

Question 1

COM 301P

Date: 30/08/2020

CED18I065

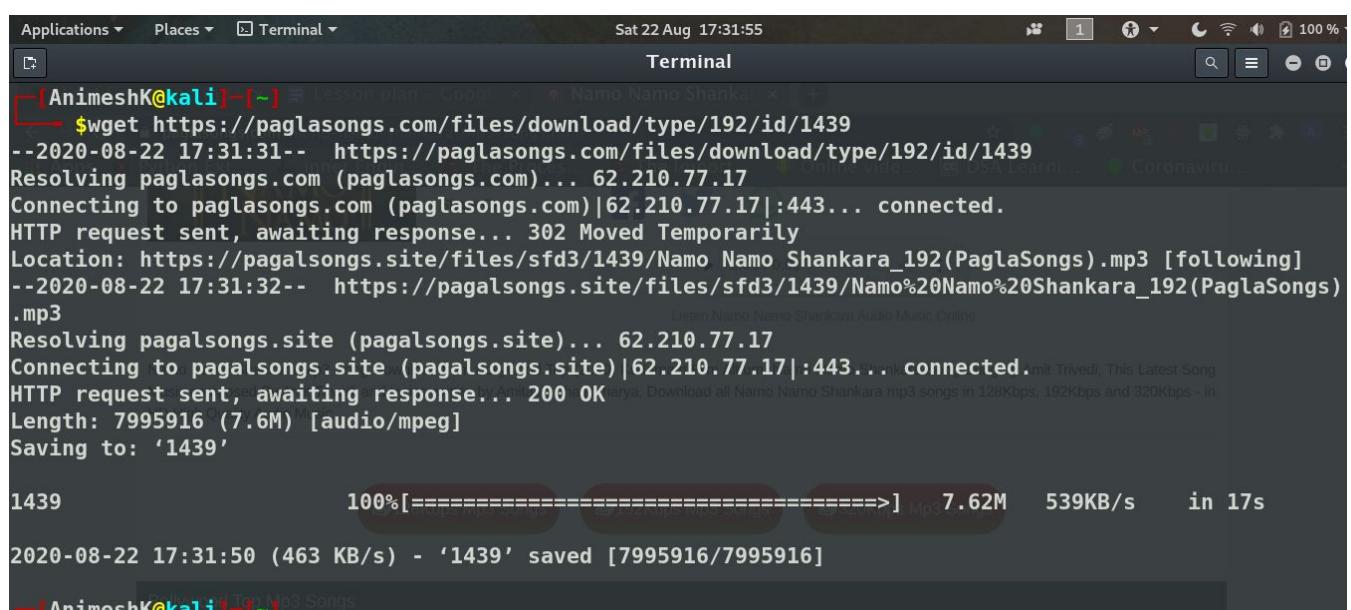
Note: Rest of the questions (Q2 to 41) are in the "Assignment_OS.pdf" file. The file you are reading currently only contains Q 1. This separation is there for readability purposes.

The 50 linux commands along with their most of the useful options and the usage syntax along with output in the form of screenshots are as below -

1. wget

- a. without any options it simply downloads the content fetched from the specified URL.
syntax: wget <url name>

- b. -O with this option it puts downloaded content into a specified file. syntax: wget -O <file name> <url>
- c. -V displays the version of wget
- d. -h Prints a help message describing all of Wget's command-line options.
- e. Screenshots:



The screenshot shows a terminal window titled "Terminal" on a Kali Linux desktop environment. The terminal output is as follows:

```
[AnimeshK@kali:~] $ wget https://paglasongs.com/files/download/type/192/id/1439
--2020-08-22 17:31:31-- https://paglasongs.com/files/download/type/192/id/1439
Resolving paglasongs.com (paglasongs.com)... 62.210.77.17
Connecting to paglasongs.com (paglasongs.com)|62.210.77.17|:443... connected.
HTTP request sent, awaiting response... 302 Moved Temporarily
Location: https://pagalsongs.site/files/sfd3/1439/Namo Namo Shankara_192(PaglaSongs).mp3 [following]
--2020-08-22 17:31:32-- https://pagalsongs.site/files/sfd3/1439/Namo%20Namo%20Shankara_192(PaglaSongs)
.mp3
Resolving pagalsongs.site (pagalsongs.site)... 62.210.77.17
Connecting to pagalsongs.site (pagalsongs.site)|62.210.77.17|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 7995916 (7.6M) [audio/mpeg]
Saving to: '1439'

1439          100%[=====] 7.62M   539KB/s   in 17s

2020-08-22 17:31:50 (463 KB/s) - '1439' saved [7995916/7995916]
```

The terminal shows the execution of the wget command to download a file from paglasongs.com. It handles a temporary redirect to pagalsongs.site and successfully downloads the file "1439" at a rate of 463 KB/s, totaling 7.62M in 17 seconds.

Applications ▾ Places ▾ Terminal ▾ Sat 22 Aug 17:36:24

```
[AnimeshK@kali]-(~) $ wget -O hello.mp3 https://paglasongs.com/files/download/type/192/id/1439
--2020-08-22 17:35:28-- https://paglasongs.com/files/download/type/192/id/1439
Resolving paglasongs.com (paglasongs.com)... 62.210.77.17
Connecting to paglasongs.com (paglasongs.com)|62.210.77.17|:443... connected.
HTTP request sent, awaiting response... 302 Moved Temporarily
Location: https://pagalsongs.site/files/sfd3/1439/Namo Namo Shankara_192(PaglaSongs).mp3 [following]
--2020-08-22 17:35:29-- https://pagalsongs.site/files/sfd3/1439/Namo%20Namo%20Shankara_192(PaglaSongs)
.mp3
Resolving pagalsongs.site (pagalsongs.site)... 62.210.77.17
Connecting to pagalsongs.site (pagalsongs.site)|62.210.77.17|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 7995916 (7.6M) [audio/mpeg]
Saving to: 'hello.mp3'

hello.mp3          100%[=====] 7.62M 1.18MB/s in 8.7s

2020-08-22 17:35:38 (902 KB/s) - 'hello.mp3' saved [7995916/7995916]

[AnimeshK@kali]-(~) $ ls
1439      armsim_linux.zip  Django_with_React  hello.zip      pixel.png      Templates
1439.1    Desktop          Documents        http_server.js Postman       Videos
armsim     Dev              Downloads       Music         postman-linux-x64.tar.gz
ARMSim.exe Dev2            hello.mp3       Pictures     q4.txt
[AnimeshK@kali]-(~)
```

```
[AnimeshK@kali]-(~) $ wget -h
GNU Wget 1.20.3, a non-interactive network retriever.
Usage: wget [OPTION]... [URL]...
Mandatory arguments to long options are mandatory for short options too.
Startup:
  -V, --version           display the version of Wget and exit
  -h, --help               print this help
  -b, --background         go to background after startup
  -e, --execute=COMMAND   execute a '.wgetrc'-style command
Logging and input file:
  -o, --output-file=FILE  log messages to FILE
  -a, --append-output=FILE append messages to FILE
  -d, --debug              print lots of debugging information
  -q, --quiet              quiet (no output)
  -v, --verbose             be verbose (this is the default)
  -nv, --no-verbose         turn off verboseness, without being quiet
  --report-speed=TYPE      output bandwidth as TYPE. TYPE can be bits
  -i, --input-file=FILE    download URLs found in local or external FILE
  -F, --force-html          treat input file as HTML
  -B, --base=URL            resolves HTML input-file links (-i -F)
  --config=FILE             specify config file to use
```

```

Applications ▾ Places ▾ Terminal ▾
Sat 22 Aug 17:58:02
Terminal
and/or open issues at https://savannah.gnu.org/bugs/?func=additem&group=wget.
[Animesh@kali:~/Desktop] $ wget -V
GNU Wget 1.20.3 built on linux-gnu.

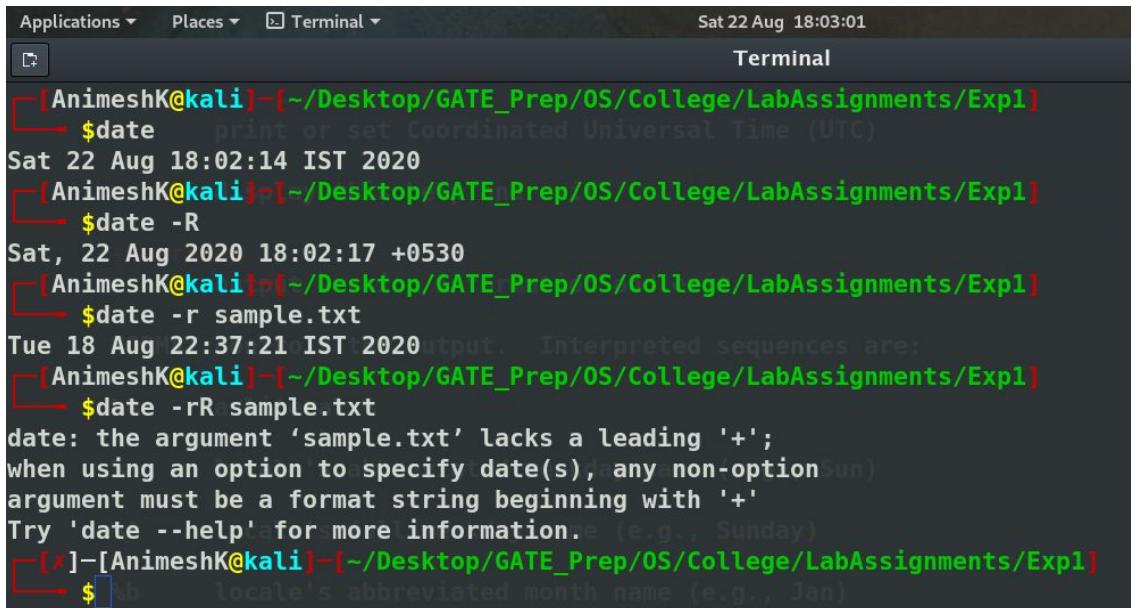
-ares +digest -gpgme +https +ipv6 +iri +large-file -metalink +nls
+ntlm +opie +psl +ssl/gnutls
Wgetrc:
  /etc/wgetrc (system)
Locale: en_US.UTF-8
  /usr/share/locale
Compile:
  gcc -DHAVE_CONFIG_H -DSYSTEM_WGETRC="/etc/wgetrc"
  -DLOCALEDIR="/usr/share/locale" -I. -I../../src -I../../lib
  -I../../lib -Wdate-time -D_FORTIFY_SOURCE=2 -fstack-protector-strong
  -I/usr/include/p11-kit-1 -DHAVE_LIBGNUTLS -DNDEBUG -g -O2
  -fdebug-prefix-map=/build/wget-zsPcF0/wget-1.20.3=.
  -fstack-protector-strong -Wformat -Werror=format-security
  -DNOSSLv2 -D_FILE_OFFSET_BITS=64 -g -Wall
Link:
  gcc -I/usr/include/p11-kit-1 -DHAVE_LIBGNUTLS -DNDEBUG -g -O2
  -fdebug-prefix-map=/build/wget-zsPcF0/wget-1.20.3=.
  -fstack-protector-strong -Wformat -Werror=format-security
  -DNOSSLv2 -D_FILE_OFFSET_BITS=64 -g -Wall -Wl,-z,relro -Wl,-z,now
  -lpcre2-8 -luuid -lfdk12 -lgnutls -lz -lpsl ftp-opie.o

```

The screenshot shows a Kali Linux desktop environment. In the top bar, there are menu items for Applications, Places, and Terminal. The terminal window is active and displays the output of the command `wget -V`, which shows the version and configuration of the GNU Wget 1.20.3 package. To the right of the terminal, a file manager window is open, showing a list of files in a directory, likely containing screenshots related to the wget command.

2. date

- a. with no options simply prints out today's date
- b. -R prints out today's date in RFC 5322 format
- c. -r prints last modified date of a file
syntax: `date -r <filename>`
- d. Screenshots:



The screenshot shows a terminal window with the following session:

```
[AnimeshK@kali] - [~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $date      print or set Coordinated Universal Time (UTC)
Sat 22 Aug 18:02:14 IST 2020
[AnimeshK@kali] - [~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $date -R
Sat, 22 Aug 2020 18:02:17 +0530
[AnimeshK@kali] - [~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $date -r sample.txt
Tue 18 Aug 22:37:21 IST 2020
[AnimeshK@kali] - [~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $date -rR sample.txt
date: the argument 'sample.txt' lacks a leading '+';
when using an option to specify date(s), any non-option argument must be a format string beginning with '+'
Try 'date --help' for more information.
[AnimeshK@kali] - [~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $b      Locale's abbreviated month name (e.g., Jan)
```

3. ping

- a. syntax: ping <url/remote host> with no options it simply sends packets and receives in an interval
- b. with -c flag, you can specify how many packets to be sent.
- c. with -i flag, the interval of sending packets can be specified
- d. with -D flag, the output is displayed in such a way that the timestamp is at front of each line.
- e. Screenshots:

Applications ▾ Places ▾ Terminal ▾ Sat 22 Aug 18:11:02 Terminal

```
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ping -i 5 google.com
PING google.com (172.217.166.206) 56(84) bytes of data.
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=1 ttl=114 time=49.4 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=2 ttl=114 time=142 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=3 ttl=114 time=48.0 ms
^C
--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 48.041/79.780/141.852/43.894 ms
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ping -D google.com
PING google.com (172.217.166.206) 56(84) bytes of data.
[1598100049.990258] 64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=1 ttl=114 time=31.1 ms
[1598100051.005988] 64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=2 ttl=114 time=48.4 ms
[1598100052.002622] 64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=3 ttl=114 time=44.2 ms
[1598100053.004387] 64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=4 ttl=114 time=45.4 ms
[1598100054.002104] 64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=5 ttl=114 time=42.1 ms
^C
--- interval
--- google.com ping statistics --- s for help or q to quit)
5 packets transmitted, 5 received, 0% packet loss, time 4004ms
```

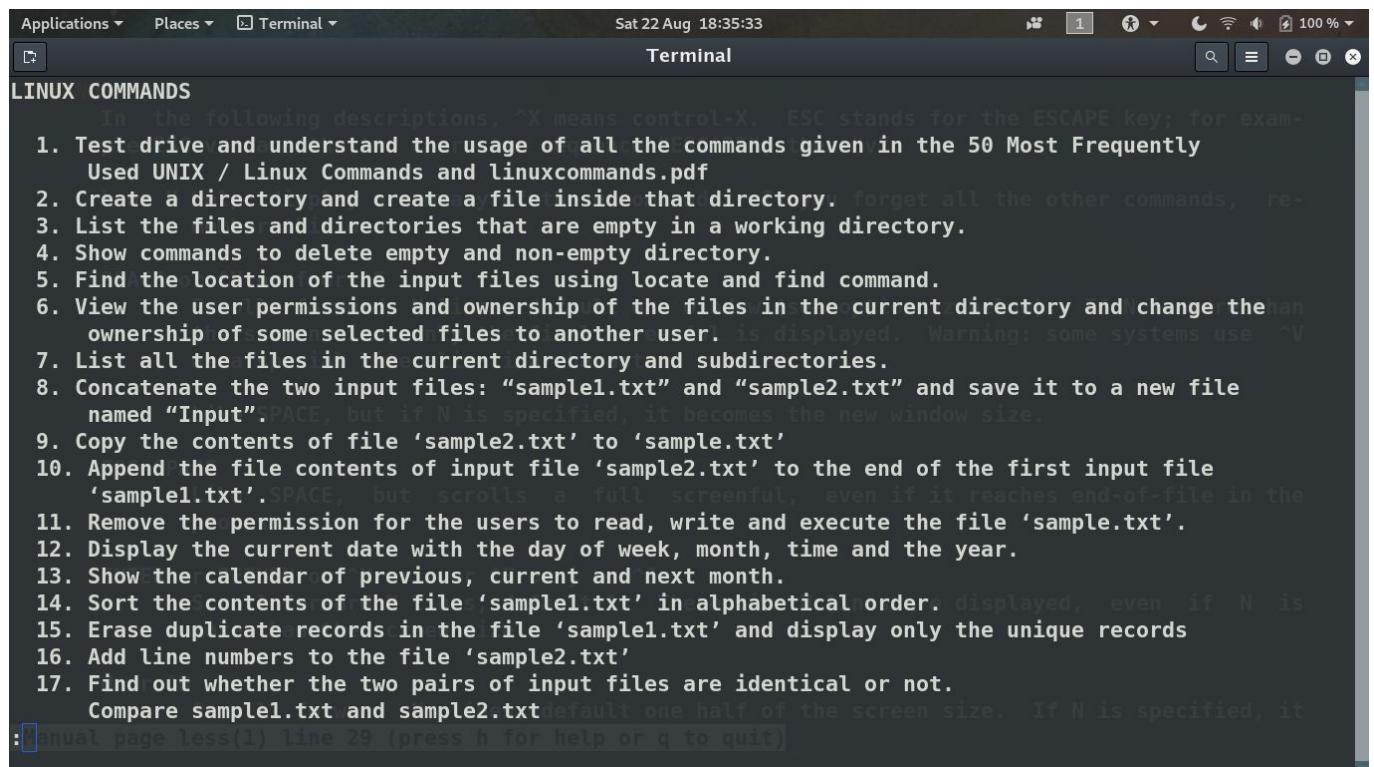
Applications ▾ Places ▾ Terminal ▾ Sat 22 Aug 18:10:08 Terminal

```
$ ping google.com packets, until the timeout expires.
PING google.com (172.217.166.206) 56(84) bytes of data.
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=1 ttl=114 time=36.4 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=2 ttl=114 time=51.0 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=3 ttl=114 time=49.5 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=4 ttl=114 time=51.6 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=5 ttl=114 time=46.7 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=6 ttl=114 time=44.5 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=7 ttl=114 time=43.8 ms
^C
--- google.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6011ms
rtt min/avg/max/mdev = 36.410/46.213/51.612/4.913 ms
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ping -c 6 google.com
PING google.com (172.217.166.206) 56(84) bytes of data.
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=1 ttl=114 time=77.9 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=2 ttl=114 time=36.3 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=3 ttl=114 time=56.4 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=4 ttl=114 time=51.6 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=5 ttl=114 time=49.3 ms
64 bytes from del03s13-in-f14.1e100.net (172.217.166.206): icmp_seq=6 ttl=114 time=47.7 ms

--- google.com ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5010ms
rtt min/avg/max/mdev = 36.348/53.223/77.932/12.609 ms
```

4. less

- a. syntax: less <filename> it prints out the file little by little, that is, instead of loading the whole file at once (like 'more'), it fetches the file in small pieces. Useful for viewing huge files
- b. up arrow: used to scroll up, if a number N specified in prompt, it'll scroll up by N lines.
- c. down arrow: used to scroll down, if a number N specified in prompt, it'll scroll down by N lines.
- d. left arrow: used to scroll horizontally left by half the width of the screen, if a number N is specified in prompt, it'll scroll up left by N characters.
- e. right arrow: used to scroll horizontally right by half the width of the screen, if a number N is specified in prompt, it'll scroll up right by N characters.
- f. -V option used to display the version
- g. Screenshots:

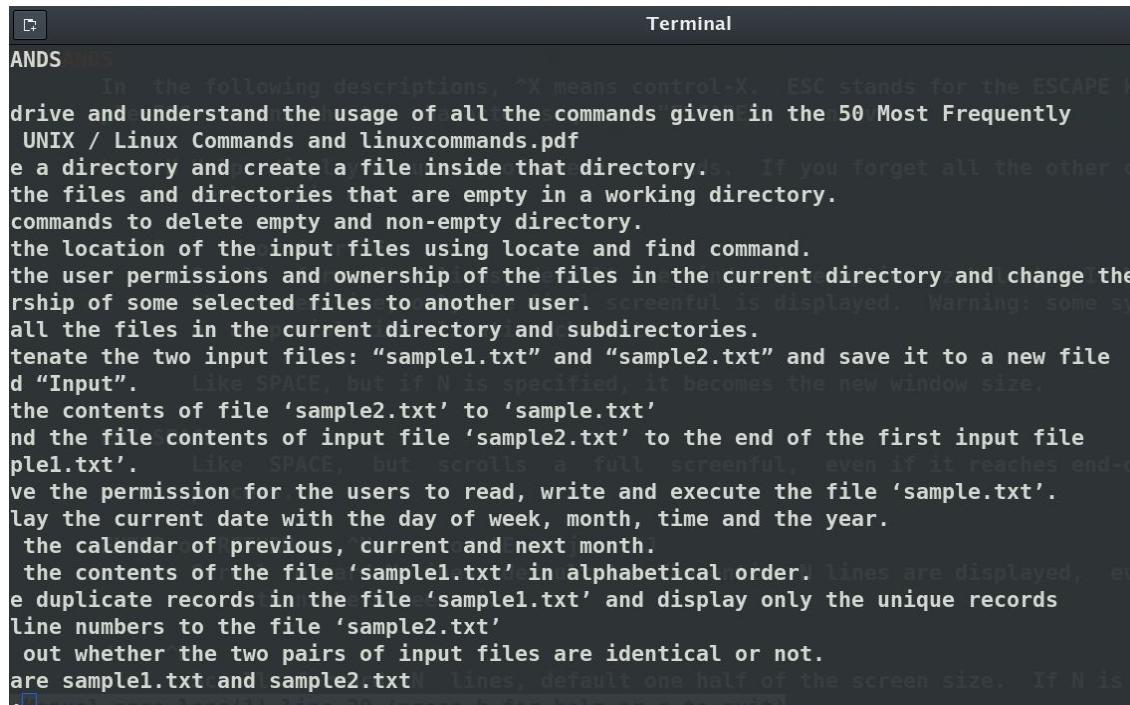


The screenshot shows a Linux desktop environment with a terminal window open. The terminal title is 'Terminal'. The window contains a list of 17 tasks related to 'LINUX COMMANDS'. The text is partially visible and includes instructions like 'Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf', 'Create a directory and create a file inside that directory.', and 'Concatenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input".' The bottom of the terminal shows the command ':q' followed by the status message 'Manual page less(1) line 29 (press h for help or q to quit)'.

