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This is to certify that the work entered in this journal
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who has worked for the year 2020-2021 in the Computer
Laboratory.

Teacher In-Charge

Head of Department

Date : _____

Examiner

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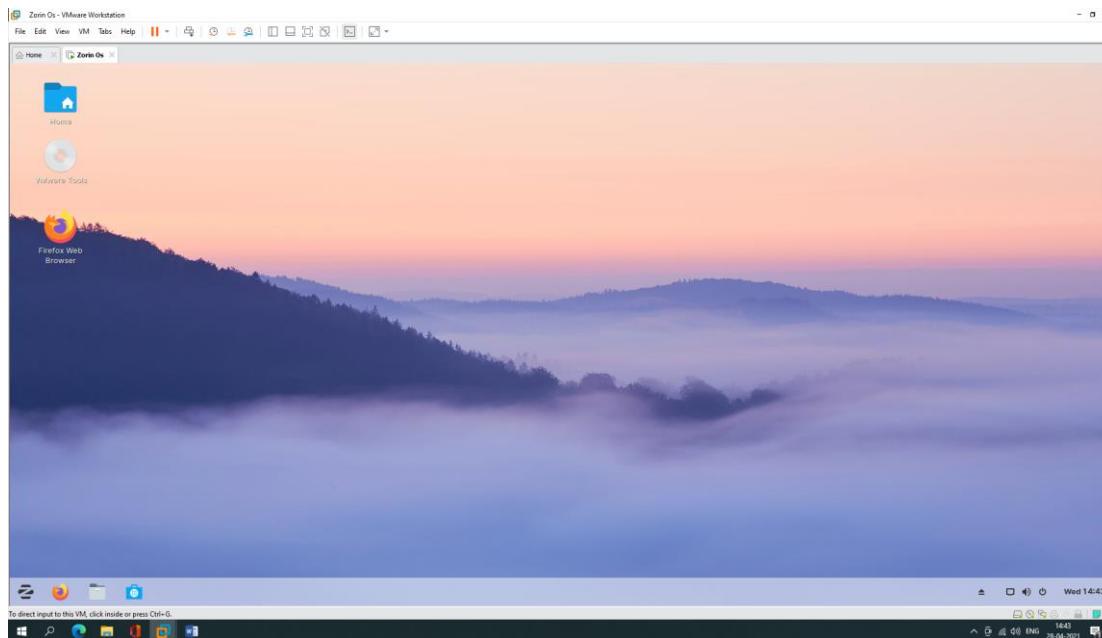
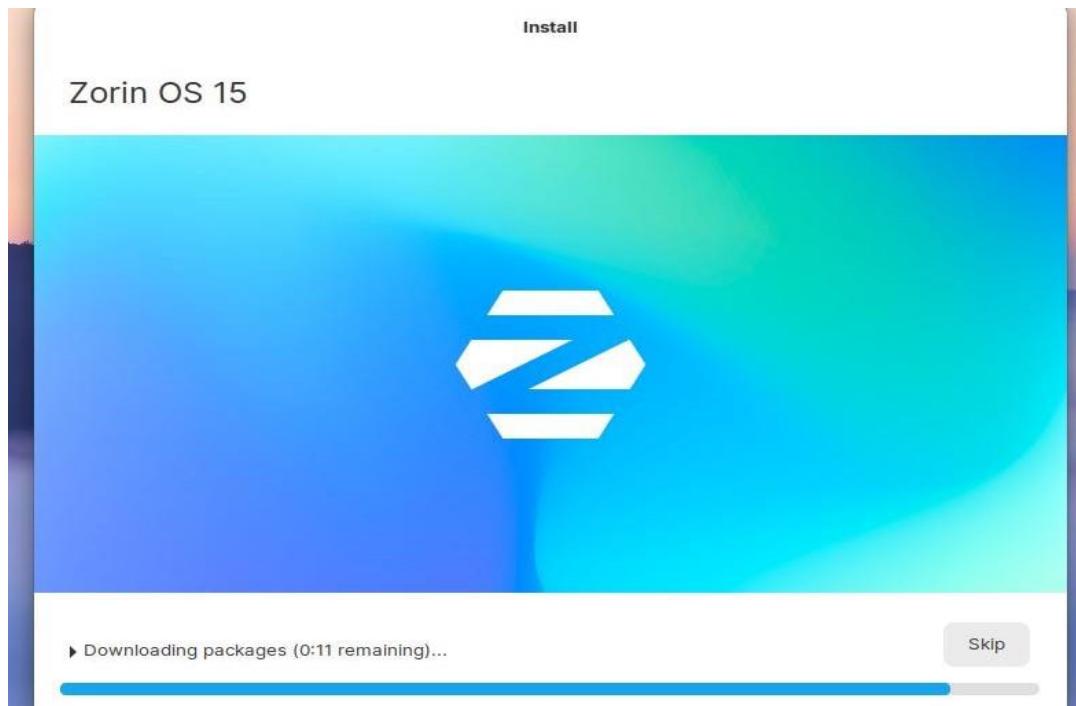
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Practical No:01

Aim: Linux Installation.

a) Install your choice of Linux distribution e.g. Ubuntu, Fedora, Debian.

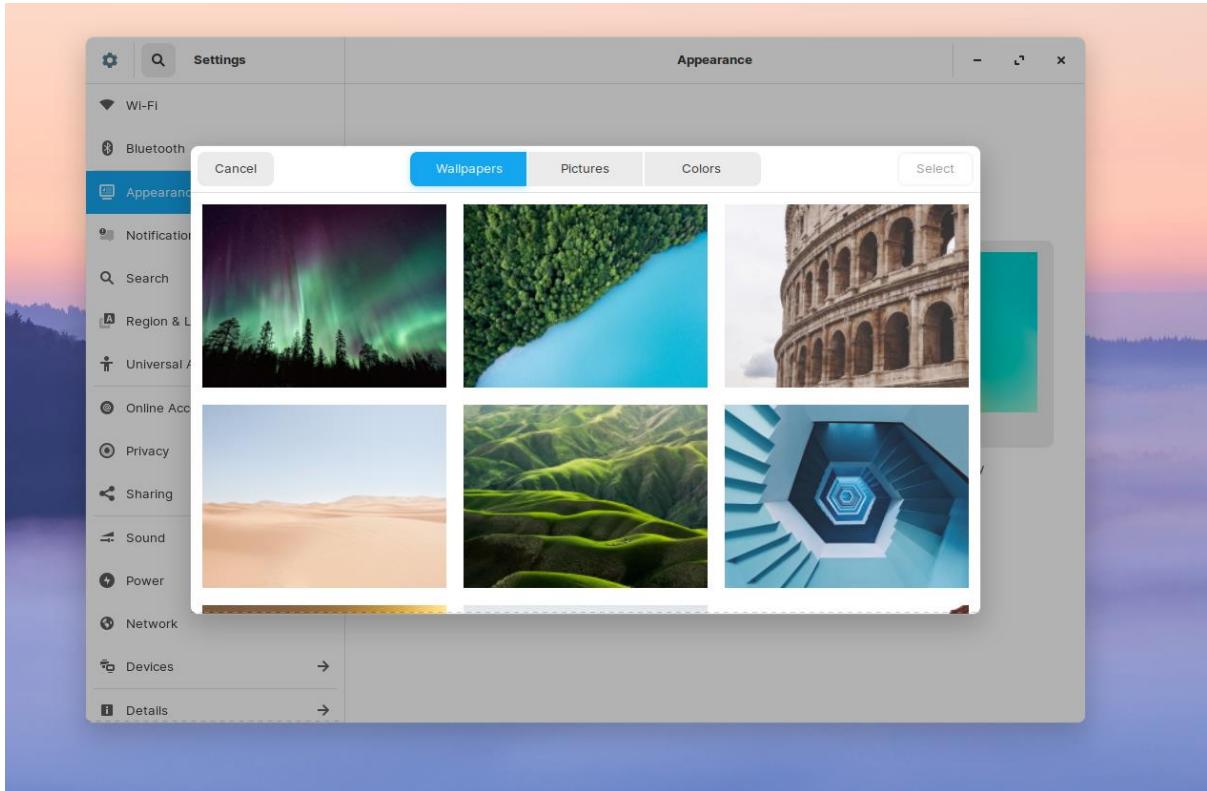
Installing Zorin Operating System:



b) Customize desktop environment by changing different default options like changing default background, themes.

Changing background

Go to settings, click on ‘appearance’ and select the option wallpaper, now you can choose any wallpaper you want to set in background.

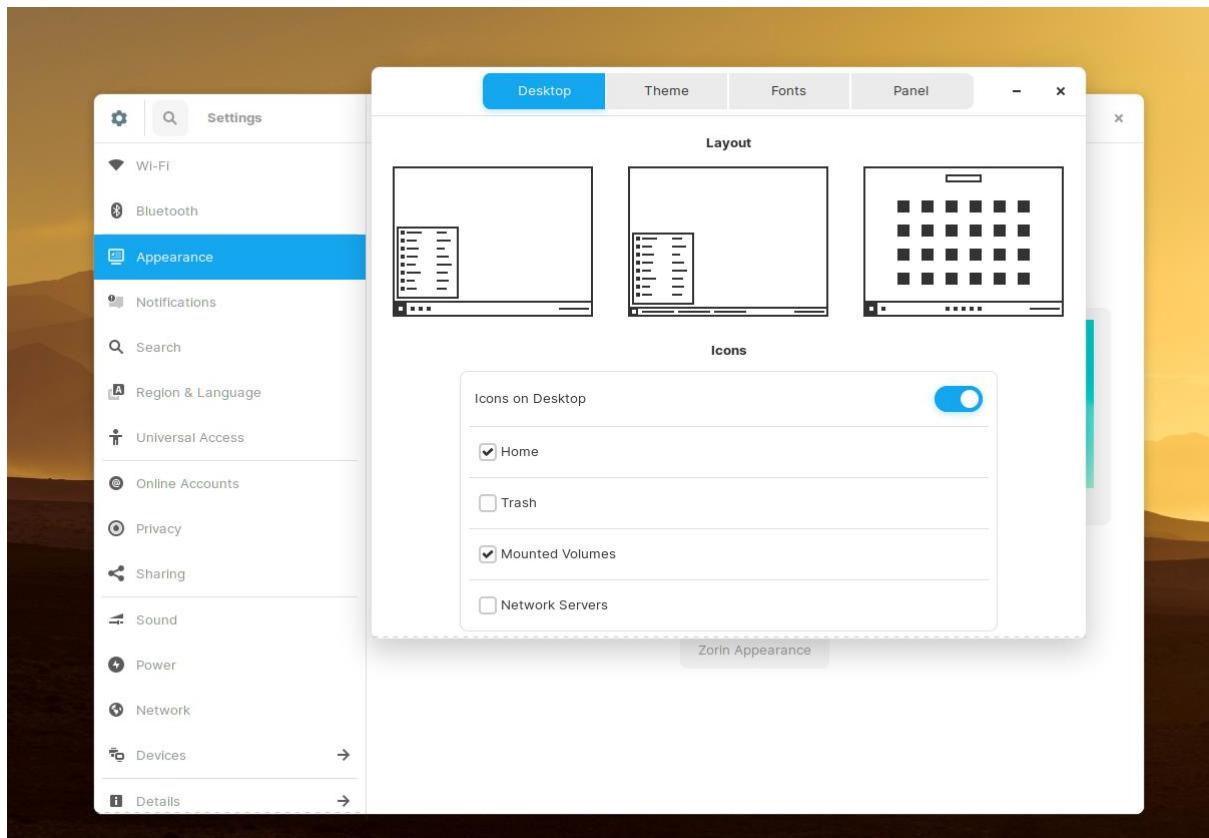


After Changing Background

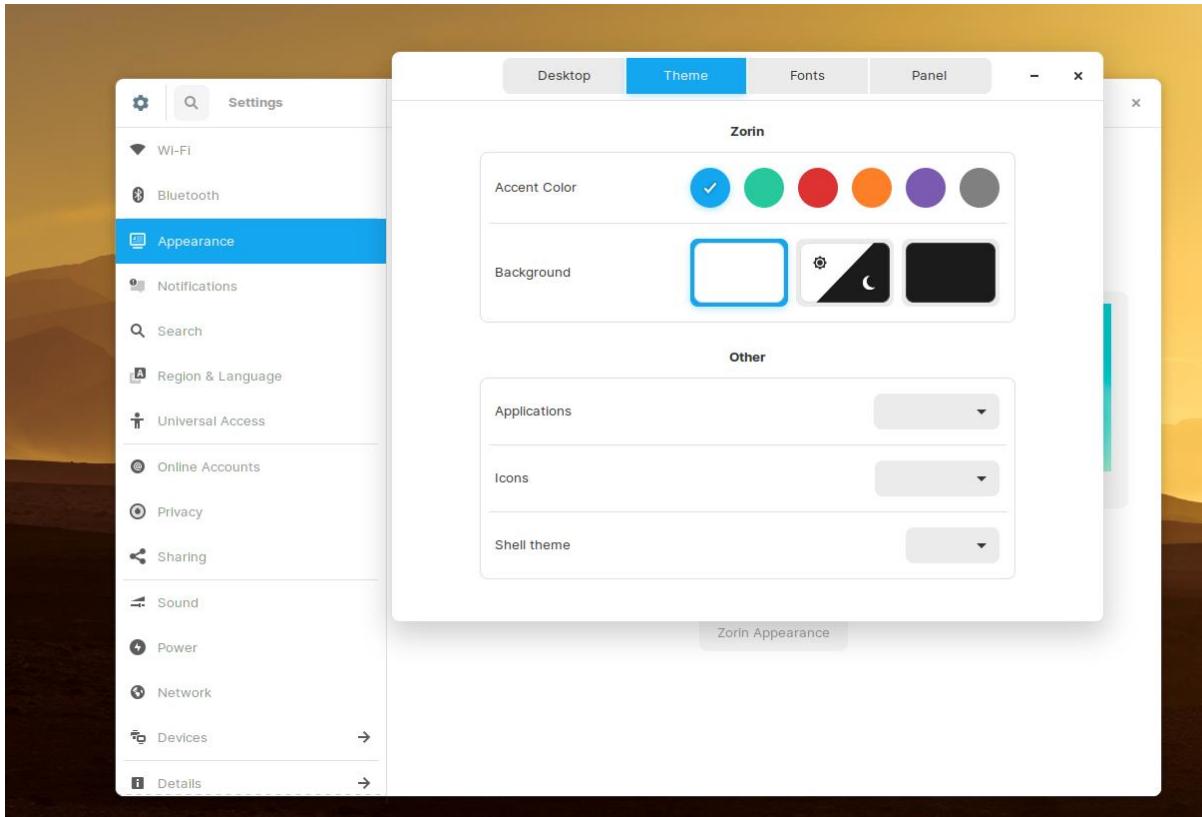


Changing theme

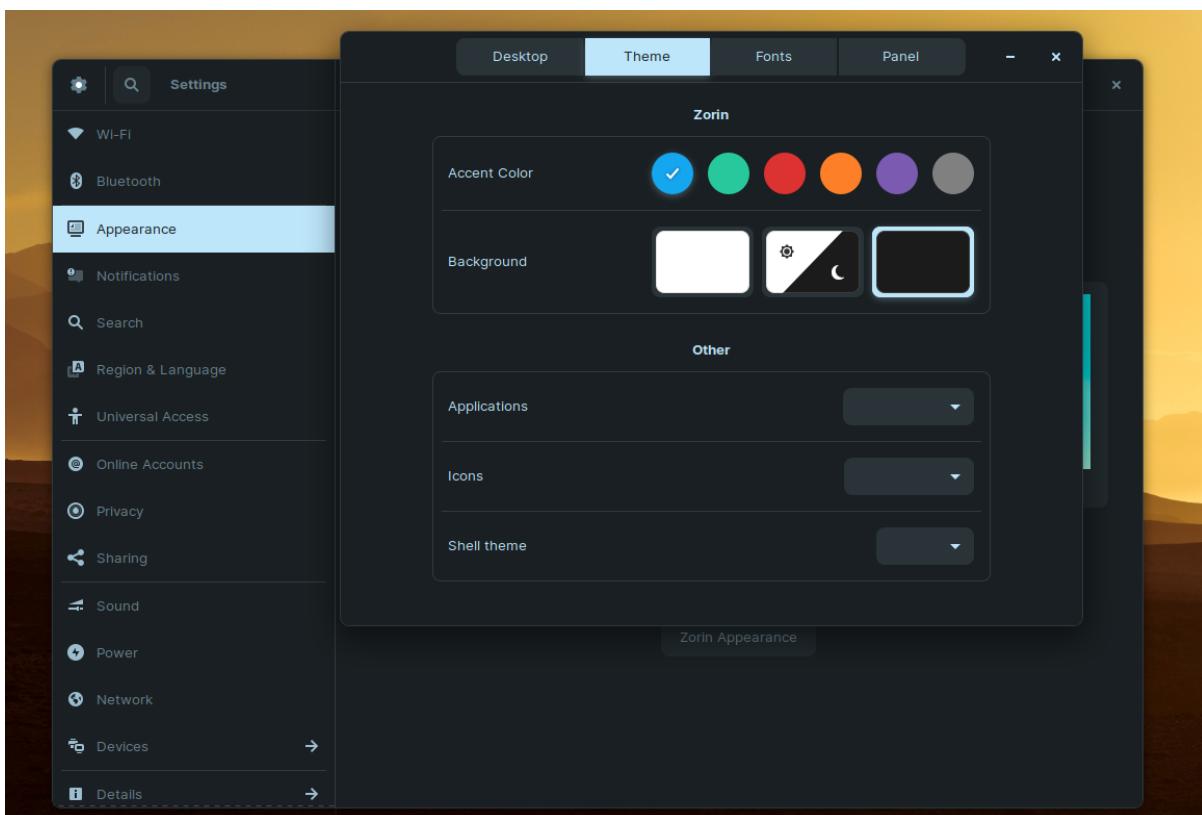
Go to settings and click on ‘Appearance’, click on the option zorin appearance.



Select the option theme and pick the theme you wanted.



After Changing the theme.

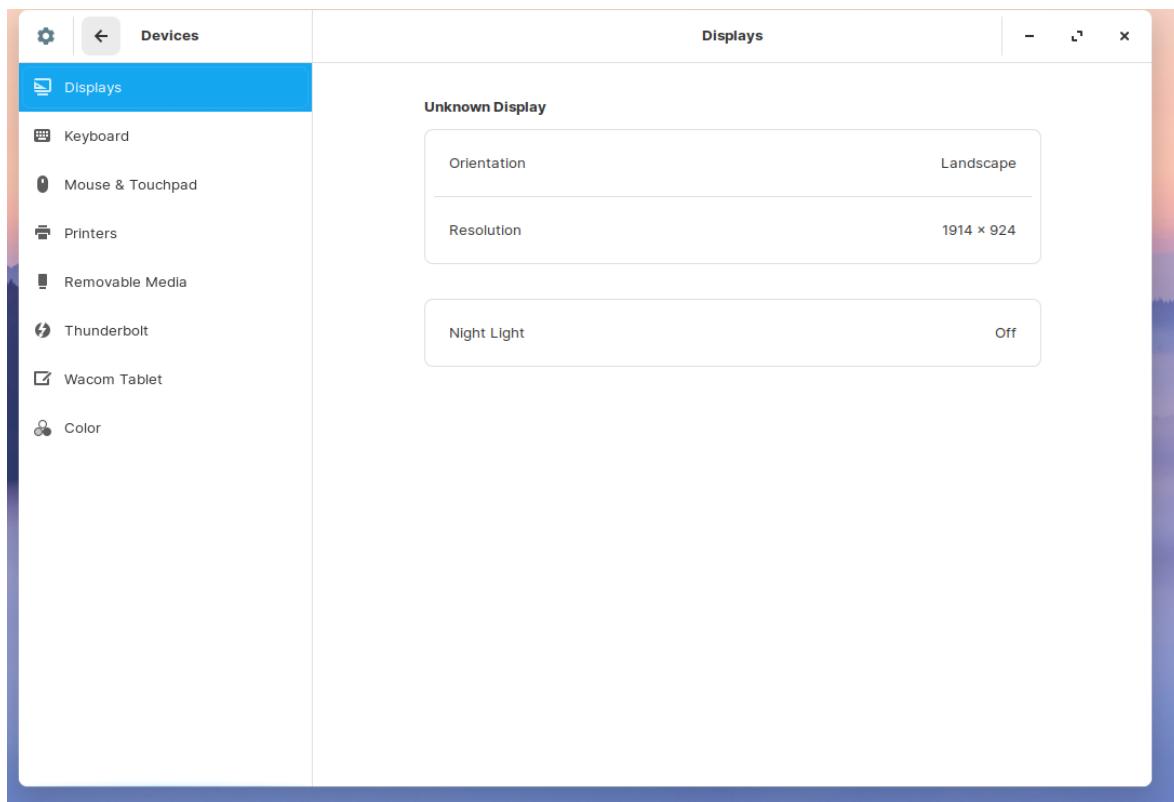


Practical No:02

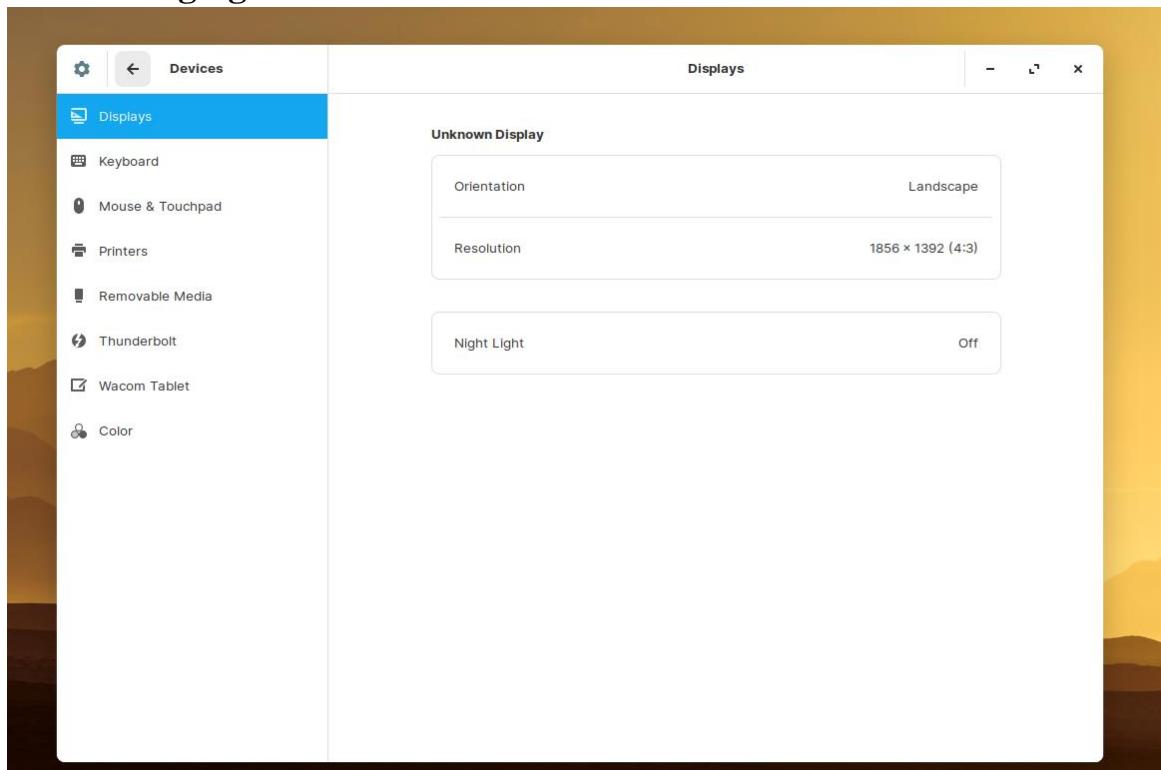
Aim: Screen Resolution, Networking, Time Settings.

