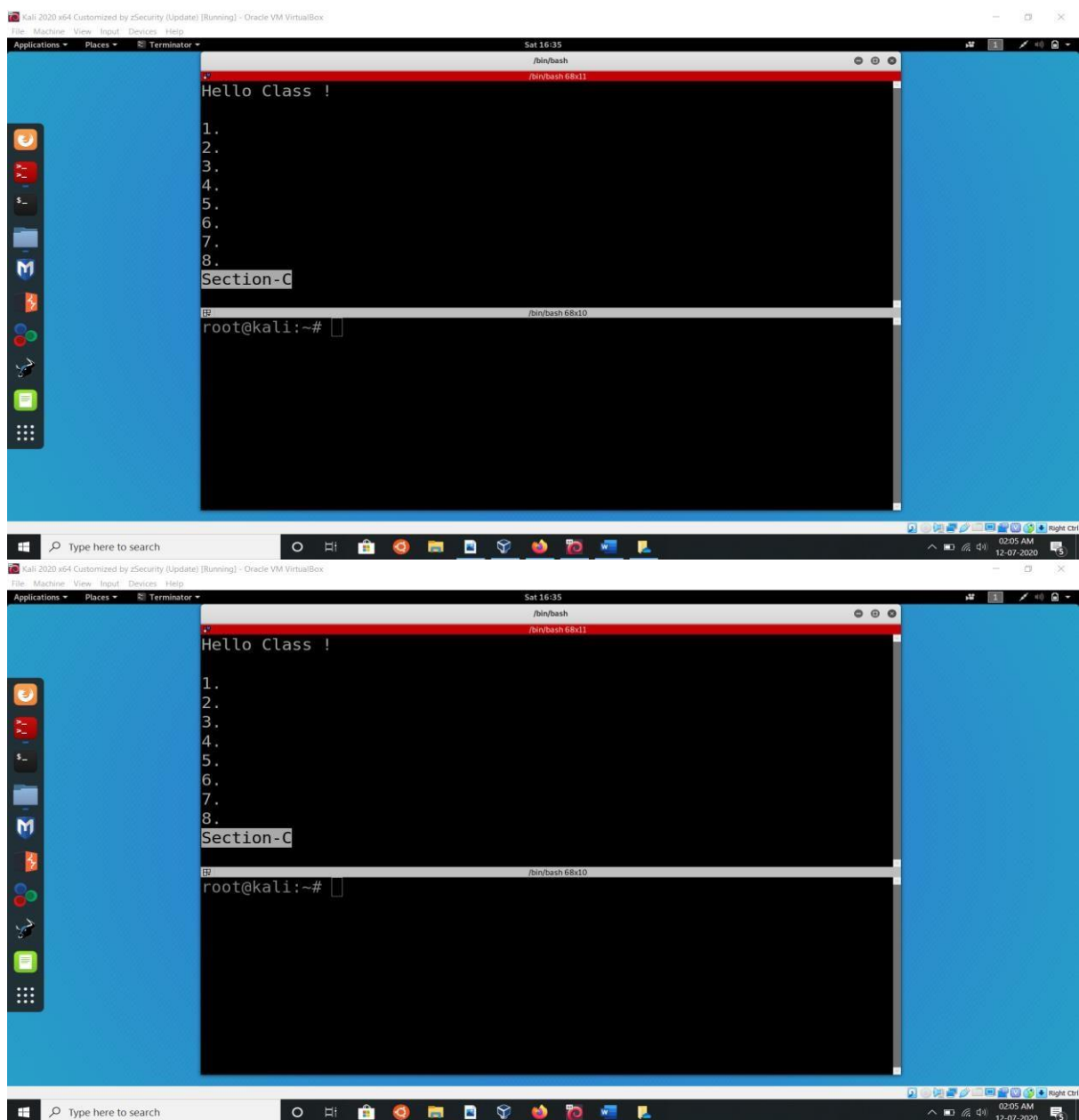
more [OPTION]... FILE...



less -: **less** command is linux utility which can be used to read contents of text file one page per time. It has faster access because if file is large, it doesn't access complete file, but access it page by page.

SYNTAX - :

