SANSKRITI BANSAL
20BCE2634

ASSIGNMENT 1

File and Directory Operations:

ls: List files and directories

cd: Change directory
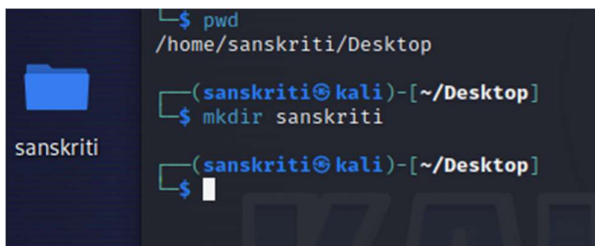
pwd: Print working directory

mkdir: Make directory

touch: Create an empty file
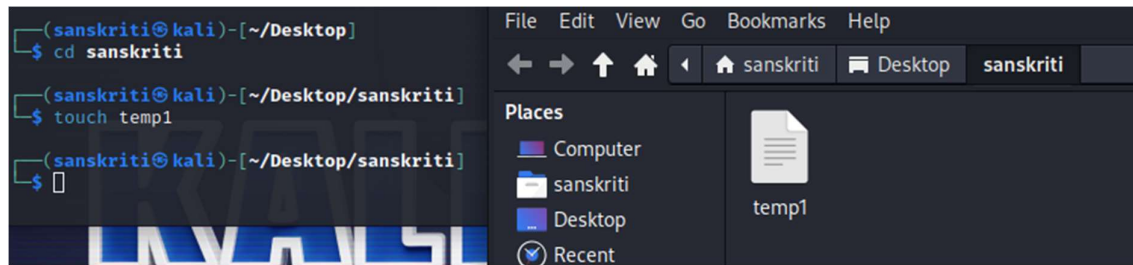
cp: Copy files and directories
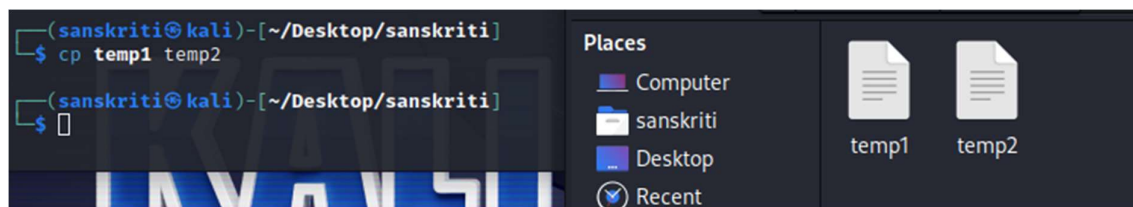
mv: Move or rename files and directories

rm: Remove files and directories
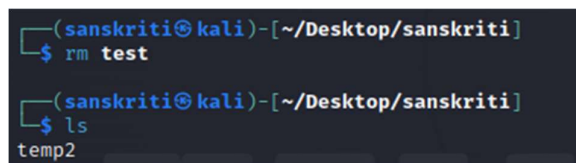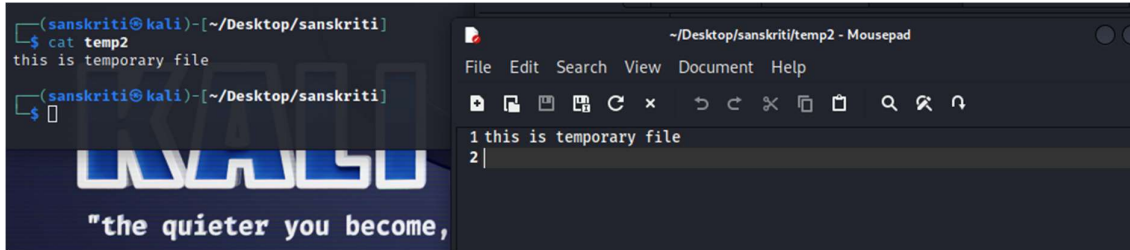
find: Search for files and directories
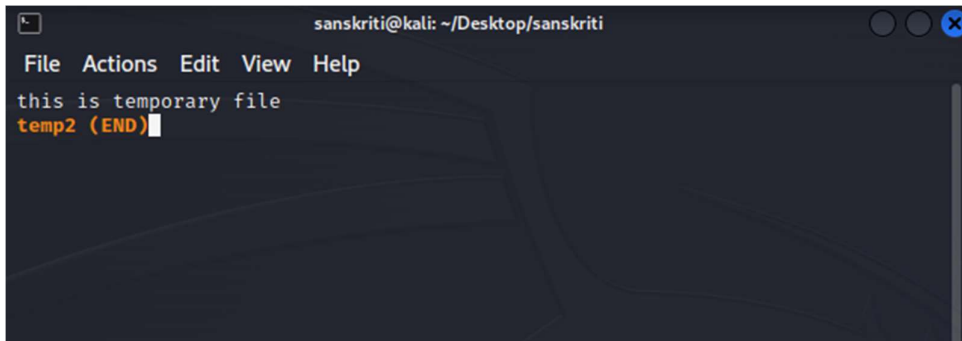
File Viewing and Editing:

cat: Concatenate and display file content

less: View file content with pagination
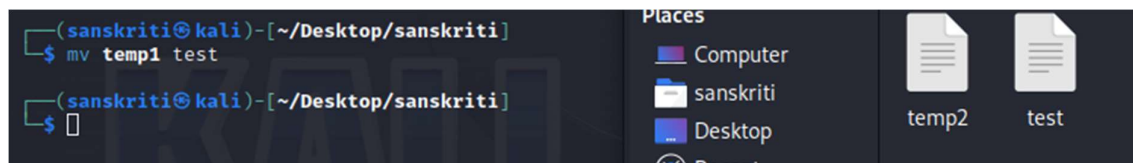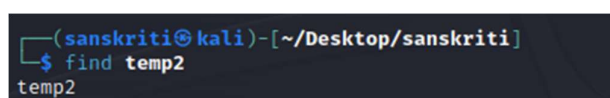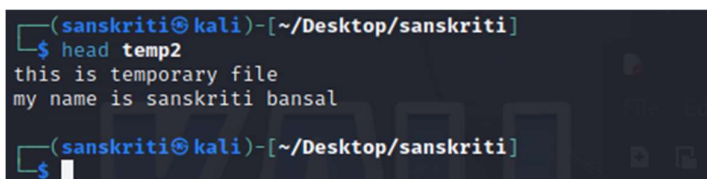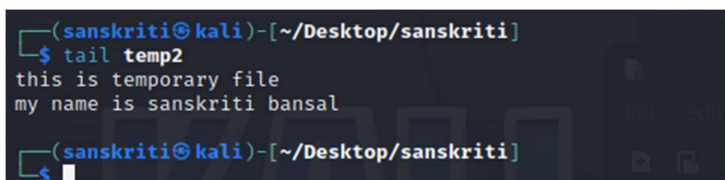

head: Display the beginning of a file
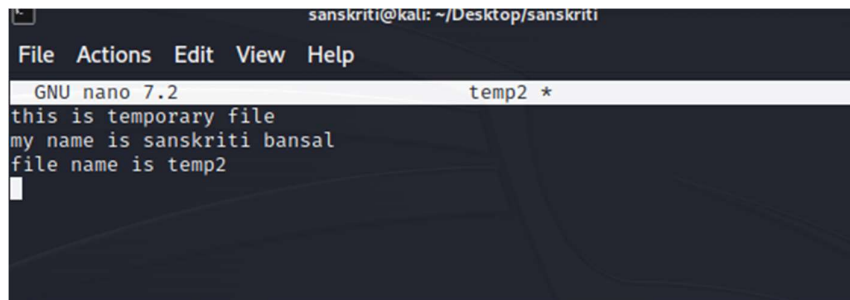
tail: Display the end of a file
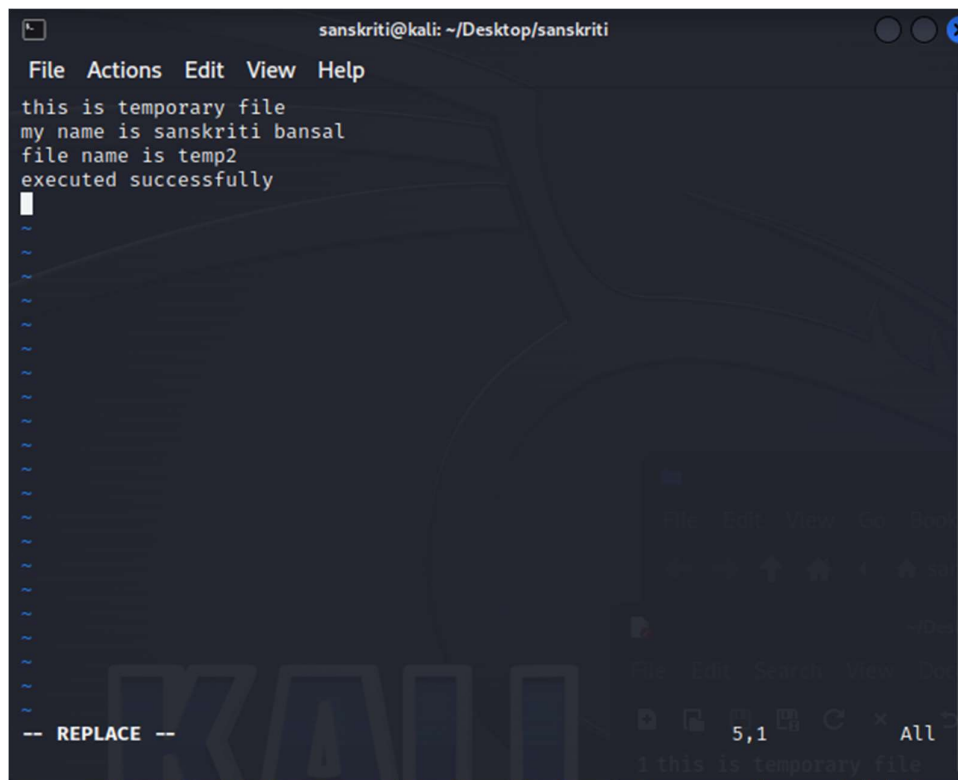
nano: Text editor for creating and editing files