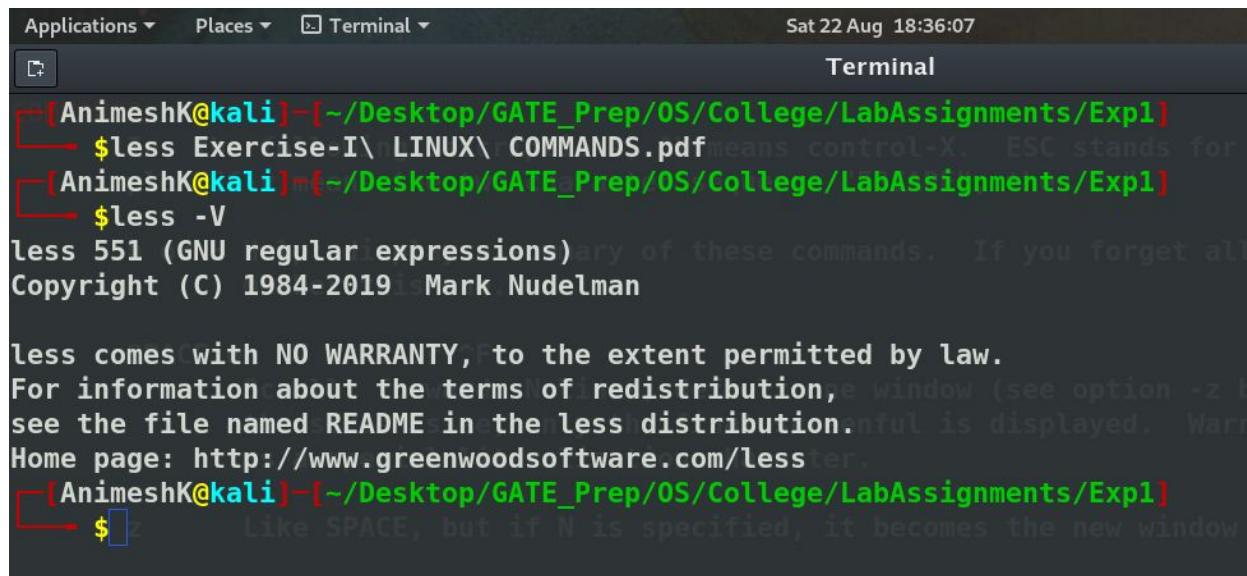
```

Applications ▾ Places ▾ Terminal ▾ Sat 22 Aug 18:35:33
Terminal
LINUX COMMANDS
In the following descriptions, ^X means control-X. ESC stands for the ESCAPE key; for example
1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf
2. Create a directory and create a file inside that directory. Forget all the other commands, remember
3. List the files and directories that are empty in a working directory.
4. Show commands to delete empty and non-empty directory.
5. Find the location of the input files using locate and find command.
6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user. is displayed. Warning: some systems use ^V
7. List all the files in the current directory and subdirectories.
8. Concatenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input".
9. Copy the contents of file 'sample2.txt' to 'sample.txt'
10. Append the file contents of input file 'sample2.txt' to the end of the first input file 'sample1.txt'. SPACE, but scrolls a full screenful, even if it reaches end-of-file in the
11. Remove the permission for the users to read, write and execute the file 'sample.txt'.
12. Display the current date with the day of week, month, time and the year.
13. Show the calendar of previous, current and next month.
14. Sort the contents of the file 'sample1.txt' in alphabetical order. displayed, even if N is
15. Erase duplicate records in the file 'sample1.txt' and display only the unique records
16. Add line numbers to the file 'sample2.txt'
17. Find out whether the two pairs of input files are identical or not.
Compare sample1.txt and sample2.txt default one half of the screen size. If N is specified, it
:q
Manual page less(1) line 29 (press h for help or q to quit)

```



ANDS ANDS
In the following descriptions, ^X means control-X. ESC stands for the ESCAPE key. In the following descriptions, ^X means control-X. ESC stands for the ESCAPE key.
drive and understand the usage of all the commands given in the 50 Most Frequently Used Commands and linuxcommands.pdf
e a directory and create a file inside that directory. If you forget all the other commands to delete empty and non-empty directory.
the location of the input files using locate and find command.
the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user. screenful is displayed. Warning: some screens are displayed. Warning: some screens are displayed.
all the files in the current directory and subdirectories.
tenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input". Like SPACE, but if N is specified, it becomes the new window size.
the contents of file 'sample2.txt' to 'sample.txt'
nd the file contents of input file 'sample2.txt' to the end of the first input file 'sample1.txt'. Like SPACE, but scrolls a full screenful, even if it reaches end-of-line.
ve the permission for the users to read, write and execute the file 'sample.txt'.
lay the current date with the day of week, month, time and the year.
the calendar of previous, current and next month.
the contents of the file 'sample1.txt' in alphabetical order. lines are displayed, even if there are duplicate records in the file 'sample1.txt' and display only the unique records.
line numbers to the file 'sample2.txt'
out whether the two pairs of input files are identical or not.
are sample1.txt and sample2.txt. lines, default one half of the screen size. If N is specified, it becomes the new window size.



Applications ▾ Places ▾ Terminal ▾ Sat 22 Aug 18:36:07
[AnimeshK@kali] ~[-/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
\$ less Exercise-I\ LINUX\ COMMANDS.pdf
[AnimeshK@kali] ~[-/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
\$ less -V
less 551 (GNU regular expressions) Copyright (C) 1984-2019 by Mark Nudelman
less comes with NO WARRANTY, to the extent permitted by law.
For information about the terms of redistribution, see the file named README in the less distribution.
Home page: http://www.greenwoodsoftware.com/less.html
[AnimeshK@kali] ~[-/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
\$ z

5. man

- a. man <function/command/program name>

it displays the detailed description about the above. The reference manual for this command/program.

b. `man <function/command/program name>.N`

directly opens the section number N of the manual, below are the various section numbers available-

- 1 Executable programs or shell commands
- 2 System calls (functions provided by the kernel)
- 3 Library calls (functions within program libraries)
- 4 Special files (usually found in /dev)
- 5 File formats and conventions, e.g. /etc/passwd
- 6 Games
- 7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7)
- 8 System administration commands (usually only for root)
- 9 Kernel routines [Non standard]

Input: `man malloc`

NAME

`malloc, free, calloc, realloc, reallocarray - allocate and free dynamic memory`

SYNOPSIS

```
#include <stdlib.h>
void *malloc(size_t size);
void free(void *ptr);
void *calloc(size_t nmemb, size_t size);
void *realloc(void *ptr, size_t size);
void *reallocarray(void *ptr, size_t nmemb, size_t size);
```

Feature Test Macro Requirements for glibc (see `feature_test_macros(7)`):

```
reallocarray():
  Since glibc 2.29: 8 System administration commands (usually only for root)
  _DEFAULT_SOURCE 9 Kernel routines [Non standard]
  Glibc 2.28 and earlier: man malloc
  _GNU_SOURCE
```

DESCRIPTION

The `malloc()` function allocates `size` bytes and returns a pointer to the allocated memory

Manual page `malloc(3)` line 1 (press h for help or q to quit)

Input: man printf.3 displays the Library calls page for 'printf'

NAME

`printf, fprintf, dprintf, sprintf, snprintf, vprintf, vfprintf, vdprintf, vsprintf, vsnprintf - formatted output conversion`

The table below shows the section numbers of the manual followed by the types of pages they contain.

SYNOPSIS

```
#include <stdio.h>
1 Executable programs or shell commands
int printf(const char *format, ...); by the kernel)
int fprintf(FILE *stream, const char *format, ...); es)
int dprintf(int fd, const char *format, ...);
int sprintf(char *str, const char *format, ...); wd
int snprintf(char *str, size_t size, const char *format, ...);
7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7)
#include <stdarg.h> ration commands (usually only for root)
9 Kernel routines [Non standard]
int vprintf(const char *format, va_list ap);
int vfprintf(FILE *stream, const char *format, va_list ap);
int vdprintf(int fd, const char *format, va_list ap);
int vsprintf(char *str, const char *format, va_list ap); CONFIGURATION, DESCRIPTION, OPTIONS,
int vsnprintf(char *str, size_t size, const char *format, va_list ap); EXPLAINING TO, NOTES, BUGS,
EXAMPLE, AUTHORS, and SEE ALSO.
```

Feature Test Macro Requirements for glibc (see `feature_test_macros(7)`):

Manual page `printf(3)` line 1 (press h for help or q to quit)

Input: man man.7 displays the Miscellaneous page for 'man'

NAME

man - macros to format man pages

SYNOPSIS

```
groff -Tascii -man file ...
groff -Tp[ro]m -man file ...
man [section] title
```

DESCRIPTION

This manual page explains the **groff an.tmac** macro package (often called the **man** macro package). This macro package should be used by developers when writing or porting man pages for Linux. It is fairly compatible with other versions of this macro package, so porting man pages should not be a major problem (exceptions include the NET-2 BSD release, which uses a totally different macro package called **mdoc**; see **mdoc(7)**).

Note that NET-2 BSD **mdoc** man pages can be used with **groff** simply by specifying the **-mdoc** option instead of the **-man** option. Using the **-mandoc** option is, however, recommended, since this will automatically detect which macro package is in use.

For conventions that should be employed when writing man pages for the Linux **man-pages** pack-

Manual page man(7) line 1 (press h for help or q to quit)

6. grep

Syntax: grep <pattern to be searched> <file name>

We use '*' for searching in the current directory.

- c : This prints only a count of the lines that match a pattern
- h : Display the matched lines, but do not display the filenames.
- i : Ignores, case for matching
- l : Displays list of filenames only.
- n : Display the matched lines and their line numbers.
- v : This prints out all the lines that do not matches the pattern

Corresponding screenshots are as below.

```
[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$grep -l "OS" *
archive_cwd.tar
grep: friends: Is a directory
grep: hello fiend: Is a directory
Input
newfile.txt
ps.txt
sample2.txt
sample3.txt
sample.txt
sp.txt
grep: tar_exp: Is a directory
test_text.txt
test.txt
[x]~[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

-c : This prints only a count of the lines that match a pattern
-h : display the matched lines, but do not display the filenames.
-i : Ignores, case for matching

```
[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$grep -h "OS" *
Binary file archive_cwd.tar matches
grep: friends: Is a directory
grep: hello fiend: Is a directory
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Unix is a great OS.
UNIX is a free OS.
Unix is a great OS.
UNIX is a free OS.
UNIxOS systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson , Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
UNIX is a free OS.
Yet another powerful OS.
UNIX is a free OS.
Yet another powerful OS.
UNIX is a free OS.
Yet another powerful OS.
UNIX is a free OS.
Yet another powerful OS.
An OS is an interface between a computer user and a computer hardware.
```

-c : This prints only a count of the lines that match a pattern
-h : display the matched lines, but do not display the filenames.
-i : Ignores, case for matching
-l : Displays list of a filenames only.
-n : Display the matched lines and their line numbers.
-v : This prints out all the lines that do not matches the pattern

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ grep "OS" *
Binary file archive_cwd.tar matches
grep: friends: Is a directory
grep: hello fiend: Is a directory
Input: An OS is an interface between a computer user and a computer hardware.
Input: An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Input: Unix is a great OS.
Input: UNIX is a free OS.
Input: Unix is a great OS.
Input: UNIX is a free OS. 6 given
Input: UnixOS systems use a centralized operating system kernel which manages system and process activities.
Input:UNIX is a free OS.
Input: Yet another powerful OS. Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
Input:UNIX is a free OS.
Input: Yet another powerful OS. -l : Displays list of filenames only.
newfile.txt:UNIX is a free OS. -n : Display the matched lines and their line numbers.
newfile.txt: Yet another powerful OS. : This prints out all the lines that do not matches the pattern
ps.txt:UNIX is a free OS.
ps.txt: Yet another powerful OS.
sample2.txt:UNIX is a free OS.
sample2.txt: Yet another powerful OS.
```

```
Applications ▾ Places ▾ Terminal ▾ Sun 23 Aug 15:02:31
Terminal
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ grep "OS" sample2.txt
UNIX is a free OS.
Yet another powerful OS.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ grep -c "OS" sample2.txt
2
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ grep -n "OS" sample2.txt
5:UNIX is a free OS.
7:Yet another powerful OS.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ grep -v "OS" sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
```

7. locate

- a. syntax: locate <options> <file name>

- b. It is used to locate the file inside the database
- c. -i ignore the case of the filename input
- d. -l limit the number of outputs of this command
- e. -c don't display the whole matched files as output but rather display their count
- f. -e out of all the files, display only those which were existing at the time when 'locate' was run.
- g. -w match only the whole path name(default)
- h. -b match only the basename (opposite to -w option)

i. Screenshots

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ locate ps.txt
    $locate refers to the standard input. Note that a database can be read
/home/AnimeshK/.cache/tracker/locale-for-miner-apps.txt
/usr/share/doc/base-passwd/users-and-groups.txt.gz
/usr/share/doc/funkload/examples/demo/cmf/groups.txt
/usr/share/doc/texlive-doc/fonts/cm/README-cmps.txt existing at the time locate is
/usr/share/golismero/wordlist/golismero/Discovery/FilenameBruteforce/sitemaps.txt
/usr/share/python-faraday/scripts/cscan/ips.txt
/usr/share/vim/vim81/doc/tips.txt files exist (if the --existing option is sp
/var/lib/gdm3/.cache/tracker/locale-for-miner-apps.txt broken symbolic links to be
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ locate -c ps.txt
8 This is the default behavior. The opposite can be specified using --
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ locate -l 4 ps.txt
/home/AnimeshK/.cache/tracker/locale-for-miner-apps.txt to standard output and exit
/usr/share/doc/base-passwd/users-and-groups.txt.gz
/usr/share/doc/funkload/examples/demo/cmf/groups.txt
/usr/share/doc/texlive-doc/fonts/cm/README-cmps.txt patterns.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ locate -i ps.txt LIMIT
/home/AnimeshK/.cache/tracker/locale-for-miner-apps.txtries. If the --count option
/usr/share/doc/base-passwd/users-and-groups.txt.gz to LIMIT.
/usr/share/doc/funkload/examples/demo/cmf/groups.txt
/usr/share/doc/texlive-doc/fonts/cm/README-cmps.txt q to quit)
/usr/share/golismero/wordlist/golismero/Discovery/FilenameBruteforce/sitemaps.txt
```

```
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ locate -e ps.txt
/home/AnimeshK/.cache/tracker/locale-for-miner-apps.txt
/usr/share/doc/base-passwd/users-and-groups.txt.gz found or if locate was invoked w
/usr/share/doc/funkload/examples/demo/cmf/groups.txt options. If no match was found
/usr/share/doc/texlive-doc/fonts/cm/README-cmps.txt
/usr/share/golismero/wordlist/golismero/Discovery/FilenameBruteforce/sitemaps.txt
/usr/share/python-faraday/scripts/cscan/ips.txt use are not fatal, search continues
/usr/share/vim/vim81/doc/tips.txt
/var/lib/gdm3/.cache/tracker/locale-for-miner-apps.txt
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ locate -w ps.txt
/home/AnimeshK/.cache/tracker/locale-for-miner-apps.txt ERNs instead of requiring or
/usr/share/doc/base-passwd/users-and-groups.txt.gz
/usr/share/doc/funkload/examples/demo/cmf/groups.txt
/usr/share/doc/texlive-doc/fonts/cm/README-cmps.txt
/usr/share/golismero/wordlist/golismero/Discovery/FilenameBruteforce/sitemaps.txt
/usr/share/python-faraday/scripts/cscan/ips.txt
/usr/share/vim/vim81/doc/tips.txt
/var/lib/gdm3/.cache/tracker/locale-for-miner-apps.txt
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl] the number of
└─$ locate -b ps.txt
/home/AnimeshK/.cache/tracker/locale-for-miner-apps.txt
/usr/share/doc/base-passwd/users-and-groups.txt.gz
/usr/share/doc/funkload/examples/demo/cmf/groups.txtq to quit)
/usr/share/doc/texlive-doc/fonts/cm/README-cmps.txt
```

8. find

- The syntax varies based upon usage
- exec it is used to search some text in multiple files
- perm find the file with entered permission in the specified directory.
- empty find the empty files and directories present in specified directory.
- name search a file in a directory by entering its name as pattern
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $find ./ -type f -name "*.txt" -exec grep 'OS' {} \;
31. Print the lines from "sample1.txt" that do not match the pattern "OS".
32. Fetch the files that contain the word "OS", "Operating System", "Operating Systems" with its
33. Find and replace the string "OS" with "Operating System".
UNIX is a free OS. Courses
Yet another powerful OS.
UNIX is a free OS.
Yet another powerful OS.
UNIX is a free OS.
Yet another powerful OS.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process
management, handling input and output, and controlling peripheral devices such as disk drives and prin
ters.
Unix is a great OS.
UNIX is a free OS. This command print lines which have 'Geek' in them and '-type f' specifies
Unix is a great OS. the input type is a file.
UNIX is a free OS.
UNIXOS systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Yet another powerful OS.
UNIX is a free OS.
Yet another powerful OS.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $find * -perm 755
friends
hello fiend
print_name.sh
tar_exp Student Courses
tar_exp/hello fiend
tar_exp/empty
tar_exp/friends
tar_exp/NewDir
tar_exp/print_name.sh
tar_exp/tar_exp
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $find * -empty
emptyfile
hello fiend
tar_exp/emptyfile
tar_exp/hello fiend 4. Search for empty files and directories.
tar_exp/empty/another.txt
tar_exp/empty/new.c $ find ./GFG -empty
tar_exp/friends
tar_exp/NewDir/badhello.c This command find all empty folders and files in the entered directory or
tar_exp/NewDir/new.c sub-directories.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ find * -name sample.txt
sample.txt
tar_exp/sample.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
```

9. tar

- a. cvf this option is used to create an archive by applying compression algorithms.
- b. xvf to extract the files from the compressed format

c. Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'  print_name.sh  sample.txt    test.txt
emptyfile             Input          ps.txt        sp.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  sample2.txt   tar_exp
friends               newfile.txt   sample3.txt   test_text.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ tar cvf thisTar.tar friends/
friends/
friends/sample2.txt
friends/samplezip.zip
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'  print_name.sh  sample.txt    test.txt
emptyfile             Input          ps.txt        sp.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  sample2.txt   tar_exp
friends               newfile.txt   sample3.txt   test_text.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mv thisTar.tar tar_exp/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cd tar_exp/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

```
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp)
└── $ls
    archive_cwd.tar      friends          NewDir        sample2.txt  test_text.txt
    archive_exp.tar       hello.c         newfile.txt   sample3.txt  test.txt
    empty_assignment_OS  'hello fiend'  print_name.sh sample.txt   thisTar.tar
    emptyfile             hi.c           ps.txt        sp.txt
    'Exercise-I LINUX COMMANDS.pdf' Input          sample1.txt  tar_exp
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp)
└── $tar xvf t
tar_exp/  thisTar.tar
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp)
└── $tar xvf thisTar.tar
friends/
friends/sample2.txt
friends/samplezip.zip
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp)
└── $ls
    archive_cwd.tar      friends          NewDir        sample2.txt  test_text.txt
    archive_exp.tar       hello.c         newfile.txt   sample3.txt  test.txt
    empty_assignment_OS  'hello fiend'  print_name.sh sample.txt   thisTar.tar
    emptyfile             hi.c           ps.txt        sp.txt
    'Exercise-I LINUX COMMANDS.pdf' Input          sample1.txt  tar_exp
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp)
```

Command used:

tar xvf <tar filename> to expand/uncompress the <tar filename> tar file.