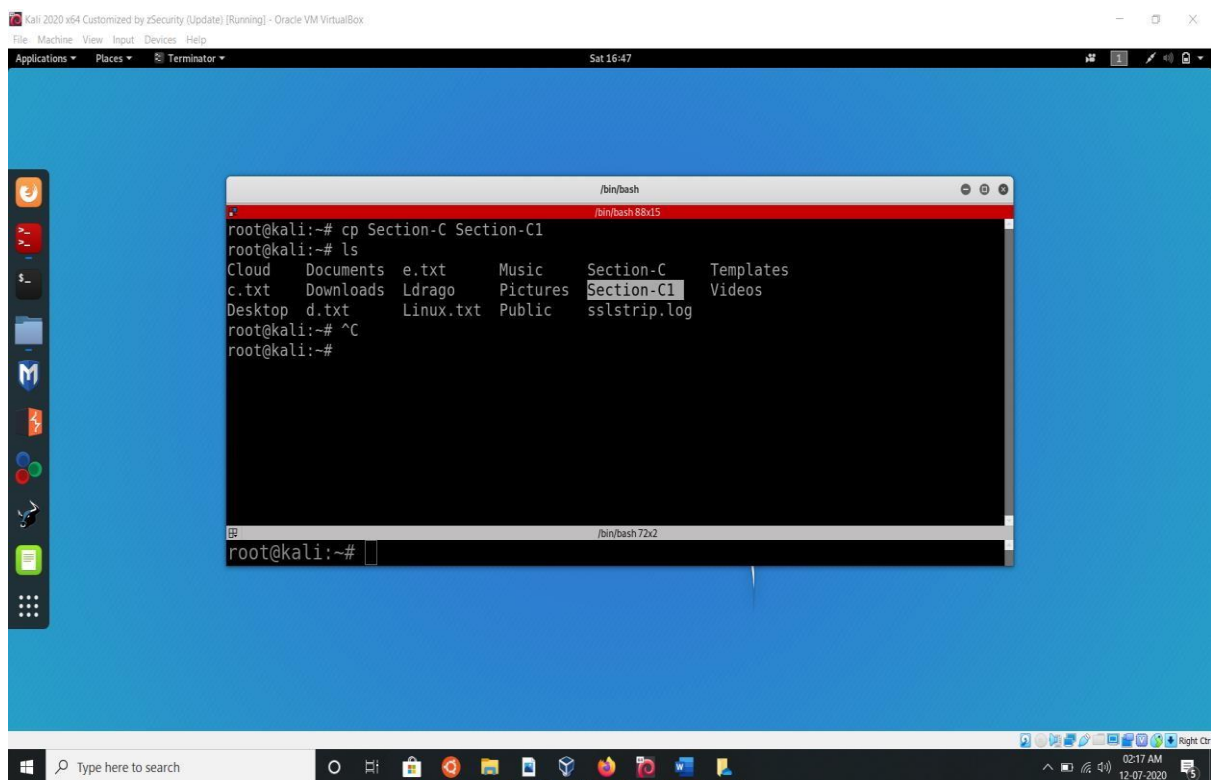
less Filename...



cp -: **cp** stands for copy. This command is used to copy files or group of files or directory. It creates an exact image of a file on a disk with different file name. **cp** command require at least two filenames in its arguments.

SYNTAX - :

cp [options] source dest..



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# cp Section-C Section-C1
root@kali:~# ls
Cloud  Documents  e.txt  Music  Section-C  Templates
c.txt  Downloads  Ldrago  Pictures  Section-C1  Videos
Desktop  d.txt  Linux.txt  Public  sslstrip.log
root@kali:~# ^C
root@kali:~#
```

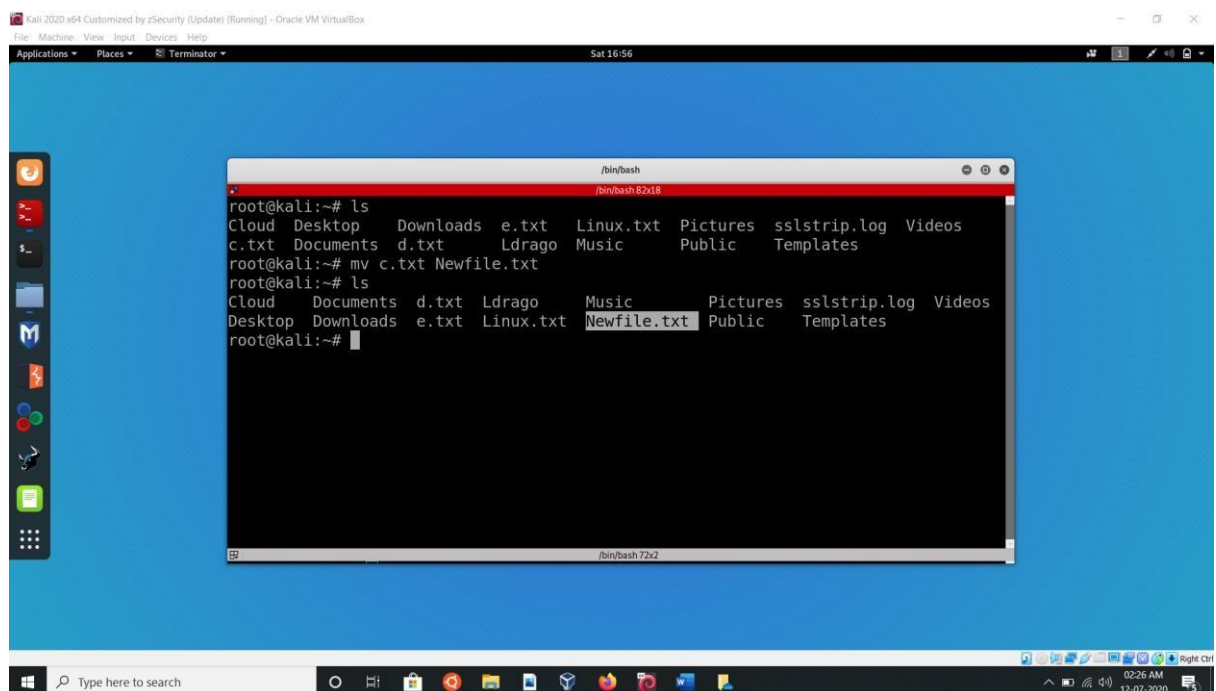
The terminal window has a title bar that reads "/bin/bash". The desktop background is blue, and the taskbar at the bottom shows various application icons and the system clock indicating 02:17 AM on 12-07-2020.

mv -: **mv** stands for move. mv is used to move one or more files or directories from one place to another in file system like UNIX. It has two distinct functions:

- (i) It rename a file or folder.
- (ii) It moves group of files to different directory. No additional space is consumed on a disk during renaming. This command normally works silently means no prompt for confirmation.

SYNTAX - :

mv [options] source dest..



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# ls
Cloud Desktop Downloads e.txt Linux.txt Pictures sslstrip.log Videos
c.txt Documents d.txt Ldrago Music Public Templates
root@kali:~# mv c.txt Newfile.txt
root@kali:~# ls
Cloud Documents d.txt Ldrago Music Pictures sslstrip.log Videos
Desktop Downloads e.txt Linux.txt Newfile.txt Public Templates
root@kali:~#
```

