

1. Sort /etc/passwd based on the full names of users and save output to external file.

```
aya@aya-virtual-machine:~$ sort -k 5 -t : /etc/passwd > /tmp/externalfile.sort
aya@aya-virtual-machine:~$ head -1 /tmp/externalfile.sort
avahi-autoipd:x:110:119:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/
nologin
aya@aya-virtual-machine:~$
```

2. Search for all files on the system that named “passwd” using two methods.

Method 1

```
nologin
aya@aya-virtual-machine:~$ locate passwd
/etc/passwd
/etc/passwd-
/etc/pam.d/chpasswd
/etc/pam.d/passwd
/etc/security/opasswd
/home/aya/Desktop/oldpasswd
/snap/core20/1974/etc/passwd
/snap/core20/1974/etc/pam.d/chpasswd
/snap/core20/1974/etc/pam.d/passwd
/snap/core20/1974/etc/security/opasswd
/snap/core20/1974/usr/bin/gpasswd
/snap/core20/1974/usr/bin/passwd
/snap/core20/1974/usr/lib/python3/dist-packages/cloudinit/sources/helpers/vmware
```

Method2

```
aya@aya-virtual-machine:~$ sudo find / -name passwd
/etc/pam.d/passwd
/etc/passwd
/snap/core20/1974/etc/pam.d/passwd
/snap/core20/1974/etc/passwd
/snap/core20/1974/usr/bin/passwd
/snap/core20/1974/usr/share/bash-completion/completions/passwd
/snap/core20/1974/usr/share/doc/passwd
/snap/core20/1974/var/lib/extrausers/passwd
/snap/core22/858/etc/pam.d/passwd
/snap/core22/858/etc/passwd
/snap/core22/858/usr/bin/passwd
```

3. Install Packages called ncompress,ksh

```
aya@aya-virtual-machine:~$ sudo apt install ncompress ksh
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ksh93u+m
Suggested packages:
  binfmt-support
The following NEW packages will be installed:
  ksh ksh93u+m ncompress
0 upgraded, 3 newly installed, 0 to remove and 46 not upgraded.
Need to get 923 kB of archives.
After this operation, 3,243 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://eg.archive.ubuntu.com/ubuntu jammy/universe amd64 ksh93u+m amd64 1.0.0~beta.2-1 [894 kB]
Get:2 http://eg.archive.ubuntu.com/ubuntu jammy/universe amd64 ksh all 20211217 [6,474 B]
```

4. Compress a file by compress, bzip2 commands and decompress it again.


compress

```
Ubuntu - VMware Workstation 17 Player (Non-commercial use only)
Player
Activities Terminal 19:14 19 ديس
aya@aya-virtual-machine: ~/Desktop
aya@aya-virtual-machine:~$ pwd
/home/aya
aya@aya-virtual-machine:~$ cd Desktop
aya@aya-virtual-machine:~/Desktop$ bzip2 oldpasswd
```

decompress

```
gdm:x:128:134:Gnome Display Manager:/var/lib/gdm3:/bin/false
aya:x:1000:1000:aya,,,:/home/aya:/bin/bash
aya@aya-virtual-machine:~/Desktop$ bunzip2 oldpasswd.bz2
aya@aya-virtual-machine:~/Desktop$
```

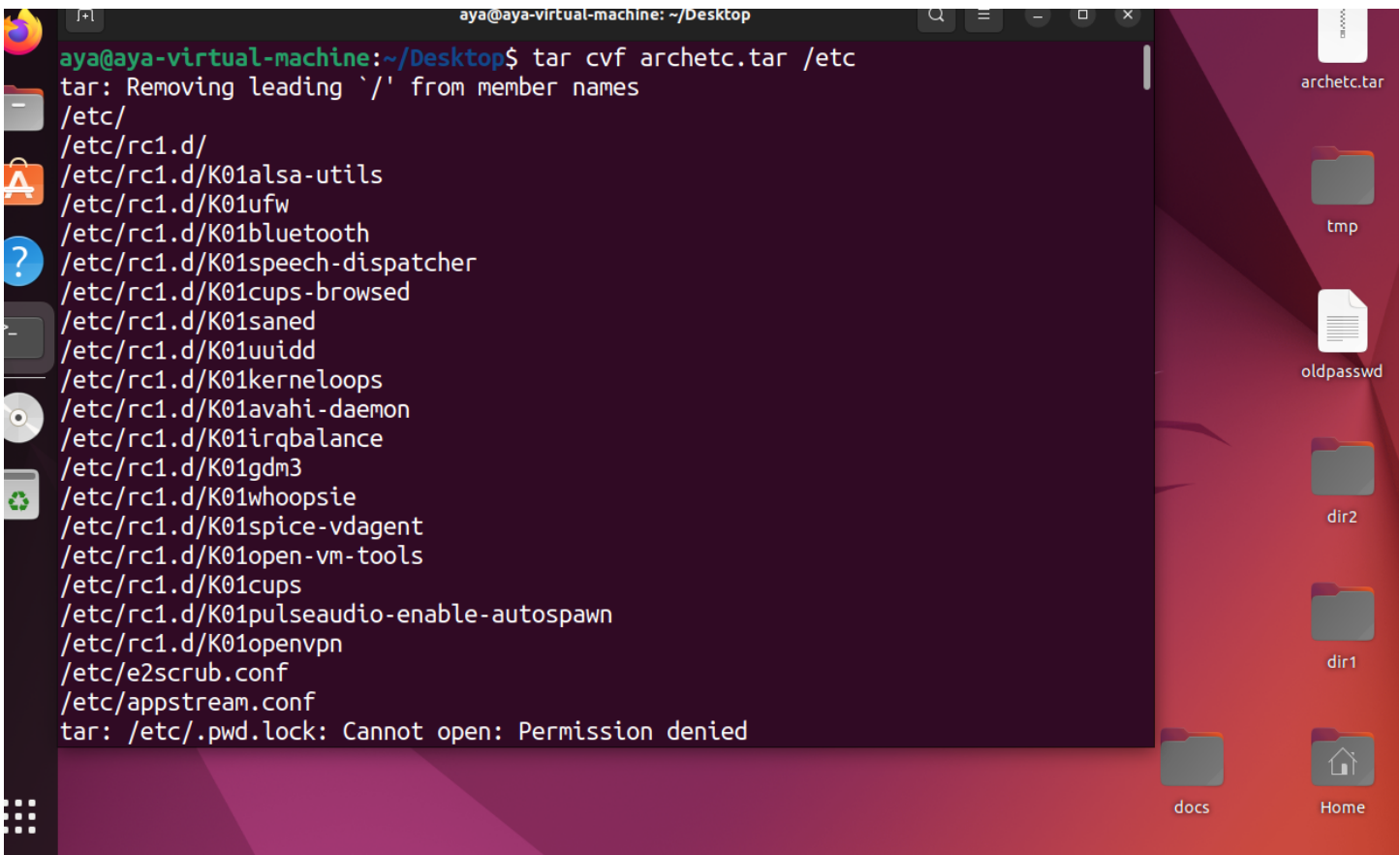
5. What is the command used to view the content of a .Z compressed file.