vi/vim: Powerful text editor for experienced users

File Permissions:

chmod: Change file permissions

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ ls
temp2

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ chmod u+rwx temp2
```

chown: Change file owner

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ chown sanskriti temp2

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$
```

chgrp: Change file group

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ chgrp sanskriti temp2

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$
```

File Compression and Archiving:

tar: Archive files

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ tar -cvf test.tar temp2
temp2

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ ls
temp2   test.tar
```

gzip: Compress files

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ gzip -k temp2

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ ls
temp2   temp2.gz   test.tar
```

Process Management:

ps: List running processes

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ ps
   PID TTY          TIME CMD
  2446 pts/0    00:00:02 zsh
 14061 pts/0    00:00:00 ps

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
```

top: Display real-time system information and processes

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ top
top - 04:40:47 up 30 min,  1 user,  load average: 0.10, 0.13, 0.10
Tasks: 153 total,   1 running, 152 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1.4 us,  0.9 sy,  0.0 ni, 97.4 id,  0.2 wa,  0.0 hi,  0.2 si,  0.0
MiB Mem :   3920.7 total,    2880.9 free,    828.5 used,    430.0 buff/cache
MiB Swap:    975.0 total,     975.0 free,      0.0 used.   3092.2 avail Mem

   PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+
   543 root      20   0  377488 108272  56416 S   1.0   2.7   0:21.83
   963 sanskri+  20   0  204024  31900  18564 S   0.7   0.8   0:05.75
   144 root     -51   0       0      0      0 S   0.3   0.0   0:01.43
   216 root      20   0       0      0      0 S   0.3   0.0   0:00.09
   849 sanskri+  20   0  217956   2444   2096 S   0.3   0.1   0:09.32
   902 sanskri+  20   0  866200 105080  77480 S   0.3   2.6   0:08.18
   908 sanskri+  20   0  217544   3484   2964 S   0.3   0.1   0:00.56
   966 sanskri+  20   0  592876  43160  33972 S   0.3   1.1   0:01.61
  2443 sanskri+  20   0  440204 103248  83968 S   0.3   2.6   0:02.15
 13627 root      20   0       0      0      0 I   0.3   0.0   0:00.01
 14220 sanskri+  20   0   11584   5108   3220 R   0.3   0.1   0:00.03
     1 root      20   0  167812  12180   9052 S   0.0   0.3   0:01.41
     2 root      20   0       0      0      0 S   0.0   0.0   0:00.02
     3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00
     4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00
     5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00
     6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00
```

kill: Terminate processes

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ ps
   PID TTY          TIME CMD
 16994 pts/0    00:00:00 zsh
 29100 pts/0    00:00:00 ps

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ kill 29100
kill: kill 29100 failed: no such process

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ ps
   PID TTY          TIME CMD
 16994 pts/0    00:00:00 zsh
 29272 pts/0    00:00:00 ps

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
```

bg: Run processes in the background

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ jobs

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ sleep 500

^Z
zsh: suspended  sleep 500

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ jobs
[1]  + suspended  sleep 500

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ bg %1
[1]  + continued  sleep 500

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ jobs
[1]  + running    sleep 500
```

fg: Bring background processes to the foreground

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ fg %1
[1]  + running    sleep 500

^Z
zsh: suspended  sleep 500

┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ jobs
[1]  + suspended  sleep 500
```

System Information:

uname: Print system information

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ uname
Linux
```

df: Display disk space usage

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ df
Filesystem      1K-blocks      Used Available Use% Mounted on
udev             1966832         0   1966832   0% /dev
tmpfs             401480       940    400540   1% /run
/dev/sda1       29801344  13271524  14990648  47% /
tmpfs            2007388         0   2007388   0% /dev/shm
tmpfs               5120         0      5120   0% /run/lock
tmpfs             401476        84    401392   1% /run/user/1000
```

free: Display memory usage

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ free
               total        used        free      shared  buff/cache   available
Mem:         4014776      836148     2957556        8164      447776     3178628
Swap:         998396           0      998396
```

uptime: Show system uptime

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ uptime
 04:42:20 up 32 min,  1 user,  load average: 0.23, 0.16, 0.11
```

who: Display logged-in users

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ who
sanskriti tty7              2023-06-05 04:15 (:0)
```

w: Display logged-in users and their activities

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ w
 04:42:30 up 32 min,  1 user,  load average: 0.19, 0.15, 0.11
USER     TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
sanskrit tty7     :0              04:15   32:27  25.30s  0.58s xfce4-session
```