Screenshot:

10. ps

- Syntax: ps <options>
- This command is used to see the status of different processes, at the time when command was executed
- a view all processes not associated with terminal
- T view all processes associated with the terminal
- r view all the running processes
- x view all the processes which are owned by you.
- d view the processes except the session leaders
- A view all the processes which are running
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ps -a
  PID TTY      TIME CMD
  739 ttys0    00:00:23 Xorg
 1111 ttys0    00:00:00 dbus-run-session
 1112 ttys0    00:00:00 dbus-daemon
 1113 ttys0    00:00:00 gnome-session-b
 1120 ttys0    00:00:00 at-spi-bus-laun
 1125 ttys0    00:00:00 dbus-daemon
 1140 ttys0    00:00:04 gnome-shell
 1161 ttys0    00:00:00 xdg-permission-
 1169 ttys0    00:00:00 gsd-sharing
 1171 ttys0    00:00:00 gsd-wacom
 1172 ttys0    00:00:00 gsd-color
 1173 ttys0    00:00:00 gsd-keyboard
 1175 ttys0    00:00:00 gsd-print-notif
 1176 ttys0    00:00:00 gsd-rfkill
 1177 ttys0    00:00:00 gsd-smartcard
 1178 ttys0    00:00:00 gsd-datetime
 1179 ttys0    00:00:00 gsd-media-keys
 1180 ttys0    00:00:00 gsd-screensaver
 1181 ttys0    00:00:00 gsd-sound
 1182 ttys0    00:00:00 gsd-a11y-settin
 1183 ttys0    00:00:00 gsd-housekeepin
 1184 ttys0    00:00:00 gsd-power
 1213 ttys0    00:00:00 at-spi2-registr
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ps -T
  PID SPID TTY      TIME CMD
 1727  1727 pts/0    00:00:01 bash
11462 11462 pts/0    00:00:00 ps
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ps -r
  PID TTY      STAT   TIME COMMAND
11465 pts/0    R+     0:00 ps -r
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ps -x
  PID TTY      STAT   TIME COMMAND
 1279 ?        Ss     0:00 /lib/systemd/systemd --user
 1280 ?        S      0:00 (sd-pam)
 1299 ?        S<sl  22:28 /usr/bin/pulseaudio --daemonize=no
 1300 ?        SNsl   0:36 /usr/libexec/tracker-miner-fs
 1303 ?        Ss     0:01 /usr/bin/dbus-daemon --session --address=systemd: --nofork --nopidfile --sys
 1319 ?        Ssl   0:00 /usr/lib/gvfs/gvfsd
 1324 ?        Sl     0:00 /usr/lib/gvfs/gvfsd-fuse /run/user/1001/gvfs -f -o big_writes
 1332 ?        Sl     0:00 /usr/bin/gnome-keyring-daemon --daemonize --login
 1334 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-udisks2-volume-monitor
 1340 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-goa-volume-monitor
 1344 ?        Sl     0:00 /usr/libexec/goa-daemon
 1351 ?        Sl     0:00 /usr/libexec/goa-identity-service
 1358 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-mtp-volume-monitor
 1362 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-gphoto2-volume-monitor
 1366 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-afc-volume-monitor
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
$ ps -d
PID TTY      TIME CMD
 2 ?    00:00:00 kthreadd
 3 ? question_1_O 00:00:00 rcu_gp
 4 ?    00:00:00 rcu_par_gp Help: Last edit was second ago
 6 ?    00:00:00 kworker/0:0H-kblockd
 8 ?    00:00:00 mm_percpu_wq
 9 ?    00:00:00 ksoftirqd/0
10 ?   00:00:19 rcu_sched command was executed
11 ?   00:00:00 rcu_bh
12 ?   00:00:00 migration/0 c. -a view all processes not associated with terminal
13 ?   00:00:23 kworker/0:1-events view all processes associated with the terminal
14 ?   00:00:00 cpuhp/0
15 ?   00:00:00 cpuhp/1 e. -r view all the running processes
16 ?   00:00:00 migration/1 f. -x view all the processes which are owned by you.
17 ?   00:00:00 ksoftirqd/1
19 ?   00:00:00 kworker/1:0H-kblockd
20 ?   00:00:00 cpuhp/2 h. -A view all the processes which are running
21 ?   00:00:03 migration/2
22 ?   00:00:00 ksoftirqd/2
24 ?   00:00:00 kworker/2:0H-kblockd
25 ?   00:00:00 cpuhp/3 11. man
26 ?   00:00:01 migration/3
27 ?   00:00:00 ksoftirqd/3 a. man <function/command/program name>
29 ?   00:00:00 kworker/3:0H-kblockd
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
$ ps -A
PID TTY      TIME CMD
 1 ?    00:00:21 systemd
 2 ?    00:00:00 kthreadd
 3 ? question_1_O 00:00:00 rcu_gp Help: Last edit was second ago
 4 ?    00:00:00 rcu_par_gp
 6 ?    00:00:00 kworker/0:0H-kblockd
 8 ?    00:00:00 mm_percpu_wq
 9 ?    00:00:00 ksoftirqd/0 command was executed
10 ?   00:00:19 rcu_sched
11 ?   00:00:00 rcu_bh c. -a view all processes not associated with terminal
12 ?   00:00:00 migration/0 d. -T view all processes associated with the terminal
13 ?   00:00:23 kworker/0:1-events
14 ?   00:00:00 cpuhp/0 e. -r view all the running processes
15 ?   00:00:00 cpuhp/1 f. -x view all the processes which are owned by you.
16 ?   00:00:00 migration/1 g. -d view the processes except the session leaders
17 ?   00:00:00 ksoftirqd/1
19 ?   00:00:00 kworker/1:0H-kblockd
20 ?   00:00:00 cpuhp/2
21 ?   00:00:03 migration/2
22 ?   00:00:00 ksoftirqd/2
24 ?   00:00:00 kworker/2:0H-kblockd
25 ?   00:00:00 cpuhp/3
26 ?   00:00:01 migration/3 a. man <function/command/program name>
27 ?   00:00:00 ksoftirqd/3
```

11. more

- syntax: more <options> <filename>

- b. This command is used to display huge files(e.g. log files) piece by piece and this way very useful
- c. This command is useful when piped with commands outputting huge content

e.g locate <filename> | more

```
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl] $ locate sample | more
/etc/alsa/conf.d/10-samplerate.conf
/etc/gdm3/PostLogin/Default.sample
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/sample.js
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/sampleSize.js
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/fp/sample.js
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/fp/sampleSize.js
/home/AnimeshK/.icons/la-capitaine-icon-theme-master/actions/22x22-dark/filename-sample-rate.svg
/home/AnimeshK/.icons/la-capitaine-icon-theme-master/actions/22x22-light/filename-sample-rate.svg
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-1.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-2.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-3.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-4.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/hermes/tests/assets/sample-application
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/hermes/tests/assets/sample-application

c. This command is useful when piped with commands outputting huge content
```

```
/etc/alsa/conf.d/10-samplerate.conf
/etc/gdm3/PostLogin/Default.sample
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/sample.js
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/sampleSize.js
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/fp/sample.js
/home/AnimeshK/.cache/typescript/3.8/node_modules/lodash/fp/sampleSize.js
/home/AnimeshK/.icons/la-capitaine-icon-theme-master/actions/22x22-dark/filename-sample-rate.svg
/home/AnimeshK/.icons/la-capitaine-icon-theme-master/actions/22x22-light/filename-sample-rate.svg
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-1.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-2.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-3.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/app-plugins-host/lib/services/_test/data/sample-zips/sample-4.zip
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/hermes/tests/assets/sample-application
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/hermes/tests/assets/sample-application
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/hermes/tests/assets/sample.tar.gz
/home/AnimeshK/.local/share/Trash/files/Postman/app/resources/app/node_modules/@postman/hermes/tests/assets/sample-application/app
--More--
```

it displays the d.

it omits the underlines in the output

- d. -u it omits the underlines in the output

- e. -s squeezes multiple blank lines to single blank line
- f. -c display the pages on the same area by overlapping the previously displayed text.
- g. -p This option clears the screen and then displays the text.
- h. -f This option does not wrap the long lines and displays them as such.
- i. Screenshots:

```

$more -u test_text.txt
LINUX COMMANDS
1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf
2. Create a directory and create a file inside that directory.
3. List the files and directories that are empty in a working directory.
4. Show commands to delete empty and non-empty directory.
5. Find the location of the input files using locate and find command.
6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.
7. List all the files in the current directory and subdirectories.
8. Concatenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input".
9. Copy the contents of file 'sample2.txt' to 'sample.txt'
10. Append the file contents of input file 'sample2.txt' to the end of the first input file 'sample1.txt'.
11. Remove the permission for the users to read, write and execute the file 'sample.txt'.
12. Display the current date with the day of week, month, time and the year.
13. Show the calendar of previous, current and next month.
14. Sort the contents of the file 'sample1.txt' in alphabetical order.
15. Erase duplicate records in the file 'sample1.txt' and display only the unique records
16. Add line numbers to the file 'sample2.txt'
17. Find out whether the two pairs of input files are identical or not. Compare sample1.txt and sample2.txt Compare sample2.txt and sample.txt
18. Show how the input file "sample1.txt" differs line by line from "sample2.txt" in context and unified form.
--More--(39%)

```

```
$more -s test_text.txt
LINUX COMMANDS
1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf
2. Create a directory and create a file inside that directory.
3. List the files and directories that are empty in a working directory.
4. Show commands to delete empty and non-empty directory.
5. Find the location of the input files using locate and find command.
6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.
7. List all the files in the current directory and subdirectories.
8. Concatenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input".
9. Copy the contents of file 'sample2.txt' to 'sample.txt'
10. Append the file contents of input file 'sample2.txt' to the end of the first input file 'sample1.txt'.
11. Remove the permission for the users to read, write and execute the file 'sample.txt'.
12. Display the current date with the day of week, month, time and the year.
13. Show the calendar of previous, current and next month.
14. Sort the contents of the file 'sample1.txt' in alphabetical order.
15. Erase duplicate records in the file 'sample1.txt' and display only the unique records
16. Add line numbers to the file 'sample2.txt'
17. Find out whether the two pairs of input files are identical or not. Compare sample1.txt and sample2.txt Compare sample2.txt and sample.txt
18. Show how the input file "sample1.txt" differs line by line from "sample2.txt" in context and unified form.
--More-- (39%)
```

more -c <file>

```
$more -c test_text.txt
LINUX COMMANDS
1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf
2. Create a directory and create a file inside that directory.
3. List the files and directories that are empty in a working directory.
4. Show commands to delete empty and non-empty directory.
5. Find the location of the input files using locate and find command.
6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.
7. List all the files in the current directory and subdirectories.
8. Concatenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input".
9. Copy the contents of file 'sample2.txt' to 'sample.txt'
10. Append the file contents of input file 'sample2.txt' to the end of the first input file 'sample1.txt'.
11. Remove the permission for the users to read, write and execute the file 'sample.txt'.
12. Display the current date with the day of week, month, time and the year.
13. Show the calendar of previous, current and next month.
14. Sort the contents of the file 'sample1.txt' in alphabetical order.
15. Erase duplicate records in the file 'sample1.txt' and display only the unique records
16. Add line numbers to the file 'sample2.txt'
17. Find out whether the two pairs of input files are identical or not. Compare sample1.txt and sample2.txt Compare sample2.txt and sample.txt
18. Show how the input file "sample1.txt" differs line by line from "sample2.txt" in context and unified form.
--More-- (39%)
```

more -p <file> //please notice it cleared the screen before printing.

```

Applications ▾ Places ▾ Terminal ▾ Tue 25 Aug 15:32:20
Terminal
Question_1_OS - Google Docs
File Edit View Insert Format Tools Help Last edit was 3 minutes ago
Normal text Roboto 12 B I U A
locate
find
tar
ps
LINUX COMMANDS
1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf
2. Create a directory and create a file inside that directory.
3. List the files and directories that are empty in a working directory.
4. Show commands to delete empty and non-empty directory.
5. Find the location of the input files using locate and find command.
6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.
7. List all the files in the current directory and subdirectories.

```

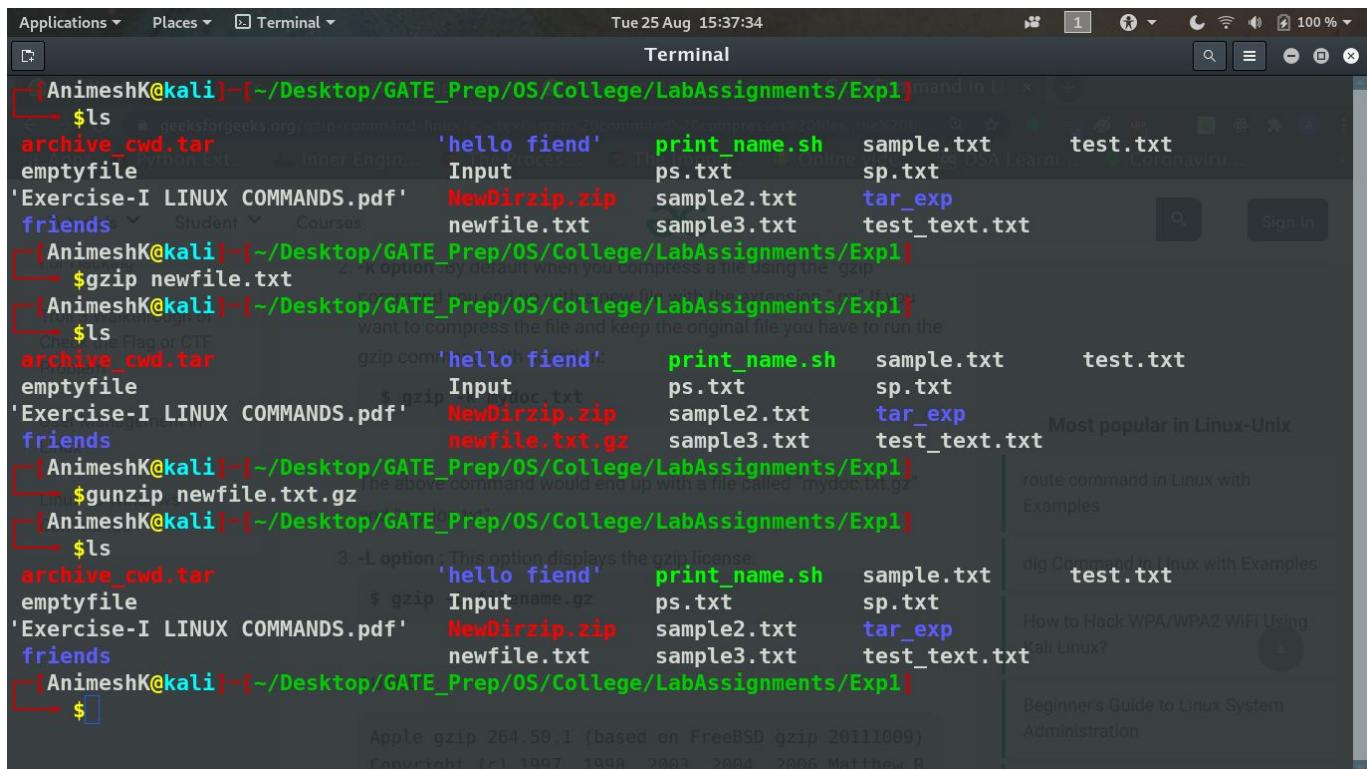
```

Applications ▾ Places ▾ Terminal ▾ Tue 25 Aug 15:32:45
Terminal
$more -f test_text.txt
LINUX COMMANDS
1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf
2. Create a directory and create a file inside that directory.
3. List the files and directories that are empty in a working directory.
4. Show commands to delete empty and non-empty directory.
5. Find the location of the input files using locate and find command.
6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.
7. List all the files in the current directory and subdirectories.
8. Concatenate the two input files: "sample1.txt" and "sample2.txt" and save it to a new file named "Input".
9. Copy the contents of file 'sample2.txt' to 'sample.txt'.
10. Append the file contents of input file 'sample2.txt' to the end of the first input file 'sample1.txt'.
11. Remove the permission for the users to read, write and execute the file 'sample.txt'.
12. Display the current date with the day of week, month, time and the year.
13. Show the calendar of previous, current and next month.
14. Sort the contents of the file 'sample1.txt' in alphabetical order.
15. Erase duplicate records in the file 'sample1.txt' and display only the unique records.
16. Add line numbers to the file 'sample2.txt'.
17. Find out whether the two pairs of input files are identical or not. Compare sample1.txt and sample2.txt. Compare sample2.txt and sample.txt.
18. Show how the input file "sample1.txt" differs line by line from "sample2.txt" in context and unified mode.

```

12. gzip

- a. Syntax: gzip <options> <file/foldername>
- b. It is short of genome zip. It is used to compress files and folders. Simple syntax simply generated a compressed file .gz
- c. gunzip used to unzip a .gz compressed file



The screenshot shows a terminal window with the following session:

```

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'    print_name.sh   sample.txt   test.txt
emptyfile             Input            ps.txt        sp.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip   sample2.txt   tar_exp
friends               newfile.txt     sample3.txt   test_text.txt

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ gzip newfile.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'    print_name.sh   sample.txt   test.txt
emptyfile             Input            ps.txt        sp.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip   sample2.txt   tar_exp
friends               newfile.txt.gz  sample3.txt   test_text.txt

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ gunzip newfile.txt.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'    print_name.sh   sample.txt   test.txt
emptyfile             Input            ps.txt        sp.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip   sample2.txt   tar_exp
friends               newfile.txt     sample3.txt   test_text.txt

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ 

```

The terminal window has a dark theme and shows various Linux commands and their outputs. A sidebar on the right contains links related to Linux commands like 'route', 'dig', and 'How to Hack WPA/WPA2 WiFi Using Kali Linux?'. The bottom of the terminal shows the version of gzip: Apple gzip 264.50.1 (based on FreeBSD gzip 20111009) Copyright (c) 1997, 1998, 2003, 2004, 2005 Matthew R.

- d. -k It preserves the original file and then creates .gz file separately, which is not the case if we don't use this option
- e. -l shows the gzip license of a file
- f. -r recursively compresses all the files of a specified directory
- g. -f used to forcefully compress a file, given that a .gz file of same name already exist. If we don't use this flag, it won't create a new .gz file.

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]

```

└─$ ls
archive_cwd.tar      'hello fiend'    print_name.sh  sample.txt  test.txt
emptyfile             Input            ps.txt        sp.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip   sample2.txt  tar_exp
friends               Student        Courses       newfile.txt  sample3.txt  test_text.txt
└─$ gzip -k newfile.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      gzip.com/hello fiend'  newfile.txt.gz  sample3.txt  test_text.txt
emptyfile             Input            print_name.sh  sample.txt  test.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  ps.txt        sp.txt
friends               newfile.txt     sample2.txt  tar_exp
└─$ gzip -L newfile.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ gzip 1.10
Copyright (C) 2018 Free Software Foundation, Inc.
Copyright (C) 1993 Jean-loup Gailly.
This is free software. You may redistribute copies of it under the terms of
the GNU General Public License <https://www.gnu.org/licenses/gpl.html>.
There is NO WARRANTY, to the extent permitted by law.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ 
```

Apple gzip 264.50,1 (based on FreeBSD gzip 20111009)
Copyright (c) 1997, 1998, 2003, 2004, 2006 Matthew R.

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]

```

└─$ ls
archive_cwd.tar      'hello fiend'    newfile.txt.gz  sample3.txt  test_text.txt
emptyfile             Input            print_name.sh  sample.txt  test.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  ps.txt        sp.txt
friends               Student        Courses       newfile.txt  sample2.txt  tar_exp
└─$ gzip -rk friends/ $ gzip -l mydoc.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'    newfile.txt.gz  sample3.txt  test_text.txt
emptyfile             Input            print_name.sh  sample.txt  test.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  ps.txt        sp.txt
friends               newfile.txt     sample2.txt  tar_exp
└─$ ls friends/
sample2.txt  sample2.txt.gz  samplezip.zip  samplezip.zip.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ gzip -f sample2.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
archive_cwd.tar      'hello fiend'    newfile.txt.gz  sample3.txt  test_text.txt
emptyfile             Input            print_name.sh  sample.txt  test.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  ps.txt        sp.txt
friends               newfile.txt     sample2.txt.gz  tar_exp
└─$ gzip -v mydoc.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

13. free

- a. Syntax: free <options>
 - b. -g #GBs used of the RAM(MM)
 - c. -b #bytes used of the RAM(MM)
 - d. -h output in human readable form
 - e. -c n Display the result n times
 - f. -l Show detailed low and high memory statistics.
 - g. -t Display a line showing the column totals.
 - h. -V Display version info

i. Screenshots

```
$free
total      used      free      shared  buff/cache   available
Mem:    8076308  3530328  1078348  1090552  3467632  3145984
Swap:  8295420      0  8295420

[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl)
$free -g
total      used      free      shared  buff/cache   available
Mem: ~ 7      3      1      1      3
Swap: 7      0      7

[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl)
$free -t
total      used      free      shared  buff/cache   available
Mem: 8076308  3523920  1090460  1084828  3461928  3158128
Swap: 8295420      0  8295420
Total: 16371728  3523920  9385880

[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl)
$man free
Display the result 6 times.
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl)
$free -c 2
f -l      Show detailed low and high memory statistics.
man      total      used      free      shared  buff/cache   available
Mem: 8076308  3556080  1066316  1069844  3453912  3140952
Swap: 8295420      0  8295420
Display version info

man      total      used      free      shared  buff/cache   available
Mem: 8076308  3556388  1067492  1068360  3452428  3142128
Swap: 8295420      0  8295420
```

```

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$free -h
total used free shared buff/cache available
Mem: 7.7Gi 3.4Gi 1.0Gi 1.0Gi 3.3Gi 3.0Gi
Swap: 7.9Gi 0B 7.9Gi

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$free -l
total used free shared buff/cache available
Mem: 8076308 3607588 1033924 1066136 3434796 3093152
Low: 8076308 7042384 1033924
High: 0 0 0
Swap: 8295420 0 8295420
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$free -t
more total used free shared ed buff/cache available
Mem: 8076308 3591132 1039924 1065344 3445252 3110400
Swap: 8295420 0 8295420
Total: 16371728 3591132 9335344 n
Output in human readable form
Display the result n times

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$free -V
free from procps-ng 3.3.15
Display a line showing the column totals.

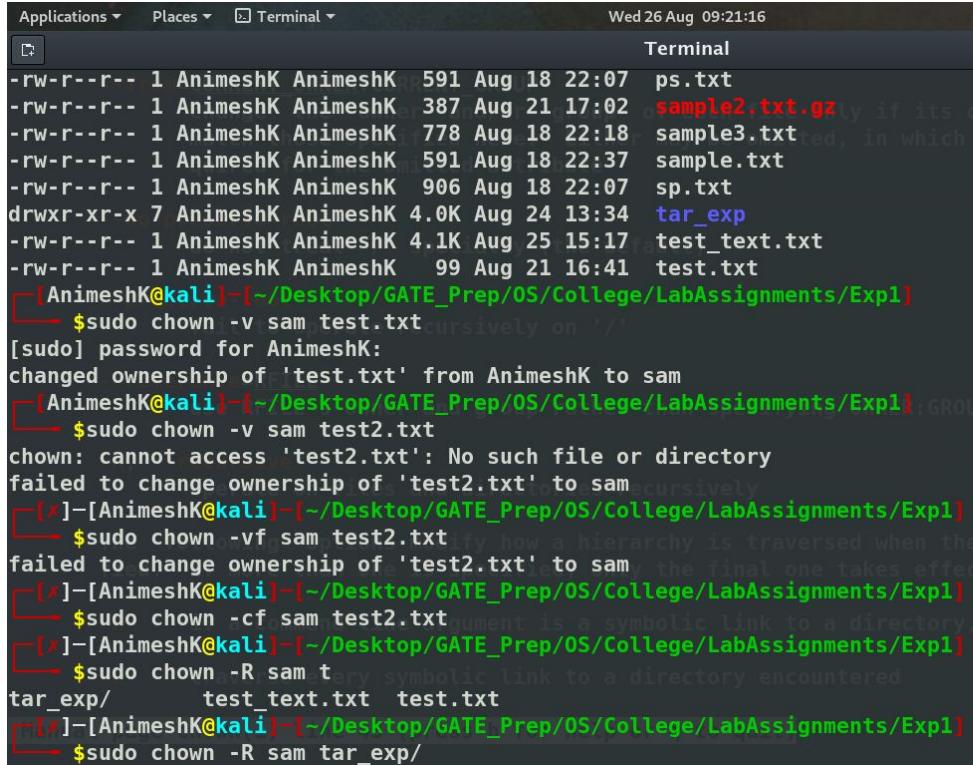
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$free -b
total used free enshots shared buff/cache available
Mem: 8270139392 3693056000 1037168640 1102749696 3539914752 3157458944
Swap: 8494510080 0 8494510080
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]

```

14. chown

- Syntax: chown <user>:<group> <file/folder1> <file/folder2> ...
- This command changes the ownership of a file or folder to a specified user or group or both.
- v verbose, whatever the processing this command does, we'll be displayed on the stdout in this verbose mode.
- c similar to verbose, but message will be displayed only if, the ownership of any item get changed by this command.
- f if some file doesn't exist or any kind of error is thrown, this command forces it not to display any such error messages.
- R recursive, as it sounds, when the chown command is applied with this option over a specified directory, it changes the ownership of all the files and directories, sub directories, sub sub directories residing within the specified directory, recursively.