- Screen Resolution: Ascertain the current screen resolution for your desktop.

Go to setting and click on ‘Displays’ and under resolution choose the one that suits you.



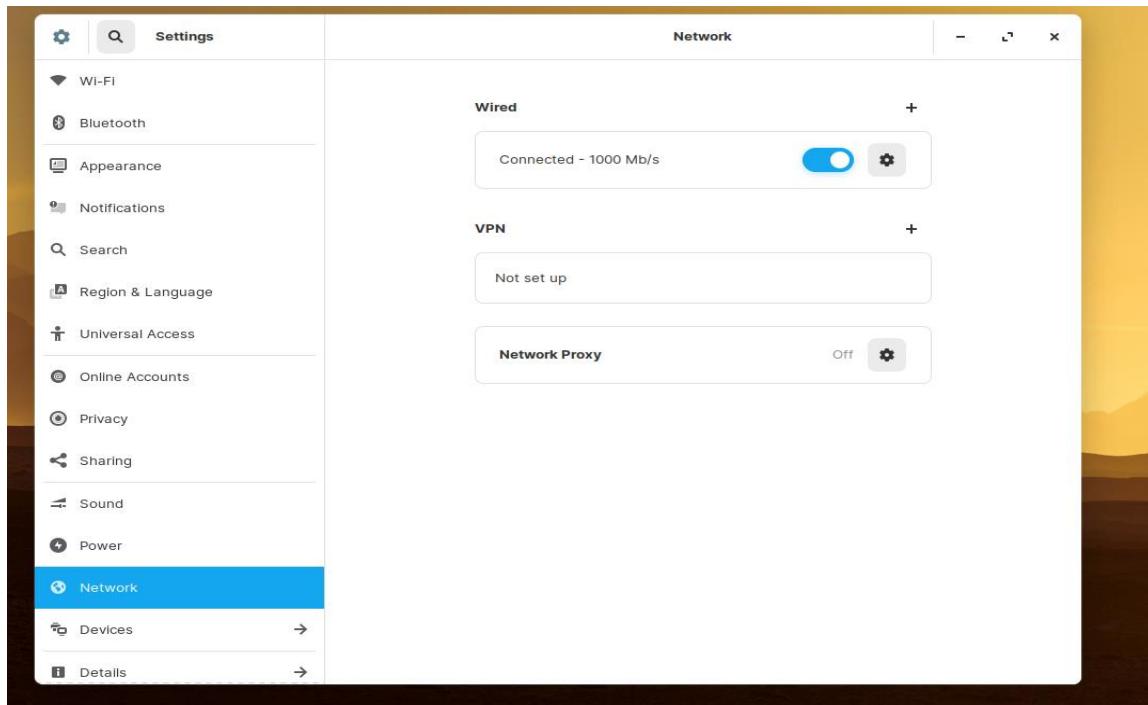
After changing the resolution.

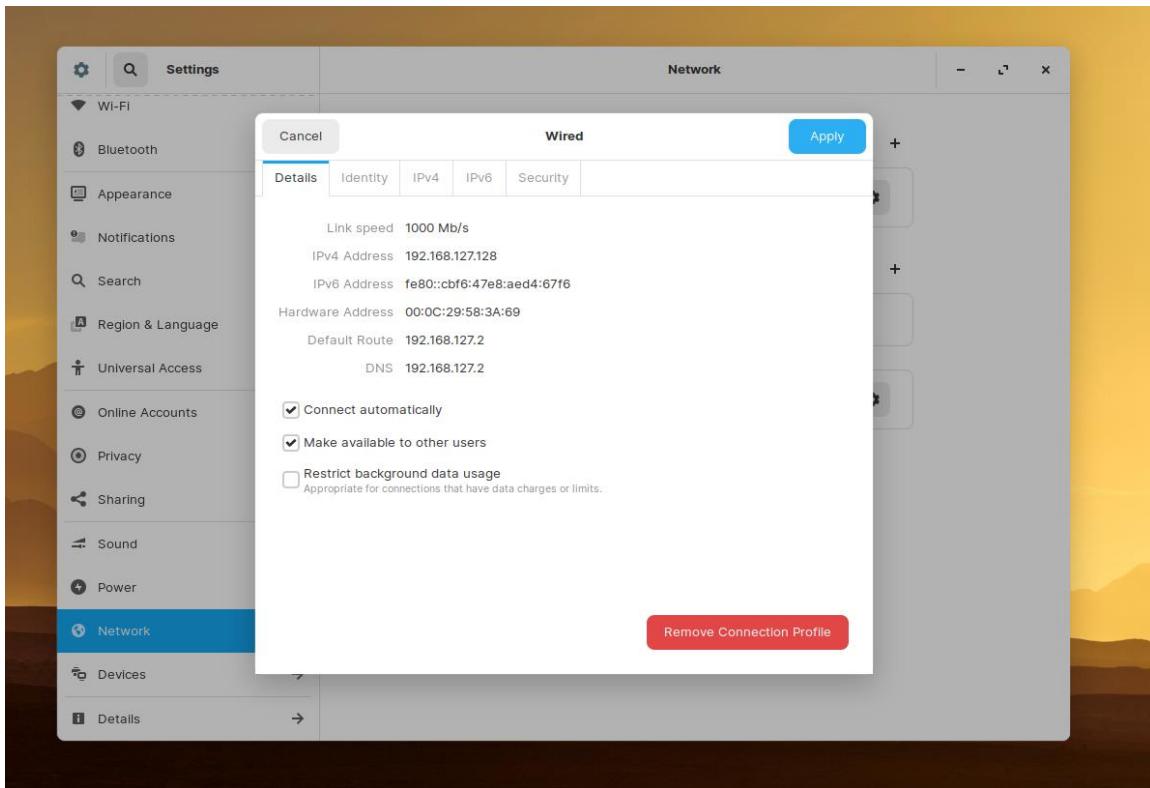


b) Networking: Get the current networking configuration for your desktop.

Are you on a wired or a wireless connection? What wireless connections are available, if any?

Using GUI





Using CMD

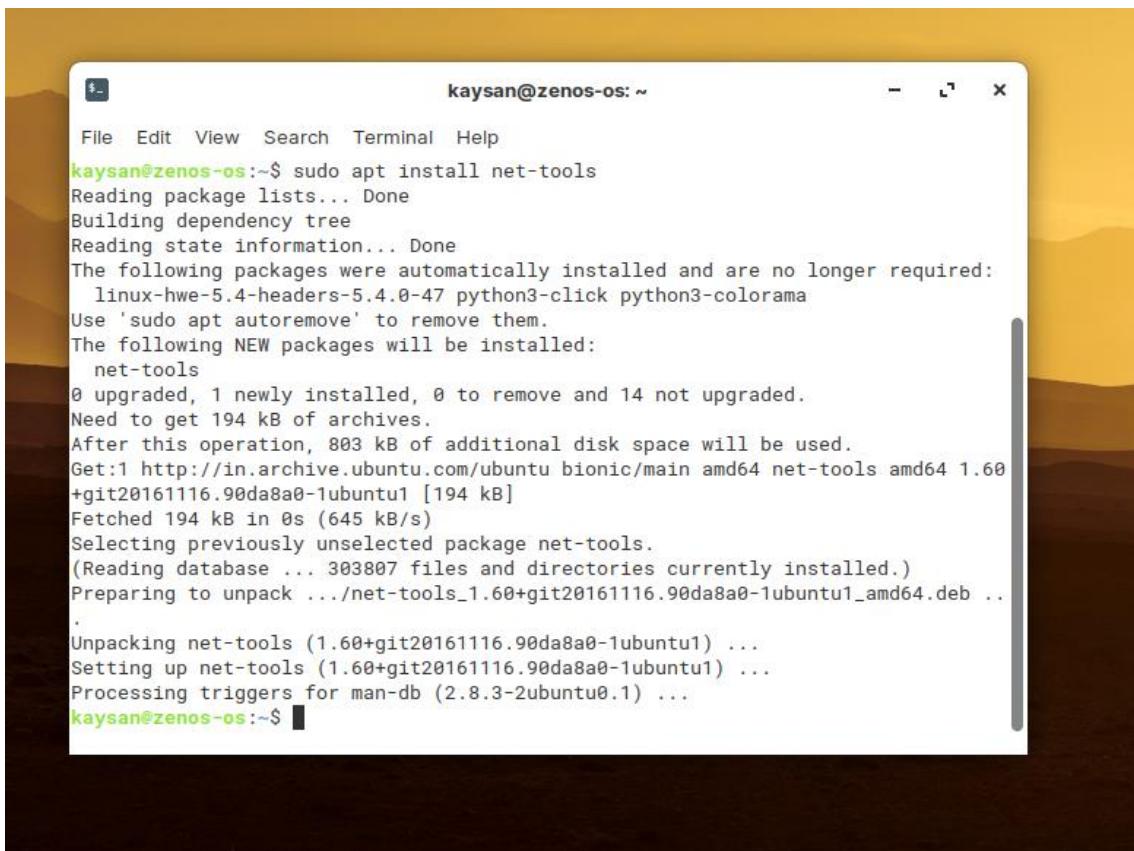
Type **ifconfig** command, if the command is not found you can install with by using command '**sudo apt install net-tools**'.

A screenshot of a terminal window titled 'kaysan@zenos-os:~\$'. The window has a standard Linux-style menu bar with File, Edit, View, Search, Terminal, and Help. The user has typed 'ifconfig' and received the following output:

```
Command 'ifconfig' not found, but can be installed with:  
sudo apt install net-tools
```

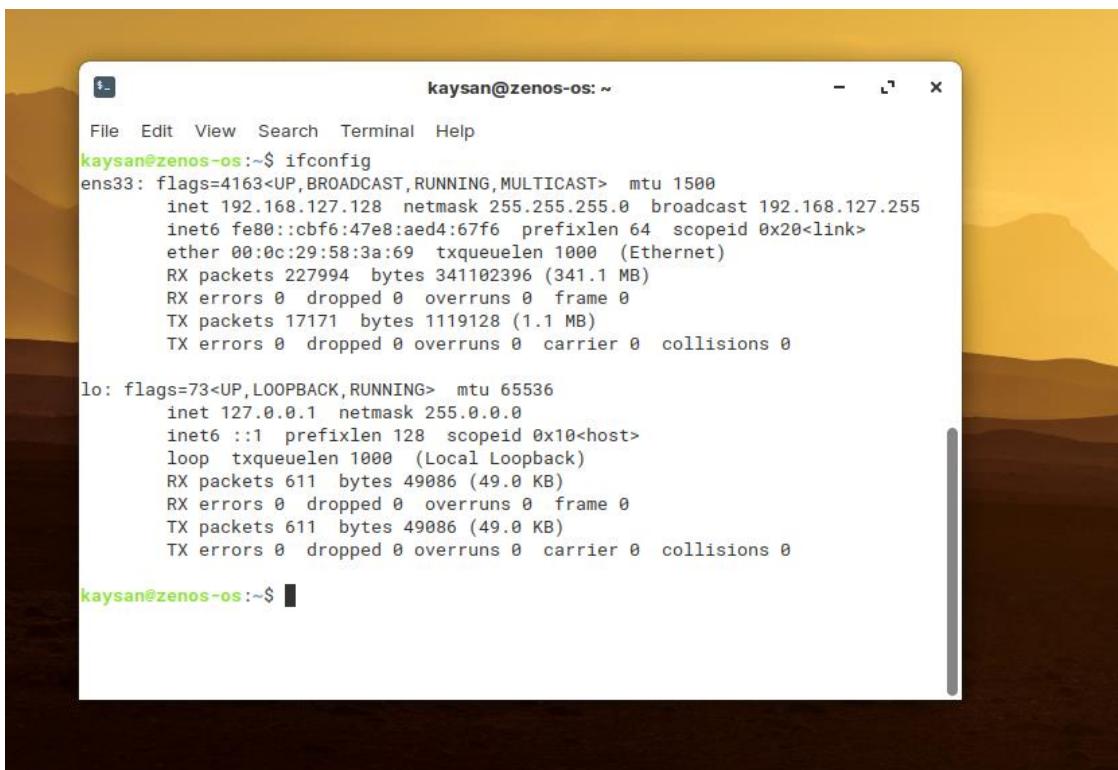
Then, the user typed 'sudo apt intall net-tools' (note the misspelling of 'install') and was prompted for a password.

```
kaysan@zenos-os:~$ sudo apt intall net-tools  
[sudo] password for kaysan: *****
```



```
kaysan@zenos-os:~$ sudo apt install net-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-hwe-5.4-headers-5.4.0-47 python3-click python3-colorama
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 14 not upgraded.
Need to get 194 kB of archives.
After this operation, 803 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/main amd64 net-tools amd64 1.60+git20161116.90da8a0-1ubuntu1 [194 kB]
Fetched 194 kB in 0s (645 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 303807 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20161116.90da8a0-1ubuntu1_amd64.deb ...
.
Unpacking net-tools (1.60+git20161116.90da8a0-1ubuntu1) ...
Setting up net-tools (1.60+git20161116.90da8a0-1ubuntu1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
kaysan@zenos-os:~$
```

After Using ifconfig.

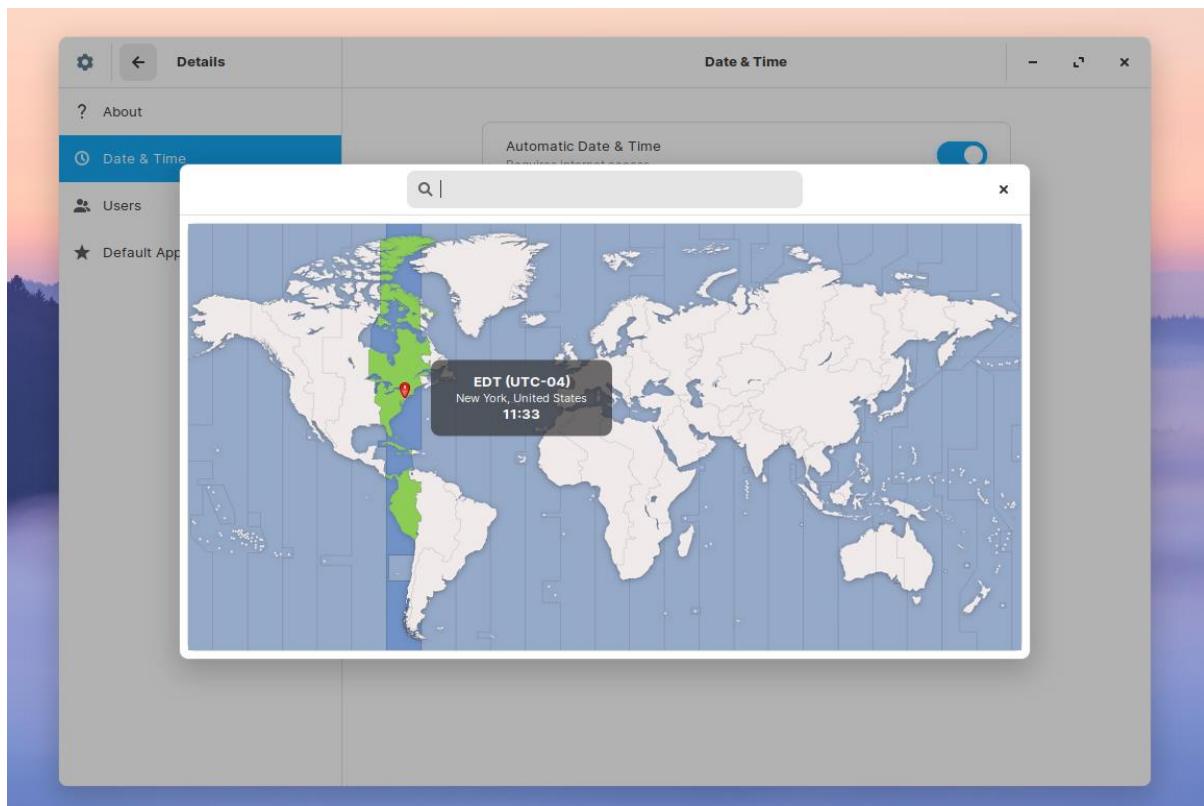


```
kaysan@zenos-os:~$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet 192.168.127.128  netmask 255.255.255.0  broadcast 192.168.127.255
        inet6 fe80::cbff:47e8:aed4:67f6  prefixlen 64  scopeid 0x20<link>
          ether 00:0c:29:58:3a:69  txqueuelen 1000  (Ethernet)
            RX packets 227994  bytes 341102396 (341.1 MB)
            RX errors 0  dropped 0  overruns 0  frame 0
            TX packets 17171  bytes 1119128 (1.1 MB)
            TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

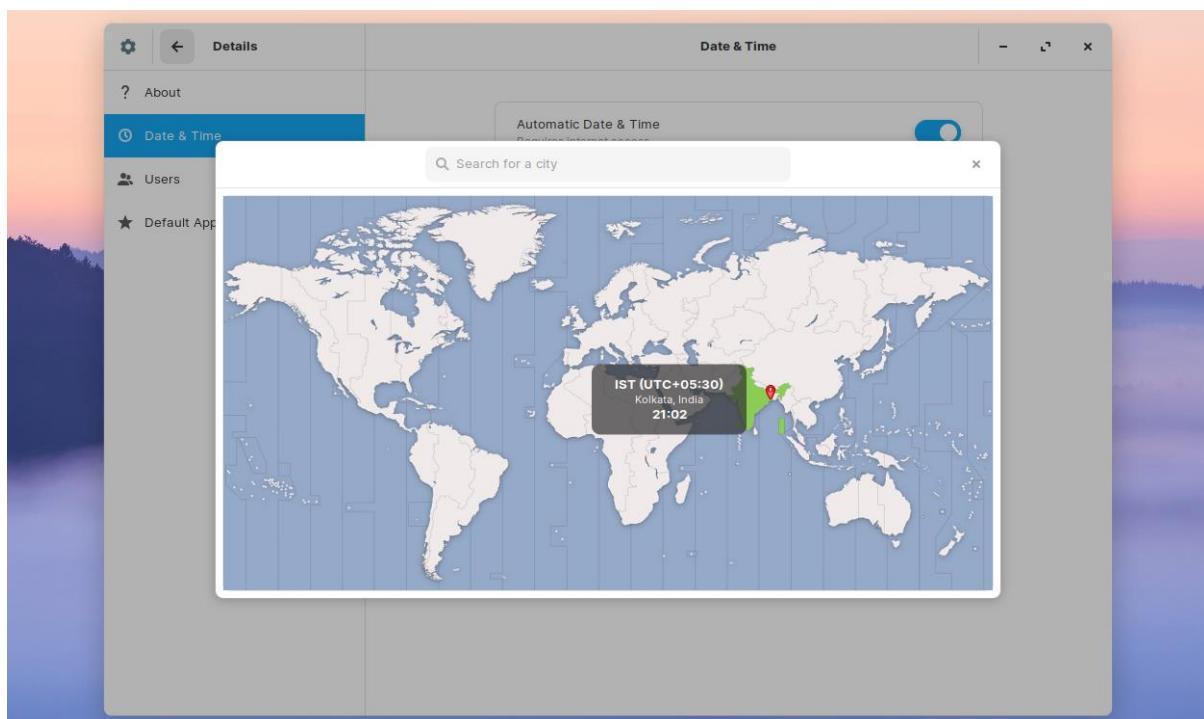
lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
      inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
          loop  txqueuelen 1000  (Local Loopback)
            RX packets 611  bytes 49086 (49.0 KB)
            RX errors 0  dropped 0  overruns 0  frame 0
            TX packets 611  bytes 49086 (49.0 KB)
            TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0
kaysan@zenos-os:~$
```

- c) Time settings: Change the time zone of your system. After noting the time change, change the time zone back to your local time zone.

Go to settings and click on ‘Date & Time’.



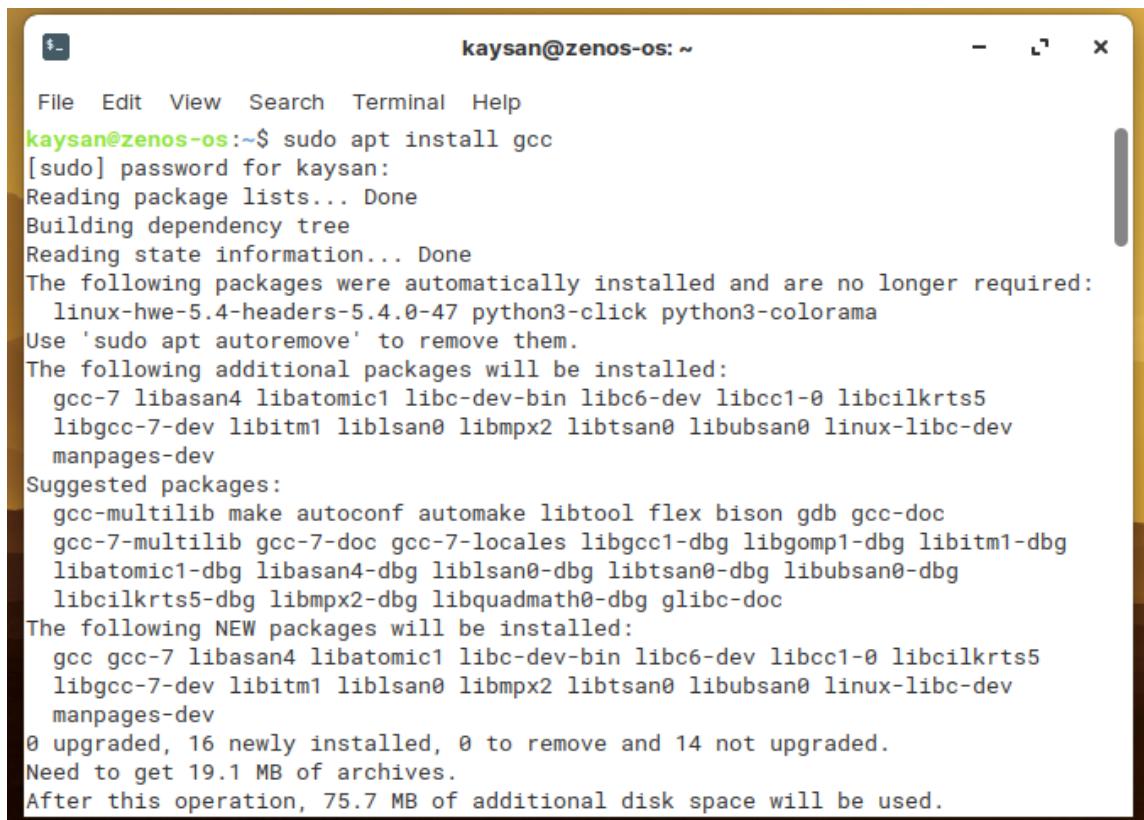
After changing time zone.



