

SANSKRITI BANSAL
20BCE2634

ASSIGNMENT 1

File and Directory Operations:

ls: List files and directories

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

cd: Change directory

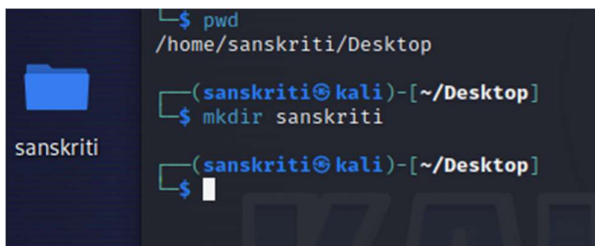
```
(sanskriti@kali)-[~]  
$ cd Desktop  
  
(sanskriti@kali)-[~/Desktop]  
$
```

pwd: Print working directory

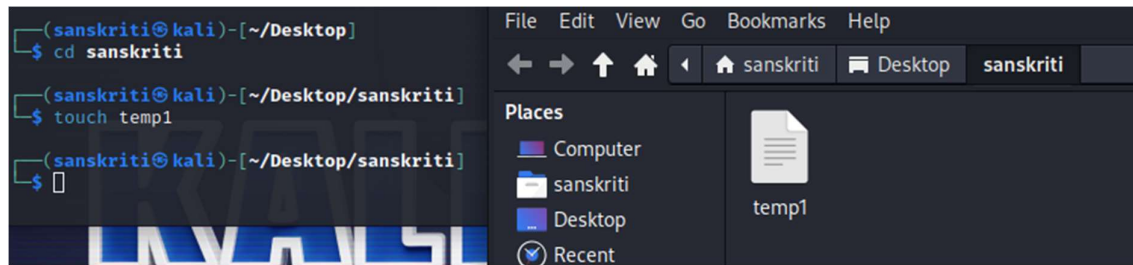
```
(sanskriti@kali)-[~/Desktop]  
$ pwd  
/home/sanskriti/Desktop  
  
(sanskriti@kali)-[~/Desktop]  
$
```

mkdir: Make directory

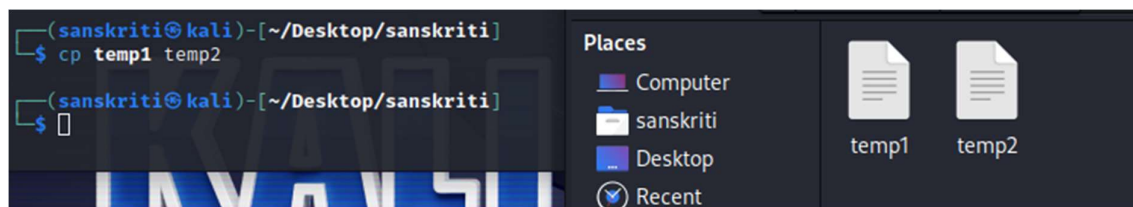
```
$ pwd  
/home/sanskriti/Desktop  
  
(sanskriti@kali)-[~/Desktop]  
$ mkdir sanskriti  
  
(sanskriti@kali)-[~/Desktop]  
$
```



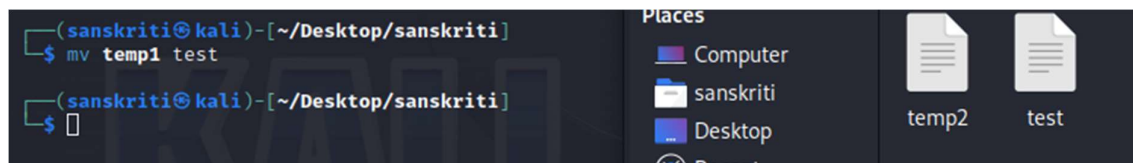
touch: Create an empty file



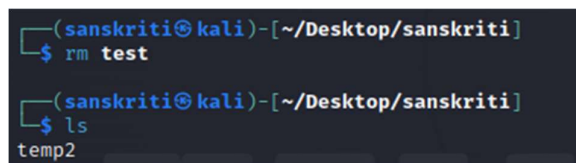
cp: Copy files and directories



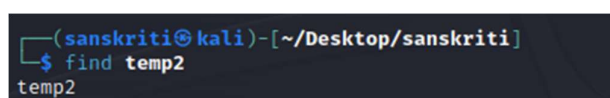
mv: Move or rename files and directories