The terminal window is titled "/bin/bash" and shows the successful execution of the `mv` command to rename `c.txt` to `Newfile.txt`. The desktop background is blue, and the taskbar at the bottom shows various application icons and the system clock indicating 02:26 AM on 12-07-2020.

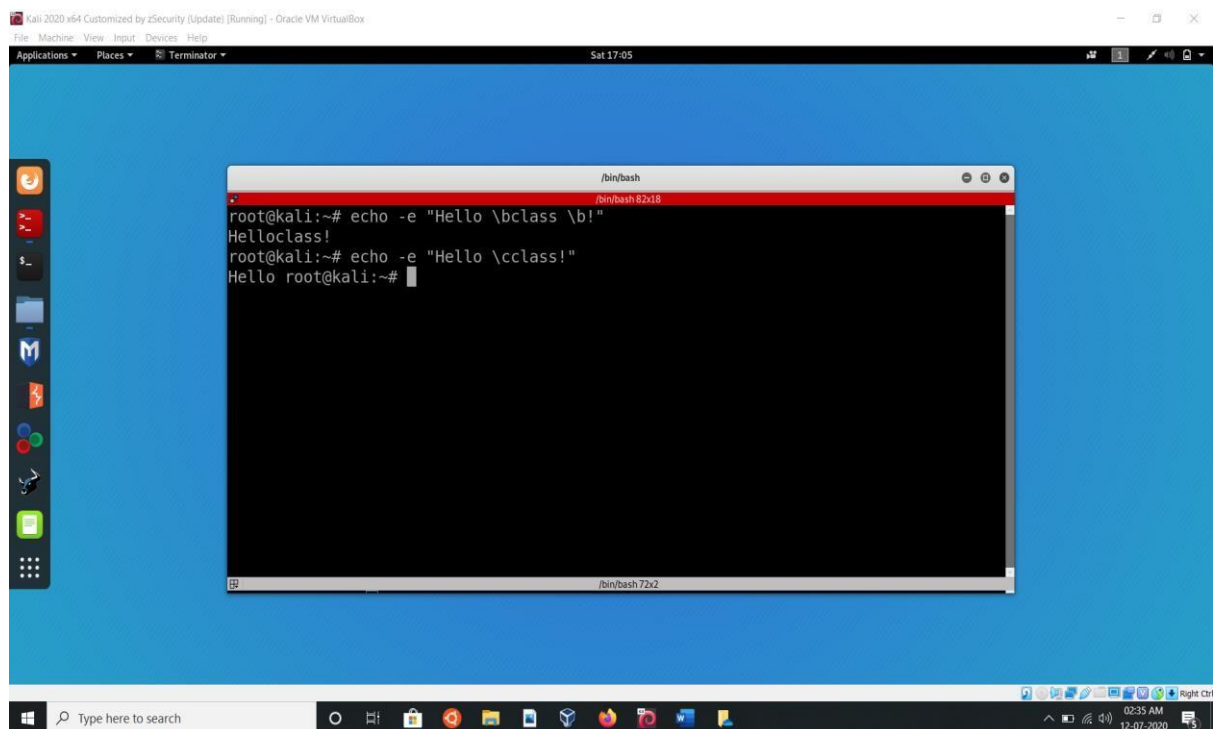
echo -: **echo** command in linux is used to display line of text/string that are passed as an argument . This is a built in command that is mostly used in shell scripts and batch files to output status text to the screen.

SYNTAX - :

echo [option] [string]

or

echo [string]



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal window has a title bar that reads "/bin/bash". The terminal content shows the following commands and output:

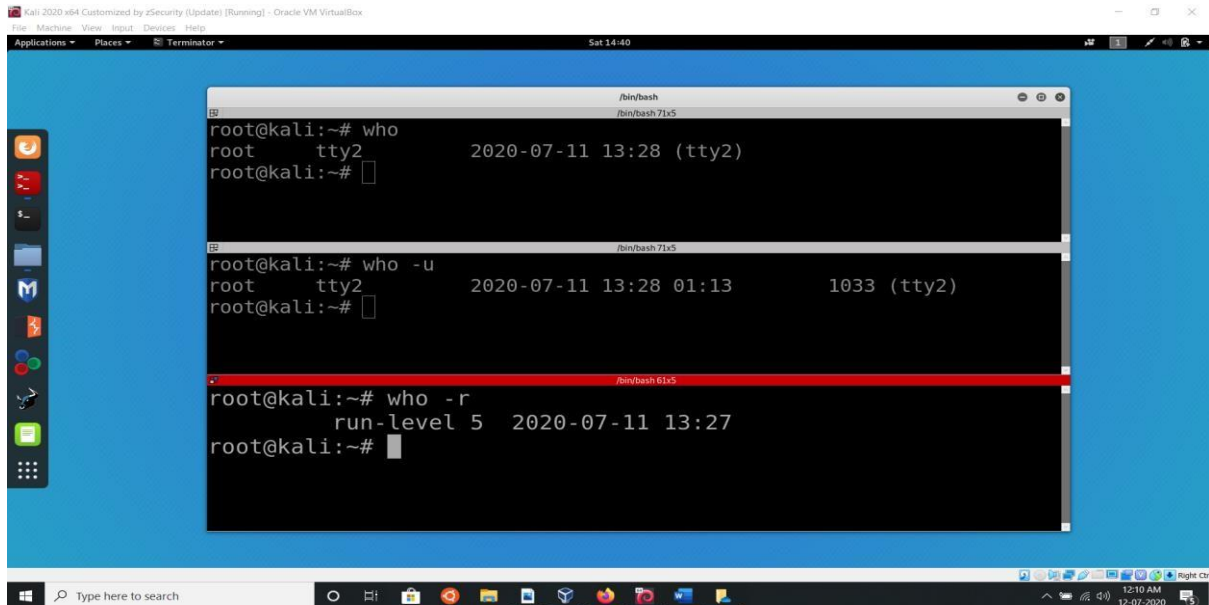
```
root@kali:~# echo -e "Hello \bclass \b!"
Hello\bclass\b!
root@kali:~# echo -e "Hello \cclass!"
Hello root@kali:~#
```

The terminal window is titled "/bin/bash" and shows the output of the echo command. The first command is "echo -e \"Hello \\bclass \\b!\"", which outputs "Hello\bclass\b!". The second command is "echo -e \"Hello \\cclass!\"", which outputs "Hello root@kali:~#".

QUERIES

A. Who is current user?

By Using **who** Command.



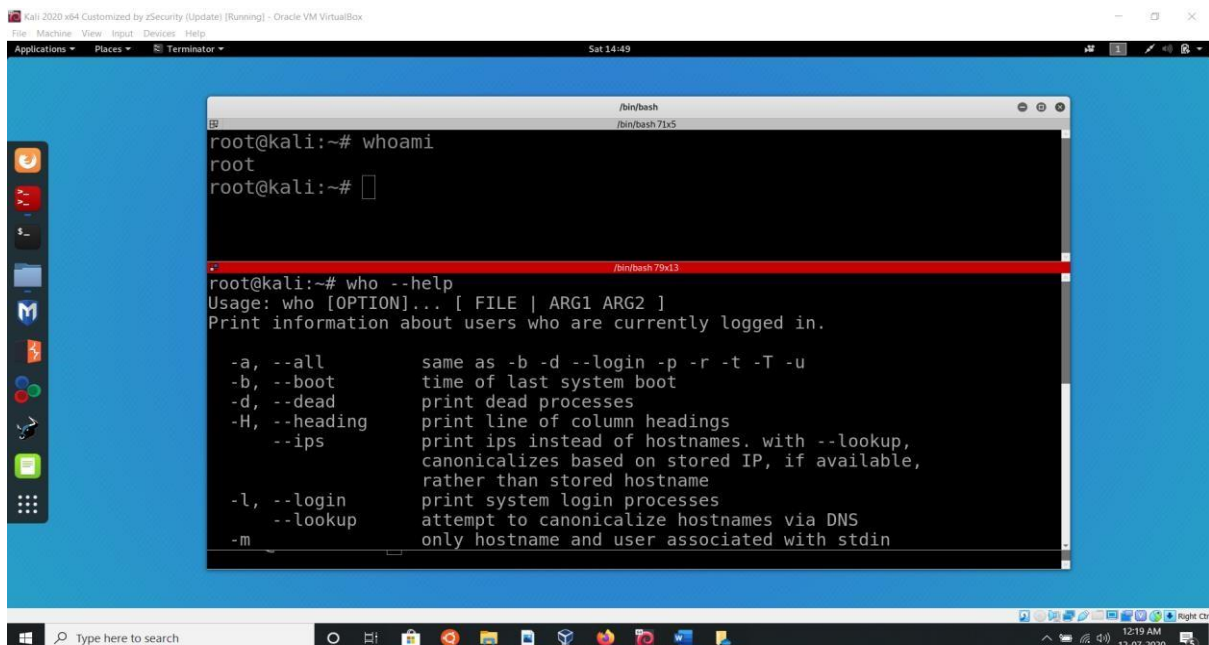
```
root@kali:~# who
root      tty2          2020-07-11 13:28 (tty2)
root@kali:~#

root@kali:~# who -u
root      tty2          2020-07-11 13:28 01:13      1033 (tty2)
root@kali:~#

root@kali:~# who -r
run-level 5  2020-07-11 13:27
root@kali:~#
```

B. What is current login name?

By Using **whoami** Command.