Practical No:03

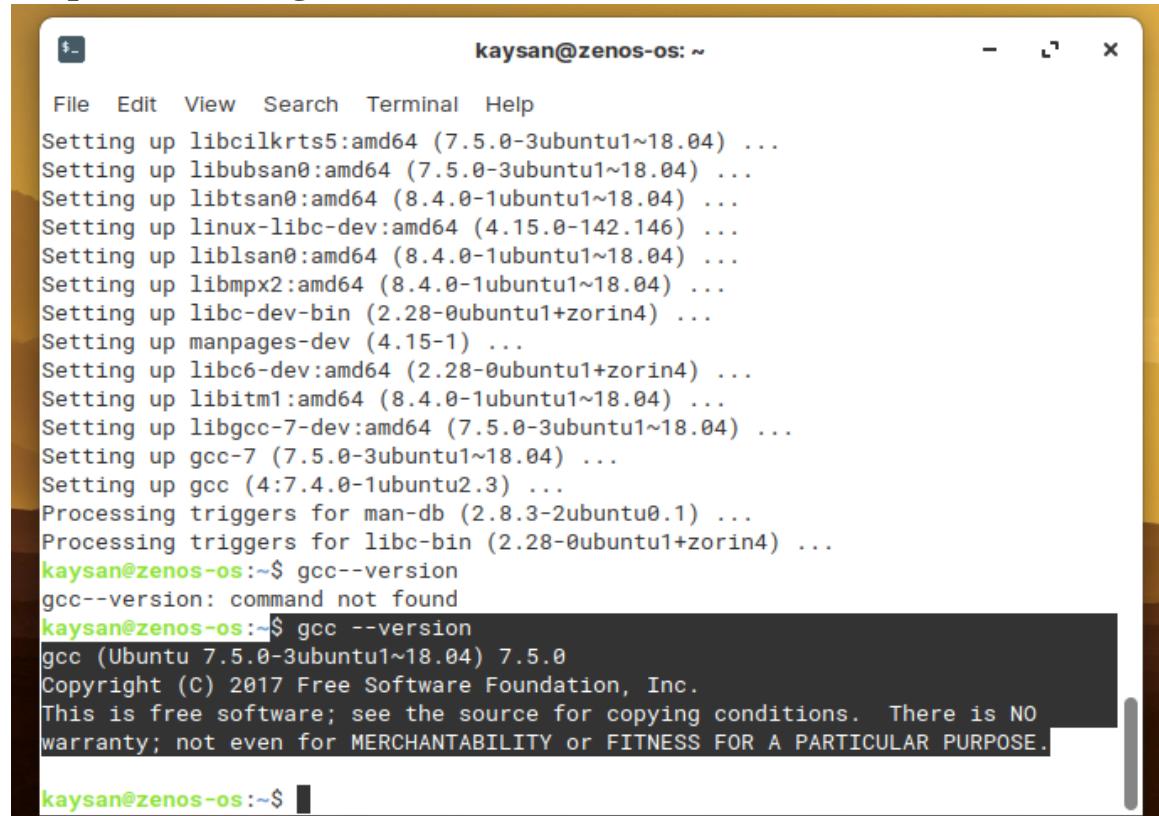
Aim: Installing and Removing Software: Install a gcc Package. Verify that it runs and then remove it.

Installation of gcc package.



```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
kaysan@zenos-os:~$ sudo apt install gcc
[sudo] password for kaysan:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-hwe-5.4.0-47 python3-click python3-colorama
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  gcc-7 libasan4 libatomic1 libc-dev-bin libc6-dev libcc1-0 libcilkrt5
  libgcc-7-dev libitm1 liblsan0 libmpx2 libtsan0 libubsan0 linux-libc-dev
  manpages-dev
Suggested packages:
  gcc-multilib make autoconf automake libtool flex bison gdb gcc-doc
  gcc-7-multilib gcc-7-doc gcc-7-locales libgcc1-dbg libgomp1-dbg libitm1-dbg
  libatomic1-dbg libasan4-dbg liblsan0-dbg libtsan0-dbg libubsan0-dbg
  libcilkrt5-dbg libmpx2-dbg libquadmath0-dbg glibc-doc
The following NEW packages will be installed:
  gcc gcc-7 libasan4 libatomic1 libc-dev-bin libc6-dev libcc1-0 libcilkrt5
  libgcc-7-dev libitm1 liblsan0 libmpx2 libtsan0 libubsan0 linux-libc-dev
  manpages-dev
0 upgraded, 16 newly installed, 0 to remove and 14 not upgraded.
Need to get 19.1 MB of archives.
After this operation, 75.7 MB of additional disk space will be used.
```

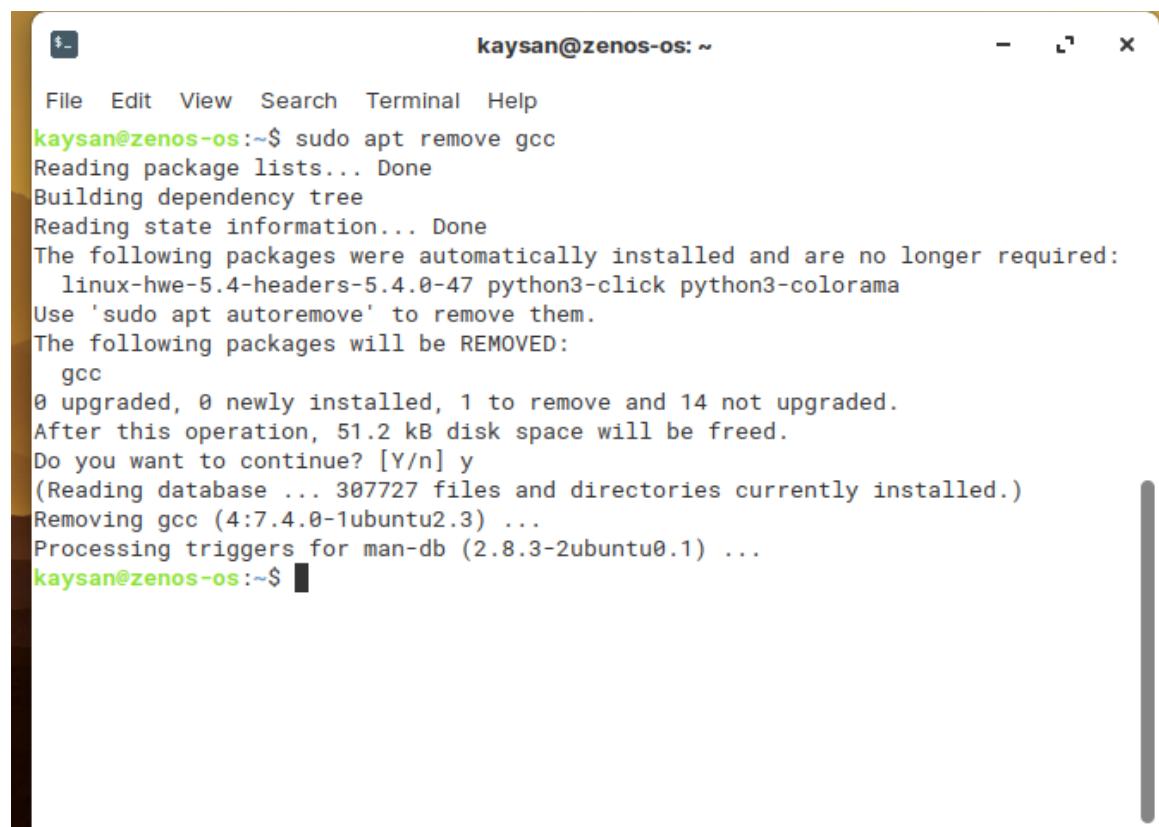
To check whether its working or not , we check the gcc version by using simple command gcc --version.



```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
Setting up libcilkrt5:amd64 (7.5.0-3ubuntu1~18.04) ...
Setting up libubsan0:amd64 (7.5.0-3ubuntu1~18.04) ...
Setting up libtsan0:amd64 (8.4.0-1ubuntu1~18.04) ...
Setting up linux-libc-dev:amd64 (4.15.0-142.146) ...
Setting up liblsan0:amd64 (8.4.0-1ubuntu1~18.04) ...
Setting up libmpx2:amd64 (8.4.0-1ubuntu1~18.04) ...
Setting up libc-dev-bin (2.28-0ubuntu1+zorin4) ...
Setting up manpages-dev (4.15-1) ...
Setting up libc6-dev:amd64 (2.28-0ubuntu1+zorin4) ...
Setting up libitm1:amd64 (8.4.0-1ubuntu1~18.04) ...
Setting up libgcc-7-dev:amd64 (7.5.0-3ubuntu1~18.04) ...
Setting up gcc-7 (7.5.0-3ubuntu1~18.04) ...
Setting up gcc (4:7.4.0-1ubuntu2.3) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for libc-bin (2.28-0ubuntu1+zorin4) ...
kaysan@zenos-os:~$ gcc--version
gcc--version: command not found
kaysan@zenos-os:~$ gcc --version
gcc (Ubuntu 7.5.0-3ubuntu1~18.04) 7.5.0
Copyright (C) 2017 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

kaysan@zenos-os:~$
```

Uninstalling the package.

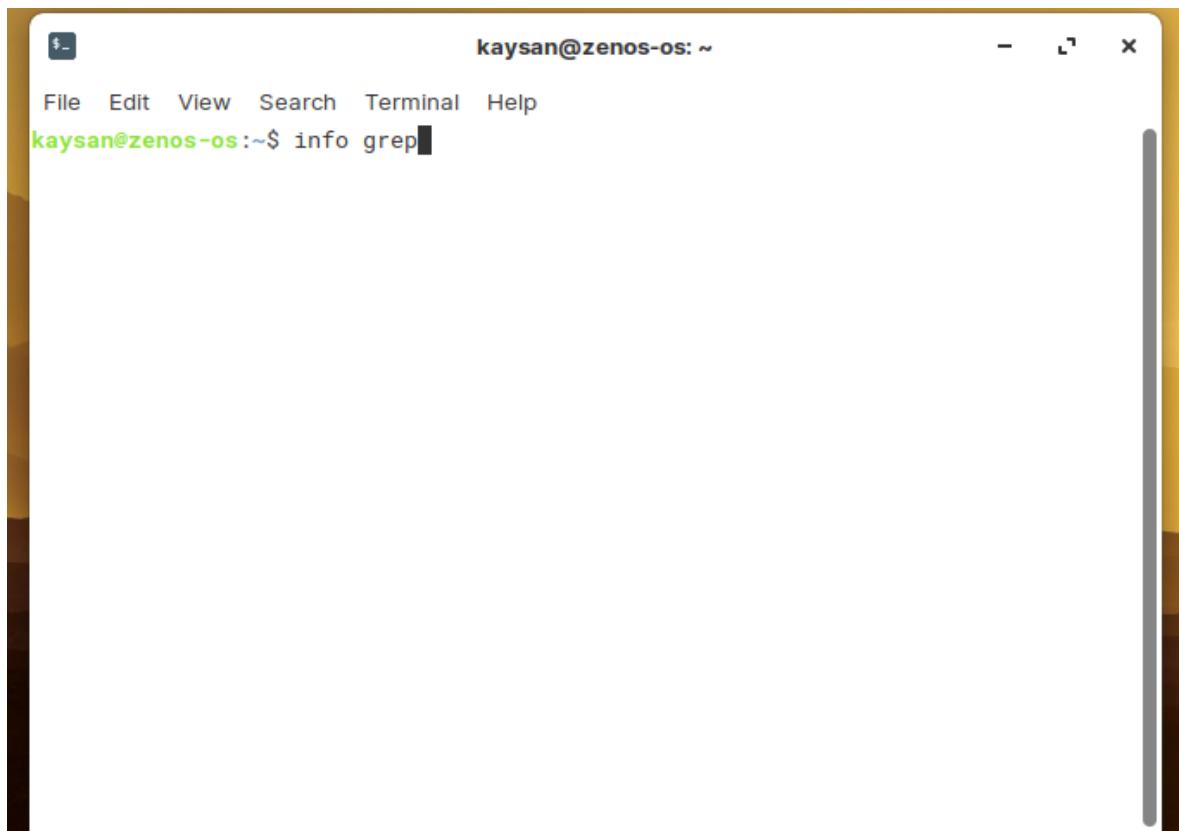


```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
kaysan@zenos-os:~$ sudo apt remove gcc
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  linux-hwe-5.4-headers-5.4.0-47 python3-click python3-colorama
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  gcc
0 upgraded, 0 newly installed, 1 to remove and 14 not upgraded.
After this operation, 51.2 kB disk space will be freed.
Do you want to continue? [Y/n] y
(Reading database ... 307727 files and directories currently installed.)
Removing gcc (4:7.4.0-1ubuntu2.3) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
kaysan@zenos-os:~$
```

Practical No:04

Aim: Documentations:

- a) Finding info Documentation: From command line: Bring up the info page for the grep command. Bring up the usage section.



The screenshot shows a terminal window with a dark brown background and a light brown border. The title bar reads "kaysan@zenos-os: ~". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". Below the menu is a green command line prompt "kaysan@zenos-os:~\$". A blue cursor is positioned after the command "info grep". The rest of the window is blank white space.

kaysan@zenos-os: ~

File Edit View Search Terminal Help

Next: Introduction, Up: (dir)

grep

'grep' prints lines that contain a match for a pattern.

This manual is for version 3.1 of GNU Grep.

This manual is for 'grep', a pattern matching engine.

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* Menu:

-----Info: (grep)Top, 31 lines --Top-----

Welcome to Info version 6.5. Type H for help, h for tutorial.

kaysan@zenos-os: ~

File Edit View Search Terminal Help

Next: Performance, Prev: Regular Expressions, Up: Top

4 Usage

Here is an example command that invokes GNU 'grep':

grep -i 'hello.*world' menu.h main.c

This lists all lines in the files 'menu.h' and 'main.c' that contain the string 'hello' followed by the string 'world'; this is because '.*' matches zero or more characters within a line. Note Regular Expressions::. The '-i' option causes 'grep' to ignore case, causing it to match the line 'Hello, world!', which it would not otherwise match.
Note Invoking::, for more details about how to invoke 'grep'.

Here are some common questions and answers about 'grep' usage.

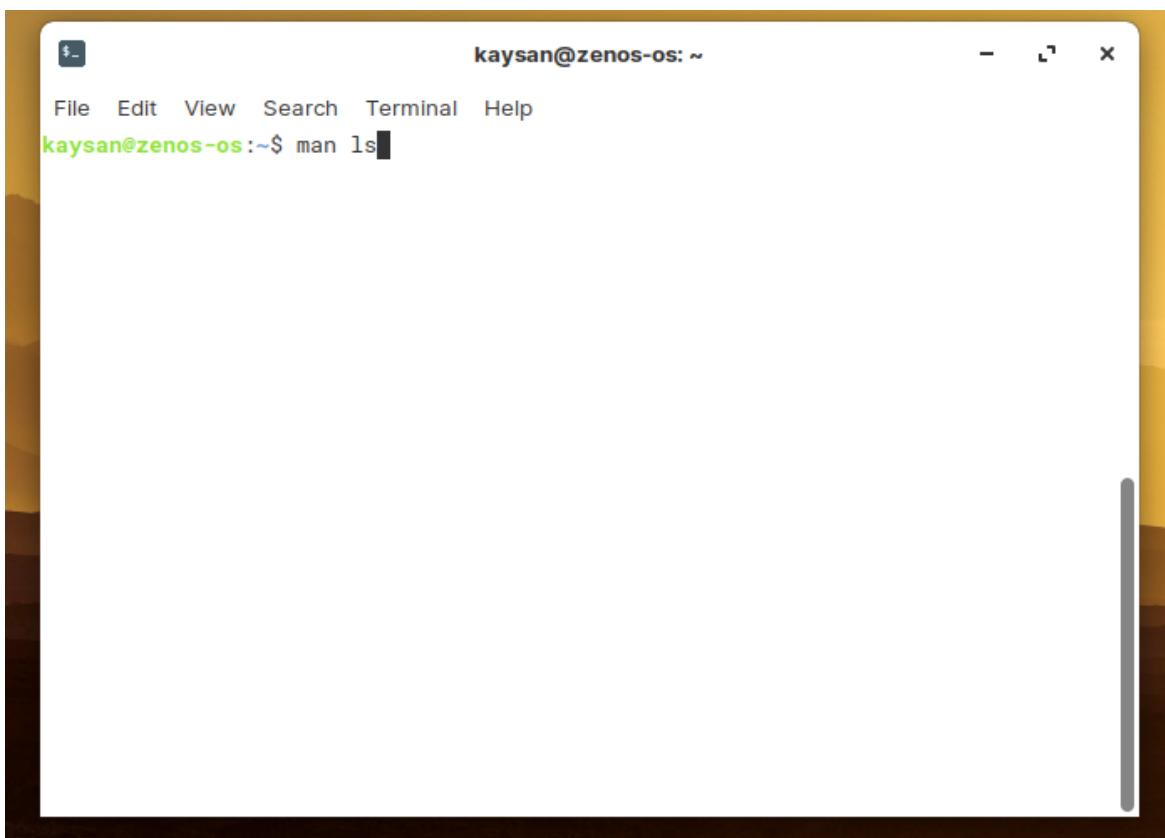
1. How can I list just the names of matching files?

grep -l 'main' *.c

-----Info: (grep)Usage, 197 lines --Top-----

Welcome to Info version 6.5. Type H for help, h for tutorial.

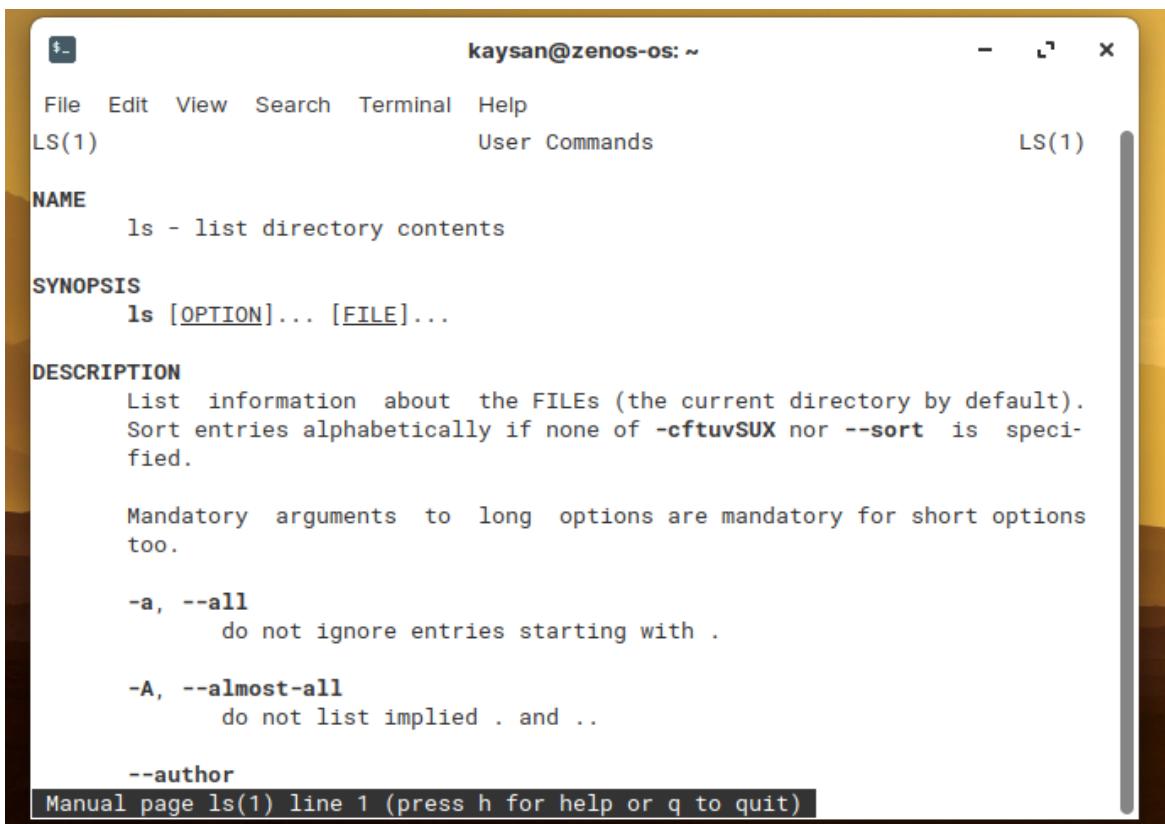
b) Finding man pages from cmd: Bring up the man page for the ‘ls’ Command.



kaysan@zenos-os: ~

File Edit View Search Terminal Help

kaysan@zenos-os:~\$ man ls



kaysan@zenos-os: ~

File Edit View Search Terminal Help

LS(1) User Commands LS(1)

NAME
ls - list directory contents

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

DESCRIPTION
List information about the FILEs (the current directory by default). Sort entries alphabetically if none of **-cftuvSUX** nor **--sort** is specified.

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

-a, --all
do not ignore entries starting with .

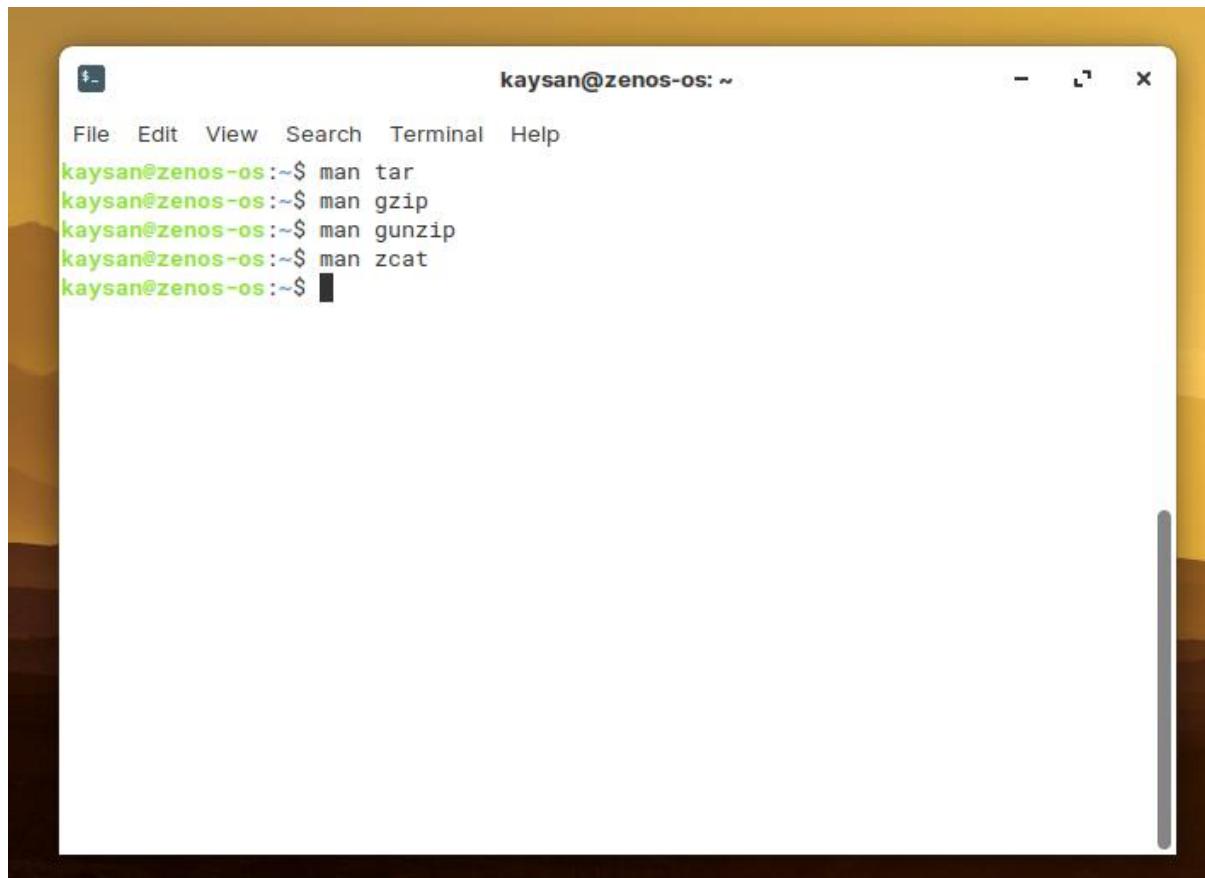
-A, --almost-all
do not list implied . and ..