Screenshots: In this screenshot, please notice the ownership of the directory 'tar_exp/'. In the present directory we show the usage of all the options mentioned above. We also recursively change the ownership of 'tar_exp/', which we'll verify in the next screenshot.



```

Applications ▾ Places ▾ Terminal ▾
Wed 26 Aug 09:21:16
Terminal
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 18 22:07 ps.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 778 Aug 18 22:18 sample3.txt
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 18 22:37 sample.txt
-rw-r--r-- 1 AnimeshK AnimeshK 906 Aug 18 22:07 sp.txt
drwxr-xr-x 7 AnimeshK AnimeshK 4.0K Aug 24 13:34 tar_exp
-rw-r--r-- 1 AnimeshK AnimeshK 4.1K Aug 25 15:17 test_text.txt
-rw-r--r-- 1 AnimeshK AnimeshK 99 Aug 21 16:41 test.txt
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ sudo chown -v sam test.txt
[sudo] password for AnimeshK:
changed ownership of 'test.txt' from AnimeshK to sam
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ sudo chown -v sam test2.txt
chown: cannot access 'test2.txt': No such file or directory
failed to change ownership of 'test2.txt' to sam
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ sudo chown -vf sam test2.txt
failed to change ownership of 'test2.txt' to sam
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ sudo chown -cf sam test2.txt
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ sudo chown -R sam t
tar_exp/      test_text.txt  test.txt
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ sudo chown -R sam tar_exp/

```

Please verify in the below screenshot: The ownership of 'tar_exp/' has been changed to 'sam' and simultaneously all the files and folders under it are also now owned by 'sam', except the default ".." which is always the ownership of parent directory 'Exp1/'. This happened because we used the option -R.(for recursive)

```

[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
$ls -lah
total 388K
drwxr-xr-x 7 sam AnimeshK 4.0K Aug 24 13:34 .
drwxr-xr-x 5 AnimeshK AnimeshK 4.0K Aug 25 15:39 ..
-rw-r--r-- 1 sam AnimeshK 160K Aug 21 18:06 archive_cwd.tar
-rw-r--r-- 1 sam AnimeshK 10K Aug 21 18:03 archive_exp.tar
drwxr-xr-x 2 sam AnimeshK 4.0K Aug 20 09:40 empty
-rw-r--r-- 1 sam AnimeshK 0 Aug 18 10:15 emptyfile
-rw-r--r-- 1 sam AnimeshK 118K Aug 18 09:53 'Exercice-I LINUX COMMANDS.pdf'
drwxr-xr-x 2 sam AnimeshK 4.0K Aug 21 20:16 friends
-rw-r--r-- 1 sam AnimeshK 10 Aug 21 18:02 hello.c
drwxr-xr-x 2 sam AnimeshK 4.0K Aug 21 14:58 'hello fiend'
-rw-r--r-- 1 sam AnimeshK 16 Aug 21 18:02 hi.c
-rw-r--r-- 1 sam AnimeshK 1.5K Aug 18 10:56 Input
drwxr-xr-x 2 sam AnimeshK 4.0K Aug 20 10:10 NewDir
-rw-r--r-- 1 sam AnimeshK 591 Aug 20 09:21 newfile.txt
-rw-r--r-- 1 sam AnimeshK 172 Aug 21 17:47 print_name.sh
-rw-r--r-- 1 sam AnimeshK 591 Aug 18 22:07 ps.txt

```

it displays the d

15. df

- Syntax: df <options> <filename(if any)>
- If no filename is passed then it displays the disc free space available on all mounted file systems
- l displays disc free space for local file systems only
- a dummy files having zero block sizes are also displayed
- h all the sizes are printed in human readable format(GB, MB and so on). The convention followed here is of 1024, (i.e. powers of 2)
- H all the sizes are printed in human readable format(GB, MB and so on). The convention followed here is of 1000, (i.e. powers of 10)
- i displays the inode information instead of block size data.

- h. **-t TYPE** displays the information of only the file systems of type TYPE
- i. **-T** displays the TYPE information of all the files
- j. **-x TYPE** displays the information(disc free space) of all the file systems which are NOT of type TYPE. (opposite of **-t TYPE**)
- k. When we specify a file name just after **df**, **df <file>** then it displays only the information of the specified file

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
└─$ df
Filesystem 1K-blocks Used Available Use% Mounted on
udev          4014072   0  4014072  0% /dev
tmpfs         807632  10064  797568  2% /run
/dev/sda5    447668104 110811876 314046168 27% /
tmpfs         4038152  439544  3598608 11% /dev/shm
tmpfs         5120 /* in this directory the disk usage details will be displayed in human readable format.
tmpfs         4038152   0  4038152  0% /sys/fs/cgroup
/dev/sdal     262144  35144  227000 14% /boot/efi
tmpfs         807628    12  807616  1% /run/user/131
tmpfs         807628    24  807604  1% /run/user/1001
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
└─$ df -l
Filesystem 1K-blocks Used Available Use% Mounted on
udev          4014072   0  4014072  0% /dev
tmpfs         807632  10064  797568  2% /run
/dev/sda5    447668104 110811880 314046164 27% /
tmpfs         4038152  435960  3602192 11% /dev/shm
tmpfs         5120   -i-  0  5120  0% /run/lock
tmpfs         4038152   0  4038152  0% /sys/fs/cgroup
/dev/sdal     262144  35144  227000 14% /boot/efi
tmpfs         807628   -i-  12  807616  1% /run/user/131
tmpfs         807628    24  807604  1% /run/user/1001
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
└─$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
└─ $ df -a
Filesystem      1K-blocks    Used   Available  Use% Mounted on
sysfs            0        0        0       - /sys
proc             0        0        0       - /proc
udev             4014072     0    4014072    0% /dev
devpts           0        0        0       - /dev/pts
tmpfs            807632    10068    797564    2% /run
/dev/sda5        447668104 110812232 314045812 27% /
securityfs       0        0        0       - /sys/kernel/security
tmpfs            4038152    438472   3599680   11% /dev/shm
tmpfs            5120      0        5120      0% /run/lock
tmpfs            4038152     0    4038152    0% /sys/fs/cgroup
cgroup2          0        0        0       - /sys/fs/cgroup/unified
cgroup           0        0        0       - /sys/fs/cgroup/systemd
pstore           0        0        0       - /sys/fs/pstore
efivarfs         0        0        0       - /sys/firmware/efi/efivars
bpf              0        0        0       - /sys/fs/bpf
cgroup           0        0        0       - /sys/fs/cgroup/blkio
cgroup           0        0        0       - /sys/fs/cgroup/pids
cgroup           0        0        0       - /sys/fs/cgroup/cpu,cpuacct
cgroup           0        0        0       - /sys/fs/cgroup/perf_event
cgroup           0        0        0       - /sys/fs/cgroup/net_cls,net_prio
cgroup           0        0        0       - /sys/fs/cgroup/cpuset
cgroup           0        0        0       - /sys/fs/cgroup/memory
cgroup           0        0        0       - /sys/fs/cgroup/freezer
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
└─ $ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            3.9G   0    3.9G   0% /dev
tmpfs           789M  9.9M  779M  2% /run
/dev/sda5        427G 106G  300G  27% /
tmpfs           3.9G  430M  3.5G  11% /dev/shm
tmpfs           5.0M   0    5.0M   0% /run/lock
tmpfs           3.9G   0    3.9G   0% /sys/fs/cgroup
/dev/sda1        256M  35M   222M  14% /boot/efi
tmpfs           789M  12K   789M  1% /run/user/131
tmpfs           789M  24K   789M  1% /run/user/1001
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
└─ $ df -H
Filesystem      Size  Used Avail Use% Mounted on
udev            4.2G   0    4.2G   0% /dev
tmpfs           828M  11M   817M  2% /run
/dev/sda5        459G 114G  322G  27% /
tmpfs           4.2G  455M  3.7G  11% /dev/shm
tmpfs           5.3M   0    5.3M   0% /run/lock
tmpfs           4.2G   0    4.2G   0% /sys/fs/cgroup
/dev/sda1        269M  36M   233M  14% /boot/efi
tmpfs           828M  13k   827M  1% /run/user/131
tmpfs           828M  25k   827M  1% /run/user/1001
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/tar_exp]
```

```
$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ df -i
Filesystem      Inodes   IUsed   IFree  IUse% Mounted on
udev            1003518     494  1003024    1% /dev
tmpfs           1009538     970  1008568    1% /run
/dev/sda5        28499968 1368875 27131093   5% /
tmpfs           1009538    2109  1007429    1% /dev/shm
tmpfs           1009538      4   1009534    1% /run/lock
tmpfs           1009538     17  1009521    1% /sys/fs/cgroup
/dev/sda1          0       0       0    - /boot/efi
tmpfs           1009538     24  1009514    1% /run/user/131
tmpfs           1009538     32  1009506    1% /run/user/1001
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ df -t tmpfs
Filesystem  1K-blocks  Used  Available Use% Mounted on
tmpfs        807632  10064   797568   2% /run
tmpfs        4038152 444872  3593280  12% /dev/shm
tmpfs         5120  /dev/shm  5120  0% /run/lock
tmpfs        4038152      0  4038152  0% /sys/fs/cgroup
tmpfs        807628     12  807616   1% /run/user/131
tmpfs        807628     24  807604   1% /run/user/1001
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ df -T
Filesystem  Type  1K-blocks  Used  Available Use% Mounted on
udev      devtmpfs  4014072     0  4014072   0% /dev
tmpfs      tmpfs   807632  10064   797568   2% /run
/dev/sda5 ext4   447668104 110812856 314045188  27% /
tmpfs      tmpfs   4038152 445672  3592480  12% /dev/shm
tmpfs      tmpfs   5120      0   5120  0% /run/lock
tmpfs      tmpfs   4038152      0  4038152  0% /sys/fs/cgroup
/dev/sda1 vfat   262144  35144   227000  14% /boot/efi
tmpfs      tmpfs   807628     12  807616   1% /run/user/131
tmpfs      tmpfs   807628     24  807604   1% /run/user/1001
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ df -x tmpfs
Filesystem  1K-blocks  Used  Available Use% Mounted on
udev      4014072     0  4014072   0% /dev
/dev/sda5  447668104 110812896 314045148  27% /
/dev/sda1  262144   35144   227000  14% /boot/efi
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $ df test_text.txt
Filesystem  1K-blocks  Used  Available Use% Mounted on
/dev/sda5  447668104 110816744 314041300  27% /
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/tar_exp]
└─ $
```

16. sort

- Syntax: sort <options> <filename>
- This command sorts the file based on ASCII.
- r Sorting In Reverse Order
- n To sort a file numerically.

- e. -k sorting a table on the basis of any column number by using -k option.
 - f. -c to check if the file given is already sorted or not
 - g. -u To sort and remove duplicates pass the -u option to sort.
 - h. -M To sort by month pass the -M option to sort.
 - i. Screenshots:

```
$ sort test.txt
Great fellow
how are you
I am gret
Oee is again good
OS is good
too many good and bad.
you are bad

$sort -r test.txt
you are bad
too many good and bad.
OS is good
Oee is again good
I am gret
how are you
Great fellow

$sort -n test.txt
Great fellow
how are you
I am gret
Oee is again good
OS is good
too many good and bad.
you are bad

$sort -k 2n test.txt
Great fellow
how are you
I am gret
Oee is again good
OS is good
OS is good
too many good and bad.
you are bad

$sort -c test.txt
sort: test.txt:3: disorder: how are you

$sort -u test.txt
Great fellow
how are you
I am gret
Oee is again good
OS is good
too many good and bad.
you are bad
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ sort -M test.txt
Great fellow
how are you
I am gret
Oee is again good
OS is good
OS is good
too many good and bad.
you are bad
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

17. pwd

- Syntax: `pwd <options>`
- Prints the present working directory starting from the root
- `-L` prints the symbolic path
- `-P` prints the actual path
- screenshot:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ pwd
/home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ pwd -L
/home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ pwd -P
/home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

18. ifconfig

- Syntax: `ifconfig <options>`
- This command is used to configure the kernel-resident network interfaces.
- `-a` This option is used to display all the interfaces available, even if they are down
- `-s` Display a short list, instead of details
- `-v` Run the command in verbose mode – log more details about

execution

f. Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ifconfig
eth0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 8c:16:45:ce:8e:9d txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      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
      chown inet6 ::1 prefixlen 128 scopeid 0x10<host>
      df loop txqueuelen 1000 (Local Loopback)
        RX packets 4780 bytes 371628 (362.9 KiB)
        RX errors 0 dropped 0 overruns 0 frame 0
      sort TX packets 4780 bytes 371628 (362.9 KiB) This option is used to display all the
      pwd TX packets 4780 bytes 371628 (362.9 KiB) This option is used to display all the
      - ifconfig TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 Display a summary instead of details
      e. -v Run the command in verbose mode

vmnet1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    man inet 192.168.77.1 netmask 255.255.255.0 broadcast 192.168.77.255
    man inet6 fe80::250:56ff:fe01:1 prefixlen 64 scopeid 0x20<link>
    ether 00:50:56:c0:00:01 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 647 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ifconfig -a
eth0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 8c:16:45:ce:8e:9d txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      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
      chown inet6 ::1 prefixlen 128 scopeid 0x10<host>
      df loop txqueuelen 1000 (Local Loopback)
        RX packets 4780 bytes 371628 (362.9 KiB)
        RX errors 0 dropped 0 overruns 0 frame 0
      sort TX packets 4780 bytes 371628 (362.9 KiB) This option is used to display all the
      pwd TX packets 4780 bytes 371628 (362.9 KiB) This option is used to display all the
      - ifconfig TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0 Display a summary instead of details
      e. -v Run the command in verbose mode

vmnet1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    man inet 192.168.77.1 netmask 255.255.255.0 broadcast 192.168.77.255
    man inet6 fe80::250:56ff:fe01:1 prefixlen 64 scopeid 0x20<link>
    ether 00:50:56:c0:00:01 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 647 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
[AnimeshK@kali] - [/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
[AnimeshK@kali] - $ifconfig -s
Iface      MTU   RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
eth0       1500     0     0     0     0        0     0     0     0     0 BMU
lo        65536   4780     0     0     0    4780     0     0     0     0 LRU
vmnet1     1500     0     0     0     0        647     0     0     0     0 BMRU
vmnet8     1500     0     0     0     0        647     0     0     0     0 BMRU
wlan0      1500 198436     0     0     0    186986     0     0     0     0 BMRU
[AnimeshK@kali] - [/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
[AnimeshK@kali] - $ifconfig -v
eth0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
      ether 8c:16:45:ce:8e:9d  txqueuelen 1000  (Ethernet)
      RX packets 0 bytes 0 (0.0 B)  a. Syntax: ifconfig <options>
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)  b. This command is used to configure the kernel-resident network interface
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
      ifconfig d. -s          Display a short list, instead of details
      lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
      man  inet 127.0.0.1 netmask 255.0.0.0
      man  inet6 ::1 prefixlen 128 scopeid 0x10<host>
      man  loop txqueuelen 1000  (Local Loopback)
      man  RX packets 4780 bytes 371628 (362.9 KiB)
      man  RX errors 0 dropped 0 overruns 0 frame 0
      man  TX packets 4780 bytes 371628 (362.9 KiB)
      man  TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
      Run the command in verbose mode – log more information about the interface
```

19. cat

- cat <options> <file1> <file2>...
- Used to print the content of all the listed files on the stdout.
- n prints the content with line no.
- s suppress the empty lines duplicated multiple times
- E highlight the end of each line with a \$
- Syntax: cat file1 > file2, overwrite the content of file1 to file2
- Syntax: cat file1 >> file2, append the content of file1 to file2
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat test.txt
Great fellow
OS is good
how are you
I am gret
Oee is again good
you are bad
too many good and bad.
OS is good
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat -n test.txt
 1 Great fellow
 2 OS is good
 3 how are you
 4 I am gret
 5 Oee is again good
 6 you are bad
 7 too many good and bad.
 8 OS is good
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

	Option 1	cat [filename-whose-contents-is-to-be-copied] > [destination-filename]
	option2	cat -s geeks.txt
	option3	cat file1 >> file2

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat -s test.txt
Great fellow
OS is good
how are you
I am gret
Oee is again good
you are bad
too many good and bad.
OS is good
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat test.txt > newtest.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat newtest.txt
Great fellow
OS is good
how are you
I am gret
Oee is again good
you are bad
too many good and bad.
OS is good
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

```

└── $ cat -E newtest.txt
Great fellow$          ↳ quest1
OS is good$           ↳ ass
how are you$          ↳ Wallpapers
I am gret$            Screenshot from 2020-08-26 13-56-17.png
Oee is again good$    Screenshot from 2020-08-26 13-55-35.png
you are bad$          Screenshot from 2020-08-25 15-57-58.png
too many good and bad.$ Screenshot from 2020-08-25 15-54-32.png
OS is good$            Screenshot from 2020-08-25 15-40-11.png
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $cat *.txt
Great fellow
OS is good
how are you
I am gret
Oee is again good
you are bad
too many good and bad.
OS is good
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.

```

```

[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $cat test.txt >> newtest.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $cat new
new_cat.txt  newfile.txt  newfile.txt.gz  newtest.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $cat newtest.txt
Great fellow
OS is good
how are you
I am gret
Oee is again good
you are bad
too many good and bad.
OS is good
Great fellow
OS is good
how are you
I am gret
Oee is again good
you are bad
too many good and bad.
OS is good
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $cat -n test.txt
1 Great fellow
2 OS is good.
3 how are you
4 I am gret
5 Oee is again good
6 you are bad
7 too many good and bad.
8 OS is good
9
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]

```

20. echo

- Syntax: echo <options><string>
- Echo command is used to display line of text <string>

- c. -n do not output the trailing newline
- d. -e enable interpretation of backslash escapes
- e. If -e is in effect, the following sequences are recognized:
 - i. \\ backslash
 - ii. \a alert (BEL)
 - iii. \b backspace
 - iv. \c produce no further output
 - v. \e escape
 - vi. \f form feed
 - vii. \n new line
 - viii. \r carriage return
 - ix. \t horizontal tab
 - x. \v vertical tab
- f. To get an alert use \a
- g. Echo can be used to print files and folders
- h. Using the redirect operator we can create a new file or append a string in a file

```
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo "animesh is here"
animesh is here
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\nre"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\bre"
animesh is hre
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\cre"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\ere"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\fre"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\nre"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\rre"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\tre"
animesh is he
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -e "animesh is he\nre"
animesh is he
re
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo -n "animesh is here"
animesh is here
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ echo "new file content" > animeshfile.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat animeshfile.txt
new file content
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