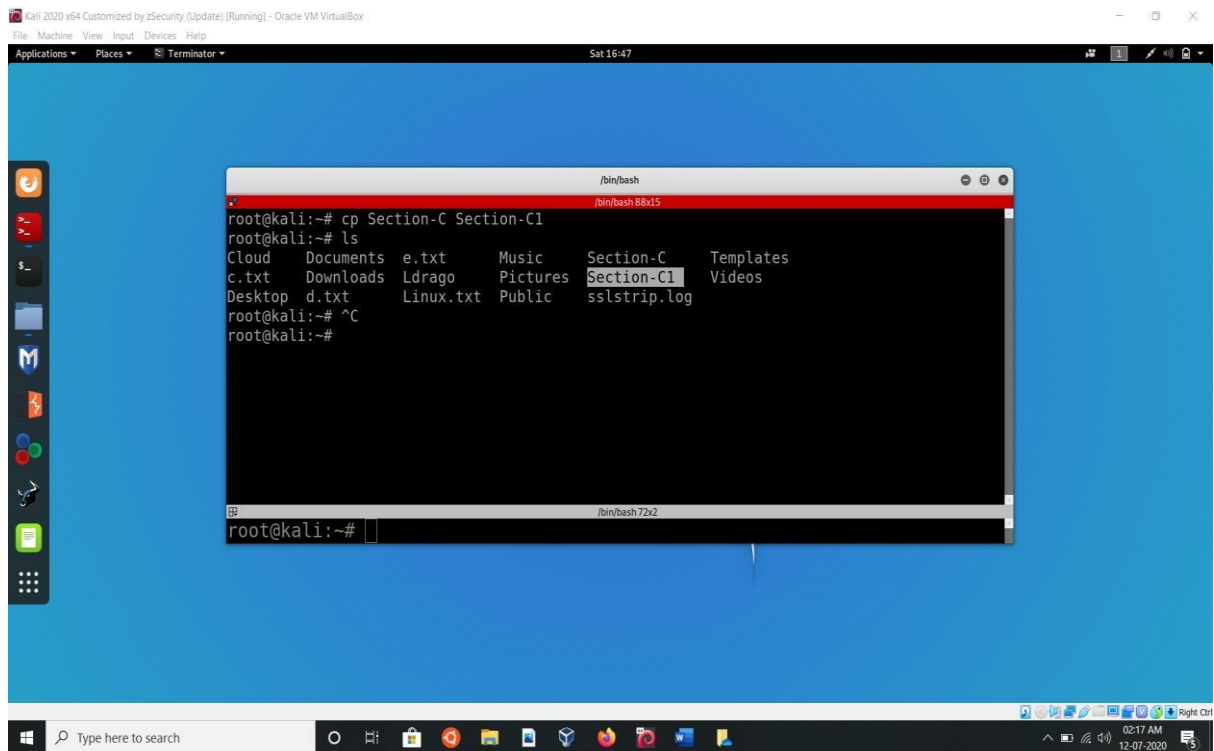
```
root@kali:~# whoami
root
root@kali:~#

root@kali:~# who --help
Usage: who [OPTION]... [ FILE | ARG1 ARG2 ]
Print information about users who are currently logged in.

-a, --all           same as -b -d --login -p -r -t -T -u
-b, --boot          time of last system boot
-d, --dead          print dead processes
-H, --heading       print line of column headings
--ips              print ips instead of hostnames. with --lookup,
                  canonicalizes based on stored IP, if available,
                  rather than stored hostname
-l, --login         print system login processes
--lookup           attempt to canonicalize hostnames via DNS
-m                only hostname and user associated with stdin
```

C. How to take backup of a file?

By using **cp** Command.