--author

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

c) Finding man pages by topic: What man pages are available that document file compression?

Commands:



A screenshot of a terminal window titled "kaysan@zenos-os: ~". The window has a standard Linux-style title bar with icons for minimize, maximize, and close. Below the title bar is a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area of the terminal shows the following command history:

```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ man tar
kaysan@zenos-os:~$ man gzip
kaysan@zenos-os:~$ man gunzip
kaysan@zenos-os:~$ man zcat
kaysan@zenos-os:~$ █
```

Command: man tar.

```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
TAR(1) GNU TAR Manual TAR(1)

NAME
tar - an archiving utility

SYNOPSIS
Traditional usage
tar {A|c|d|r|t|u|x}{GnSkUW0mpsMBiajJzZhPlRvwo} [ARG...]

UNIX-style usage
tar -A [OPTIONS] ARCHIVE ARCHIVE
tar -c [-f ARCHIVE] [OPTIONS] [FILE...]
tar -d [-f ARCHIVE] [OPTIONS] [FILE...]
tar -t [-f ARCHIVE] [OPTIONS] [MEMBER...]
tar -r [-f ARCHIVE] [OPTIONS] [FILE...]
tar -u [-f ARCHIVE] [OPTIONS] [FILE...]
tar -x [-f ARCHIVE] [OPTIONS] [MEMBER...]
Manual page tar(1) line 1 (press h for help or q to quit)
```

Command: man gzip, man gunzip, man zcat.

```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
GZIP(1) General Commands Manual GZIP(1)

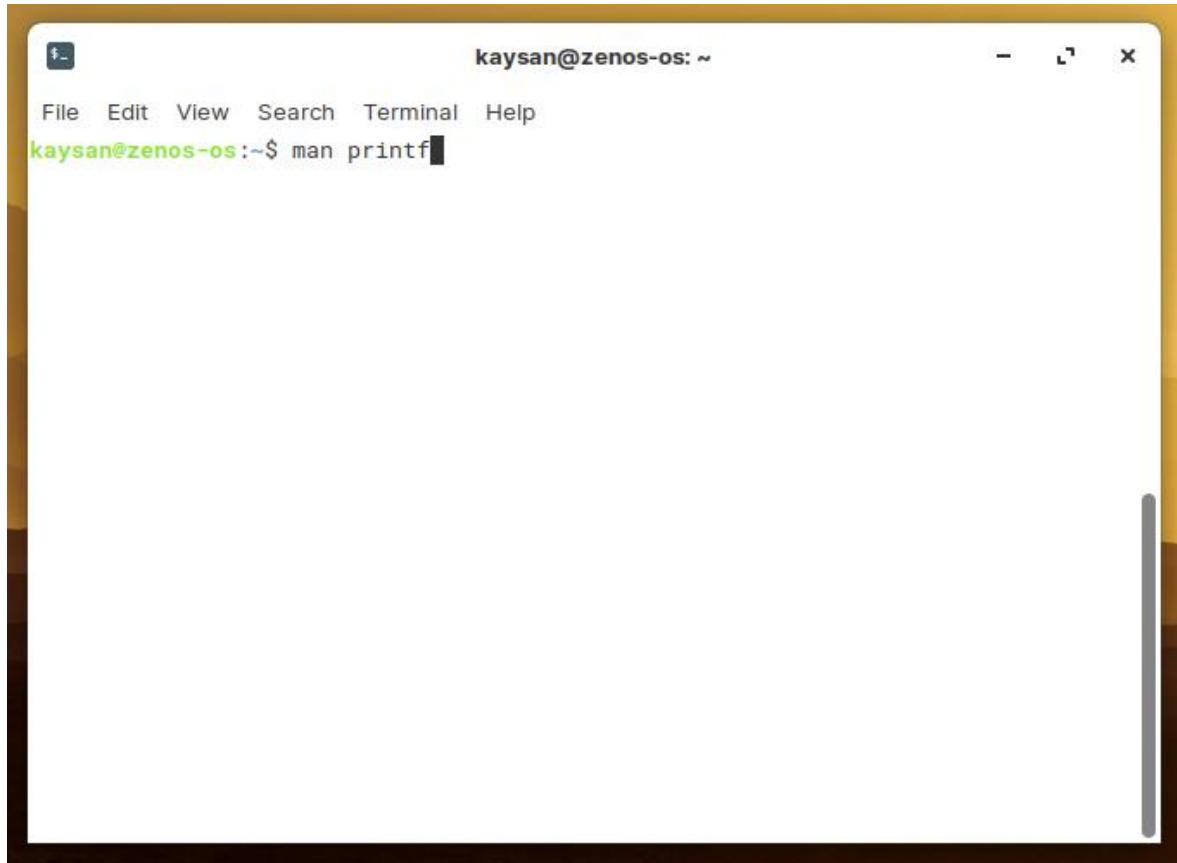
NAME
gzip, gunzip, zcat - compress or expand files

SYNOPSIS
gzip [ -acdfhklLnNrtvV19 ] [--rsyncable] [-S suffix] [ name ... ]
gunzip [ -acfhlLnNrtvV ] [-S suffix] [ name ... ]
zcat [ -fhLV ] [ name ... ]

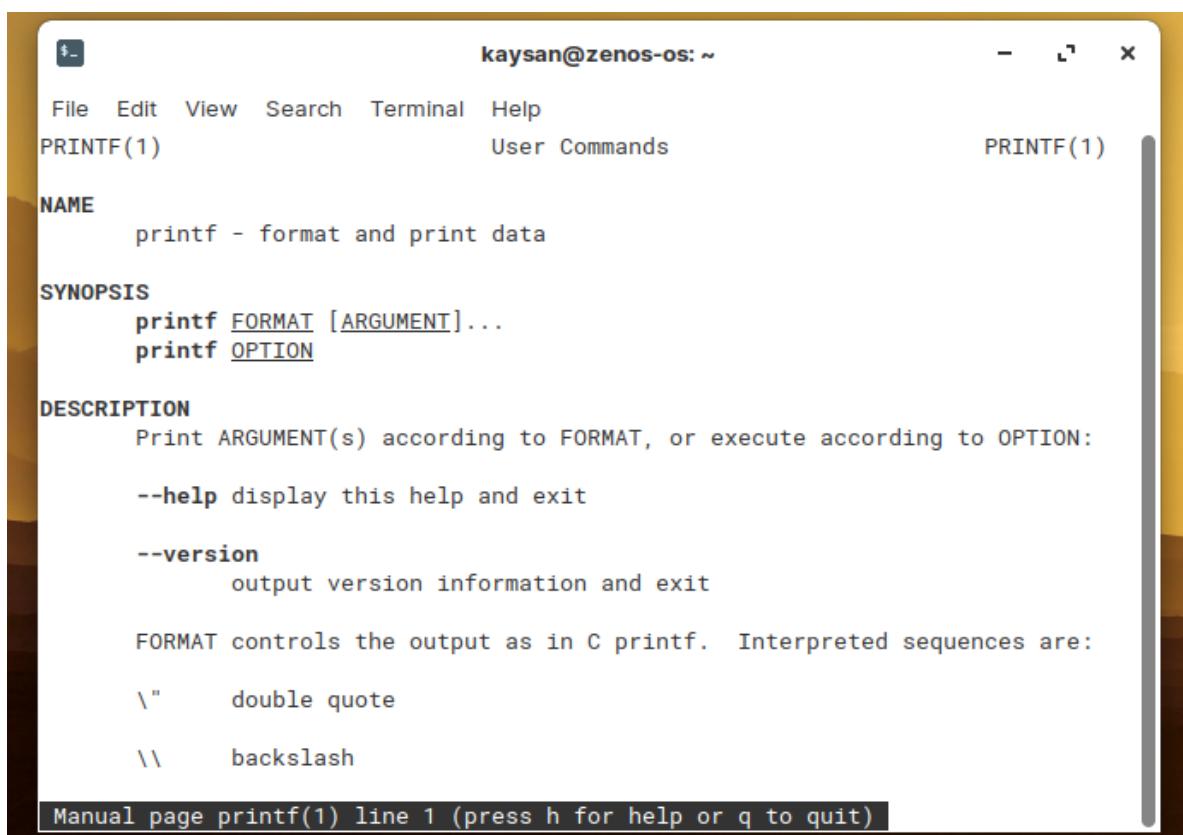
DESCRIPTION
Gzip reduces the size of the named files using Lempel-Ziv coding
(LZ77). Whenever possible, each file is replaced by one with the
extension .gz, while keeping the same ownership modes, access and modi-
fication times. (The default extension is -gz for VMS, z for MSDOS,
OS/2 FAT, Windows NT FAT and Atari.) If no files are specified, or if
a file name is "-", the standard input is compressed to the standard
output. Gzip will only attempt to compress regular files. In particu-
lar, it will ignore symbolic links.

If the compressed file name is too long for its file system, gzip truncates
it. Gzip attempts to truncate only the parts of the file name
longer than 3 characters. (A part is delimited by dots.) If the name
Manual page gzip(1) line 1 (press h for help or q to quit)
```

d) Finding man pages by Section From the command line, bring up the man page for the printf library function. Which manual page section are library functions found?



kaysan@zenos-os:~\$ man printf



```
printf(1) User Commands PRINTF(1)

NAME
    printf - format and print data

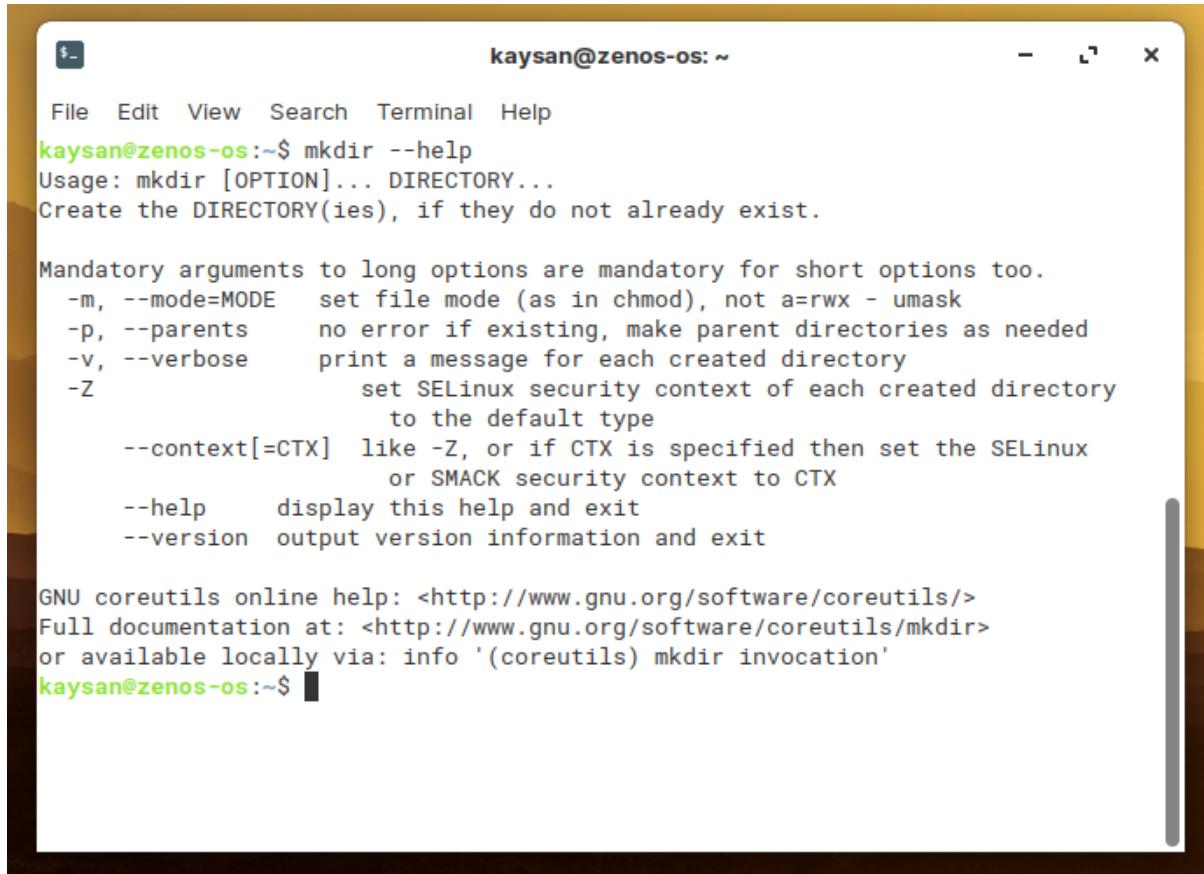
SYNOPSIS
    printf FORMAT [ARGUMENT]...
    printf OPTION

DESCRIPTION
    Print ARGUMENT(s) according to FORMAT, or execute according to OPTION:
        --help display this help and exit
        --version
            output version information and exit
    FORMAT controls the output as in C printf. Interpreted sequences are:
        \"      double quote
        \\      backslash

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

e) Command-Line Help List the available options for the mkdir command. How can you do this?

Use mkdir –help command



The screenshot shows a terminal window titled 'kaysan@zenos-os: ~'. The window contains the following text:

```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ mkdir --help
Usage: mkdir [OPTION]... DIRECTORY...
Create the DIRECTORY(ies), if they do not already exist.

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

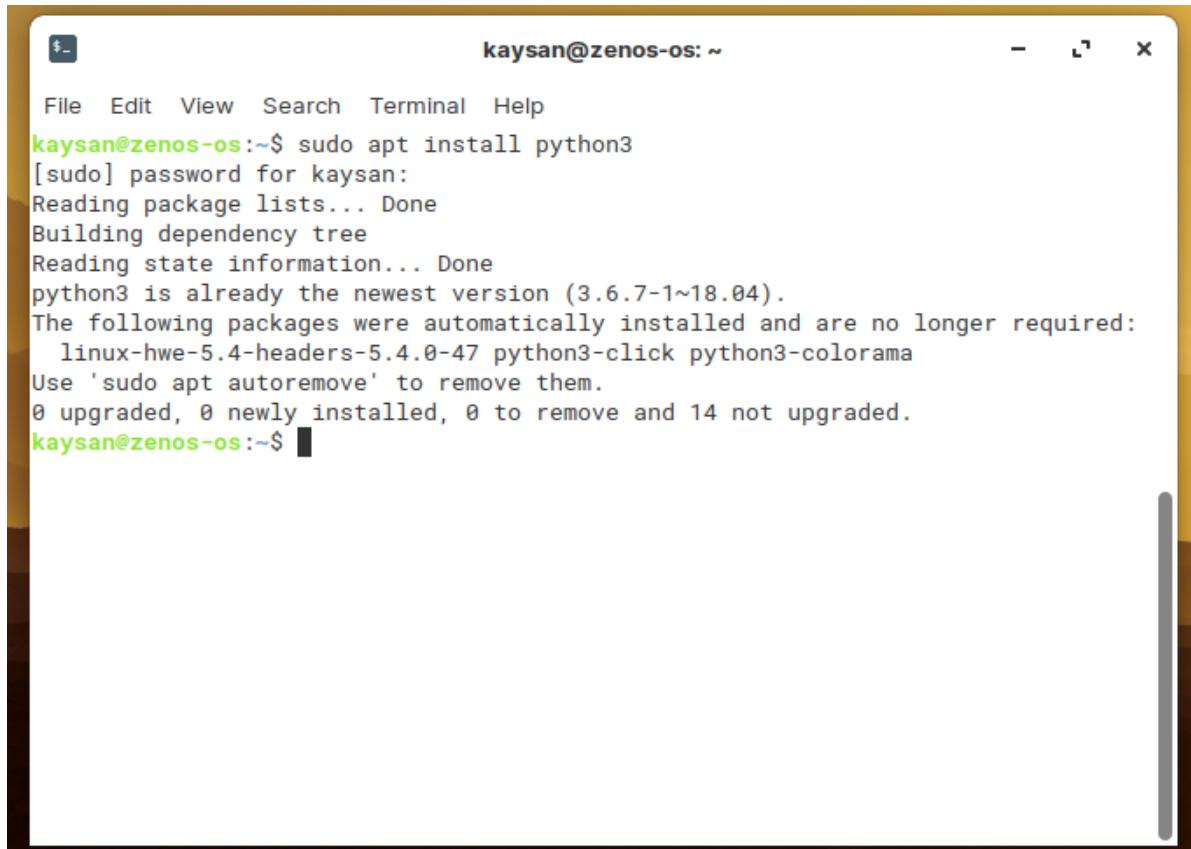
GNU coreutils online help: <http://www.gnu.org/software/coreutils/>
Full documentation at: <http://www.gnu.org/software/coreutils/mkdir>
or available locally via: info '(coreutils) mkdir invocation'
kaysan@zenos-os:~$
```

Practical No:05

Aim: Command line operations:

- Install any new package on your system.

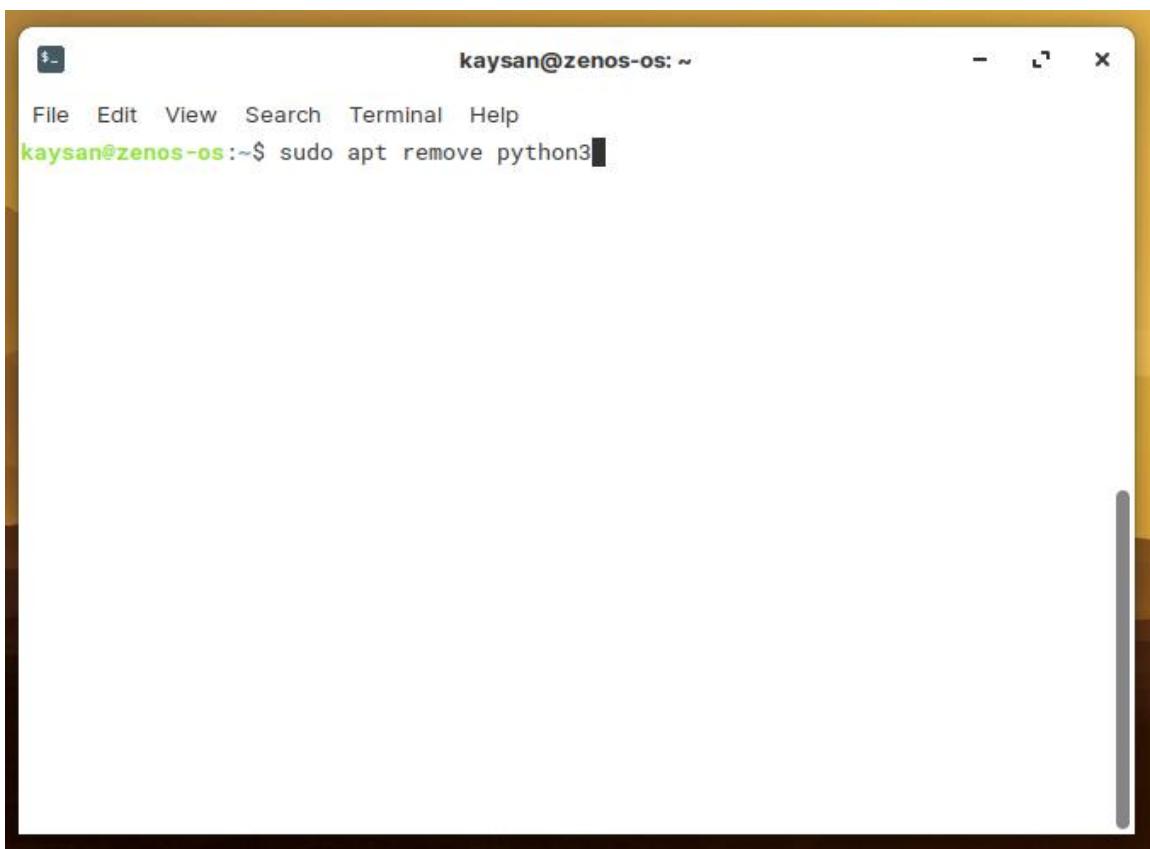
Installing python3 from terminal:



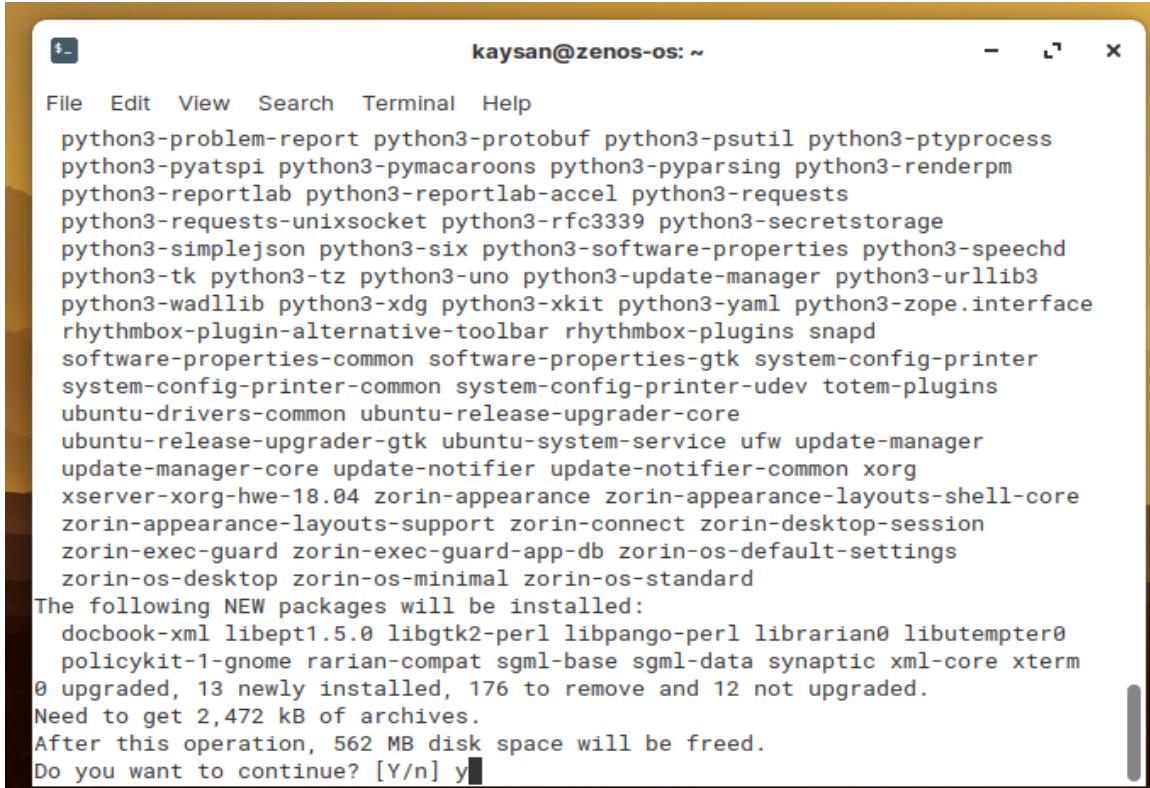
The screenshot shows a terminal window titled 'kaysan@zenos-os: ~'. The window contains the following text output from a terminal session:

```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ sudo apt install python3
[sudo] password for kaysan:
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3 is already the newest version (3.6.7-1~18.04).
The following packages were automatically installed and are no longer required:
  linux-hwe-5.4-headers-5.4.0-47 python3-click python3-colorama
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 14 not upgraded.
kaysan@zenos-os:~$
```

b) Remove the package installed.