21. chmod

- a. chmod <options> <mode> <file1> <file2> ...
- b. Change mode is used to change the mode of a file or a folder
- c. The mode is expressed as a 3 digit no. corresponding to user, group and others.
 - i. rwx - 111
 - ii. r -x - 101
 - iii. - -x - 001
 - iv. the mode 744 stands for rwx(111) permission for user, r -(100) permission for group and r -(100) permission for others.
- d. -R is used to change the mode recursively

```
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/friends)
└─$ ls -alh
total 24K
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 25 15:38 .
drwxr-xr-x 5 AnimeshK AnimeshK 4.0K Aug 26 14:39 ..
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 21 17:02 sample2.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 529 Aug 21 20:12 samplezip.zip
-rw-r--r-- 1 AnimeshK AnimeshK 517 Aug 21 20:12 samplezip.zip.gz
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/friends)
└─$ chmod 744 samplezip.zip
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/friends)
└─$ ls -alh
total 24K
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 25 15:38 .
drwxr-xr-x 5 AnimeshK AnimeshK 4.0K Aug 26 14:39 ..
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 21 17:02 sample2.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 529 Aug 21 20:12 samplezip.zip
-rw-r--r-- 1 AnimeshK AnimeshK 517 Aug 21 20:12 samplezip.zip.gz
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/friends)
└─$ 
```

The name is an abbreviation of change mode.

```
[AnimeshK@kali](-~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -alh
total 356K
drwxr-xr-x 5 AnimeshK AnimeshK 4.0K Aug 26 14:39 .
drwxr-xr-x 3 AnimeshK AnimeshK 4.0K Aug 18 09:58 ..
-rw-r--r-- 1 AnimeshK AnimeshK 17 Aug 26 14:39 animeshfile.txt
-rw-r--r-- 1 AnimeshK AnimeshK 160K Aug 21 18:06 archive_cwd.tar
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 18 10:15 emptyfile
-rw-r--r-- 1 AnimeshK AnimeshK 118K Aug 18 09:53 'Exercise-I LINUX COMMANDS.pdf'
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 25 15:38 friends
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 21 14:58 'hello fiend'
-rw-r--r-- 1 AnimeshK AnimeshK 1.5K Aug 18 10:56 Input
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 26 13:53 new_cat.txt
-rw-r--r-- 1 AnimeshK AnimeshK 164 Aug 21 20:11 NewDirzip.zip
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 26 13:54 newfile.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 20 09:21 newfile.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 220 Aug 26 14:01 newtest.txt
-rwrxr-xr-x 1 AnimeshK AnimeshK 172 Aug 21 17:47 print_name.sh
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 18 22:07 ps.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 778 Aug 18 22:18 sample3.txt
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 18 22:37 sample.txt
-rw-r--r-- 1 AnimeshK AnimeshK 906 Aug 18 22:07 sp.txt
drwxr-xr-x 7 sam AnimeshK 4.0K Aug 24 13:34 tar_exp
-rw-r--r-- 1 AnimeshK AnimeshK 4.1K Aug 25 15:17 optest_text.txt
-rw-r--r-- 1 AnimeshK AnimeshK 110 Aug 26 10:06 test.txt
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ chmod -R 777 friends
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -alh
total 356K Commands
drwxr-xr-x 5 AnimeshK AnimeshK 4.0K Aug 26 14:39 .
drwxr-xr-x 3 AnimeshK AnimeshK 4.0K Aug 18 09:58 ..
-rw-r--r-- 1 AnimeshK AnimeshK 17 Aug 26 14:39 animeshfile.txt
-rw-r--r-- 1 AnimeshK AnimeshK 160K Aug 21 18:06 archive_cwd.tar
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 18 10:15 emptyfile
-rw-r--r-- 1 AnimeshK AnimeshK 118K Aug 18 09:53 'Exercise-I LINUX COMMANDS.pdf'
drwxrwxrwx 2 AnimeshK AnimeshK 4.0K Aug 25 15:38 friends
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 21 14:58 'hello fiend'
-rw-r--r-- 1 AnimeshK AnimeshK 1.5K Aug 18 10:56 Input
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 26 13:53 new_cat.txt
-rw-r--r-- 1 AnimeshK AnimeshK 164 Aug 21 20:11 NewDirzip.zip
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 26 13:54 newfile.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 20 09:21 newfile.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 220 Aug 26 14:01 newtest.txt
-rwrxr-xr-x 1 AnimeshK AnimeshK 172 Aug 21 17:47 print_name.sh
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 18 22:07 ps.txt
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 778 Aug 18 22:18 sample3.txt
-rw-r--r-- 1 AnimeshK AnimeshK 591 Aug 18 22:37 sample.txt
-rw-r--r-- 1 AnimeshK AnimeshK 906 Aug 18 22:07 sp.txt
drwxr-xr-x 7 sam AnimeshK 4.0K Aug 24 13:34 tar exp
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cd friends/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/friends]
└─$ ls -alh
total 24K Commands
drwxrwxrwx 2 AnimeshK AnimeshK 4.0K Aug 25 15:38 .
drwxr-xr-x 5 AnimeshK AnimeshK 4.0K Aug 26 14:39 ..
-rwxrwxrwx 1 AnimeshK AnimeshK 591 Aug 21 17:02 sample2.txt
-rwxrwxrwx 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rwxrwxrwx 1 AnimeshK AnimeshK 529 Aug 21 20:12 samplezip.zip
-rwxrwxrwx 1 AnimeshK AnimeshK 517 Aug 21 20:12 samplezip.zip.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/friends]
└─$
```

22. top

- Syntax: top
- This command displays processor activity of your Linux box and also displays tasks managed by kernel in real-time. It'll show processor and memory are being used and other information like running processes. This may help you to take correct action.

- c. Press k and option will come to kill a process. Type the pid of process to kill that process
- d. You can sort by cpu usage by pressing shift+p
- e. You can change the priority of a processes by pressing r and entering its pid.

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
17969	AnimeshK	20	0	9252	3808	3224	R	11.8	0.0	0:00.03	top
1373	AnimeshK	20	0	368424	56712	41804	S	5.9	0.7	14:28.97	Xorg
1621	AnimeshK	20	0	758716	88060	46516	S	5.9	1.1	3:30.57	nautilus
17957	root	20	0	0	0	0	I	5.9	0.0	0:00.06	kworker/u16:3-events_unbound
1	root	20	0	165032	10252	7784	S	0.0	0.1	0:22.78	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.02	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
9	root	20	0	0	0	0	S	0.0	0.0	0:00.63	ksoftirqd/0
10	root	20	0	0	0	0	I	0.0	0.0	0:21.59	rcu_sched
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_bh
12	root	rt	0	0	0	0	S	0.0	0.0	0:00.09	migration/0
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
15	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
16	root	rt	0	0	0	0	S	0.0	0.0	0:00.08	migration/1
17	root	20	0	0	0	0	S	0.0	0.0	0:00.19	ksoftirqd/1

23. diff

- a. diff <options> <file1> <file2>
- b. -c output in context format.
- c. -u output in unified format.
- d. -i case insensitive
- e. -s reports the identical files
- f. -b whitespaces are ignored while comparing
- g. -q for reporting only when there is difference

h. -r to look recursively

i. Screenshots:

```
[x]-[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $diff -i news.txt sample.txt
9d8
< extra content
[ ]-[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $diff -u news.txt sample.txt
--- news.txt 2020-08-28 19:17:35.661479364 +0530
+++ sample.txt 2020-08-18 22:37:21.291545524 +0530
@@ -6,4 +6,3 @@
 Multiuser operating system.
 Yet another powerful OS.

-extra content
[ ]-[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $diff -c news.txt sample.txt
*** news.txt 2020-08-28 19:17:35.661479364 +0530
--- sample.txt 2020-08-18 22:37:21.291545524 +0530
*****
*** 6,9 ****
 Multiuser operating system.
 Yet another powerful OS.

- extra content
--- 6,8 ---
[x]-[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

```
[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $diff -r friends/ tar_exp/
Only in tar_exp/: archive_cwd.tar
Only in tar_exp/: archive_exp.tar
Only in tar_exp/: empty
Only in tar_exp/: emptyfile
Only in tar_exp/: Exercise-I LINUX COMMANDS.pdf
Only in tar_exp/: friends
Only in tar_exp/: hello.c
Only in tar_exp/: hello_fiend
Only in tar_exp/: hi.c
Only in tar_exp/: Input
Only in tar_exp/: NewDir
Only in tar_exp/: newfile.txt
Only in tar_exp/: print_name.sh
Only in tar_exp/: ps.txt
Only in tar_exp/: sample1.txt
Only in friends/: sample2.txt.gz
Only in tar_exp/: sample3.txt
Only in tar_exp/: sample.txt
Only in friends/: samplezip.zip
Only in friends/: samplezip.zip.gz
Only in tar_exp/: sp.txt
Only in tar_exp/: tar_exp
Only in tar_exp/: test_text.txt
Only in tar_exp/: test.txt
```

24. shutdown

- a. shutdown <options> <time> <message(if any)>
 - b. Both immediately shutdown or shutdown after a certain duration can be specified.
Only the root user is permitted to execute the shutdown command.
 - c. -H halt
 - d. -P power-off(default)
 - e. -r reboot
 - f. -c cancel a pending shutdown
 - g. Screenshot:

```
[AnimeshK@kali] ~ [~]  
$ shutdown now
```

25. mount

- a. mount <file system name>
 - b. It is used to mount the filesystem found on a device to a big tree structure(Linux filesystem) rooted at '/'.
c. umount can be used to detach these devices from the Tree.

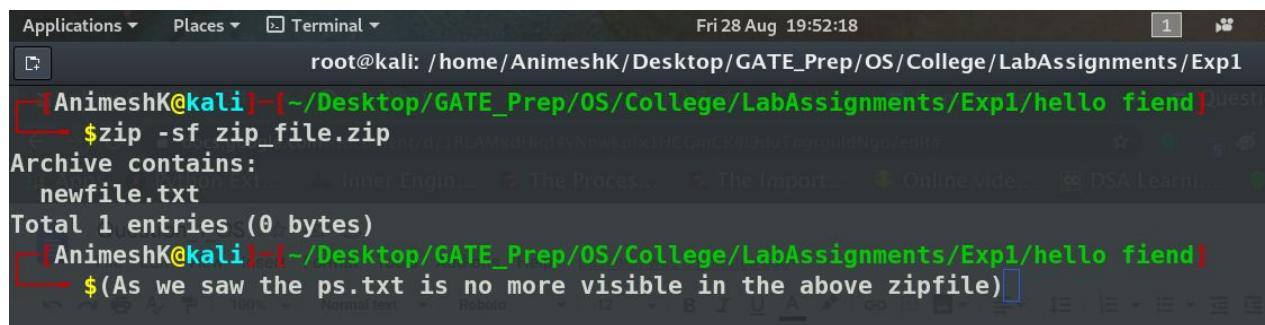
```
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ sudo su
root@kali:/home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl# lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda      8:0    0  931.5G  0 disk
└─sda1   8:1    0   260M  0 part /boot/efi
├─sda2   8:2    0    16M  0 part
└─sda3   8:3    0  487.6G  0 part
├─sda4   8:4    0 1000M  0 part
└─sda5   8:5    0  434.8G  0 part /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl
└─sda6   8:6    0    7.9G  0 part [SWAP]
root@kali:/home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl# mount /dev/sda1
```

26. zip

- a. Syntax: zip name.zip <file1> <file2>...
- b. It is a compression and file packaging utility for Unix. Each file is stored in single name.zip file.
- c. -u and -d : inserting files into zip folder
- d. -d deleting files into zip folder
- e. -sf : to view the contents of zip folder
- f. unzip <zip name> : unzipping a zip folder

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
animeshfile.txt      'hello fiend'    newfile.txt.gz   sample2.txt.gz  test_text.txt
archive_cwd.tar       Input            news.txt       sample3.txt   test.txt
emptyfile             new_cat.txt     newtest.txt   sample.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  print_name.sh sp.txt
friends               newfile.txt    ps.txt        tar_exp
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ zip_file.zip newfile.txt
adding: newfile.txt (stored 0%)
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ zip -u zip_file.zip ps.txt
adding: ps.txt (deflated 40%)
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
animeshfile.txt      'hello fiend'    newfile.txt.gz   sample2.txt.gz  test_text.txt
archive_cwd.tar       Input            news.txt       sample3.txt   test.txt
emptyfile             new_cat.txt     newtest.txt   sample.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  print_name.sh sp.txt
friends               newfile.txt    ps.txt        zip_file.zip
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mv zip_file.zip hello\ fiend/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cd hello\ fiend/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ ls
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ man
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ ls
zip_file.zip
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ unzip zip_file.zip
Archive: zip_file.zip
extracting: newfile.txt
inflating: ps.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ ls
newfile.txt  ps.txt  zip_file.zip
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ zip -d zip_file.zip ps.txt
deleting: ps.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ ls
newfile.txt  ps.txt  zip_file.zip
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
```



```
root@kali: /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/hello friend]
$zip -sf zip_file.zip
Archive contains:
newfile.txt
Total 1 entries (0 bytes)
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/hello friend]
$(As we saw the ps.txt is no more visible in the above zipfile)
```

27. vim

- a. vim <options> <file name>
- b. vim is an editor available in UNIX based systems
- c. The above commands opens the file if it exists and if it doesn't exist, it creates it and opens.
- d. -R filename : Opens an existing file in read only mode.
- e. ESC + colon + w! save the contents written till now
- f. ESC + colon + q! quit editing and get back to the command prompt of linux
- g. Screenshot:

```
#include <iostream>
int main() {
    int n = 10;
    while (n--) {
        cout << n << endl;
    }
    cout << "hello world" << endl;
    return 0;
}
diff
shutdown
mount
zip
vim
man
man
man
man
man
man
man
man
:w!
```

27. vim

- a. vim <options> <file name>
- b. vim is an editor available in UNIX based system
- c. The above commands opens the file if it exists and opens.(by default read mode)
- d. -R filename : Opens an existing file in read only mode
- e.

it displays the d

```
#include <iostream>
int main() {
    int n = 10;
    while (n--) {
        cout << n << endl;
    }
    cout << "hello world" << endl;
    return 0;
}
diff
shutdown
mount
zip
vim
man
man
man
man
man
man
man
man
:w!
```

27. vim

- a. vim <options> <file name>
- b. vim is an editor available in UNIX based system
- c. The above commands opens the file if it exists and opens.(by default read mode)
- d. -R filename : Opens an existing file in read only mode
- e.

it displays the d

"**iamnew.cpp**" [New] 10L, 131C written

The screenshot shows a terminal window with the following session:

```

root@kali: /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend]
$ ls
newfile.txt ps.txt zip_file.zip
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend]
$ vim iamnew.cpp
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend]
$ cat iamnew.cpp
#include <iostream>

int main() {
    int n = 10;
    while (n--) {
        cout << n << endl;
    }
    cout << "hello world" << endl;
    return 0;
}

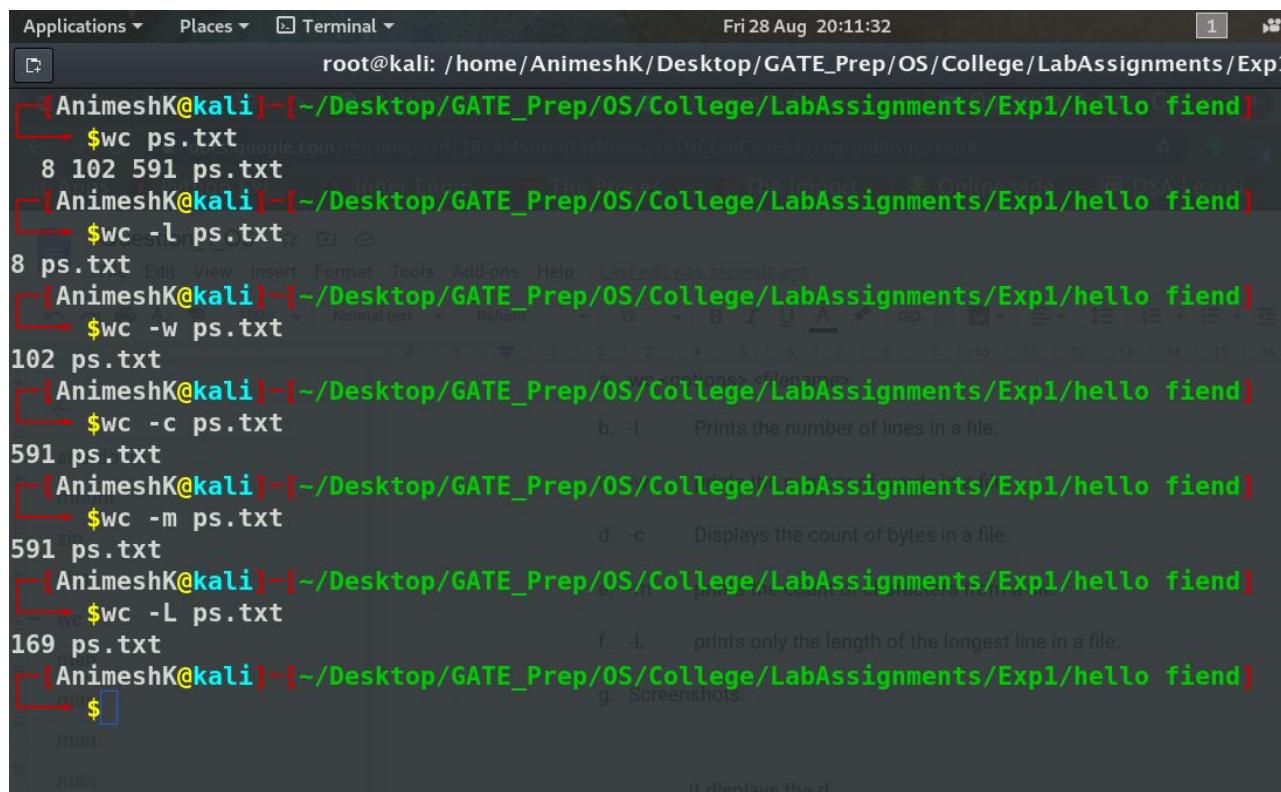
```

Annotations in the terminal window:

- As we saw the ps.txt is no more visible in the above zipfile**
- 27. vim**
- a. vim <options> <file name>**
- b. vim is an editor available in UNIX based systems**
- and opens (by default read mode)**
- d. -R filename : Opens an existing file in read only mode.**

28. wc

- wc <options> <filename>
- l Prints the number of lines in a file.
- w prints the number of words in a file.
- c Displays the count of bytes in a file.
- m prints the count of characters from a file.
- L prints only the length of the longest line in a file.
- Screenshots:



The screenshot shows a terminal window titled 'root@kali: /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend'. The user has run several 'wc' commands on a file named 'ps.txt'. The output is as follows:

```

[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ wc ps.txt
    8 102 591 ps.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ wc -l ps.txt
8 ps.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ wc -w ps.txt
102 ps.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ wc -c ps.txt
      b. -l      Prints the number of lines in a file.
591 ps.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ wc -m ps.txt
      d. -c      Displays the count of bytes in a file.
591 ps.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ wc -L ps.txt
      f. -L      prints only the length of the longest line in a file.
169 ps.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ man
      g. Screenshots:

```

it displays the d

29. uname

- uname <options>
- Displays various kinds of information about the system.
- a system info
- s kernel name
- n hostname of the network node
- r kernel release date
- v version of the current kernel
- p ltype of the processor.
- i platform of the hardware.
- o name of the operating system
- m machine hardware name.