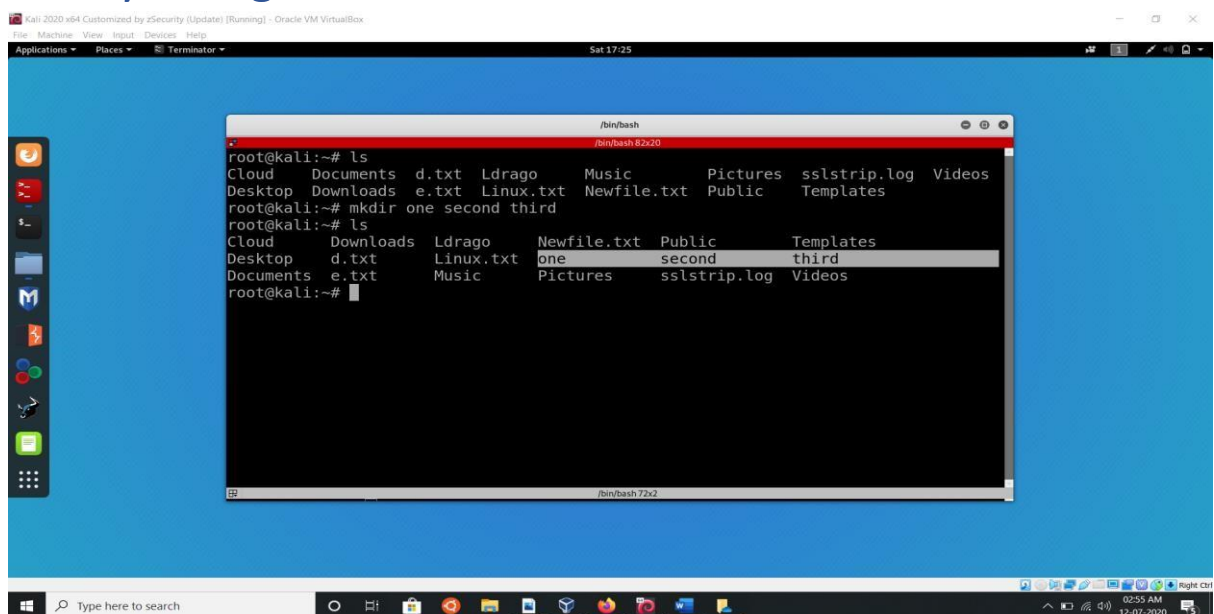
The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# cp Section-C Section-C1
root@kali:~# ls
Cloud  Documents  e.txt  Music  Section-C  Templates
c.txt  Downloads  Ldrago  Pictures  Section-C1  Videos
Desktop d.txt      Linux.txt  Public  sslstrip.log
root@kali:~# ^C
root@kali:~#
```

The terminal window is titled "/bin/bash" and shows the file listing after the copy operation. The desktop background is blue, and the taskbar at the bottom shows various application icons and the system clock.

D. How to create 3 sub directories in a directory using single line Command?

By Using **mkdir** Command.

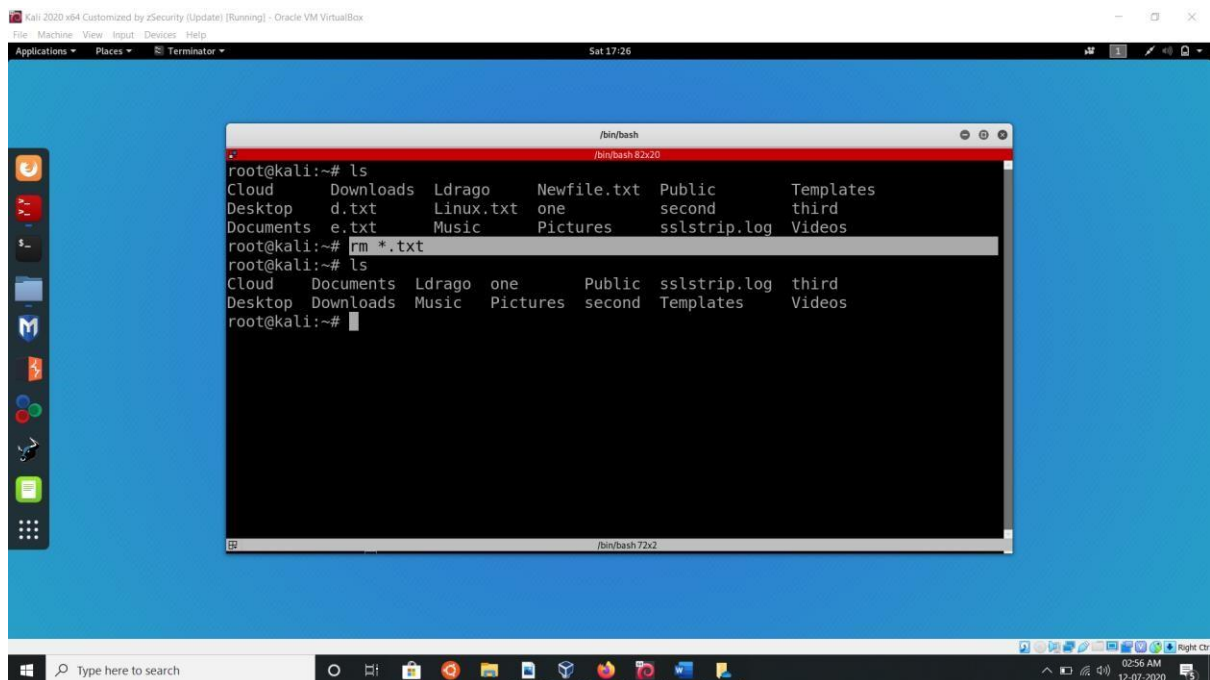


The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# ls
Cloud  Documents  d.txt  Ldrago  Music  Pictures  sslstrip.log  Videos
Desktop Downloads  e.txt  Linux.txt  Newfile.txt  Public  Templates
root@kali:~# mkdir one second third
root@kali:~# ls
Cloud  Downloads  Ldrago  Newfile.txt  Public  Templates
Desktop  d.txt      Linux.txt  one          second  third
Documents e.txt      Music    Pictures     sslstrip.log  Videos
root@kali:~#
```

The terminal window is titled "/bin/bash" and shows the file listing after the mkdir command is executed. The desktop background is blue, and the taskbar at the bottom shows various application icons and the system clock.