```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
kaysan@zenos-os:~$ sudo apt remove python3
```



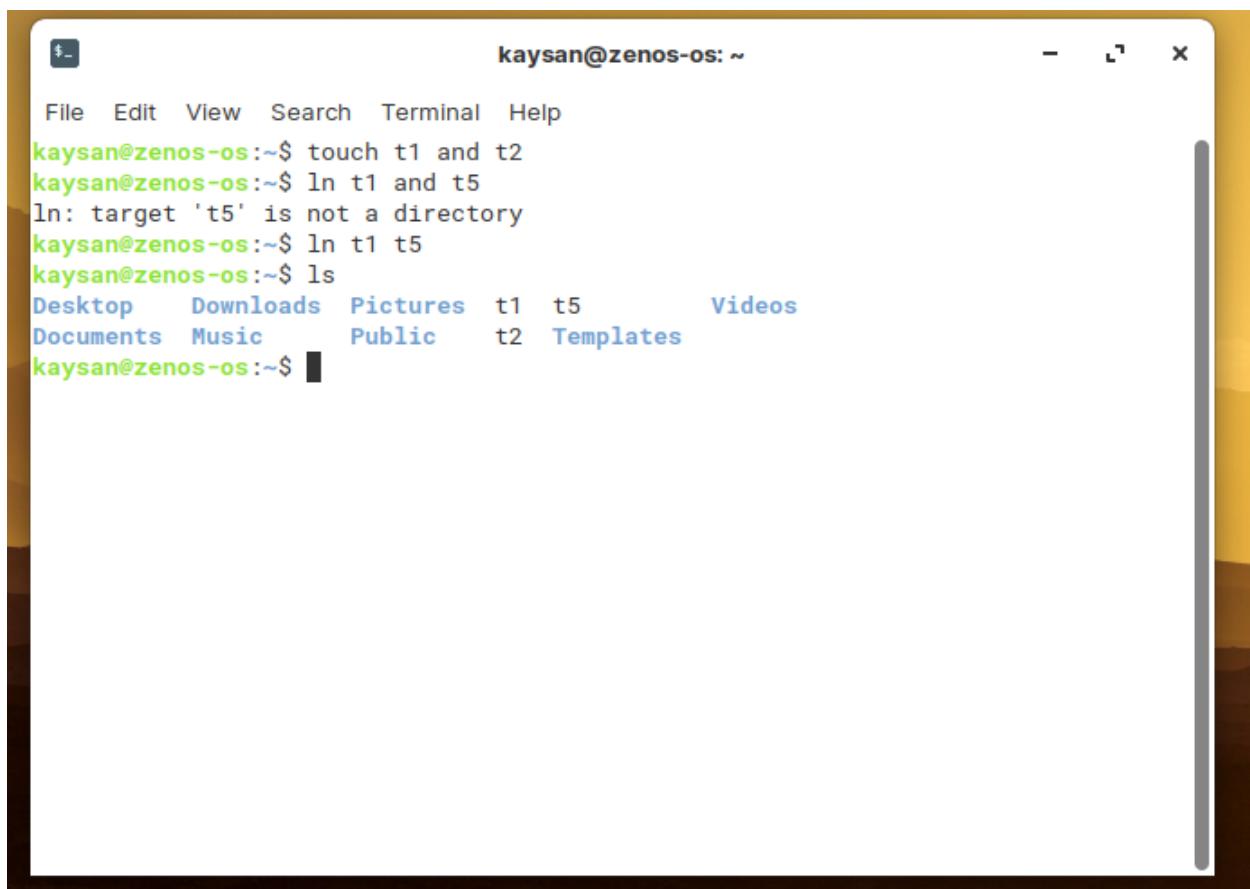
```
kaysan@zenos-os: ~
File Edit View Search Terminal Help
python3-problem-report python3-protobuf python3-psutil python3-ptyp
python3-pyatspi python3-pymacaroons python3-pyparsing python3-renderpm
python3-reportlab python3-reportlab-accel python3-requests
python3-requests-unixsocket python3-rfc3339 python3-secretstorage
python3-simplejson python3-six python3-software-properties python3-speechd
python3-tk python3-tz python3-uno python3-update-manager python3-urllib3
python3-wadllib python3-xdg python3-xkit python3-yaml python3-zope.interface
rhythmbox-plugin-alternative-toolbar rhythmbox-plugins snapd
software-properties-common software-properties-gtk system-config-printer
system-config-printer-common system-config-printer-udev totem-plugins
ubuntu-drivers-common ubuntu-release-upgrader-core
ubuntu-release-upgrader-gtk ubuntu-system-service ufw update-manager
update-manager-core update-notifier update-notifier-common xorg
xserver-xorg-hwe-18.04 zorin-appearance zorin-appearance-layouts-shell-core
zorin-appearance-layouts-support zorin-connect zorin-desktop-session
zorin-exec-guard zorin-exec-guard-app-db zorin-os-default-settings
zorin-os-desktop zorin-os-minimal zorin-os-standard
The following NEW packages will be installed:
docbook-xml libept1.5.0 libgtk2-perl libpango-perl librarian0 libutempter0
policykit-1-gnome rarian-compat sgml-base sgml-data synaptic xml-core xterm
0 upgraded, 13 newly installed, 176 to remove and 12 not upgraded.
Need to get 2,472 kB of archives.
After this operation, 562 MB disk space will be freed.
Do you want to continue? [Y/n] y
```

c) Find the passwd file in / using find command.

```
kaysan@zenos-os:~$ find /etc passwd
/etc
/etc/rc6.d
/etc/rc6.d/K01irqbalance
/etc/rc6.d/K01plymouth
/etc/rc6.d/K01openvpn
/etc/rc6.d/K01spice-vdagent
/etc/rc6.d/K01open-vm-tools
/etc/rc6.d/K01alsa-utils
/etc/rc6.d/K01gdm3
/etc/rc6.d/K01uuidd
/etc/rc6.d/K01bluetooth
/etc/rc6.d/K01cups-browsed
/etc/rc6.d/K01saned
/etc/rc6.d/K01networking
/etc/rc6.d/K01speech-dispatcher
/etc/rc6.d/K01kerneloops
/etc/rc6.d/K01avahi-daemon
/etc/rc6.d/K01rsyslog
/etc/login.defs
/etc/console-setup
/etc/console-setup/compose.ISO-8859-1.inc
/etc/console-setup/ISO-8859-1.acm
/etc/console-setup/compose.CP1256.inc
```

```
kaysan@zenos-os:~$ find /etc passwd
/etc
/etc/rc3.d/S01plymouth
/etc/rc3.d/S01bluetooth
/etc/rc3.d/S01gdm3
/etc/rc3.d/S01irqbalance
/etc/rc3.d/S01spice-vdagent
/etc/rc3.d/S01cups
/etc/rc3.d/S01acpid
/etc/rc3.d/S01avahi-daemon
/etc/rc3.d/S01rsyslog
/etc/rc3.d/S01saned
/etc/rc3.d/S01speech-dispatcher
/etc/rc3.d/S01rsync
/etc/rc3.d/S01dbus
/etc/rc3.d/S01kerneloops
/etc/rc3.d/S01open-vm-tools
/etc/rc3.d/S01uuidd
/etc/rc3.d/S01cron
/etc/rc3.d/S01anacron
/etc/rc3.d/S01grub-common
/etc/rc3.d/S01console-setup.sh
/etc/rc3.d/S01openvpn
/etc/rc3.d/S01cups-browsed
find: 'passwd': No such file or directory
kaysan@zenos-os:~$
```

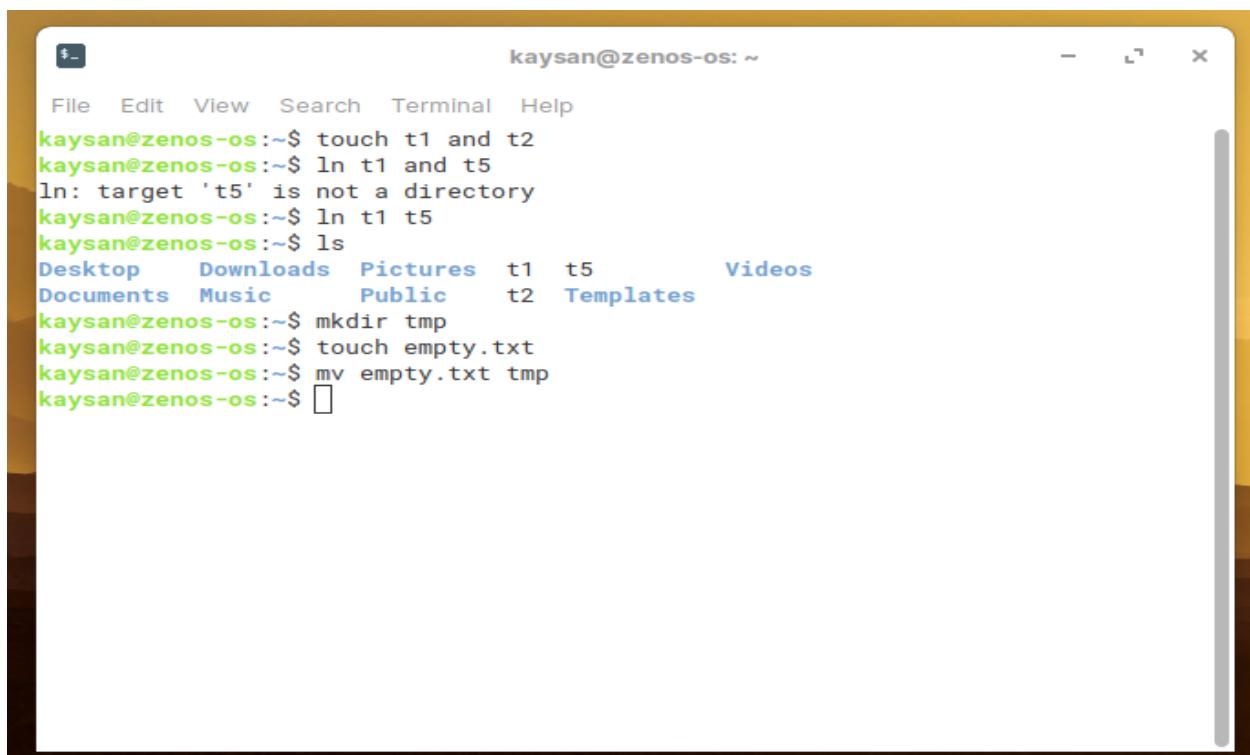
d) Create a symbolic link to file.



kaysan@zenos-os: ~

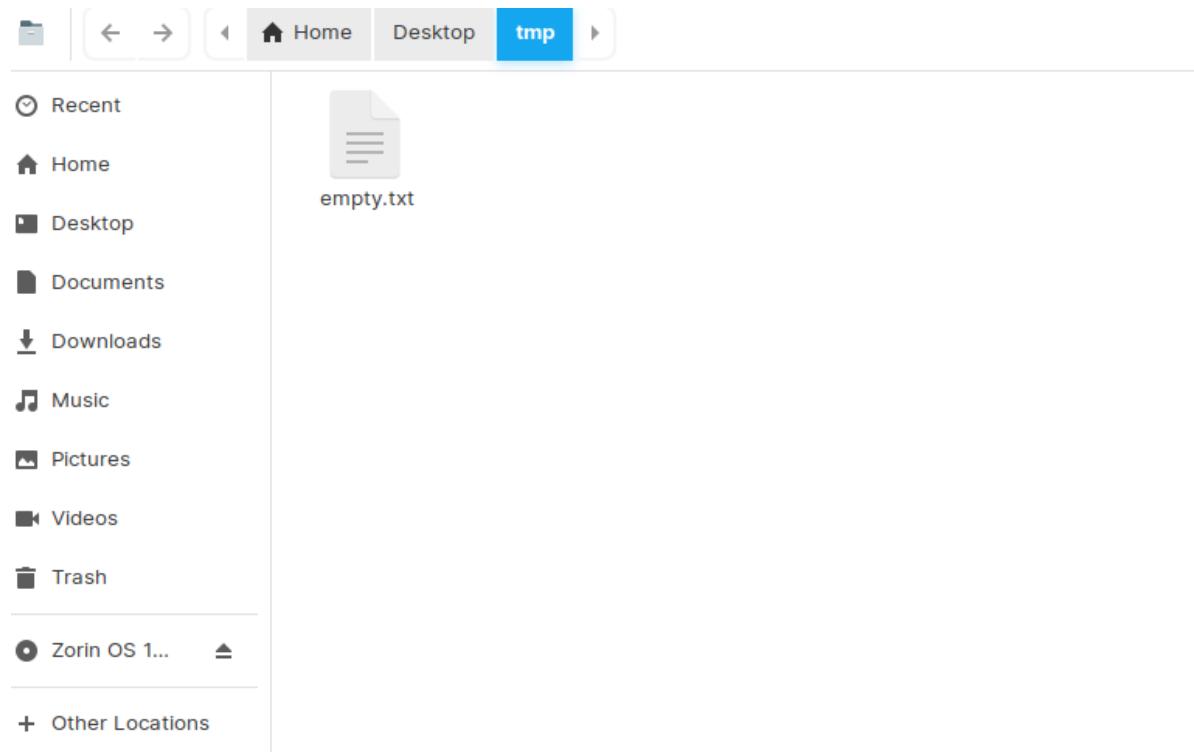
```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ touch t1 and t2
kaysan@zenos-os:~$ ln t1 and t5
ln: target 't5' is not a directory
kaysan@zenos-os:~$ ln t1 t5
kaysan@zenos-os:~$ ls
Desktop Downloads Pictures t1 t5 Videos
Documents Music Public t2 Templates
kaysan@zenos-os:~$
```

e) Create an empty file example.txt and move it in /tmp directory using relative path name.



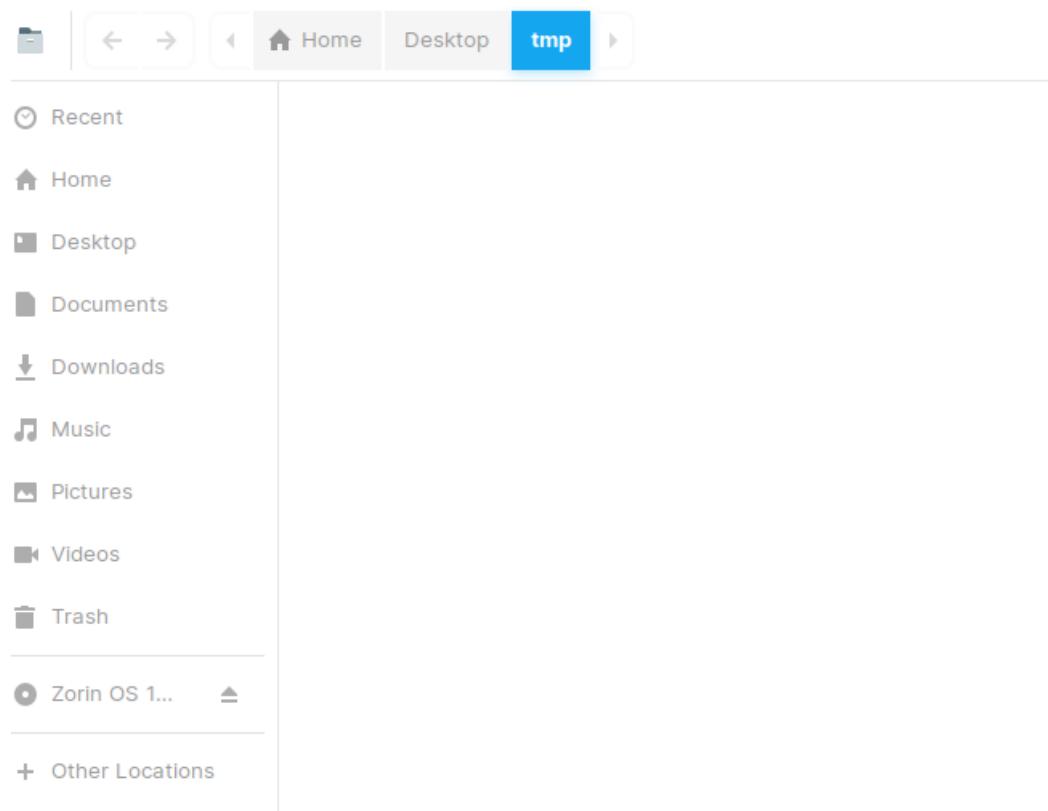
kaysan@zenos-os: ~

```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ touch t1 and t2
kaysan@zenos-os:~$ ln t1 and t5
ln: target 't5' is not a directory
kaysan@zenos-os:~$ ln t1 t5
kaysan@zenos-os:~$ ls
Desktop Downloads Pictures t1 t5 Videos
Documents Music Public t2 Templates
kaysan@zenos-os:~$ mkdir tmp
kaysan@zenos-os:~$ touch empty.txt
kaysan@zenos-os:~$ mv empty.txt tmp
kaysan@zenos-os:~$
```



f) Delete the file moved to /tmp in previous step using absolute path.

```
kaysan@zenos-os:~$ touch t1 and t2
kaysan@zenos-os:~$ ln t1 and t5
ln: target 't5' is not a directory
kaysan@zenos-os:~$ ln t1 t5
kaysan@zenos-os:~$ ls
Desktop  Downloads  Pictures  t1  t5      Videos
Documents  Music   Public    t2  Templates
kaysan@zenos-os:~$ mkdir tmp
kaysan@zenos-os:~$ touch empty.txt
kaysan@zenos-os:~$ mv empty.txt tmp
kaysan@zenos-os:~$ rm /home/kaysan/Desktop/tmp/empty.txt
bash: rm:/home/kaysan/Desktop/tmp/empty.txt: No such file or directory
kaysan@zenos-os:~$ rm /home/kaysan/Desktop/tmp/empty.txt
rm: cannot remove '/home/kaysan/Desktop/tmp/empty.txt': No such file or director
y
kaysan@zenos-os:~$ rm /home/kaysan/Desktop/tmp/empty.txt
kaysan@zenos-os:~$
```



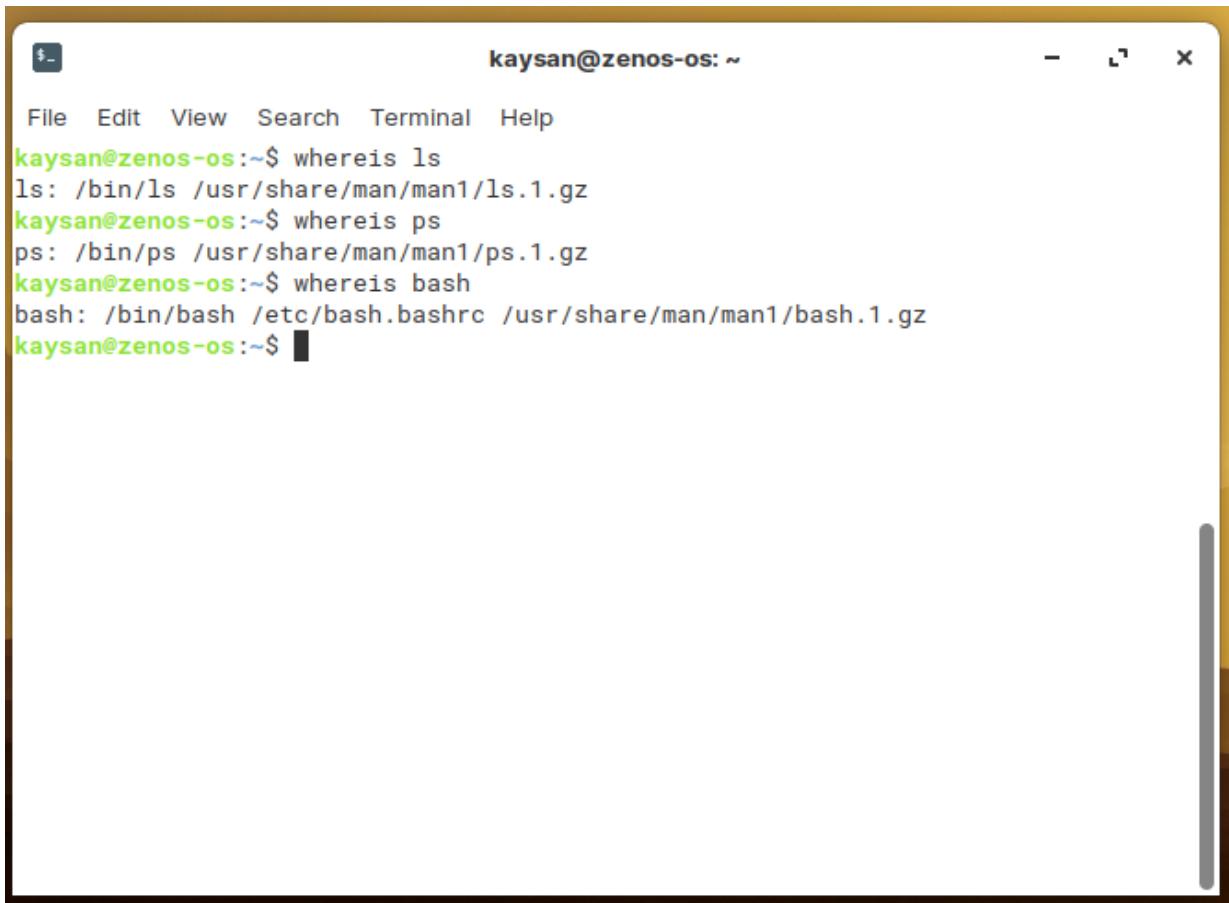
g) Find the location of ls, ps, bash commands.

Using which Command

A screenshot of a terminal window titled 'kaysan@zenos-os: ~'. The window shows the following command-line session:

```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ which ls
/bin/ls
kaysan@zenos-os:~$ which ps
/bin/ps
kaysan@zenos-os:~$ which bash
/bin/bash
kaysan@zenos-os:~$
```

Using whereis Command



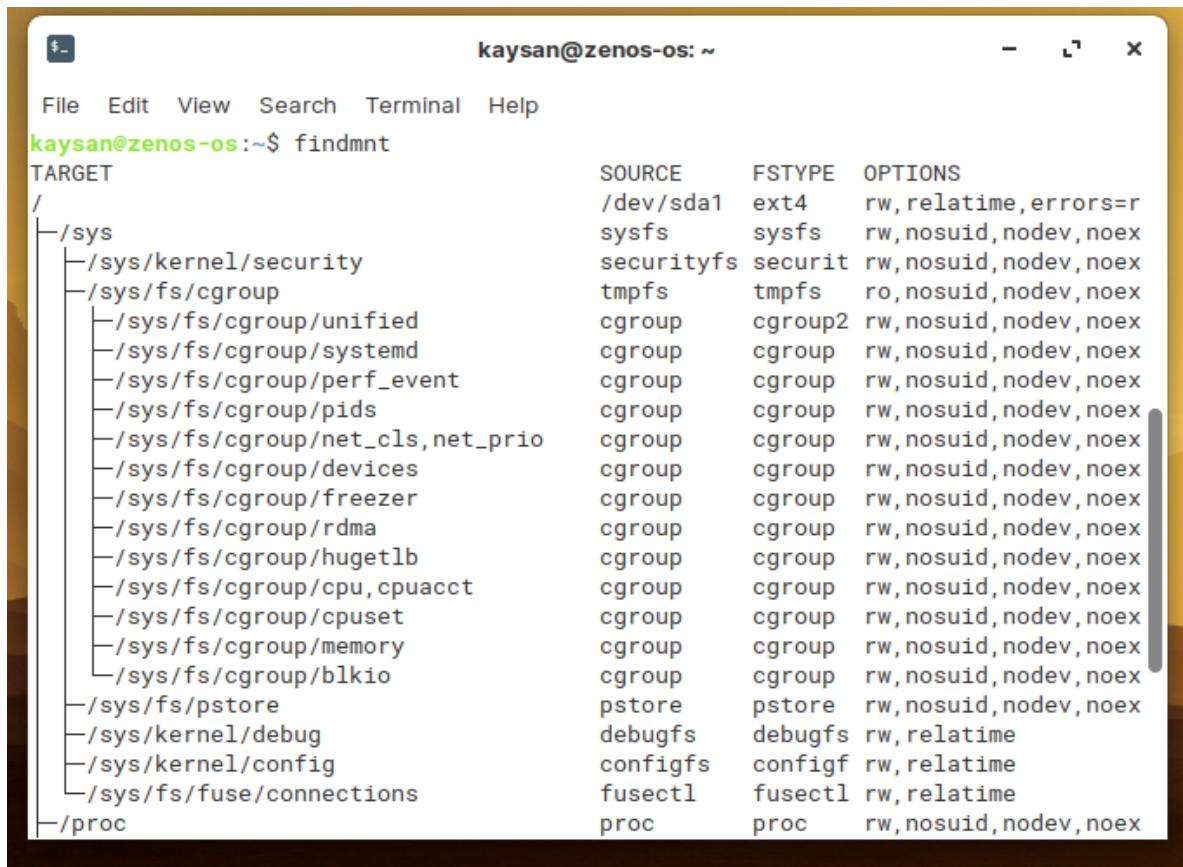
```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ whereis ls
ls: /bin/ls /usr/share/man/man1/ls.1.gz
kaysan@zenos-os:~$ whereis ps
ps: /bin/ps /usr/share/man/man1/ps.1.gz
kaysan@zenos-os:~$ whereis bash
bash: /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz
kaysan@zenos-os:~$
```

Practical No:06

Aim: File Operations.

- a) Explore mounted filesystems on your system.

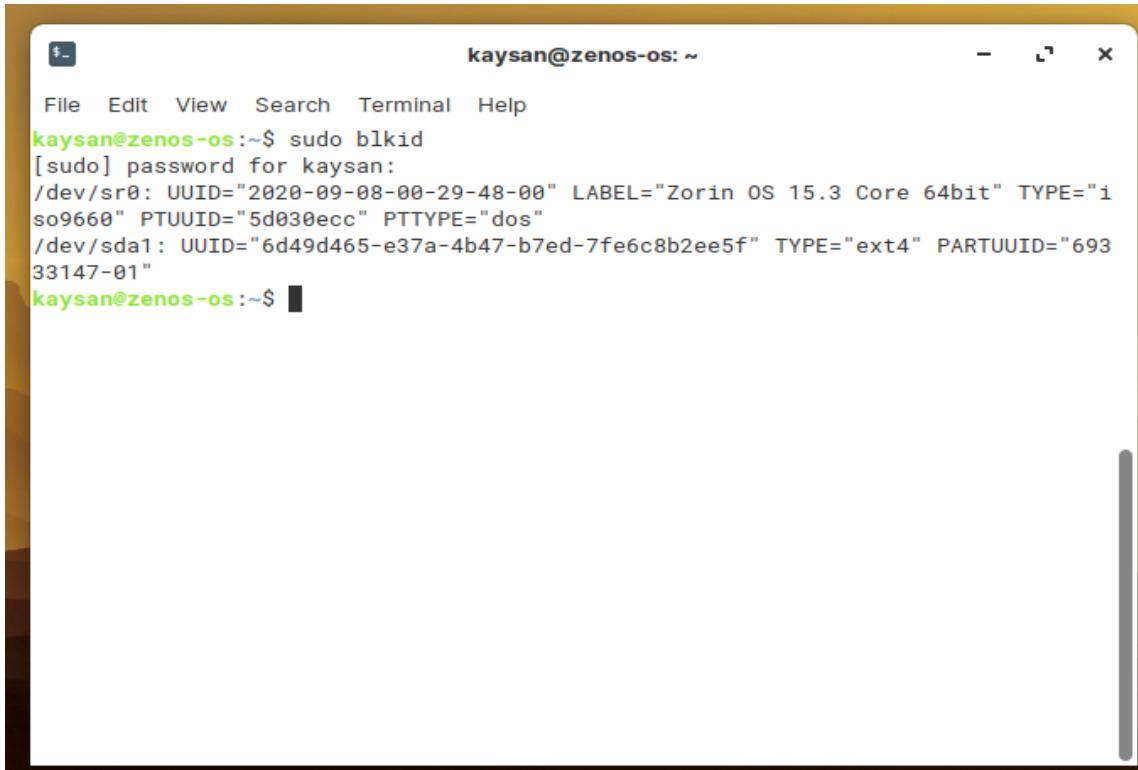
Using findmnt command.



```
kaysan@zenos-os:~$ findmnt
TARGET                                SOURCE      FSTYPE    OPTIONS
/                                     /dev/sda1  ext4      rw,relatime,errors=r
/sys                                  sysfs     sysfs    rw,nosuid,nodev,noexec
/sys/kernel/security                  securityfs  security  rw,nosuid,nodev,noexec
/sys/fs/cgroup                       tmpfs     tmpfs    ro,nosuid,nodev,noexec
/sys/fs/cgroup/unified                cgroup    cgroup2  rw,nosuid,nodev,noexec
/sys/fs/cgroup/systemd                cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/perf_event             cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/pids                  cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/net_cls,net_prio       cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/devices                cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/freezer                cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/rdma                  cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/hugetlb                cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/cpu,cpuacct            cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/cpuset                 cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/memory                cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/cgroup/blkio                 cgroup    cgroup   rw,nosuid,nodev,noexec
/sys/fs/pstore                        pstore    pstore   rw,nosuid,nodev,noexec
/sys/kernel/debug                     debugfs   debugfs  rw,relatime
/sys/kernel/config                   configfs  configf  rw,relatime
/sys/fs/fuse/connections              fusectl   fusectl  rw,relatime
/proc                                proc      proc    rw,nosuid,nodev,noexec
```

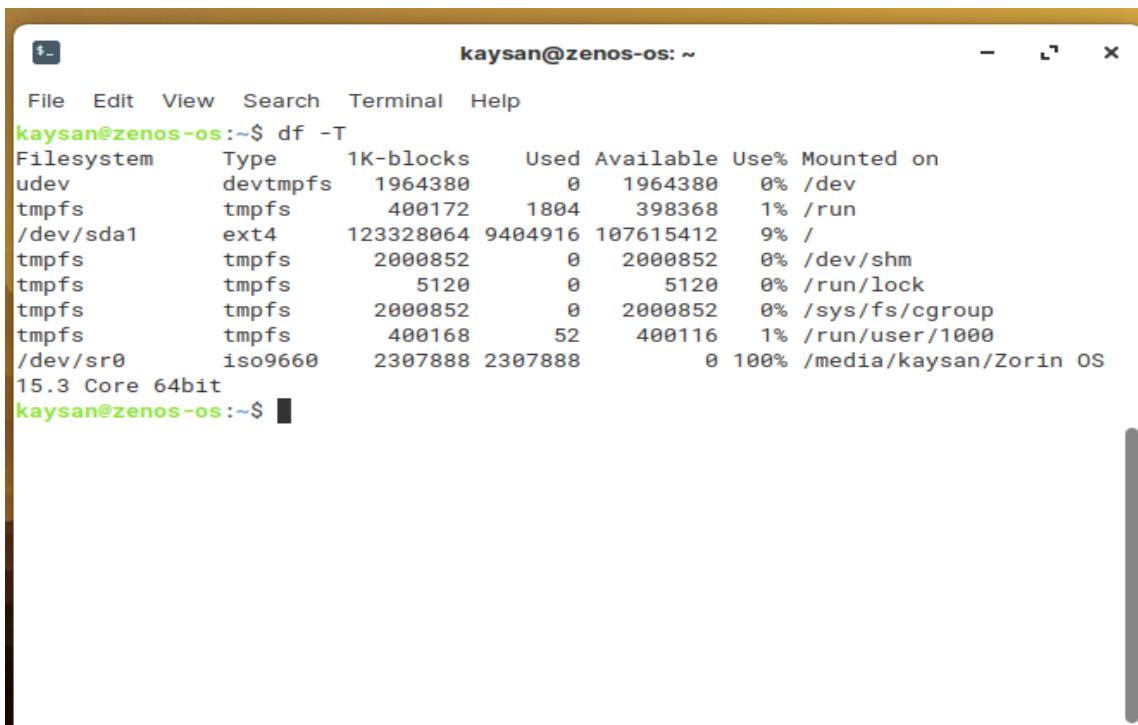
b) What are the different ways of exploring mounted filesystem on Linux?

Finding mounted filesystem type by using blkid command.



```
kaysan@zenos-os:~$ sudo blkid
[sudo] password for kaysan:
/dev/sr0: UUID="2020-09-08-00-29-48-00" LABEL="Zorin OS 15.3 Core 64bit" TYPE="iso9660" PTUUID="5d030ecc" PTTYPE="dos"
/dev/sda1: UUID="6d49d465-e37a-4b47-b7ed-7fe6c8b2ee5f" TYPE="ext4" PARTUUID="69333147-01"
kaysan@zenos-os:~$
```

Finding mounted filesystem type by using df command.



```
kaysan@zenos-os:~$ df -T
Filesystem      Type      1K-blocks      Used   Available  Use% Mounted on
udev            devtmpfs    1964380        0   1964380   0% /dev
tmpfs           tmpfs       400172     1804   398368   1% /run
/dev/sda1        ext4     123328064  9404916  107615412  9% /
tmpfs           tmpfs       2000852        0   2000852   0% /dev/shm
tmpfs           tmpfs        5120        0     5120   0% /run/lock
tmpfs           tmpfs       2000852        0   2000852   0% /sys/fs/cgroup
tmpfs           tmpfs       400168       52   400116   1% /run/user/1000
/dev/sr0         iso9660    2307888    2307888        0 100% /media/kaysan/Zorin OS
15.3 Core 64bit
kaysan@zenos-os:~$
```

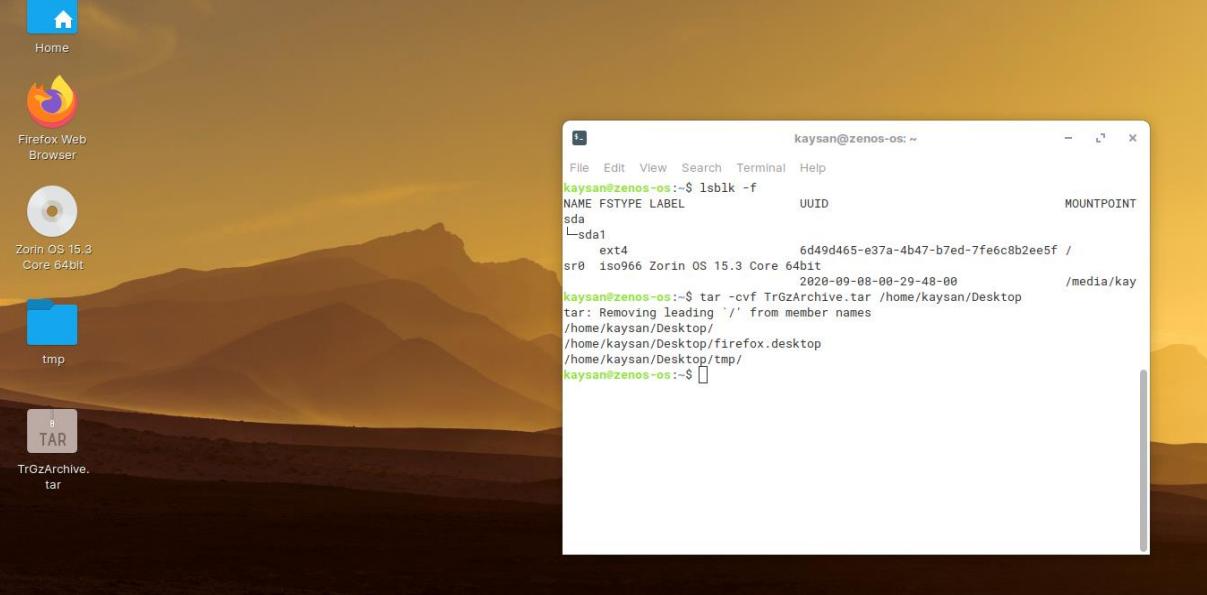
Finding mounted filesystem type by using lsblk command.



```
kaysan@zenos-os:~$ lsblk -f
NAME FSTYPE LABEL UUID                                     MOUNTPOINT
sda
└─sda1
    ext4
sr0  iso966 Zorin OS 15.3 Core 64bit
                                2020-09-08-00-29-48-00
                                         /media/kay
kaysan@zenos-os:~$
```

- c) Archive and backup your home directory or work directory using tar, gzip commands.

Using tar command.



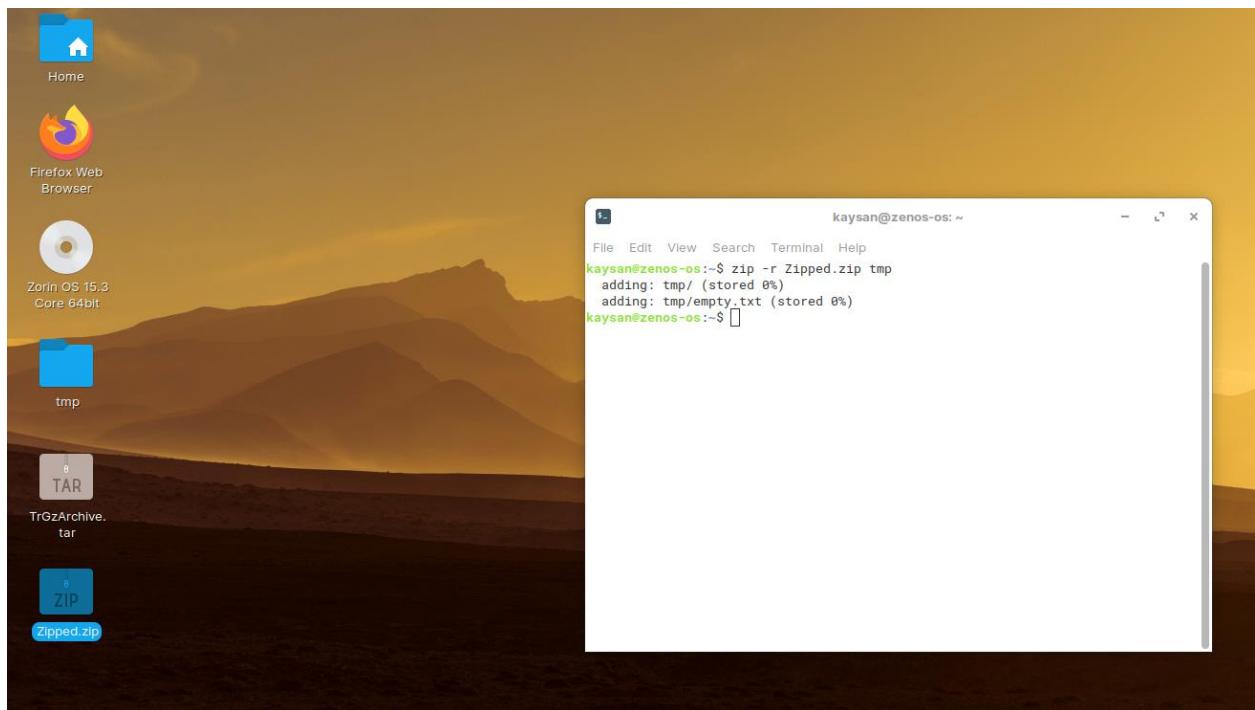
```
kaysan@zenos-os:~$ lsblk -f
NAME FSTYPE LABEL UUID                                     MOUNTPOINT
sda
└─sda1
    ext4
sr0  iso966 Zorin OS 15.3 Core 64bit
                                2020-09-08-00-29-48-00
                                         /media/kay
kaysan@zenos-os:~$ tar -cvf TrGzArchive.tar /home/kaysan/Desktop/
tar: Removing leading '/' from member names
/home/kaysan/Desktop/
/home/kaysan/Desktop/firefox.desktop
/home/kaysan/Desktop/tmp/
kaysan@zenos-os:~$
```

Using gzip command to compress.

kaysan@zenos-os: ~/Pictures

```
File Edit View Search Terminal Help
kaysan@zenos-os:~/Pictures$ cd
kaysan@zenos-os:~$ ls
Desktop Downloads Pictures t1 t5      tmp          Videos
Documents Music Public t2 Templates TrGzArchive.tar
kaysan@zenos-os:~$ cd Pictures
kaysan@zenos-os:~/Pictures$ ls
Scenary.png
kaysan@zenos-os:~/Pictures$ gzip -v Scenary.png
gzip: Scenary.png: No such file or directory
kaysan@zenos-os:~/Pictures$ gzip -v Scenary.png
Scenary.png:       0.0% -- replaced with Scenary.png.gz
kaysan@zenos-os:~/Pictures$ ls
Scenary.png.gz
kaysan@zenos-os:~/Pictures$
```

Zipped file can be created using zip command.



d) Use dd command to create files and explore different options to dd.

```
kaysan@zenos-os:~$ dd if=/dev/zero of=test.img bs=1024 count=0 seek=1024
0+0 records in
0+0 records out
0 bytes copied, 0.000105355 s, 0.0 kB/s
kaysan@zenos-os:~$ ls -l
total 80
drwxr-xr-x 3 kaysan kaysan    4096 Apr 28 16:28 Desktop
drwxr-xr-x 2 kaysan kaysan    4096 Apr 28 14:46 Documents
drwxr-xr-x 2 kaysan kaysan    4096 Apr 28 14:00 Downloads
drwxr-xr-x 2 kaysan kaysan    4096 Apr 28 14:00 Music
drwxr-xr-x 2 kaysan kaysan 28672 Apr 28 16:24 Pictures
drwxr-xr-x 2 kaysan kaysan    4096 Apr 28 14:00 Public
-rw-rw-r-- 2 kaysan kaysan      0 Apr 28 15:36 t1
-rw-rw-r-- 1 kaysan kaysan      0 Apr 28 15:36 t2
-rw-rw-r-- 2 kaysan kaysan      0 Apr 28 15:36 t5
drwxr-xr-x 2 kaysan kaysan    4096 Apr 28 13:34 Templates
-rw-rw-r-- 1 kaysan kaysan 1048576 Apr 28 16:32 test.img
drwxrwxr-x 2 kaysan kaysan    4096 Apr 28 15:43 tmp
-rw-rw-r-- 1 kaysan kaysan 20480 Apr 28 16:17 TrGzArchive.tar
drwxr-xr-x 2 kaysan kaysan    4096 Apr 28 14:00 Videos
kaysan@zenos-os:~$
```

```
kaysan@zenos-os:~$ dd --help
Usage: dd [OPERAND]...
      or: dd OPTION
Copy a file, converting and formatting according to the operands.

bs=BYTES      read and write up to BYTES bytes at a time (default: 512);
               overrides ibs and obs
cbs=BYTES      convert BYTES bytes at a time
conv=CONVS     convert the file as per the comma separated symbol list
count=N        copy only N input blocks
ibs=BYTES      read up to BYTES bytes at a time (default: 512)
if=FILE        read from FILE instead of stdin
iflag=FLAGS    read as per the comma separated symbol list
obs=BYTES      write BYTES bytes at a time (default: 512)
of=FILE        write to FILE instead of stdout
oflag=FLAGS    write as per the comma separated symbol list
seek=N         skip N obs-sized blocks at start of output
skip=N         skip N ibs-sized blocks at start of input
status=LEVEL   The LEVEL of information to print to stderr;
               'none' suppresses everything but error messages,
               'noxfer' suppresses the final transfer statistics,
               'progress' shows periodic transfer statistics