rm: Remove files and directories

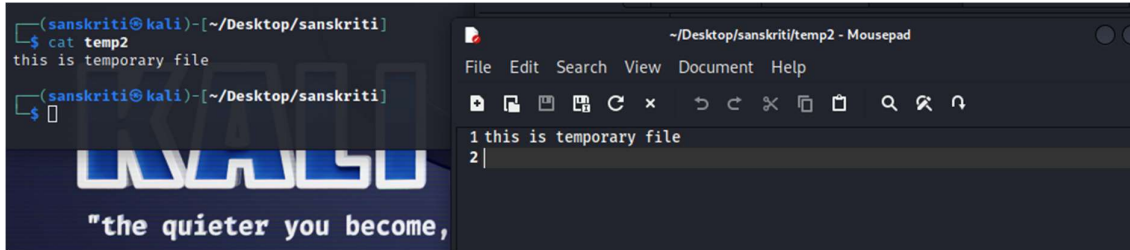


find: Search for files and directories



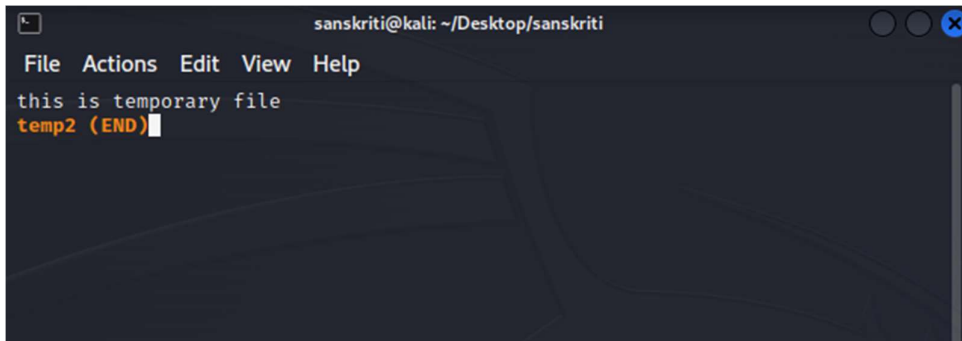
File Viewing and Editing:

cat: Concatenate and display file content



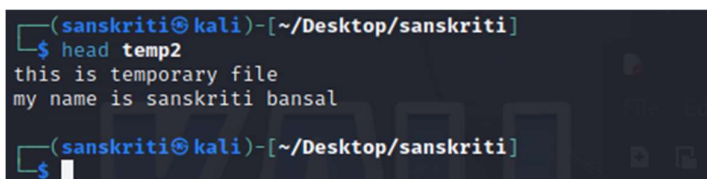
The image shows two side-by-side screenshots. The left screenshot is a terminal window with the prompt `(sanskriti@kali) - [~/Desktop/sanskriti]`. It shows the command `$ cat temp2` being executed, resulting in the output `this is temporary file`. The right screenshot is a Mousepad editor window titled `~/Desktop/sanskriti/temp2 - Mousepad`. It shows the file content: `1 this is temporary file` and `2 |` on the next line.

less: View file content with pagination



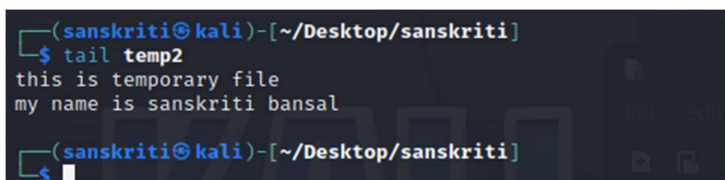
The image shows a terminal window titled `sanskriti@kali: ~/Desktop/sanskriti`. It displays the output of the `less` command, showing `this is temporary file` and `temp2 (END)` at the bottom.