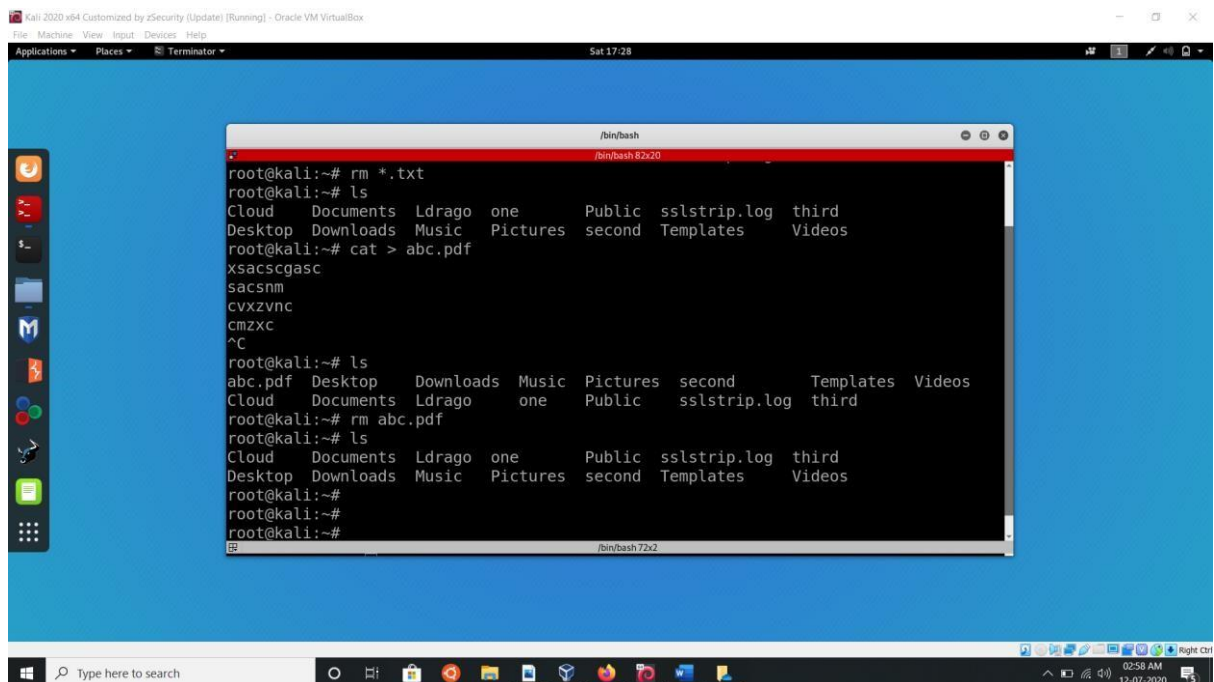
E. How to remove file of .txt extension? BY using **rm** Command.



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# ls
Cloud      Downloads  Ldrago    Newfile.txt  Public      Templates
Desktop    d.txt      Linux.txt  one          second      third
Documents  e.txt      Music     Pictures     sslstrip.log Videos
root@kali:~# rm *.txt
root@kali:~# ls
Cloud      Documents  Ldrago    one          Public      sslstrip.log  third
Desktop    Downloads  Music     Pictures     second      Templates     Videos
root@kali:~#
```

F. How to remove file of any extension? By Using **rm** Command.

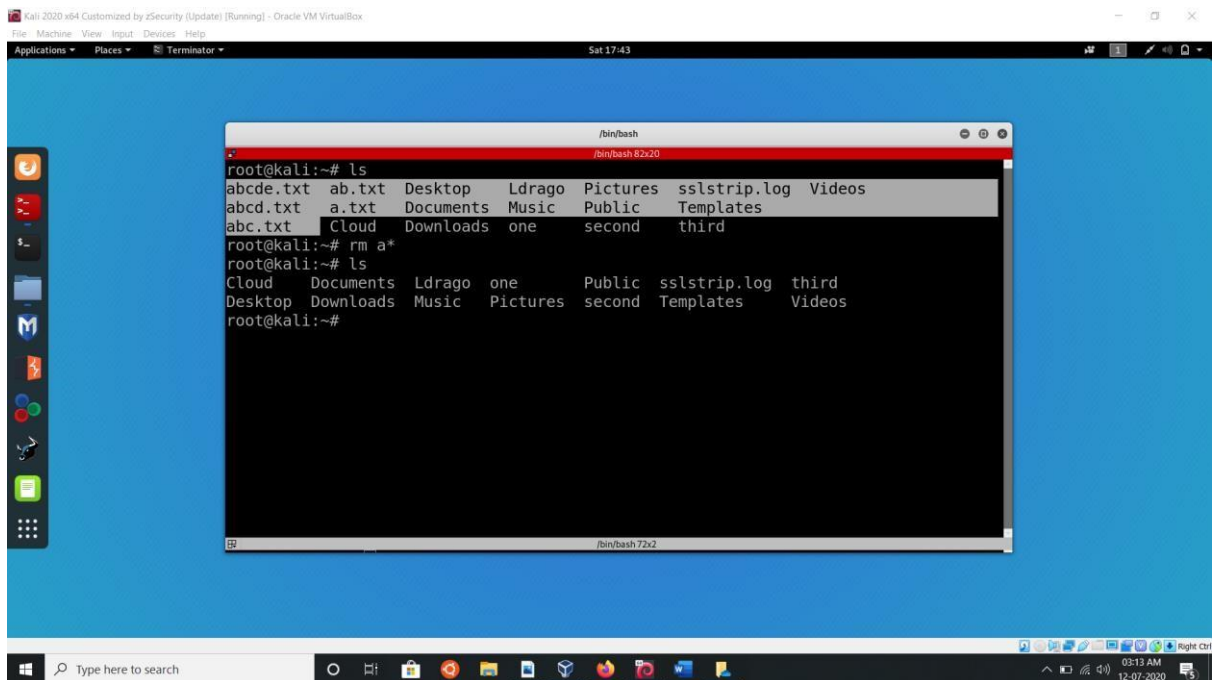


The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# rm *.txt
root@kali:~# ls
Cloud      Documents  Ldrago    one          Public      sslstrip.log  third
Desktop    Downloads  Music     Pictures     second      Templates     Videos
root@kali:~# cat > abc.pdf
xsacscgasc
sacsnm
cvxzvnc
cmzxc
^C
root@kali:~# ls
abc.pdf Desktop Downloads Music Pictures second Templates Videos
Cloud Documents Ldrago one Public sslstrip.log third
root@kali:~# rm abc.pdf
root@kali:~# ls
Cloud Documents Ldrago one Public sslstrip.log third
Desktop Downloads Music Pictures second Templates Videos
root@kali:~#
root@kali:~#
root@kali:~#
```