I. Screenshots

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname
Linux
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -a
Linux kali 4.19.0-kali4-amd64 #1 SMP Debian 4.19.28-2kali1 (2019-03-18) x86_64 GNU/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -s
Linux
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -n
kali
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -r
4.19.0-kali4-amd64
• The command 'uname' displays the information about the system.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -v
#1 SMP Debian 4.19.28-2kali1 (2019-03-18)
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -p
unknown
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$ uname -i
unknown
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└─$
```

• -r option: It prints the kernel name.

• -v option: It prints the kernel release date.

• -p option: It prints the version of the current kernel.

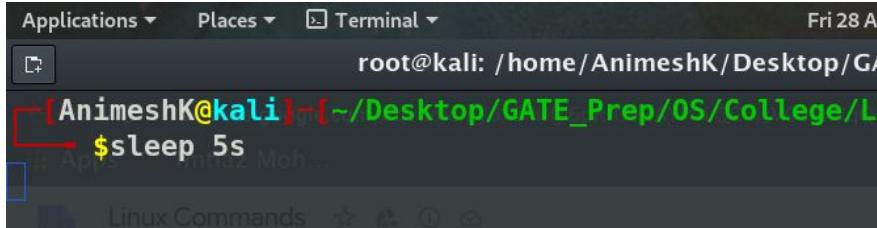
• -i option: It prints the platform of the hardware.

• -o option: It prints the name of the operating system.

30. sleep

- a. sleep <time><suffix>
- b. delay for a <time> amount of time
- c. Available suffixes:
 - i. s seconds(default)
 - ii. m minutes
 - iii. h hours
 - iv. d days
- d. Screenshots:

During Sleep:



```
root@kali: /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend)
$sleep 5s
```

After sleep



```
root@kali: /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend)
$sleep 5s
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello_fiend)
```

31. xargs

- a. <process> | xargs <options> <command>
- b. The <process> outputs some <string> and xargs parses the string in this way -


```
<command> <string>
```
- c. -p used to display the commands being executed using confirmation from user(yes/no)
- d. -t view the command

e. Screenshots:

```

root@kali: /home/AnimeshK/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ echo hello.txt | xargs -t touch
touch hello.txt
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ ls
hello.txt iamnew.cpp newfile.txt ps.txt world zip_file.zip
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ echo zip_file.zip | xargs rm
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ ls
hello.txt iamnew.cpp newfile.txt ps.txt world
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ echo newDir | xargs -P mkdir
xargs: invalid number "mkdir" for -P option
Try 'xargs --help' for more information.
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ echo newDir | xargs -p mkdir
mkdir newDir ?...y
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ ls
hello.txt iamnew.cpp newDir newfile.txt ps.txt world
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend)
└─$ 

```

32. sed

- a. The stream editor command's syntax varies from operation to operation.
- b. sed '/<word to delete>/d' <filename>
 - i. It deletes the <pattern> from <filename>
- c. sed "s/<find pattern>/<replace pattern>/" <filename>
 - i. It replaces the <find pattern> with <replace pattern> at all occurrences

```

└── $cat ps.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└── $sed "s/can/ball/" ps.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people ball use a Unix computer at the same time; hence Unix is called a multiuser system.
A user ball also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

c. sed "s/<find pattern>/<replace pattern>/" <filename>
i. It replaces the <find pattern> with <replace pattern> at all occurrences

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]

```

```

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└── $cat ps.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
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[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]
└── $sed "/Yet/d" ps.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
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A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.

c. sed "s/<find pattern>/<replace pattern>/" <filename>
i. It replaces the <find pattern> with <replace pattern> at all occurrences

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/hello fiend]

```

33. htop

- This is similar to top, but it shows the dynamic data in its own colourful manner.

- b. It typically lists out all the active processes and you are allowed to kill any process using any way i.e. SIGABRT or SIGSEGV or any other way listed out in it, just select the process by up, down button and press F9 and it'll display all the options to kill the selected process.
- c. -C no colour output
- d. -p=<pid1>, <pid2> only shows the listed PID infos in the output.
- e. -t show processes in a tree view(child process and parent processes arranged in the form of a tree)
- f. -v show version information
- g. -h show the summary of the command for help
- h. up/down to select different processes(simulation of scrolling over the htop page).
- i. Screenshots

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop --delay=DELAY
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -C
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -p=1405,2001 in monochrome mode
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -t
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -s
htop: option requires an argument -- 's'
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -b
htop: invalid option -- 'b'
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -v
htop 2.2.0 - (C) 2004-2020 Hisham Muhammad
Released under the GNU GPL. processes of a given user

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ htop -h Output version information and exit
htop 2.2.0 - (C) 2004-2020 Hisham Muhammad
Released under the GNU GPL.

Show processes in tree view
-C --no-color htop(1) line 2: Use a monochrome colorscheme [t]
-d --delay=DELAY Set the delay between updates, in tenths of seconds
```

```

1 [|||]Tasks related to processes (killing 2.6%)cin5) [|||] be done without entering 3.3%
2 [|||]their PIDs. 5.8%] 6 [|||] 3.3%
3 [|||] 3.3%] 7 [|||] 2.7%
4 [|||]LINE OPTIONS 1.3%] 8 [|||] 4.7%
Mem[|||||]4.42G/7.70G]and Tasks: 168, 577 thr; 1 running
Swp[ 0K/7.91G] Load average: 0.44 1.06 1.14
Uptime: 05:17:11
d --delay=DELAY
Delay between updates, in tenths of seconds

```

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
3793	AnimeshK	20	0	2110M	121M	73024	S	8.6	1.5	13:39.88	/usr/bin/totem --gapplication-service
1405	AnimeshK	20	0	326M	51140	33340	S	6.6	0.6	15:01.94	/usr/lib/xorg/Xorg vt2 -displayfd 3 -aut
2538	AnimeshK	20	0	618M	96316	72224	S	2.6	1.2	5:15.51	gnome-control-center wifi
1325	AnimeshK	9	-11	2483M	28292	21944	S	2.0	0.4	3:24.63	/usr/bin/pulseaudio --daemonize=no
14834	AnimeshK	20	0	5484	3764	2912	R	1.3	0.0	0:00.11	htop
1501	AnimeshK	20	0	4928M	370M	180M	S	1.3	4.7	11:21.40	/usr/bin/gnome-shell
1407	AnimeshK	-6	0	2483M	28292	21944	S	0.7	0.4	1:48.33	/usr/bin/pulseaudio --daemonize=no
1653	AnimeshK	20	0	1712M	464M	244M	S	0.7	5.9	14:02.53	/opt/google/chrome/chrome
1728	AnimeshK	20	0	464M	47716	35488	S	0.7	0.6	0:28.37	/usr/libexec/gnome-terminal-server
2012	AnimeshK	20	0	372M	101M	68092	S	0.7	1.3	4:41.72	/opt/google/chrome/chrome --type=utility
2009	AnimeshK	20	0	372M	101M	68092	S	0.7	1.3	4:58.78	/opt/google/chrome/chrome --type=utility
3801	AnimeshK	20	0	2110M	121M	73024	S	0.7	1.5	0:44.40	/usr/bin/totem --gapplication-service
3814	AnimeshK	20	0	2110M	121M	73024	S	0.7	1.5	1:25.69	/usr/bin/totem --gapplication-service
3816	AnimeshK	20	0	2110M	121M	73024	S	0.7	1.5	0:39.73	/usr/bin/totem --gapplication-service

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit

using -C

```

1 [##*]Tasks related to processes (killing 3.9%)cin5) [##* be done without entering 2.0%
2 [##*]their PIDs. 4.0%] 6 [##* 7.2%
3 [# 1.3%] 7 [##* 5.2%
4 [##*LINE OPTIONS 1.3%] 8 [##* 3.9%
Mem[|||||]##***4.45G/7.70G]and Tasks: 170, 599 thr; 1 running
Swp[ 0K/7.91G] Load average: 0.44 1.04 1.13
Uptime: 05:17:17
d --delay=DELAY
Delay between updates, in tenths of seconds

```

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
3793	AnimeshK	20	0	2110M	121M	73024	S	9.2	1.5	13:40.38	/usr/bin/totem --gapplication-service
1405	AnimeshK	20	0	326M	51028	33228	S	5.9	0.6	15:02.31	/usr/lib/xorg/Xorg vt2 -displayfd 3 -aut
1325	AnimeshK	9	-11	2483M	28292	21944	S	2.0	0.4	3:24.74	/usr/bin/pulseaudio --daemonize=no
1501	AnimeshK	20	0	4928M	371M	180M	S	2.0	4.7	11:21.70	/usr/bin/gnome-shell
2538	AnimeshK	20	0	618M	96316	72224	S	2.0	1.2	5:15.66	gnome-control-center wifi
14865	AnimeshK	20	0	5576	3856	2784	R	1.3	0.0	0:00.12	htop -C
1407	AnimeshK	-6	0	2483M	28292	21944	S	1.3	0.4	1:48.40	/usr/bin/pulseaudio --daemonize=no
1653	AnimeshK	20	0	1712M	464M	244M	S	1.3	5.9	14:02.59	/opt/google/chrome/chrome
2012	AnimeshK	20	0	371M	101M	68088	S	1.3	1.3	4:41.78	/opt/google/chrome/chrome --type=utility
2009	AnimeshK	20	0	371M	101M	68088	S	1.3	1.3	4:58.85	/opt/google/chrome/chrome --type=utility
2916	AnimeshK	20	0	4583M	130M	78768	S	1.3	1.6	0:18.59	/opt/google/chrome/chrome --type=rendere
3816	AnimeshK	20	0	2110M	121M	73024	S	1.3	1.5	0:39.76	/usr/bin/totem --gapplication-service
1728	AnimeshK	20	0	464M	47716	35488	S	0.7	0.6	0:28.42	/usr/libexec/gnome-terminal-server
2096	AnimeshK	20	0	4616M	169M	71480	S	0.7	2.1	0:47.77	/opt/google/chrome/chrome --type=rendere

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit

listed only the requested PIDs, but they are currently in the background thus not visible.

```

1 [ Tasks related to processes (killing 0.0%]
2 [ their PIDs.                                1.2%] 6 [ ]
3 [ ]                                              2.4%] 7 [ ]
4 [ ] LINE OPTIONS                                1.8%] 8 [ ]
Mem[|||||4.44G/7.70G]and Tasks: 169, 580 thr; 1 running
Swp[          0K/7.91G] Load average: 0.71 1.07 1.14
Uptime: 05:17:35
-d --delay=DELAY
      Delay between updates, in tenths of seconds
PID USER      PRI  NI   VIRT   RES   SHR   S CPU% MEM%   TIME+  Command
--no-color --no-colour
Start htop in monochrome mode

-h --help
Display a help message and exit

-p --pid=PID,PID...
Show only the given PIDs

-s --sort-key COLUMN
Sort by this column (use --sort-key help for a column list)

-u --user=USERNAME
Show only the processes of a given user
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit

```

Selecting a process using up/down and killing options below

Send signal:	PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
3 SIGQUIT	3793	AnimeshK	20	0	2110M	121M	73024	S	8.5	1.5	13:56.02	/usr/bin/totem --gapplication
4 SIGILL	1405	AnimeshK	20	0	326M	51036	33236	S	5.9	0.6	15:15.29	/usr/lib/Xorg/Xorg vt2 -d
5 SIGTRAP	15042	AnimeshK	20	0	5572	3988	2908	R	2.0	0.0	0:00.28	htop
6 SIGABRT	1501	AnimeshK	20	0	4928M	371M	180M	S	2.0	4.7	11:29.91	/usr/bin/gnome-shell
6 SIGIOT	2538	AnimeshK	20	0	618M	96316	72224	R	2.0	1.2	5:19.63	gnome-control-center wifi
7 SIGBUS	1653	AnimeshK	20	0	1714M	461M	241M	S	2.0	5.9	14:14.42	/opt/google/chrome/chrome
8 SIGFPE	1325	AnimeshK	9	-11	2483M	28292	21944	S	1.3	0.4	3:27.87	/usr/bin/pulseaudio --daem
9 SIGKILL	2009	AnimeshK	20	0	372M	101M	68100	S	1.3	1.3	5:03.85	/opt/google/chrome/chrome
10 SIGUSR1	1407	AnimeshK	-6	0	2483M	28292	21944	S	1.3	0.4	1:50.11	/usr/bin/pulseaudio --daem
11 SIGSEGV	1987	AnimeshK	20	0	1714M	461M	241M	S	1.3	5.9	0:02.93	/opt/google/chrome/chrome
12 SIGUSR2	2012	AnimeshK	20	0	372M	101M	68100	S	0.7	1.3	4:46.63	/opt/google/chrome/chrome
13 SIGPIPE	3814	AnimeshK	20	0	2110M	121M	73024	S	0.7	1.5	1:27.41	/usr/bin/totem --gapplication
14 SIGALRM	1728	AnimeshK	20	0	464M	47716	35488	S	0.7	0.6	0:29.34	/usr/libexec/gnome-terminal
15 SIGTERM	3805	AnimeshK	20	0	2110M	121M	73024	S	0.7	1.5	0:33.75	/usr/bin/totem --gapplication

EnterSend EscCancel

Output in a tree like structure as below,

```

1 [|||]--delay=DELAY          9.2%] 5 [|||] 7.3%
2 [|||] Delay between updates, in tenths of a second 7.4%] 6 [|||] 7.3%
3 [|||] 7.2%] 7 [|||] 3.9%
4 [|||] -no-color --no-colour 5.3%] 8 [|||] 6.0%
Mem[|||||] 4.47G/7.70G] Tasks: 171, 604 thr; 1 running
Swp[ 0K/7.91G] Load average: 0.70 1.05 1.13
Uptime: 05:17:55

--help
Display a help message and exit.

PID USER      PRI  NI  VIRT   RES   SHR S CPU% MEM%   TIME+  Command
 1 root      20   0 161M 10340 7692 S  0.7  0.1  0:31.83 /sbin/init
7992 root      20   0 12736 8212 7144 S  0.0  0.1  0:00.04 sshd: AnimeshK [priv]
8000 AnimeshK  20   0 13020 5024 3928 S  0.7  0.1  0:01.18 sshd: AnimeshK@pts/1
8001 AnimeshK  20   0 11612 8392 3532 S  0.0  0.1  0:01.83 -bash
14901 AnimeshK 20   0 5580 3988 2916 R  4.6  0.0  0:00.26 column list
1687 AnimeshK  20   0 339M 16560 12628 S  0.0  0.2  0:00.07 htop -t
1693 AnimeshK  20   0 339M 16560 12628 S  0.0  0.2  0:00.00 /usr/lib/gnome-settings-daemon/gsd-pr
1692 AnimeshK  20   0 339M 16560 12628 S  0.0  0.2  0:00.00 /usr/lib/gnome-settings-daemon/gsd
1617 AnimeshK  20   0 194M 22344 17164 S  0.0  0.3  0:00.80 /usr/lib/gnome-settings-daemon/gsd-lo
1704 AnimeshK  20   0 194M 22344 17164 S  0.0  0.3  0:00.00 /usr/lib/gnome-settings-daemon/gsd
1703 AnimeshK  20   0 194M 22344 17164 S  0.0  0.3  0:00.00 /usr/lib/gnome-settings-daemon/gsd
1365 AnimeshK  20   0 231M 7588 6592 S  0.0  0.1  0:00.27 /usr/bin/gnome-keyring-daemon --daemo
1500 AnimeshK  20   0 231M 7588 6592 S  0.0  0.1  0:00.00 /usr/bin/gnome-keyring-daemon --da
1368 AnimeshK  20   0 231M 7588 6592 S  0.0  0.1  0:00.15 /usr/bin/gnome-keyring-daemon --da
F1Help F2Setup F3Search F4Filter F5Sorted F6Collapse F7Nice -F8Nice +F9Kill F10Quit

```

34. alias

- alias <options> <new name(alias)>=<command name>
- This command is used to give a name of your choice to a certain command.
- alias make_this=mkdir, after this command the make_this command the same as mkdir
- p This option prints all the defined aliases in reusable format
- unalias <name> this will remove the alias <name>
- Screenshots:

The terminal window shows the following alias definitions:

```
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ alias make_this=mkdir
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls DHAR
animeshfile.txt      'hello fiend'    newfile.txt.gz   sample2.txt.gz  test_text.txt
archive_cwd.tar      Input             news.txt       sample3.txt    test.txt
emptyfile            new_cat.txt      newtest.txt   sample.txt
'Exercise-I LINUX COMMANDS.pdf' NewDirzip.zip  print_name.sh sp.txt
friends              newfile.txt     ps.txt        tar_exp
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ make_this NewDir
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
animeshfile.txt      'hello fiend'    newfile.txt.gz   ps.txt      name of
archive_cwd.tar      Input           newfile.txt.gz  sample2.txt.gz tar_exp
emptyfile            new_cat.txt    news.txt       sample3.txt    test.txt
'Exercise-I LINUX COMMANDS.pdf' NewDir      newtest.txt   sample.txt
friends              NewDirzip.zip  print_name.sh sp.txt
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

A tooltip for the alias 'make_this' is displayed, explaining its definition and usage.

The terminal window shows the following alias definitions and the help information for the '-p' option:

```
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ alias -p
alias alert='notify-send --urgency=low -i "$( [ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''$s/^\\s*[0-9]\\+\\s*//;s/[;&|]\\s*alert$/'\\''")"
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
alias make_this='mkdir'
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ alias -p
alias alert='notify-send --urgency=low -i "$( [ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''$s/^\\s*[0-9]\\+\\s*//;s/[;&|]\\s*alert$/'\\''")'
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
```

A tooltip for the '-p' option is displayed, explaining its purpose.

35. kill

a. kill <options> <PID>

- b. Entering the PID of respective process to be killed, will kill the process completely.
- c. -l prints all options like SIGSEGV, SIGABRT etc for choosing the way you want to terminate.
- d. Screenshots:

```

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ps
    PID TTY      TIME CMD
 1765 pts/0  00:00:00 bash
 4210 pts/0  00:00:02 a.out
 4225 pts/0  00:00:00 ps
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $kill -9 4210
[1]+  Killed                  ./a.out
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ps
    PID TTY      TIME CMD
 1765 pts/0  00:00:00 bash
 4229 pts/0  00:00:00 ps
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $

```

```

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $kill -l
 1) SIGHUP      2) SIGINT      3) SIGQUIT      4) SIGILL      5) SIGTRAP
 6) SIGABRT     7) SIGBUS      8) SIGFPE       9) SIGKILL     10) SIGUSR1
11) SIGSEGV     12) SIGUSR2     13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGSTKFLT   17) SIGCHLD     18) SIGCONT     19) SIGSTOP     20) SIGTSTP
21) SIGTTIN     22) SIGTTOU     23) SIGURG      24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM   27) SIGPROF     28) SIGWINCH    29) SIGIO       30) SIGPWR
31) SIGSYS      34) SIGRTMIN    35) SIGRTMIN+1  36) SIGRTMIN+2  37) SIGRTMIN+3
38) SIGRTMIN+4  39) SIGRTMIN+5  40) SIGRTMIN+6  41) SIGRTMIN+7  42) SIGRTMIN+8
43) SIGRTMIN+9  44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6  59) SIGRTMAX-5  60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1  64) SIGRTMAX
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $

```

36. service

- a. service <options> <service name>
- b. start to start the service
- c. stop to stop the service
- d. status to print the status of the service on the stdout
- e. restart to restart the service
- f. service --status-all It lists all the active and inactive processes
- g. [+] = Active process
- h. [-] = Inactive process
- i. Screenshots:

```
[AnimeshK@kali]-(~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$service --status-all
[ + ] acpid
[ - ] apache-htcacheclean
[ - ] apache2 Tools Help
[ - ] apparmor
[ - ] arpwatch
[ - ] atftpd
[1-15 ] avahi-daemon
[1-16 ] binfmt-support
[1-17 ] bluetooth
[ - ] console-setup.sh
[ + ] cron
[1-21 ] cryptodisks
[1-22 ] cryptodisks-early
[ - ] darkstat
[ + ] dbus
[1-24 ] dns2tcp
[1-25 ] exim4
[ + ] gdm3
[ + ] haveged
[ - ] hwclock.sh
[ - ] inetsim
[ - ] iodined
[ + ] irqbalance
[ - ] keyboard-setup.sh
```

\$service --status-all

```
[ + ] acpid
[ - ] atka-utils
[ - ] cron
[ + ] apparmor
[ + ] appert
[ + ] avahi-daemon
[ - ] bluetooth
[ - ] console-setup.sh
[ + ] cron
[ - ] cryptodisks
[ - ] cryptodisks-early
[ + ] cups
[ + ] cups-browsed
[ + ] dbus
[ + ] grub-common
[ - ] hwclock.sh
[ + ] irqbalance
[ + ] kerneloops
[ - ] keyboard-setup.sh
[ + ] kmod
[ + ] med
[ * ] network-manager
[ - ] plymouth
[ - ] plymouth-log
[ - ] pppd-dns
[ + ] procps
[ - ] rsync
```

(b) service [servicename] start
 (c) service [servicename] status
 (d) service [servicename] restart
 (e) service [servicename] stop

Now, we start a service

The terminal window shows the command \$service ssh start being run. A modal dialog box titled 'Authentication Required' appears, asking for a password for the user AnimeshK. The password field is empty.

```
[ - ] rwhod
[ - ] samba-ad-dc
[ - ] sanded
[ - ] screen-cleanup
[ + ] smartmontools
[ - ] smbd
[ - ] snmpd
[ - ] speech-dispatcher
[ - ] ssh
[ - ] sslh
[ + ] stunnel4
[ - ] sudo
[ - ] sysstat
[ - ] thin
[ + ] udev
[ - ] unattended-upgrades
[ - ] uuidd
[ - ] vmware
[ - ] vmware-USBArbitrator
[ - ] x11-common
[ - ] AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
$service ssh start
```

Now we stop the service we just started

The terminal window shows the command \$service ssh stop being run. A modal dialog box titled 'Authentication Required' appears, asking for a password for the user AnimeshK. The password field is empty.