head: Display the beginning of a file



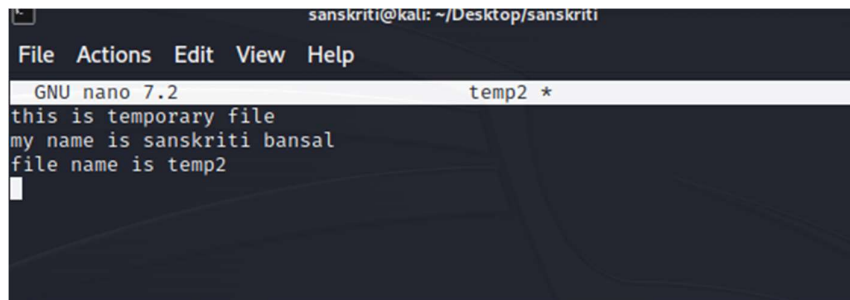
The image shows a terminal window with the prompt `(sanskriti@kali) - [~/Desktop/sanskriti]`. It shows the command `$ head temp2` being executed, resulting in the output `this is temporary file` and `my name is sanskriti bansal`.

tail: Display the end of a file



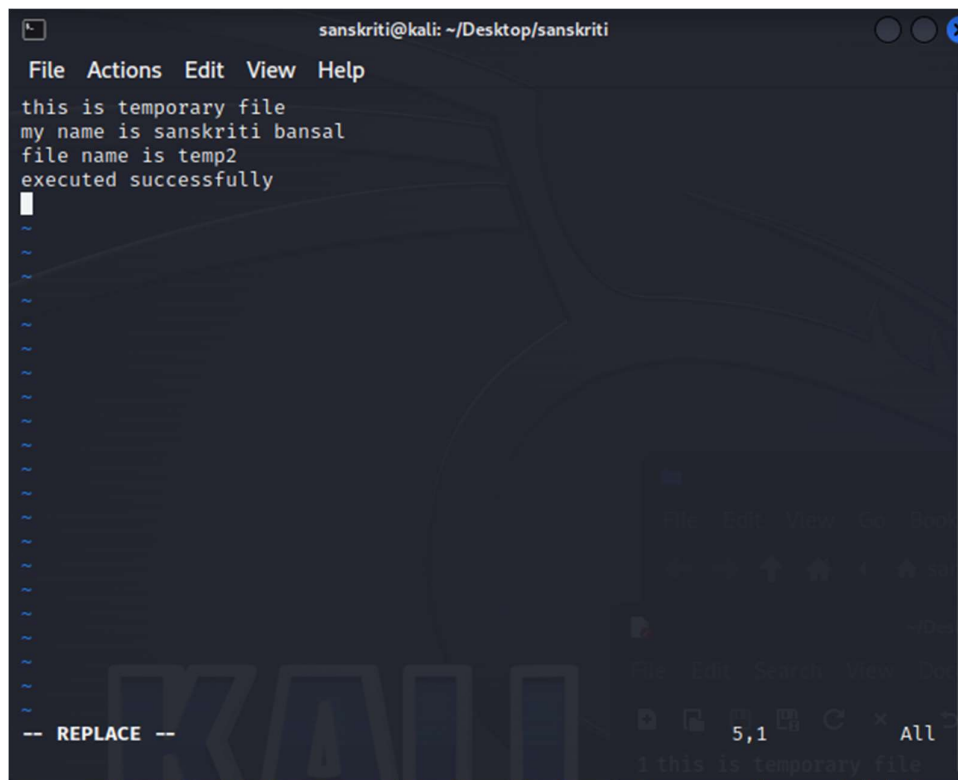
The image shows a terminal window with the prompt `(sanskriti@kali) - [~/Desktop/sanskriti]`. It shows the command `$ tail temp2` being executed, resulting in the output `this is temporary file` and `my name is sanskriti bansal`.

nano: Text editor for creating and editing files



A screenshot of the nano text editor running in a terminal window. The window title is 'sanskriti@kali: ~/Desktop/sanskriti'. The menu bar shows 'File Actions Edit View Help'. The status bar at the top indicates 'GNU nano 7.2' and 'temp2 *'. The text content of the file 'temp2' is: 'this is temporary file', 'my name is sanskriti bansal', and 'file name is temp2'. The cursor is positioned at the end of the third line.

vi/vim: Powerful text editor for experienced users



A screenshot of the vim text editor running in a terminal window. The window title is 'sanskriti@kali: ~/Desktop/sanskriti'. The menu bar shows 'File Actions Edit View Help'. The text content of the file 'temp2' is: 'this is temporary file', 'my name is sanskriti bansal', 'file name is temp2', and 'executed successfully'. The cursor is positioned at the end of the fourth line. The bottom status bar shows '-- REPLACE --' and '5,1 All'. A large 'KANO' watermark is visible in the background.