G. How to remove file starting with "a"?

By using **rm** Command.

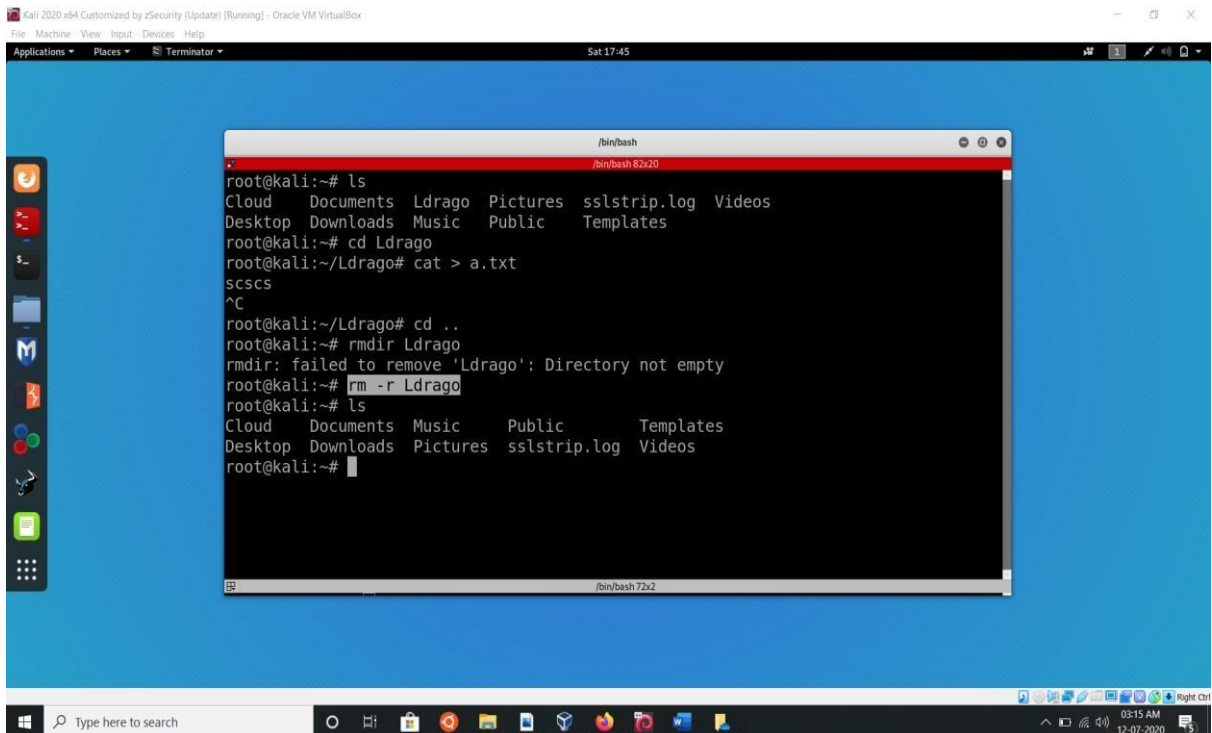


The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# ls
abcde.txt  ab.txt  Desktop  Ldrago  Pictures  sslstrip.log  Videos
abcd.txt   a.txt   Documents Music    Public    Templates
abc.txt    Cloud  Downloads one      second    third
root@kali:~# rm a*
root@kali:~# ls
Cloud  Documents  Ldrago  one  Public  sslstrip.log  third
Desktop Downloads  Music   Pictures  second  Templates    Videos
root@kali:~#
```

H. How to remove non empty directory?

By Using **rm -r** Command.



The screenshot shows a Kali Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
root@kali:~# ls
Cloud  Documents  Ldrago  Pictures  sslstrip.log  Videos
Desktop Downloads  Music   Public    Templates
root@kali:~# cd Ldrago
root@kali:~/Ldrago# cat > a.txt
scscs
^C
root@kali:~/Ldrago# cd ..
root@kali:~# rmdir Ldrago
rmdir: failed to remove 'Ldrago': Directory not empty
root@kali:~# rm -r Ldrago
root@kali:~# ls
Cloud  Documents  Music   Public    Templates
Desktop Downloads  Pictures  sslstrip.log  Videos
root@kali:~#
```