N and BYTES may be followed by the following multiplicative suffixes:
```

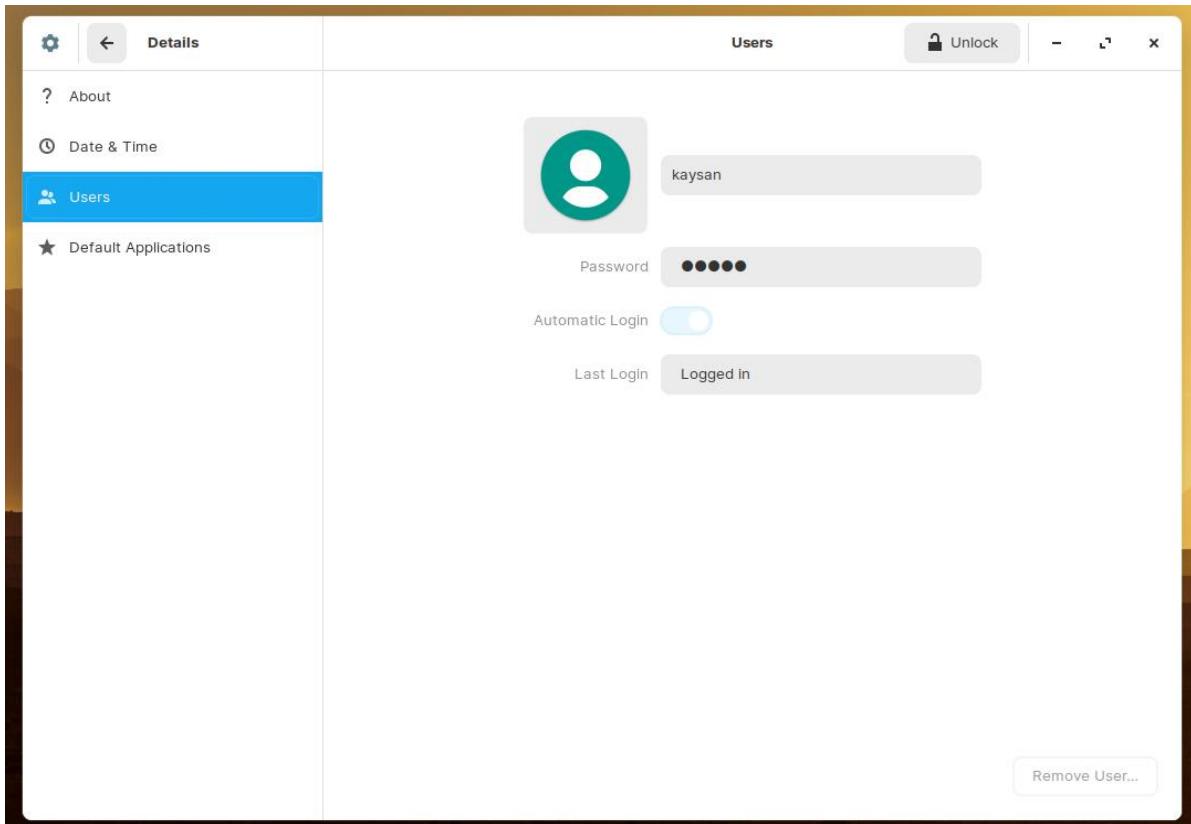
Practical No:07

Aim: Use Environment.

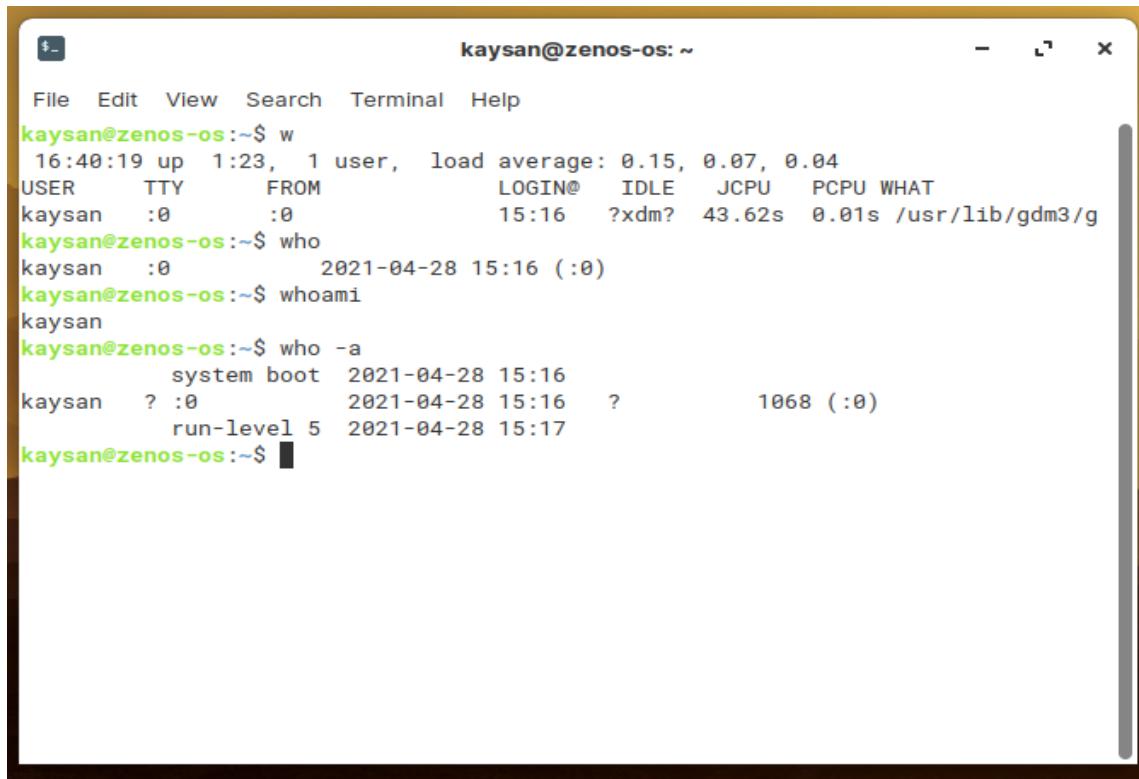
a) Which account are you logged in? How do you find out?

Using GUI

Go to settings, search Users and click on ‘Users’.

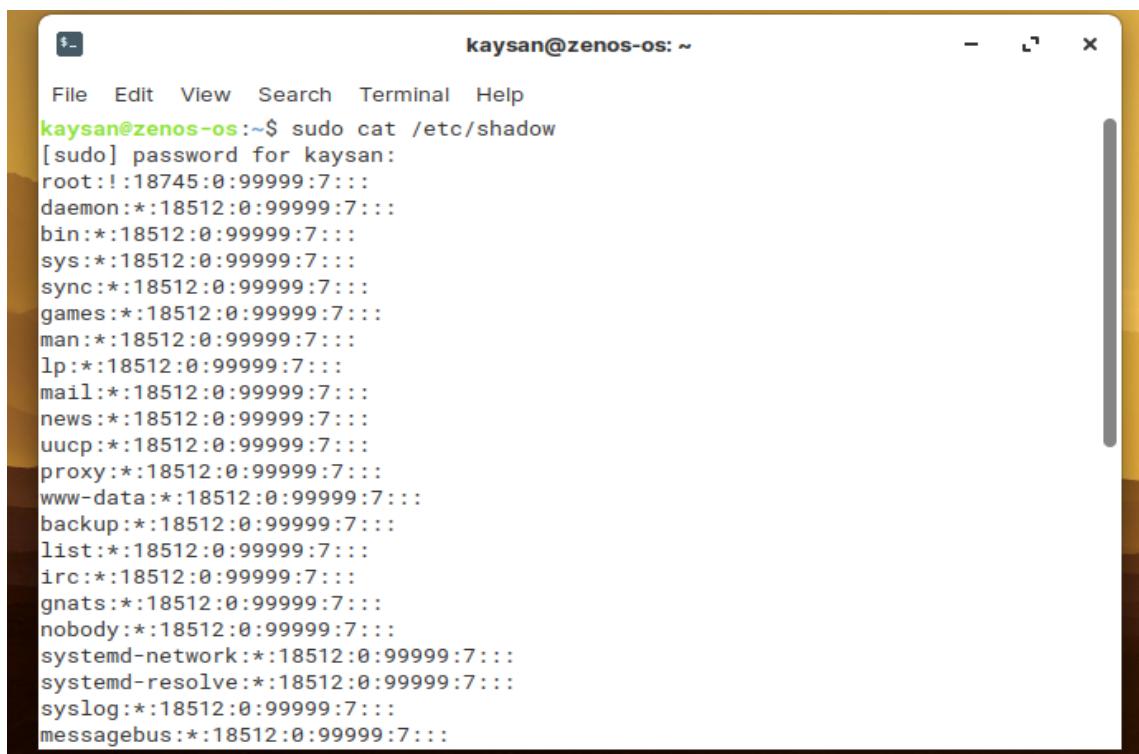


Using Terminal



```
kaysan@zenos-os:~$ w
16:40:19 up 1:23, 1 user,  load average: 0.15, 0.07, 0.04
USER   TTY      FROM          LOGIN@    IDLE   JCPU   PCPU WHAT
kaysan :0          :0          15:16    ?xdm?  43.62s  0.01s /usr/lib/gdm3/g
kaysan@zenos-os:~$ who
kaysan :0          2021-04-28 15:16 (:0)
kaysan@zenos-os:~$ whoami
kaysan
kaysan@zenos-os:~$ who -a
system boot 2021-04-28 15:16
kaysan ? :0          2021-04-28 15:16 ?           1068 (:0)
run-level 5 2021-04-28 15:17
kaysan@zenos-os:~$
```

- b. Display /etc/shadow file using cat and understand the importance of shadow file. How it's different than passwd file.



```
kaysan@zenos-os:~$ sudo cat /etc/shadow
[sudo] password for kaysan:
root!:18745:0:99999:7:::
daemon:*:18512:0:99999:7:::
bin:*:18512:0:99999:7:::
sys:*:18512:0:99999:7:::
sync:*:18512:0:99999:7:::
games:*:18512:0:99999:7:::
man:*:18512:0:99999:7:::
lp:*:18512:0:99999:7:::
mail:*:18512:0:99999:7:::
news:*:18512:0:99999:7:::
uucp:*:18512:0:99999:7:::
proxy:*:18512:0:99999:7:::
www-data:*:18512:0:99999:7:::
backup:*:18512:0:99999:7:::
list:*:18512:0:99999:7:::
irc:*:18512:0:99999:7:::
gnats:*:18512:0:99999:7:::
nobody:*:18512:0:99999:7:::
systemd-network:*:18512:0:99999:7:::
systemd-resolve:*:18512:0:99999:7:::
syslog:*:18512:0:99999:7:::
messagebus:*:18512:0:99999:7:::
```

The screenshot shows a terminal window titled "kaysan@zenos-os: ~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main content area displays the man page for the "passwd" command. It includes sections for "FILES" (listing /etc/passwd and /etc/shadow) and "EXIT VALUES" (listing exit codes 0, 1, and 2). The status bar at the bottom indicates "Manual page passwd(1) line 150/190 94% (press h for help or q to quit)".

```
passwd uses PAM to authenticate users and to change their passwords.

FILES
/etc/passwd
    User account information.

/etc/shadow
    Secure user account information.

/etc/pam.d/passwd
    PAM configuration for passwd.

EXIT VALUES
The passwd command exits with the following values:

0
    success

1
    permission denied

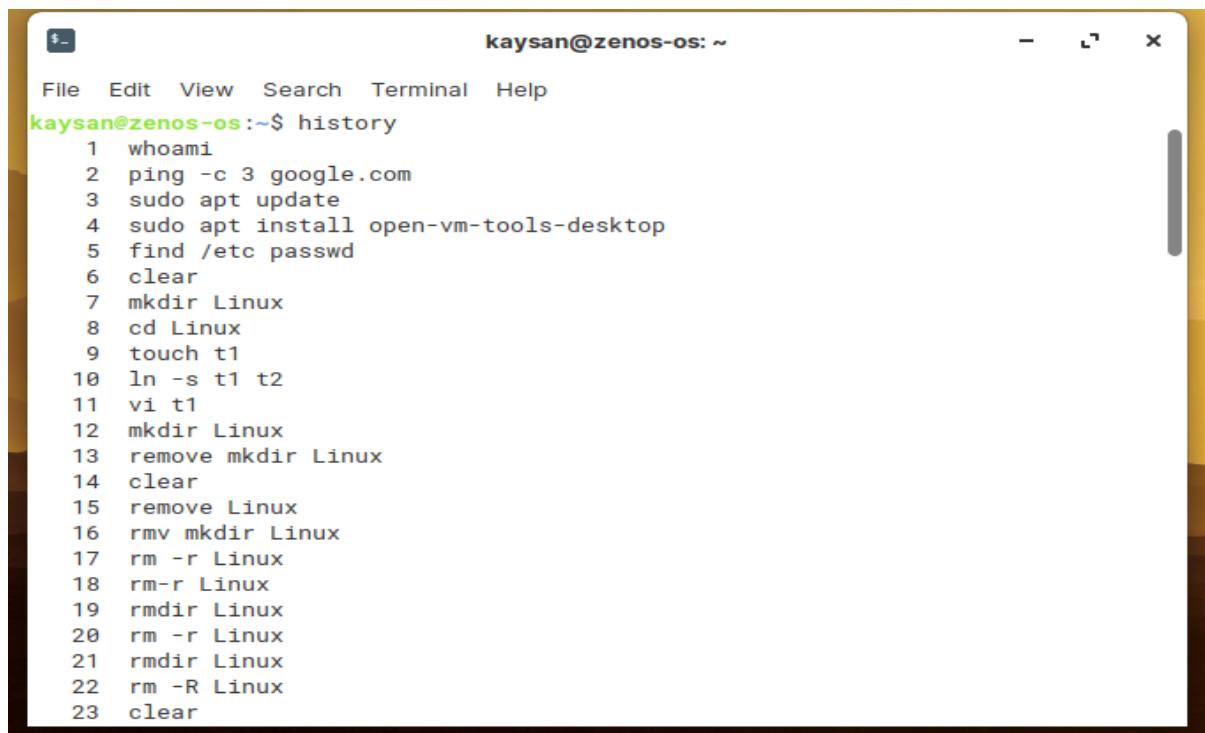
2
Manual page passwd(1) line 150/190 94% (press h for help or q to quit)
```

c. Get you current working directory.

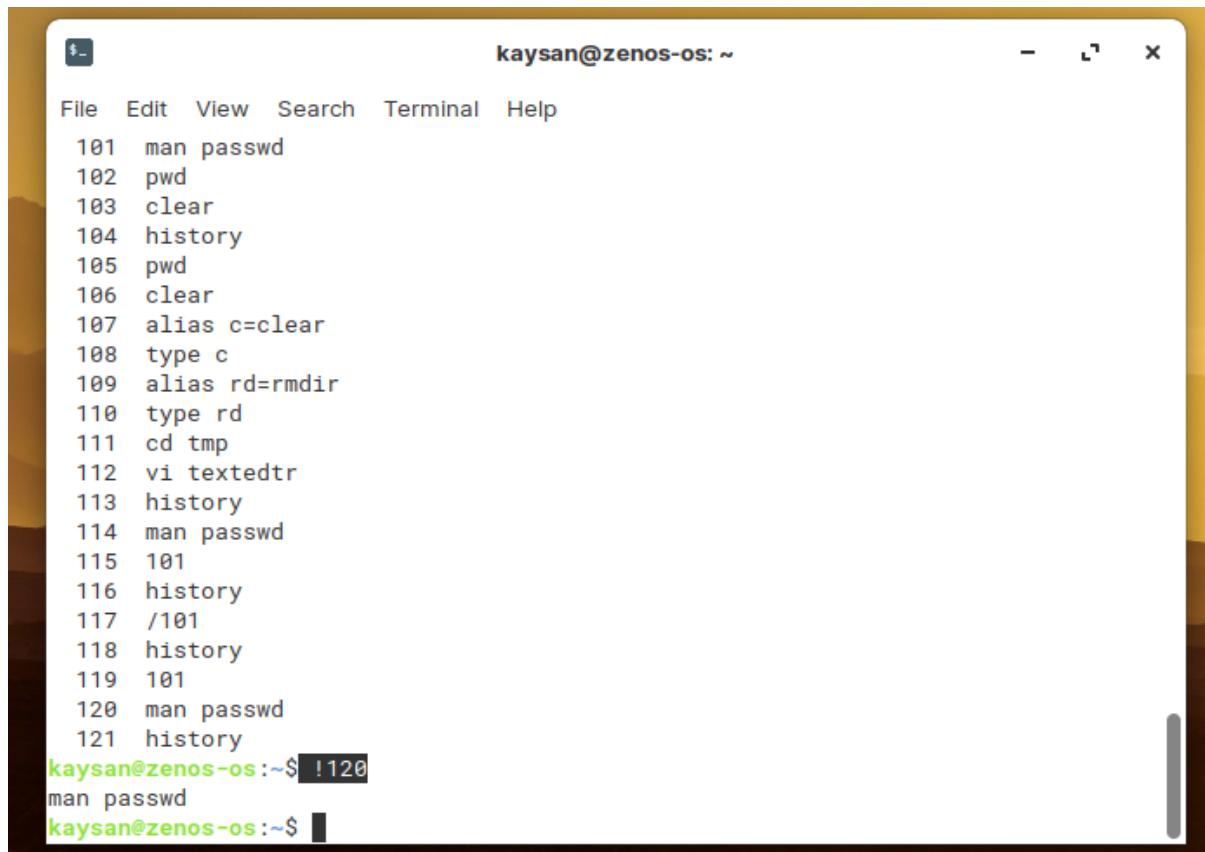
The screenshot shows a terminal window titled "kaysan@zenos-os: ~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main content area shows the result of the "pwd" command, which outputs "/home/kaysan". The status bar at the bottom is blank.

```
kaysan@zenos-os:~$ pwd
/home/kaysan
kaysan@zenos-os:~$
```

d. Explore different ways of getting command history, how to run previously executed command without typing it?



```
kaysan@zenos-os:~$ history
1 whoami
2 ping -c 3 google.com
3 sudo apt update
4 sudo apt install open-vm-tools-desktop
5 find /etc passwd
6 clear
7 mkdir Linux
8 cd Linux
9 touch t1
10 ln -s t1 t2
11 vi t1
12 mkdir Linux
13 remove mkdir Linux
14 clear
15 remove Linux
16 rmv mkdir Linux
17 rm -r Linux
18 rm-r Linux
19 rmdir Linux
20 rm -r Linux
21 rmdir Linux
22 rm -R Linux
23 clear
```



```
kaysan@zenos-os:~$ 
File Edit View Search Terminal Help
101 man passwd
102 pwd
103 clear
104 history
105 pwd
106 clear
107 alias c=clear
108 type c
109 alias rd=rmdir
110 type rd
111 cd tmp
112 vi textedtr
113 history
114 man passwd
115 101
116 history
117 /101
118 history
119 101
120 man passwd
121 history
kaysan@zenos-os:~$ !120
man passwd
kaysan@zenos-os:~$ 
```

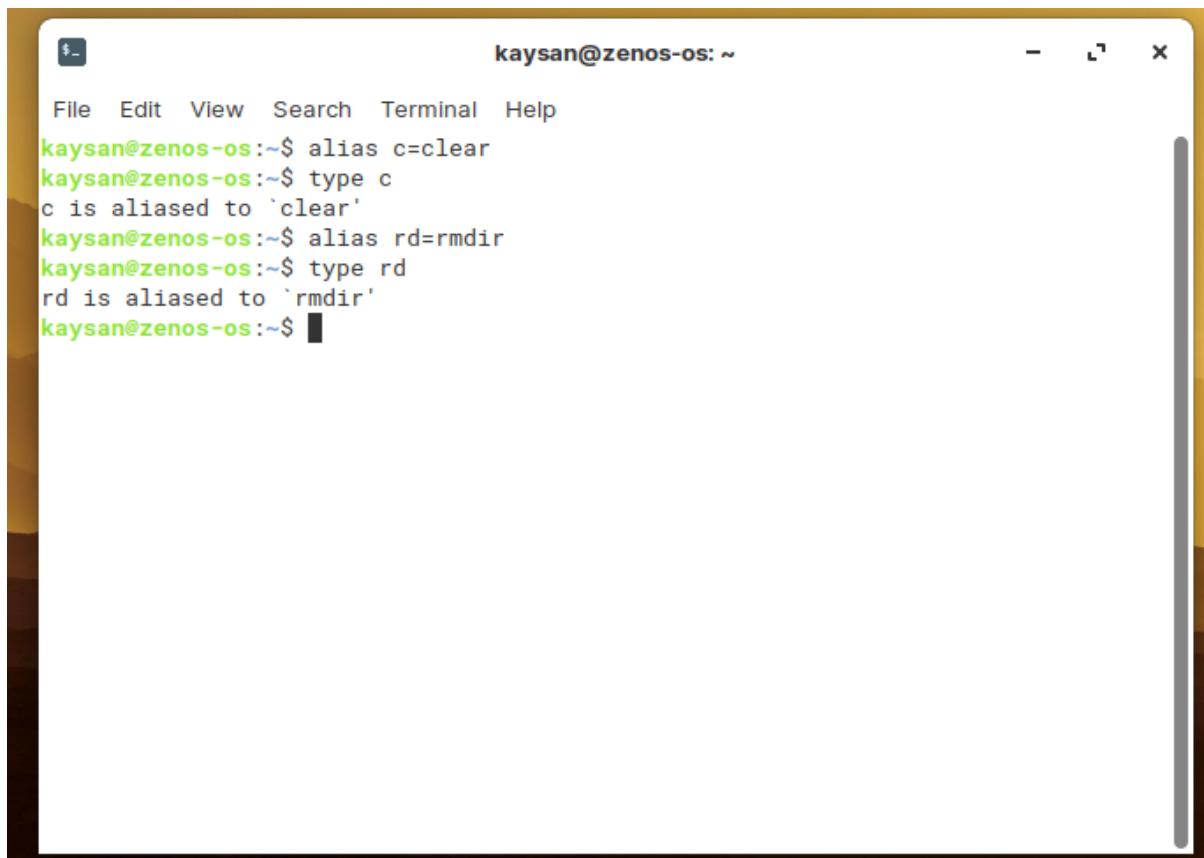
To run a previously executed command without typing, we can press the upper arrow button to navigate and hit Enter button.



A screenshot of a terminal window titled "kaysan@zenos-os: ~". The window has a menu bar with File, Edit, View, Search, Terminal, and Help. The terminal content shows a history of commands:

```
File Edit View Search Terminal Help
84 clear
85 dd --help
86 clear
87 start from the top
88 w
89 who
90 whoami
91 who -a
92 clear
93 root
94 #
95 #root
96 root
97 cat /etc/shadow
98 root cat/etc/shadow
99 sudo cat/etc/shadow
100 sudo cat /etc/shadow
101 man passwd
102 pwd
103 clear
104 history
kaysan@zenos-os:~$ pwd
/home/kaysan
kaysan@zenos-os:~$
```

e) Create alias to most commonly used commands like.



A screenshot of a terminal window titled "kaysan@zenos-os: ~". The window has a menu bar with File, Edit, View, Search, Terminal, and Help. The terminal content shows the creation of aliases:

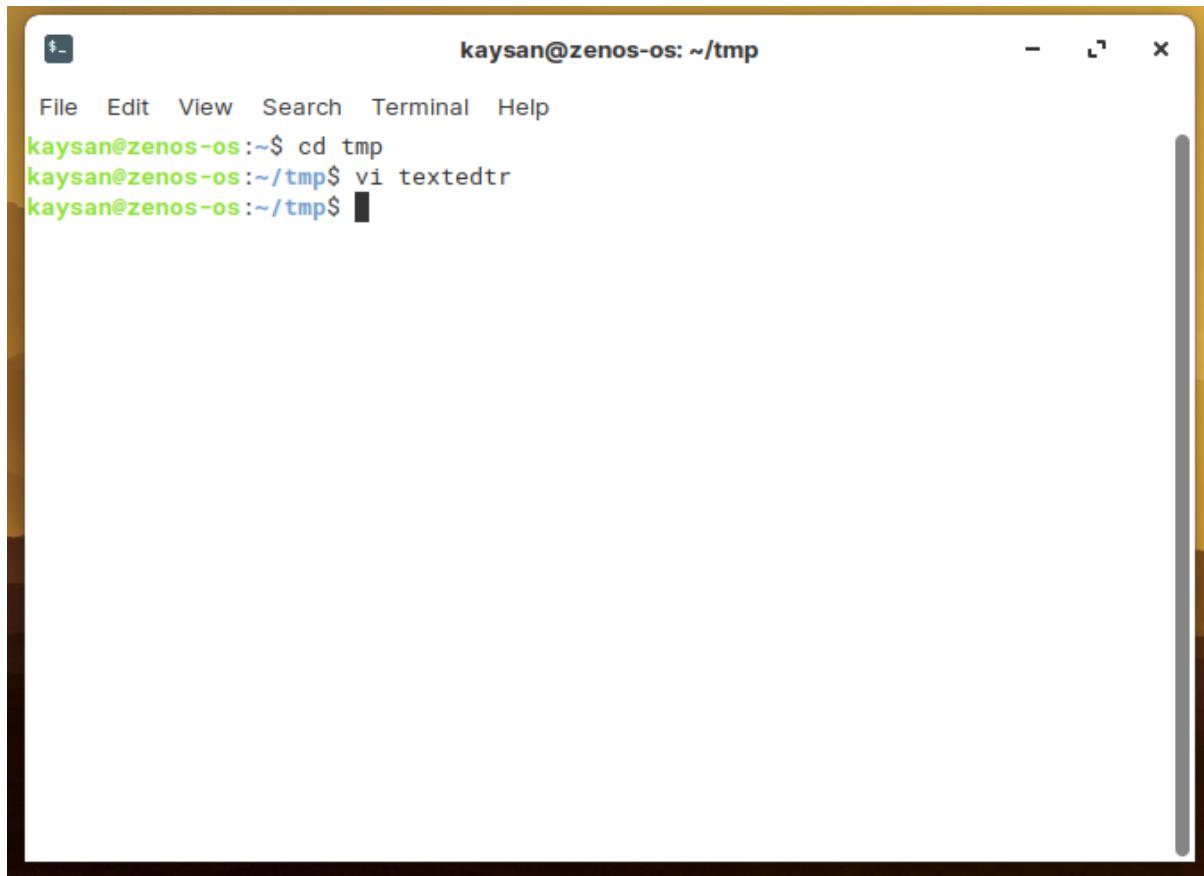
```
File Edit View Search Terminal Help
kaysan@zenos-os:~$ alias c=clear
kaysan@zenos-os:~$ type c
c is aliased to `clear'
kaysan@zenos-os:~$ alias rd=rmdir
kaysan@zenos-os:~$ type rd
rd is aliased to `rmdir'
kaysan@zenos-os:~$
```

Practical No:08

Aim: Linux Editors: vim/gedit/nano

- Create, modify, search, navigate a file in editor,

Creating a file in vi editor:



The screenshot shows a terminal window titled "kaysan@zenos-os: ~/tmp". The window has a standard Linux-style title bar with icons for minimize, maximize, and close. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal itself displays the following command sequence:

```
kaysan@zenos-os:~$ cd tmp
kaysan@zenos-os:~/tmp$ vi textedtr
kaysan@zenos-os:~/tmp$ █
```

The command "cd tmp" changes the directory to "/tmp". The command "vi textedtr" starts the vi text editor on a file named "textedtr" in the current directory. The final line shows the cursor at the end of the file name.

Modification

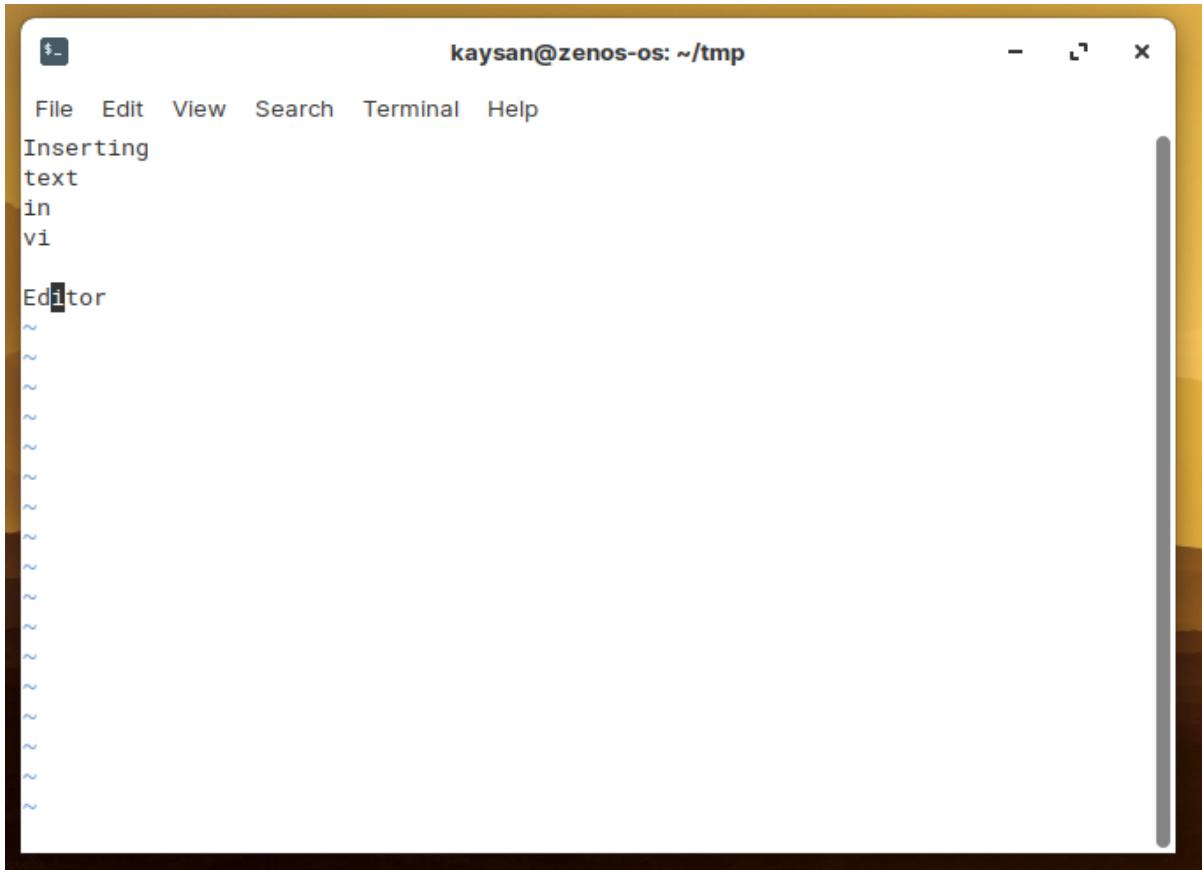
~ represents an empty line.

To insert text, press ‘i’ button.

esc + :wq to save and exit.

To Search

Press esc + ? followed by characters or words for backword search and esc + / for forward search.

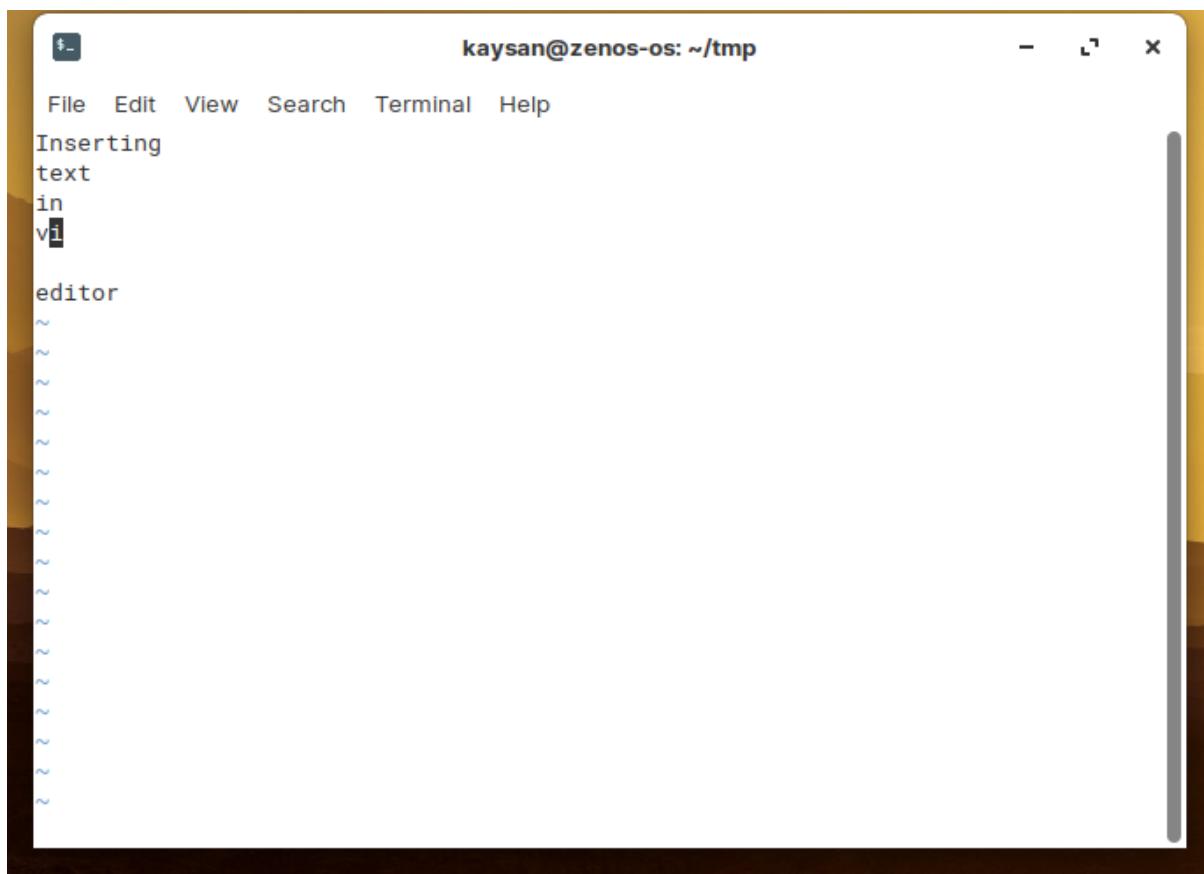


```
File Edit View Search Terminal Help
Inserting
text
in
vi

Editor
~
```

For more than one occurrence, press ‘n’ to jump to the next occurrence.

Navigation



A screenshot of a terminal window titled "kaysan@zenos-os: ~/tmp". The window has a dark brown border and a light gray title bar. The main area shows the text "Inserting text in vi editor" followed by approximately 20 blank lines. At the top, there is a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom right shows a vertical scroll bar.

Press Esc + h to move left in a line,

Press Esc + l to move right in a line,

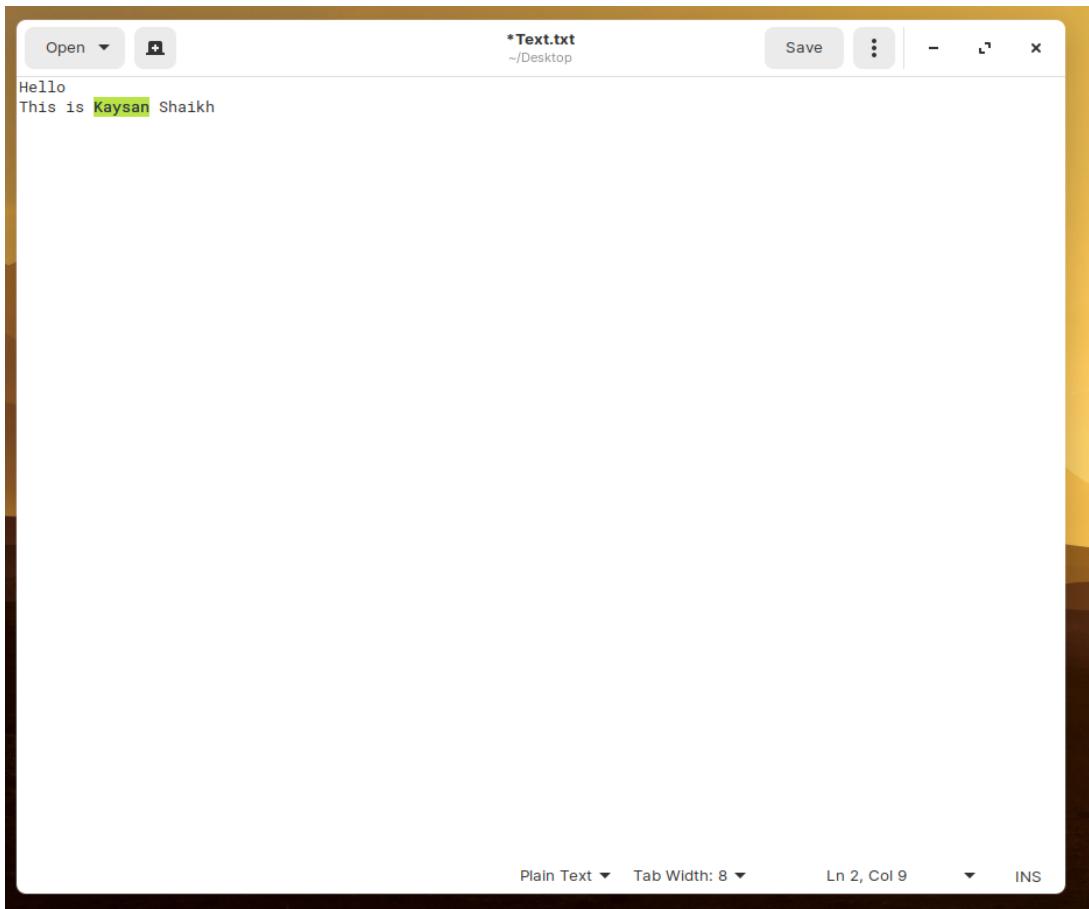
Press Esc + j to move a line upward,

Press Esc + k to move to the next line.

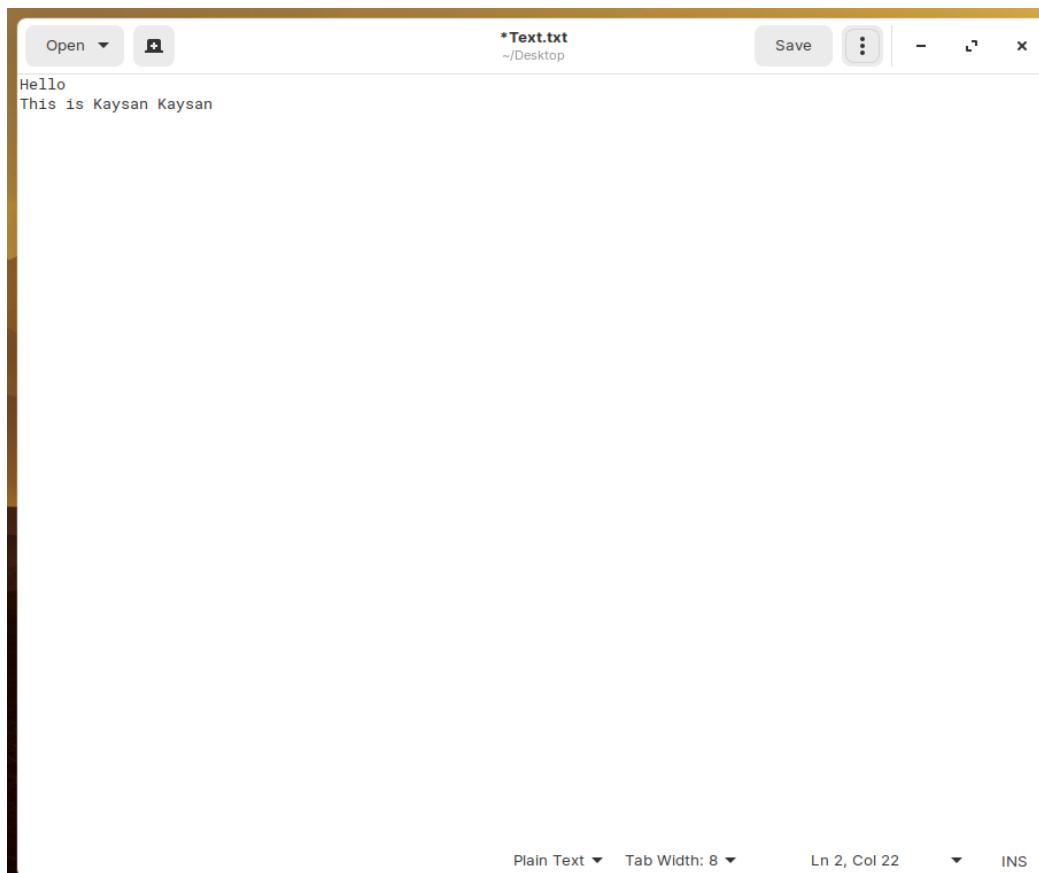
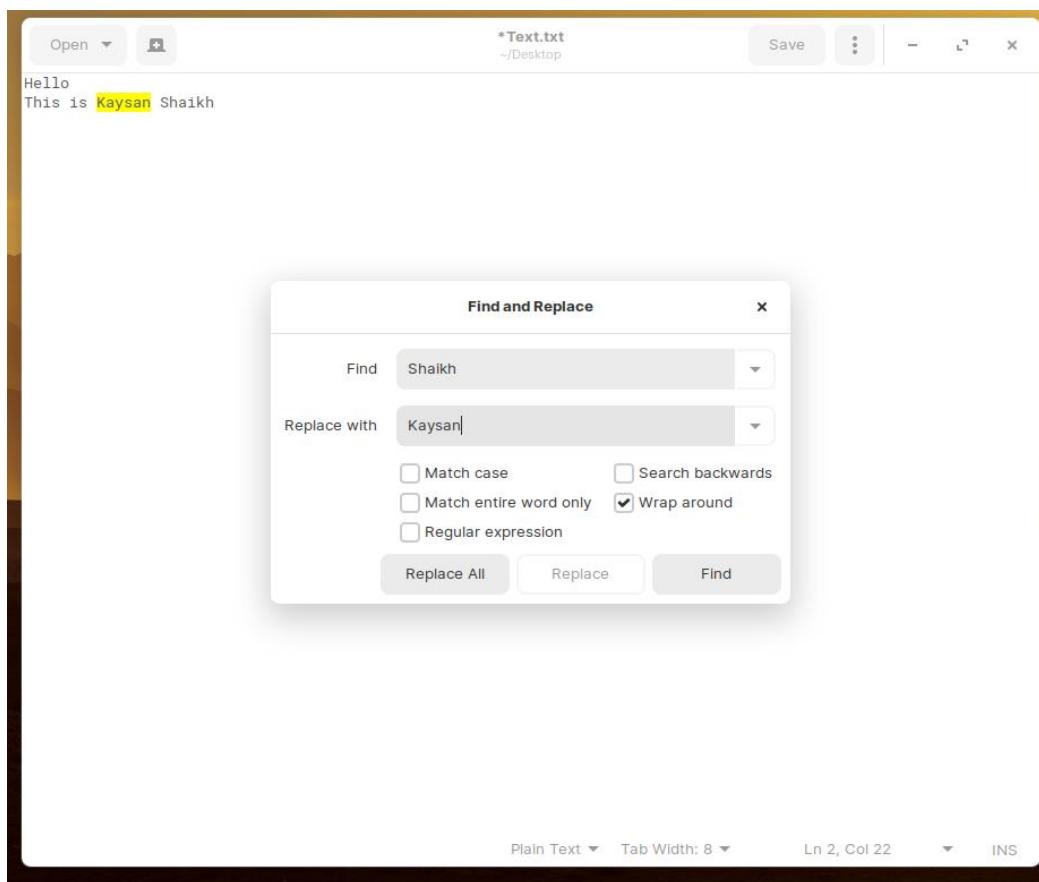
b) Learn all essential commands like search, search/replace, highlight, show line numbers.

Search

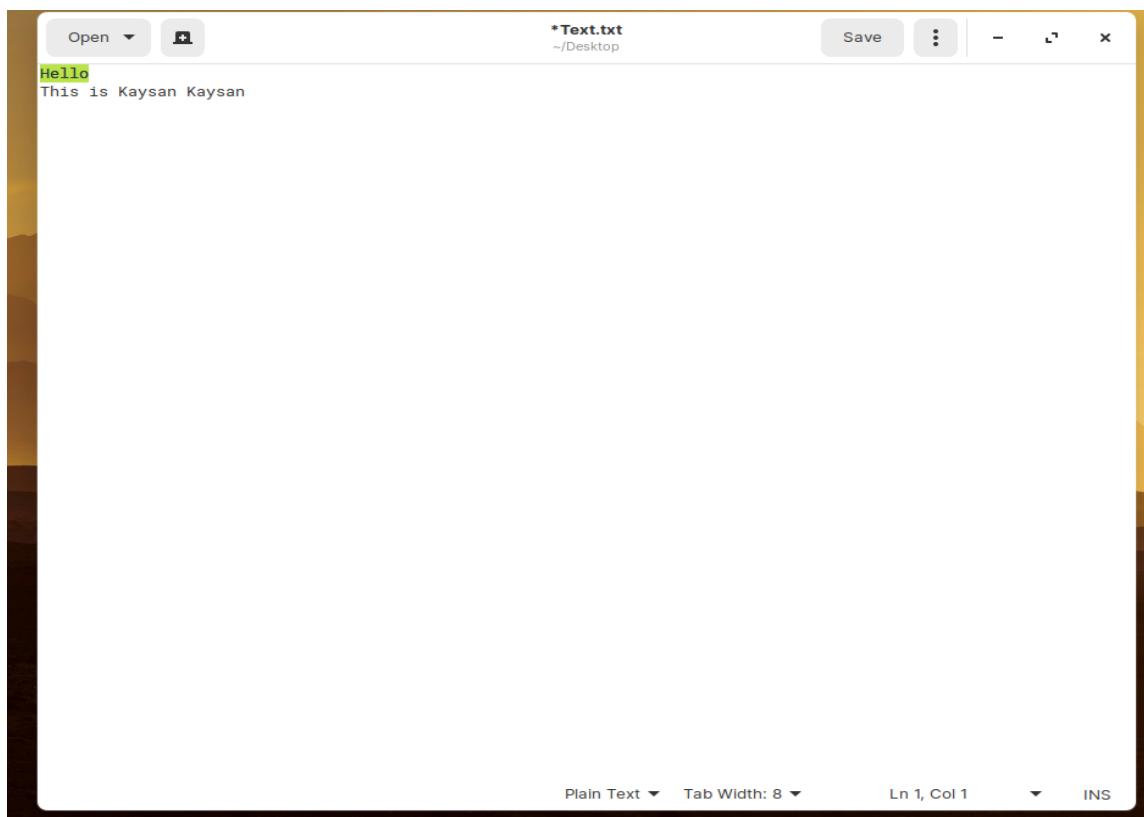
Select the find option and type the keyword you wanted to search for e.g. I search ‘Kaysan’.



Search/Replace



Highlight



Show line numbers

Go to preference and select display line Numbers.