```
[ - ] rwhod
[ - ] samba-ad-dc
[ - ] sanded
[ - ] screen-cleanup
[ + ] smartmontools
[ - ] smbd
[ - ] snmpd
[ - ] speech-dispatcher
[ - ] ssh
[ - ] sslh
[ + ] stunnel4
[ - ] sudo
[ - ] sysstat
[ - ] thin
[ + ] udev
[ - ] unattended-upgrades
[ - ] uuidd
[ - ] vmware
[ - ] vmware-USBArbitrator
[ - ] x11-common
[ - ] AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
$service ssh start
[ - ] AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
$service ssh stop
```

Now we check the status of this service

The screenshot shows a terminal window in a desktop environment. The title bar says "Terminal". The status bar at the top right shows the date and time: "Sun 30 Aug 08:14:44". The terminal window displays the following session:

```

[ - ] C ssh docs.google.com/document/d/1wi3KflLzo_YtCHlQbu32dcf_1gWAoJMZoIJAm_xVXQ/edit
[ - ] ssh laz.Moh...
[ + ] stunnel4
[ - ] sudoAssignment_1
[ - ] sysstat Tools Help
[ - ] thin
[ + ] udev
[ - ] unattended-upgrades
[ - ] uuid
[ - ] vmware
[ - ] vmware-USBArbitrator
[ - ] x11-common
[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
$service ssh start
[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
$service ssh stop
[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
$service ssh status
● ssh.service - OpenBSD Secure Shell server
  Loaded: loaded (/lib/systemd/system/ssh.service; disabled; vendor preset: disabled)
  Active: inactive (dead)
    Docs: man:sshd(8)
          man:sshd_config(5)
[AnimeshK@kali]~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
$
```

The terminal shows the user navigating through a directory, starting the ssh service, stopping it, and then checking its status. The status output indicates the service is inactive (dead) because it was stopped.

Similarly this command can be used with all the services.

37. export

- a. `export <options>`
- b. This command is used to print all the export variables(not only of the current shell)
- c. `-p` to view all the exported variables on the current shell.
- d. New variables can created using this command

`export <variable name>=path`

- e. `export -f <fun name>` can be used to refer to the `<fun name>` function.
- f. To call the function, simply enter `<fun name>` as if it were a command, but this should be done after the above command has gotten executed.
- g. Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ export
declare -x COLORTERM="truecolor"
declare -x DBUS_SESSION_BUS_ADDRESS="unix:path=/run/user/1001/bus"
declare -x DESKTOP_AUTOSTART_ID="10d61b1ccdf2849e91159875361833651600000014140019"
declare -x DESKTOP_SESSION="gnome"           .10 EXPORT
declare -x DISPLAY=:1"                      The export command, on the other hand, provides the ability to update the current shell session
declare -x GDMSESSION="gnome"                about the change you made to the exported variable. You don't have to wait until the new shell
declare -x GDM_LANG="en_GB.UTF-8"             session to use the value of the variable you changed.
declare -x GNOME_DESKTOP_SESSION_ID="this-is-deprecated" .session to use the value of the variable you changed
declare -x GNOME_TERMINAL_SCREEN="/org/gnome/Terminal/screen/6db809e7_d45f_4554_a1bf_301e77dc2ea3"
declare -x GNOME_TERMINAL_SERVICE=:1.64"      .COLORTERM=truecolor
declare -x GPG_AGENT_INFO="/run/user/1001/gnupg/S.gpg-agent:0:1" .abstract</tmp/dbus-P13tw6V0a.guideb
declare -x GTK_MODULES="gail:atk-bridge"       .DESKTOP_SESSION=plasma
declare -x HOME="/home/AnimeshK"              .DISPLAY=:1"
declare -x LANG="en_GB.UTF-8"                 .GDM_AGENT_INFO=/run/user/1001/gnupg/S.gpg-agent:0:1"
declare -x LESSCLOSE="/usr/bin/lesspipe %s %s" .KDE_FULL_SESSION=true
declare -x LESSOPEN="| /usr/bin/lesspipe %s"    .KDE_SESSION_UID=1000
declare -x LOGNAME="AnimeshK"                  .KDE_SESSION_VERSION=5
declare -x LS_COLORS="rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01:0
r=40;31:01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31
:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz
=01;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=01;31:*.lzo
=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31:*.tz=01;31:*
.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01
:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:*.dwm=01;31:*.es
```

```
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ export -p
declare -x COLORTERM="truecolor"
declare -x DBUS_SESSION_BUS_ADDRESS="unix:path=/run/user/1001/bus"
declare -x DESKTOP_AUTOSTART_ID="10d61b1ccdf2849e91159875361833651600000014140019"
declare -x DESKTOP_SESSION="gnome"
declare -x DISPLAY=":1"
declare -x GDMSESSION="gnome"
declare -x GDM_LANG="en_GB.UTF-8"
declare -x GNOME_DESKTOP_SESSION_ID="this-is-deprecated"
declare -x GNOME_TERMINAL_SCREEN="/org/gnome/Terminal/screen/6db809e7_d45f_4554_a1bf_301e77dc2ea3"
declare -x GNOME_TERMINAL_SERVICE=":1.64"
declare -x GPG_AGENT_INFO="/run/user/1001/gnupg/S.gpg-agent:0:1"
declare -x GTK_MODULES="gail:atk-bridge"
declare -x HOME="/home/AnimeshK"
declare -x LANG="en_GB.UTF-8"
declare -x LESSCLOSE="/usr/bin/lesspipe %s %s"
declare -x LESSOPEN="| /usr/bin/lesspipe %s"
declare -x LOGNAME="AnimeshK"
declare -x LS_COLORS="rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01:or=40;31:01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=01;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:*.dwm=01;31:*,es
```

Referring to a functions and calling as below,

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ fun() { echo "hello world as usual"; }
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ export A-f fun
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ fun
hello world as usual
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $
```

Setting a new variable as below,

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ export CAR=/home/AnimeshK/Desktop/GATE_Prep/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $ export | grep CAR
declare -x CAR="/home/AnimeshK/Desktop/GATE_Prep/"
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $
```

38. ip

- Syntax: ip <options> <object> <command>
- a s to show all network interfaces and their respective ip addresses and information
- a s dev <interface name> to show addresses and properties of <interface name> interface
- 4 to see information of ipv4 only
- 6 to see informations of ipv6 only
- s to display statistics data for interfaces
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ip a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state DOWN group default qlen 1000
    link/ether 8c:16:45:ce:8e:9d brd ff:ff:ff:ff:ff:ff
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 30:24:32:e1:6f:09 brd ff:ff:ff:ff:ff:ff
    inet 192.168.43.157/24 brd 192.168.43.255 scope global dynamic noprefixroute wlan0
        valid_lft 2189sec preferred_lft 2189sec
    inet6 fe80::ebd0:57d3:476a:4268/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
4: vmnet1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000
    link/ether 00:50:56:c0:00:01 brd ff:ff:ff:ff:ff:ff
    inet 192.168.77.1/24 brd 192.168.77.255 scope global vmnet1
        valid_lft forever preferred_lft forever
    inet6 fe80::250:56ff:fec0:1/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
5: vmnet8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000

```

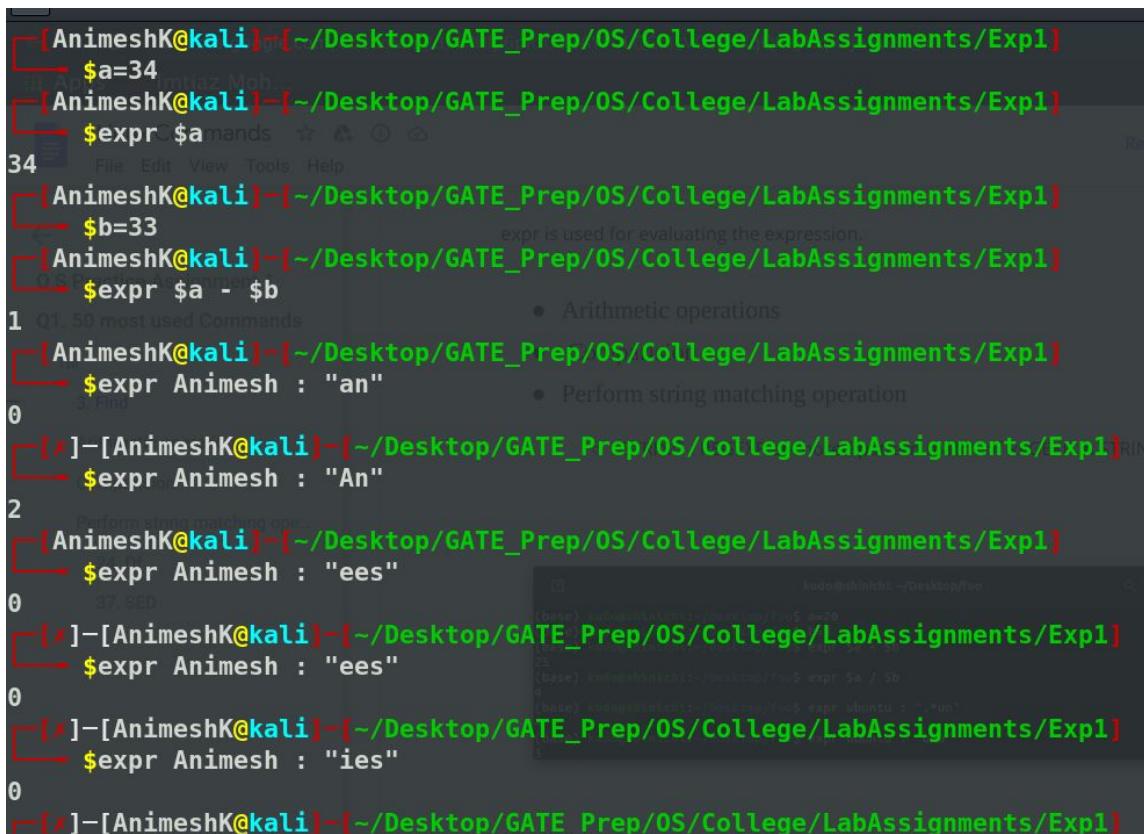
```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ip a s wlan0
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 30:24:32:e1:6f:09 brd ff:ff:ff:ff:ff:ff
    inet 192.168.43.157/24 brd 192.168.43.255 scope global dynamic noprefixroute wlan0
        valid_lft 2109sec preferred_lft 2109sec
    inet6 fe80::ebd0:57d3:476a:4268/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ip -4 a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    inet 192.168.43.157/24 brd 192.168.43.255 scope global dynamic noprefixroute wlan0
        valid_lft 2072sec preferred_lft 2072sec
4: vmnet1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000
    link/ether 00:50:56:c0:00:01 brd ff:ff:ff:ff:ff:ff
    inet 192.168.77.1/24 brd 192.168.77.255 scope global vmnet1
        valid_lft forever preferred_lft forever
5: vmnet8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN group default qlen 1000
    link/ether 00:50:56:c0:00:02 brd ff:ff:ff:ff:ff:ff
    inet 172.16.167.1/24 brd 172.16.167.255 scope global vmnet8
        valid_lft forever preferred_lft forever
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ip -s link show wlan0
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP mode
1000 Linux Commands
link/ether 30:24:32:e1:6f:09 brd ff:ff:ff:ff:ff:ff
RX: bytes packets errors dropped overrun mcast
95817670 108686 0 0 0
TX: bytes packets errors dropped carrier collsns
28904648 60447 0 0 0
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ip -6 a s
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 state UNKNOWN qlen 1000
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 state UP qlen 1000
    inet6 fe80::ebd0:57d3:476a:4268/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
4: vmnet1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 state UNKNOWN qlen 1000
    inet6 fe80::250:56ff:fe01:64 scope link
        valid_lft forever preferred_lft forever
5: vmnet8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 state UNKNOWN qlen 1000
    inet6 fe80::250:56ff:fec0:8/64 scope link
        valid_lft forever preferred_lft forever
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ip a s dev wlan0
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 30:24:32:e1:6f:09 brd ff:ff:ff:ff:ff:ff
    inet 192.168.43.157/24 brd 192.168.43.255 scope global dynamic noprefixroute wlan0
        valid_lft 3444sec preferred_lft 3444sec
    inet6 fe80::ebd0:57d3:476a:4268/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

39. expr

- expr <arithmetic expression>
- It is mostly used to do arithmetic evaluations
- expr <string> : "reg exp", matches the regular expression "reg exp" with the specified <string> string.
- Screenshots:



```
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ a=34
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr $a
34
File Edit View Tools Help
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ b=33
expr is used for evaluating the expression.
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr $a - $b
1 Q1. 50 most used Commands
• Arithmetic operations
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr Animesh : "an"
0
• Perform string matching operation
0
[x]~[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr Animesh : "An"
2
Perform string matching op...
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr Animesh : "ees"
0
37. SED
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr Animesh : "ees"
0
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ expr Animesh : "eas"
0
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

40. whereis

- whereis <options> <name>
- locate the binary, source, and manual page files for a command <name>
- b for search for executables
- m to search for manuals
- s to search for sources
- B to change or otherwise limit the places where *whereis* searches for binaries.
- M to change or limit the places for search of manual sections
- S to change or limit the places for search of sources
- f to terminate the last directory list and send a signal to the start of file names. It's used whenever the -B, -M, or -S options are used.
- l to trace the path taken
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis gedit
gedit: /usr/bin/gedit /usr/lib/x86_64-linux-gnu/gedit /usr/share/gedit /usr/share/man/man1/gedit.1.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis vim
vim: /usr/bin/vim.tiny /usr/bin/vim.gtk /usr/bin/vim.basic /usr/bin/vim /etc/vim /usr/share/vim /usr/share/man/man1/vim.1.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis -m vim
vim: /usr/share/man/man1/vim.1.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis -b vim
vim: /usr/bin/vim.tiny /usr/bin/vim.gtk /usr/bin/vim.basic /usr/bin/vim /etc/vim /usr/share/vim
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis -s vim
vim: /bin /usr/bin
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis -B vim
whereis: option -f is missing
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis -B /usr -f gedit
gedit: /usr/share/man/man1/gedit.1.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─ $whereis -l nano
bin: /usr/bin
bin: /usr/sbin
bin: /usr/lib/x86_64-linux-gnu
bin: /usr/lib
bin: /usr/lib64
bin: /etc
bin: /usr/games
bin: /usr/local/bin
bin: /usr/local/sbin
bin: /usr/local/etc
bin: /usr/local/lib
bin: /usr/local/games
bin: /usr/include
bin: /usr/local
bin: /usr/libexec
bin: /usr/share
bin: /home/AnimeshK/.nvm/versions/node/v14.3.0/bin
bin: /home/AnimeshK/.local/bin
man: /usr/share/man/fr
man: /usr/share/man/nb
man: /usr/share/man/de
man: /usr/share/man/pt
man: /usr/share/man/ca
man: /usr/share/man/zh
```

41. ssh

- a. The ssh service is used to login to a remote machine using its host and <ip> to be able to use the computing power of that remote machine. Its syntax is as below,
- b. ssh <host>@<ip> to connect to the pc with username <host> and ip address as given
- c. After this it prompts for entering the password of the remote machine.
- d. service ssh status to view the current status of ssh (active/inactive)
- e. service ssh start to start the service ssh
- f. service ssh stop to stop the service ssh
- g. Screenshots:

Making the 'ssh' service active -

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $service ssh status
● ssh.service - OpenBSD Secure Shell server
  Loaded: loaded (/lib/systemd/system/ssh.service; disabled; vendor preset: disabled)
  Active: inactive (dead)
    Docs: man:sshd(8)
          man:sshd_config(5)
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $service ssh start
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $service ssh status
● ssh.service - OpenBSD Secure Shell server
  Loaded: loaded (/lib/systemd/system/ssh.service; disabled; vendor preset: disabled)
  Active: active (running) since Sun 2020-08-30 09:13:19 IST; 3s ago
    Docs: man:sshd(8)
          man:sshd_config(5)
  Process: 7949 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
  Main PID: 7950 (sshd)
    Tasks: 1 (limit: 4915)
   Memory: 1.3M
  CGroup: /system.slice/ssh.service
          └─7950 /usr/sbin/sshd -D

rhaldmar@kali:~$ ssh haldhar@192.168.43.178
Are you ready for Kubernetes 1.19? It's nearly here! Try RCG with
Management: https://landscape.canonical.com
Support: https://ubuntu.com/advantage

[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $]
```

logging in to my machine(let us pretend it is a local machine)

```
[AnimeshK@kali](-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ sudo ssh AnimeshK@localhost
The authenticity of host 'localhost (::1)' can't be established.
ECDSA key fingerprint is SHA256:dQ9B4Rt/7PpW+uPYHnZZxt58QL+74epYl9Vz1LtBzR8.
Are you sure you want to continue connecting (yes/no)? y
Please type 'yes' or 'no': yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
AnimeshK@localhost's password:
Linux kali 4.19.0-kali4-amd64 #1 SMP Debian 4.19.28-2kali1 (2019-03-18) x86_64
2:PWD:2:23 packages can be updated.
The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent_nd_address] [-c cipher_
permitted by applicable law.

[AnimeshK@kali](-[~)
└─$ ssh
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-B bind_interface] [-p port] [-O query_option] [-R
[-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
[-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
[-i identity_file] [-J [user@]host[:port]] [-L address]
[-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
[-Q query_option] [-R address] [-S ctl_path] [-W host:port]
[-w local_tun[:remote_tun]] destination [command]
[x]-[AnimeshK@kali](-[~]
```

Making the 'ssh' service inactive

```
[AnimeshK@kali](-[~/document/d/1e_aUnhraZUYt-nvb22QwU9F_InfC_qrgV-Aymxi_YA/edit
└─$ service ssh stop
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ===
Authentication is required to stop 'ssh.service'.
Authenticating as: AnimeshK
Password:
==== AUTHENTICATION COMPLETE ===
[AnimeshK@kali](-[~)
└─$ service ssh status
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; disabled; vendor preset: disabled)
     Active: inactive (dead)
       Docs: man:sshd(8)
              man:sshd_config(5)
[x]-[AnimeshK@kali](-[~]
└─$
```

42. bzip2

- a. bzip2 <options> <file name>
- b. It also compresses the files like zip and gzip, but the compression algorithm used is different.

- c. -k Along with the created .bz2 file the original file also survives
- d. If we don't use above option, the compressed file .bz2 only survives and the original file is deleted automatically
- e. -d The compressed .bz2 file is passed as an argument and it is used to decompress the passed file
- f. -v Along with compression, display the compression ratio as well.
- g. Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ls
33 'Exercise-I LINUX COMMANDS.pdf' new_cat.txt news.txt sample.txt
animeshfile.txt friends NewDir print_name.sh sp.txt
a.out hello.c NewDirzip.zip ps.txt tar_exp
archive_cwd.tar 'hello fiend'
emptyfile Input newfile.txt sample2.txt.gz test_text.txt
                           newfile.txt.gz sample3.txt test.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ bzip2 -v news.txt
news.txt: 1.437:1, 5.567 bits/byte, 30.41% saved, 605 in, 421 out.
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ls
33 'Exercise-I LINUX COMMANDS.pdf' new_cat.txt news.txt.bz2 sample.txt
animeshfile.txt friends NewDir print_name.sh sp.txt
a.out hello.c NewDirzip.zip ps.txt tar_exp
archive_cwd.tar 'hello fiend'
emptyfile Input newfile.txt sample2.txt.gz test_text.txt
                           newfile.txt.gz sample3.txt test.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ bzip2 -d newfile.txt.bz2
bzip2: Can't open input file newfile.txt.bz2: No such file or directory.
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ bzip2 -d news.txt.bz2
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ls
33 'Exercise-I LINUX COMMANDS.pdf' new_cat.txt news.txt sample.txt
animeshfile.txt friends NewDir print_name.sh sp.txt
a.out hello.c NewDirzip.zip ps.txt tar_exp
archive_cwd.tar 'hello fiend'
emptyfile Input newfile.txt sample2.txt.gz test_text.txt
                           newfile.txt.gz sample3.txt test.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ bzip2 -k sample3.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ls
33
animeshfile.txt friends NewDirzip.zip sample2.txt.gz test_text.txt
a.out hello.c newfile.txt sample3.txt test.txt
archive_cwd.tar 'hello fiend' newfile.txt.gz sample3.txt.bz2
emptyfile Input news.txt sample.txt
                           new_cat.txt print_name.sh sp.txt
                           NewDir ps.txt tar_exp
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
```

43. awk

- a. awk programming language is a scripting language used mainly for report creation and manipulating with contents of the files.
- b. awk by default parses the file contents by white spaces, though it is possible to be able to parse based on any other separators using FS=""
 - e.g. FS="," //parses the strings based on comma(,)
- c. syntax: awk "<awk> program" <some_target_file>
- d. We can write command line programs with awk, though it is possible to write awk code in a separate file with .awk extension, which can later be interpreted using
 - syntax: awk -f <my_awk_file.awk> <some_target_file>
where the my_awk_file.awk does manipulation over <some_target_file> and prints its content
- e. BEGIN block This contents put in this block will be displayed before any content of the file
- f. END block The contents put in this block will be displayed after all the contents of the file
- g. if statements can be used for conditional statements
- h. for statements can be used for iterations
- i. {print} is the most used statement to print the content on stdout.
- j. \$n can be used within print to print the content of n'th column of each row
- k. /<regex> can be used to print only those lines which contain the <regex> pattern.
- l. Screenshots:

```
[AnimeshK@kali]--[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cat goods.txt
stationary, pen, 23
artificial, table, 234
stationary, pencil, 10
edibles, pizza, 400
artificial, chair, 239
edibles, samosa, 34
stationary, scale, 40
[AnimeshK@kali]--[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ awk '{print}' goods.txt
stationary, pen, 23
artificial, table, 234
stationary, pencil, 10
edibles, pizza, 400
artificial, chair, 239
edibles, samosa, 34
stationary, scale, 40
[AnimeshK@kali]--[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ awk '/edibles/{print}' goods.txt
edibles, pizza, 400
edibles, samosa, 34
[AnimeshK@kali]--[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $awk '/edibles/{print $2}' goods.txt
pizza,
samosa,
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $vim my_script.awk
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $awk -f my_script.awk goods.txt
My items list for today
stationary, pen, 23
stationary, pencil, 10
pizza
stationary, scale, 40
*****
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└── $
```