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<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<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

```
(sanskriti@kali)-[~/Desktop/sanskriti]
$ wget https://wordpress.org/latest.zip
--2023-06-05 05:30:36-- https://wordpress.org/latest.zip
Resolving wordpress.org (wordpress.org) ... 198.143.164.252
Connecting to wordpress.org (wordpress.org)|198.143.164.252|:443 ... connected.
HTTP request sent, awaiting response... 200 OK
Length: 24498824 (23M) [application/zip]
Saving to: 'latest.zip'

latest.zip           100%[=====>] 23.36M  6.68MB/s  in 4.0s
2023-06-05 05:30:41 (5.78 MB/s) - 'latest.zip' saved [24498824/24498824]

(sanskriti@kali)-[~/Desktop/sanskriti]
$ ls
latest.zip  temp2  temp2.gz  test.tar
```

System Administration:

sudo: Execute commands with superuser privileges

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

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

```
(sanskriti@kali)-[~/Desktop/sanskriti]
$ systemctl
UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
proc-sys-fs-binfmt_misc.automount  loaded active running Arbitrary Executable Fi>
sys-devices-pci0000:00-0000:00:01.1-ata2-host2-target2:0:0-2:0:0:0-block-sr0.device loaded active plugged VBOX_CD-ROM
sys-devices-pci0000:00-0000:00:03.0-net-eth0.device loaded active plugged 82540EM Gigabit Etherne>
sys-devices-pci0000:00-0000:00:05.0-sound-card0-controlC0.device loaded active plugged /sys/devices/pci0000:00>
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda-sda1.device loaded active plugged VBOX_HARDDISK 1
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda-sda2.device loaded active plugged VBOX_HARDDISK 2
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda-sda5.device loaded active plugged VBOX_HARDDISK 5
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda.device loaded active plugged VBOX_HARDDISK
sys-devices-platform-serial8250-tty-ttyS0.device loaded active plugged /sys/devices/platform/s>
sys-devices-platform-serial8250-tty-ttyS1.device loaded active plugged /sys/devices/platform/s>
sys-devices-platform-serial8250-tty-ttyS2.device loaded active plugged /sys/devices/platform/s>
sys-devices-platform-serial8250-tty-ttyS3.device loaded active plugged /sys/devices/platform/s>
sys-devices-virtual-misc-rfkill.device loaded active plugged /sys/devices/virtual/mi>
sys-module-configfs.device loaded active plugged /sys/module/configfs
sys-module-fuse.device loaded active plugged /sys/module/fuse
sys-subsystem-net-devices-eth0.device loaded active plugged 82540EM Gigabit Etherne>
-.mount loaded active mounted Root Mount
dev-hugepages.mount loaded active mounted Huge Pages File System
dev-mqueue.mount loaded active mounted POSIX Message Queue Fil>
proc-sys-fs-binfmt_misc.mount loaded active mounted Arbitrary Executable Fi>
run-credentials-systemd\x2dsysctl.service.mount loaded active mounted /run/credentials/system>
run-credentials-systemd\x2dsysusers.service.mount loaded active mounted /run/credentials/system>
run-credentials-systemd\x2dtmpfiles\x2dsetup.service.mount loaded active mounted /run/credentials/system>
run-credentials-systemd\x2dtmpfiles\x2dsetup\x2ddev.service.mount loaded active mounted /run/credentials/system>
run-rpc_pipefs.mount loaded active mounted RPC Pipe File System
run-user-1000-gvfs.mount loaded active mounted /run/user/1000/gvfs
run-user-1000.mount loaded active mounted /run/user/1000
sys-fs-fuse-connections.mount loaded active mounted FUSE Control File System
sys-kernel-config.mount loaded active mounted Kernel Configuration Fi>
sys-kernel-debug.mount loaded active mounted Kernel Debug File System
sys-kernel-tracing.mount loaded active mounted Kernel Trace File Syste>
systemd-ask-password-plymouth.path loaded active waiting Forward Password Reques>
systemd-ask-password-wall.path loaded active waiting Forward Password Reques>
init.scope loaded active running System and Service Mana>
```