Networking:

ifconfig: Configure network interfaces

```
 ┌──(sanskriti☉kali)-[~/Desktop/sanskriti]
 └─$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.0.2.15  netmask 255.255.255.0  broadcast 10.0.2.255
        inet6 fe80::a00:27ff:fece:a9c3  prefixlen 64  scopeid 0×20<link>
        ether 08:00:27:ce:a9:c3  txqueuelen 1000  (Ethernet)
        RX packets 6  bytes 1226 (1.1 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 35  bytes 3956 (3.8 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0×10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 4  bytes 240 (240.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 4  bytes 240 (240.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

ping: Send ICMP echo requests to a network host

```
 ┌──(sanskriti☉kali)-[~/Desktop/sanskriti]
 └─$ ping -c 5  www.google.com
PING www.google.com (142.250.194.228) 56(84) bytes of data.
64 bytes from del12s08-in-f4.1e100.net (142.250.194.228): icmp_seq=1 ttl=59 time=9.61 ms
64 bytes from del12s08-in-f4.1e100.net (142.250.194.228): icmp_seq=2 ttl=59 time=11.0 ms
64 bytes from del12s08-in-f4.1e100.net (142.250.194.228): icmp_seq=3 ttl=59 time=10.8 ms
64 bytes from del12s08-in-f4.1e100.net (142.250.194.228): icmp_seq=4 ttl=59 time=10.5 ms
64 bytes from del12s08-in-f4.1e100.net (142.250.194.228): icmp_seq=5 ttl=59 time=10.9 ms

── www.google.com ping statistics ──
5 packets transmitted, 5 received, 0% packet loss, time 4013ms
rtt min/avg/max/mdev = 9.608/10.563/10.987/0.500 ms
```

ssh: Securely connect to a remote system

ssh stands for "Secure Shell". It is a protocol used to securely connect to a remote server/system. ssh is secure in the sense that it transfers the data in encrypted form between the host and the client. It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

Syntax:
ssh user_name@host(IP/Domain_name)

scp: Securely copy files between systems

scp (secure copy) command in Linux system is used to copy file(s) between servers in a secure way. The SCP command or secure copy allows the secure transferring of files between the local host and the remote host or between two remote hosts. It uses the

same authentication and security as it is used in the Secure Shell (SSH) protocol. SCP is known for its simplicity, security, and pre-installed availability.

Syntax:
```
scp [-i identity_file] [-l limit] [-o ssh_option] [-P port] [-S program] [[user@]host1:]file1 … [[user@]host2:]file2
```

wget: Download files from the web

System Administration:

sudo: Execute commands with superuser privileges

apt-get: Package management for Debian-based distributions

```
┌──(sanskriti㉿kali)-[~/Desktop/sanskriti]
└─$ apt-get
apt 2.5.6 (amd64)
Usage: apt-get [options] command
       apt-get [options] install|remove pkg1 [pkg2 ...]
       apt-get [options] source pkg1 [pkg2 ...]

apt-get is a command line interface for retrieval of packages
and information about them from authenticated sources and
for installation, upgrade and removal of packages together
with their dependencies.

Most used commands:
  update - Retrieve new lists of packages
  upgrade - Perform an upgrade
  install - Install new packages (pkg is libc6 not libc6.deb)
  reinstall - Reinstall packages (pkg is libc6 not libc6.deb)
  remove - Remove packages
  purge - Remove packages and config files
  autoremove - Remove automatically all unused packages
  dist-upgrade - Distribution upgrade, see apt-get(8)
  dselect-upgrade - Follow dselect selections
  build-dep - Configure build-dependencies for source packages
  satisfy - Satisfy dependency strings
  clean - Erase downloaded archive files
  autoclean - Erase old downloaded archive files
  check - Verify that there are no broken dependencies
  source - Download source archives
  download - Download the binary package into the current directory
  changelog - Download and display the changelog for the given package

See apt-get(8) for more information about the available commands.
Configuration options and syntax is detailed in apt.conf(5).
Information about how to configure sources can be found in sources.list(5).
Package and version choices can be expressed via apt_preferences(5).
Security details are available in apt-secure(8).
                              This APT has Super Cow Powers.
```

systemctl: Manage system services