44. ls

- This simply prints the files and directories available in current directory
- Syntax: ls <options> <dir(if any)>
- a prints all the files and directories including .(current dir) and ..(parent dir)
- A prints all the files and directories excluding .(current dir) and ..(parent dir)
- t prints the last edited files/dirs
- l to display file permissions, last modified time and size
- h prints the information in human readable form
- lt to sort the input based on the last modified time
- ls <dir>/ to list the content in the child directory <dir>/
- ls -ld <dir>/ to display permissions, last modified time and size of the child directory <dir>/
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl] application x +  
└─$ ls -t  
empty_dir      text_folder    NewDir      archive_cwd.tar  Input  
'hello fiend' my_script.awk  friends     sample2.txt.gz  emptyfile  
cp_new          33            tar_exp     newfile.txt.gz  'Exercise-I LINUX COMMANDS.pdf'  
txt_dir         Stud          a.out       NewDirzip.zip  sample3.txt.bz2  
└─$ ls -1  
33 bc command in Linux with  
a.out samples  
archive_cwd.tar  
cp_new  
empty_dir  
emptyfile  
'Exercise-I LINUX COMMANDS.pdf'  
friends  
'hello fiend'  
Input  
my_script.awk  
NewDir  
NewDirzip.zip  
newfile.txt.gz  
sample2.txt.gz  
sample3.txt.bz2  
tar_exp  
text folder
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl] application x +  
└─$ ls -l  
total 360  
-rw-r--r-- 1 AnimeshK AnimeshK   3 Aug 30 08:57 33  
-rwxr-xr-x 1 AnimeshK AnimeshK 16456 Aug 30 08:05 a.out  
-rw-r--r-- 1 AnimeshK AnimeshK 163840 Aug 21 18:06 archive_cwd.tar  
drwxr-xr-x 2 AnimeshK AnimeshK  4096 Aug 30 12:00 cp_new  
drwxr-xr-x 4 AnimeshK AnimeshK  4096 Aug 30 12:09 empty_dir  
-rw-r--r-- 1 AnimeshK AnimeshK    0 Aug 18 10:15 emptyfile  
-rw-r--r-- 1 AnimeshK AnimeshK 120472 Aug 18 09:53 'Exercise-I LINUX COMMANDS.pdf'  
drwxrwxrwx 2 AnimeshK AnimeshK  4096 Aug 25 15:38 friends  
drwxr-xr-x 3 AnimeshK AnimeshK  4096 Aug 30 12:00 'hello fiend'  
-rw-r--r-- 1 AnimeshK AnimeshK 1497 Aug 18 10:56 Input  
-rw-r--r-- 1 AnimeshK AnimeshK 136 Aug 30 10:05 my_script.awk  
drwxr-xr-x 2 AnimeshK AnimeshK  4096 Aug 30 07:58 NewDir  
-rw-r--r-- 1 AnimeshK AnimeshK 164 Aug 21 20:11 NewDirzip.zip  
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 20 09:21 newfile.txt.gz  
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz  
-rw-r--r-- 1 AnimeshK AnimeshK 443 Aug 18 22:18 sample3.txt.bz2  
drwxr-xr-x 7 samles  AnimeshK 4096 Aug 24 13:34 tar_exp  
drwxr-xr-x 2 AnimeshK AnimeshK 4096 Aug 30 11:59 text_folder  
drwxr-xr-x 2 AnimeshK AnimeshK 4096 Aug 30 11:59 txt_dir
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -a
. archive_cwd.tar 'Exercise-I LINUX COMMANDS.pdf' my_script.awk
.. cp_new friends NewDir
33 empty_dir 'hello fiend' NewDirzip.zip
a.out emptyfile Input newfile.txt.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -alh
total 368K
drwxr-xr-x 10 AnimeshK AnimeshK 4.0K Aug 30 12:07 .
drwxr-xr-x 3 AnimeshK AnimeshK 4.0K Aug 18 09:58 ..
-rw-r--r-- 1 AnimeshK AnimeshK 3 Aug 30 08:57 33
-rw-r--r-x 1 AnimeshK AnimeshK 17K Aug 30 08:05 a.out
-rw-r--r-- 1 AnimeshK AnimeshK 160K Aug 21 18:06 archive_cwd.tar
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 30 12:00 cp_new
drwxr-xr-x 4 AnimeshK AnimeshK 4.0K Aug 30 12:09 empty_dir
-rw-r--r-- 1 AnimeshK AnimeshK 0 Aug 18 10:15 emptyfile
-rw-r--r-- 1 AnimeshK AnimeshK 118K Aug 18 09:53 'Exercise-I LINUX COMMANDS.pdf'
drwxrwxrwx 2 AnimeshK AnimeshK 4.0K Aug 25 15:38 friends
drwxr-xr-x 3 AnimeshK AnimeshK 4.0K Aug 30 12:00 'hello fiend'
-rw-r--r-- 1 AnimeshK AnimeshK 1.5K Aug 18 10:56 Input
-rw-r--r-- 1 AnimeshK AnimeshK 136 Aug 30 10:05 my_script.awk
drwxr-xr-x 2 AnimeshK AnimeshK 4.0K Aug 30 07:58 NewDir
-rw-r--r-- 1 AnimeshK AnimeshK 164 Aug 21 20:11 NewDirzip.zip
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 20 09:21 newfile.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls friends/
sample2.txt sample2.txt.gz samplezip.zip samplezip.zip.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -ld friends/
drwxrwxrwx 2 AnimeshK AnimeshK 4096 Aug 25 15:38 friends/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -lt
total 360
drwxr-xr-x 4 AnimeshK AnimeshK 4096 Aug 30 12:09 empty_dir
drwxr-xr-x 3 AnimeshK AnimeshK 4096 Aug 30 12:00 'hello fiend'
drwxr-xr-x 2 AnimeshK AnimeshK 4096 Aug 30 12:00 cp_new
drwxr-xr-x 2 AnimeshK AnimeshK 4096 Aug 30 11:59 txt_dir
drwxr-xr-x 2 AnimeshK AnimeshK 4096 Aug 30 11:59 text_folder
-rw-r--r-- 1 AnimeshK AnimeshK 136 Aug 30 10:05 my_script.awk
-rw-r--r-- 1 AnimeshK AnimeshK 3 Aug 30 08:57 33
-rw-r--r-x 1 AnimeshK AnimeshK 16456 Aug 30 08:05 a.out
drwxr-xr-x 2 AnimeshK AnimeshK 4096 Aug 30 07:58 NewDir
drwxrwxrwx 2 AnimeshK AnimeshK 4096 Aug 25 15:38 friends
drwxr-xr-x 7 sam AnimeshK 4096 Aug 24 13:34 tar_exp
-rw-r--r-- 1 AnimeshK AnimeshK 164 Aug 21 20:11 NewDirzip.zip
-rw-r--r-- 1 AnimeshK AnimeshK 163840 Aug 21 18:06 archive_cwd.tar
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 21 17:02 sample2.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 387 Aug 20 09:21 newfile.txt.gz
-rw-r--r-- 1 AnimeshK AnimeshK 443 Aug 18 22:18 sample3.txt.bz2
-rw-r--r-- 1 AnimeshK AnimeshK 1497 Aug 18 10:56 Input
```

Notice the difference between -a and -A below

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -A
33          empty_dir      'hello fiend'    NewDirzip.zip
a.out        emptyfile     Input             newfile.txt.gz
archive_cwd.tar 'Exercise-I LINUX COMMANDS.pdf' my_script.awk
cp_new       Student      Friends          NewDir      sample2.txt.gz
                           cp_new           friends      my_script.awk
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      sample2.txt.gz
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      sample3.txt.bz2
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      tar_exp
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      text_folder
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      txt_dir
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls -a
.
..
33          archive_cwd.tar  'Exercise-I LINUX COMMANDS.pdf'  my_script.awk
..          cp_new           friends                  NewDir      sample2.txt.gz
.           cp_new           friends                  my_script.awk
33          empty_dir        'hello fiend'    NewDirzip.zip
a.out        emptyfile     Input             NewDir      sample3.txt.bz2
                           cp_new           friends      my_script.awk
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      tar_exp
                           empty_dir        'hello fiend'  NewDirzip.zip
                           a.out            emptyfile   Input             newfile.txt.gz
                           cp_new           Student      Friends          NewDir      text_folder
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

45. cd

- a. cd <options> <directory path>
- b. changes directory to specified path <directory path>
- c. cd changes directory to user's home directory
- d. cd ~ same operation as above
- e. cd / changes directory to root directory, the mother of all directories
- f. cd . no changes(the '.' is reserved for current directory)
- g. cd .. changes to parent directory(the '..' is reserved for parent directory)
- h. Screenshots:

```
[AnimeshK@kali]~[~]
└─$ cd Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ cd Lab_Assignment_1
[AnimeshK@kali]~[~/Lab_Assignment_1]
└─$ cd Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ cd ~
[AnimeshK@kali]~[~]
└─$ cd /
[AnimeshK@kali]~[/]
└─$ ls
0          etc          1.14 CD      initrd.img.old lib32      opt      sbin    usr
bin        google-chrome-stable_current_amd64.deb lib          lost+found  proc    srv     var
boot      home          (a) Change directory to 'home' lib32      media    root    sys    vmlinuz
dev        initrd.img   (b) Change directory to 'initrd.img' lib64      mnt     run     tmp    vmlinuz.old
[AnimeshK@kali]~[/]
└─$ cd Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/
-bash: cd: Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/: No such file or directory
[x]~[AnimeshK@kali]~[/]
└─$ cd
[AnimeshK@kali]~[~]
└─$ cd Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
```

```
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ ls
33          empty_dir          'hello fiend'      NewDirzip.zip      tar_exp
a.out       emptyfile          Input              newfile.txt.gz    text_folder
archive_cwd.tar Tools/Exercise-I LINUX COMMANDS.pdf my_script.awk  sample2.txt.gz  txt_dir
cp_new      friends            NewDir            sample3.txt.bz2
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ cd friends/
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1/friends]
└─$ cd ..
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$ cd .
[AnimeshK@kali]~[~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
└─$
```

46. cp

- This command is used to copy files and directories into other files or directories
- `cp <source file> <dest file>` copies the contents of `<source file>` to `<dest file>`
- `cp <file1> <file2> <dest folder>` copies the listed files to `<dest folder>`
- `cp -r <dir1> <dir2>` recursively copies all the content of `<dir1>` to `<dir2>`

- e. `cp *.<extension> <dest folder>` copies all the files with <extension> to the already existing directory <dest folder>

- f. Screenshot:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cat animeshfile.txt
new file content
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cp animeshfile.txt cp_ani.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cat cp_ani.txt
new file content
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ ls
33          'Exercise-I LINUX COMMANDS.pdf'    my_script.awk      news.txt      sample.txt
animeshfile.txt  friends                      new_cat.txt      print_name.sh  sp.txt
a.out          goods.txt                     a. service <options>  NewDir        ps.txt
archive_cwd.tar  hello.c                      b. start       to start  NewDirzip.zip  sample2.txt.gz
cp_ani.txt      'hello fiend'                45. cd           newfile.txt   sample3.txt
emptyfile       Input                         a. service <options>  newfile.txt.gz  sample3.txt.bz2
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cp NewDir cp_new
cp: -r not specified; omitting directory 'NewDir'
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cp -r NewDir cp_new
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ ls cp_new/
b. start       to start the service
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ ls
33          emptyfile
a. service <options>  Input           newfile.txt.gz  sample3.txt.bz2
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ ls
33          emptyfile
animeshfile.txt  'Exercise-I LINUX COMMANDS.pdf'    Input           newfile.txt.gz  sample3.txt.bz2
a.out          friends                          my_script.awk  news.txt      sample.txt
archive_cwd.tar  goods.txt                     new_cat.txt    print_name.sh  sp.txt
cp_ani.txt      hello.c                        NewDir        ps.txt
cp_new         'hello fiend'                  NewDirzip.zip  sample2.txt.gz
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cp animeshfile.txt hello.c cp_new/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ ls cp_new/
animeshfile.txt  hello.c
(b) cp (filelist) [destfolder]
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cp *.txt text_folder
cp: target 'text_folder' is not a directory
[x]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ mkdir text_folder
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ cp *.txt text_folder
(d) cp -r [src_folder] [dest_folder]: recursive copying a directory
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $ ls text_folder/
animeshfile.txt  goods.txt      newfile.txt  ps.txt      sample.txt  test_text.txt
cp_ani.txt      new_cat.txt    news.txt     sample3.txt  sp.txt      test.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl1]
└── $
```

47. mkdir

- a. mkdir <options> <directory>
- b. -v for verbose mode
- c. -p parent directories are created automatically if required
- d. --version mkdir command version is displayed
- e. --help shows summary of this command
- f. -m to set permissions to the directory while creation.
- g. Screenshots:

Here while creating a directory 'permit_dir/' we have set the permissions to be rw-, so we don't have permission to execute. Therefore it is not possible for us to create any file within this directory or even cd or ls into it.

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mkdir hello
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mkdir -p hello2/other/child_one
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls hello2/
    Courses
other
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mkdir -m a=rw- permit_dir
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ touch permit_dir/newF.c
touch: cannot touch 'permit_dir/newF.c': Permission denied
[×]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ cd permit_dir/
-bash: cd: permit_dir/: Permission denied
[×]-[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mkdir -v another
mkdir: created directory 'another'
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ 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
```

```
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
   Tutorials ↴ Student ↴ Cto the default type
      --context[=CTX]  like -Z, or if CTX is specified then set the SELinux
cp command in Linux with          or SMACK security context to CTX
example:           --help    display this help and exit
                  --version output version information and exit
mv command in Linux
   with example:  mkdir [options...] [directories ...]
GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
Full documentation at: <https://www.gnu.org/software/coreutils/mkdir>
or available locally via: info '(coreutils) mkdir invocation'
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
$ mkdir --version
mkdir (GNU coreutils) 8.30  mkdir --version
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.

Simple Calculator in Bash
Written by David MacKenzie.
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

48. rmdir

- a. rmdir <options> <empty directory name>
 - b. This command is used to remove empty directories. Therefore this is not very useful, we use rm in its place.
 - c. -V verbose mode
 - d. -p remove the ancestors as well.
 - e. Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $ls
    new1  new2  new3  new4
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $rmadir new3
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $rmadir -v new4
rmadir: removing directory, 'new4'
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $cd new2
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir/new2]
└── $ls
    new21
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir/new2]
└── $rmadir -p new21
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir/new2]
└── $ls
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir/new2]
└── $cd ..
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $ls
    new1  new2
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $ls new2/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl/empty_dir]
└── $
```

49. mv

- mv <source> <dest>
- It is used to either a file or group of files to another directory or just to rename the files
- mv <oldname> <newname> renames the <oldname> file
- mv <file1> <file2> <dir> moves listed files to <dir>
- i to behave interactively(it'll ask yes/no each time it overwrites some file/dir)
- b to create a backup of old file before overwriting
- mv *.<extension> <dest folder> moves all the files with <extension> to the already existing directory <dest folder>
- Screenshots:

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33 'Exercise-I LINUX COMMANDS.pdf' new_cat.txt ps.txt test_text.txt
animeshfile.txt friends NewDir sample2.txt.gz test.txt
a.out Question_1_OS goods.txt NewDirzip.zip sample3.txt text_folder
archive_cwd.tar hello.c newfile.txt sample3.txt.bz2
cp_ani.txt 'hello fiend' newfile.txt.gz sample.txt
cp_new Input news.txt sp.txt
emptyfile my_script.awk print_name.sh tar_exp
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mv cp_ani.txt new_cp_ani.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33
animeshfile.txt
a.out
archive_cwd.tar
cp_new
emptyfile
'Exercise-I LINUX COMMANDS.pdf'
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33
animeshfile.txt
a.out
archive_cwd.tar
cp_new
emptyfile
'Exercise-I LINUX COMMANDS.pdf'
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mv new_c
new_cat.txt new_cp_ani.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mv new_cat.txt new_cp_ani.txt text_folder/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls text_folder/
animeshfile.txt goods.txt new_cp_ani.txt news.txt sample3.txt sp.txt test.txt
cp_ani.txt new_cat.txt newfile.txt ps.txt sample.txt test_text.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

b. It is used to either move a file or group of files to another directory or just to rename the file.

```
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33                               'Exercise-I LINUX COMMANDS.pdf'   my_script.awk      print_name.sh    sp.txt
animeshfile.txt                 friends                      NewDir          ps.txt
a.out                            goods.txt                   NewDirzip.zip  sample2.txt.gz  tar_exp
archive_cwd.tar                 hello.c                     newfile.txt     sample3.txt    test_text.txt
cp_new                           'hello fiend'           newfile.txt.gz  sample3.txt.bz2 test.txt
emptyfile                       Input                         news.txt       sample.txt
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mkdir txt_dir
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mv *.txt txt_dir
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls txt_dir/
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33                               emptyfile                  'hello fiend'   NewDirzip.zip  sample3.txt.bz2
animeshfile.txt                 'Exercise-I LINUX COMMANDS.pdf' Input          newfile.txt.gz  tar_exp
a.out                            friends                   files          my_script.awk  text_folder
archive_cwd.tar                 hello.c                   files          print_name.sh test.txt
cp_new                           'hello fiend'           files          NewDir        sample2.txt.gz  txt_dir
[AnimeshK@kali] -[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$
```

```
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ ls
33           emptyfile          'hello fiend'      NewDirzip.zip    sample3.txt.bz2
a.out        OS_Lab_Assignmen'tExercise-I LINUX COMMANDS.pdf' Input      newfile.txt.gz  tar_exp
archive_cwd.tar friends          my_script.awk     print_name.sh  text_folder
cp_new       hello.c           NewDir            sample2.txt.gz  txt_dir

[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ mv -i *.c cp_new
mv: overwrite 'cp_new/hello.c'? y
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ ls
33 6 KILL
emptyfile          'hello fiend'      NewDirzip.zip    sample3.txt.bz2
a.out             'Exercise-I LINUX COMMANDS.pdf' Input      newfile.txt.gz  tar_exp
archive_cwd.tar  friends          my_script.awk     print_name.sh  text_folder
cp_new           'hello.c'           NewDir            sample2.txt.gz  txt_dir

[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ mv -b print_name.sh hello\ fiend/
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ mv -b print_name.sh hello\ fiend/
[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$ ls
33 8 PING
emptyfile          'hello fiend'      Input          newfile.txt.gz  text_folder
a.out              TE                 my_script.awk  sample2.txt.gz  txt_dir
archive_cwd.tar  friends          NewDir         sample3.txt.bz2
cp_new             'hello.c'          NewDirzip.zip  tar_exp

[AnimeshK@kali:~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]$
```

50. rm

- a. rm <options> <file/dir name>
- b. It is a powerful tool to remove files and directories, combined with options like -f it can be hugely powerful.
- c. -f stands for force, doesn't prompt for anything, simply remove what's been said(:))
- d. -r recursively remove all the directories and files inside a directory
- e. -i interactive mode(asks yes/no while deleting every file/dir)
- f. -d remove empty directories
- g. -v verbose mode
- h. --help summary help
- i. --version version info of this command
- j. **The infamous command rm -rf is used to delete the directory recursively and forcefully, is dangerous(regretting and miserable actually) in case you do it on root(/) itself.**

```
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33 another empty_dir hello2 NewDirzip.zip tar_exp
emptyfile emptyfile 'hello fiend' newfile.txt.gz text_folder
a.out Exercise-I LINUX COMMANDS.pdf Input permit dir txt_dir
archive_cwd.tar friends my_script.awk sample2.txt.gz
cp_new hello NewDir sample3.txt.bz2
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm a.out
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm -r empty_dir/
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm -ir cp_new/
combined with options like -f it
can be hugely powerful.
rm: descend into directory 'cp_new/'? y stands for force, doesn't prompt for anything, simply remove what's
rm: remove regular file 'cp_new/hello.c'? y
rm: remove regular file 'cp_new/animeshfile.txt'? y
rm: remove directory 'cp_new/'? y d. -r recursively remove all the directories and files inside a directory
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm -rf another/
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ mkdir empty_dir
[AnimeshK@kali](-/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
```

```
[x]-[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm -d empty_dir/
[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ ls
33 Question_1_OS friends Input newfile.txt.gz tar_exp
archive cwd.tar hello my_script.awk permit_dir text_folder
emptyfile hello2 NewDir sample2.txt.gz txt_dir
'Exercise-I LINUX COMMANDS.pdf' 'hello fiend' NewDirzip.zip sample3.txt.bz2
[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm -h
rm: invalid option -- 'h'
Try 'rm --help' for more information.
[AnimeshK@kali]-[~/Desktop/GATE_Prep/OS/College/LabAssignments/Expl]
└─$ rm --help
Usage: rm [OPTION]... [FILE]...
Remove (unlink) the FILE(s).
-a, -r, -R      recursively remove all the directories and files inside a directory
-f, --force     ignore nonexistent files and arguments, never prompt
-i             prompt before every removal
-I             prompt once before removing more than three files, or
               when removing recursively; less intrusive than -i,
               while still giving protection against most mistakes
-rmrf          remove (unlink) the FILE(s) and any intermediate
               directories containing them; if -i is given, never prompt
-r, -R          recursively remove all the directories and files inside a directory
--interactive[=WHEN]  prompt according to WHEN: never, once (-I), or
                     always (-i); without WHEN, prompt always
--one-file-system when removing a hierarchy recursively, skip any
                  directory that is on a file system different from
                  the current one, or recursive and
--no-preserve-root do not preserve root directory when removing hierarchies
--no-recurse    do not descend into subdirectories when removing hierarchies
--no-preserve-root
--no-recurse
```

```
[AnimeshK@kali] - [~/Desktop/GATE_Prep/OS/College/LabAssignments/Exp1]
$ rm --version
rm (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 Paul Rubin, David MacKenzie, Richard M. Stallman,
and Jim Meyering.
```

Thanks

Animesh Kumar

CED18I065

Note: Rest of the questions (Q2 to 41) are in the "Assignment_OS.pdf" file. The file you are reading currently only contains Q 1. This separation is there for readability purposes.