A terminal window on a Linux desktop. The prompt is `aya@aya-virtual-machine: ~/Desktop$`. The command `bzcat oldpasswd.bz2` has been executed. The output lists system users and their details, including root, daemon, bin, sys, sync, games, man, lp, mail, news, uucp, proxy, www-data, backup, list, irc, gnats, nobody, systemd-network, systemd-resolve, and messagebus. On the desktop, a file named `oldpasswd.bz2` is visible.

```
aya@aya-virtual-machine: ~/Desktop$ bzcat oldpasswd.bz2
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:102:105:/:/nonexistent:/usr/sbin/nologin
```

6. Backup/Archive /etc directory using tar utility.

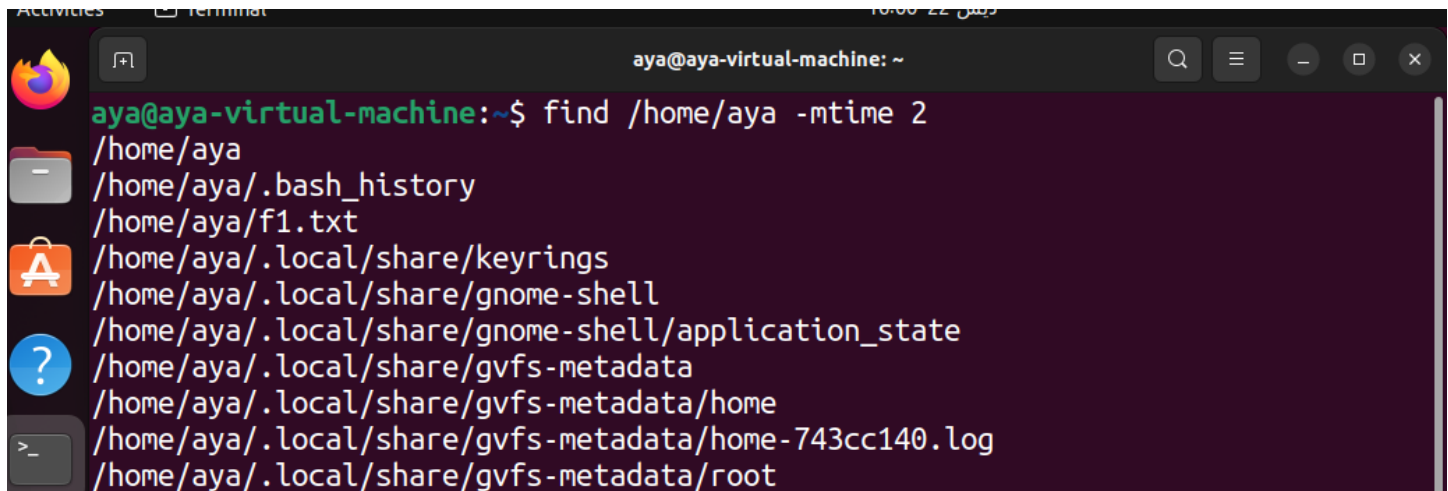


A terminal window on a Linux desktop. The prompt is `aya@aya-virtual-machine: ~/Desktop$`. The command `tar cvf archetc.tar /etc` has been executed. The output shows the files being archived, including `/etc/`, `/etc/rc1.d/`, and various configuration files. The command ends with an error: `tar: /etc/.pwd.lock: Cannot open: Permission denied`. On the desktop, a file named `archetc.tar` is visible.

```
aya@aya-virtual-machine: ~/Desktop$ tar cvf archetc.tar /etc
tar: Removing leading '/' from member names
/etc/
/etc/rc1.d/
/etc/rc1.d/K01alsa-utils
/etc/rc1.d/K01ufw
/etc/rc1.d/K01bluetooth
/etc/rc1.d/K01speech-dispatcher
/etc/rc1.d/K01cups-browsed
/etc/rc1.d/K01saned
/etc/rc1.d/K01uudd
/etc/rc1.d/K01kerneloops
/etc/rc1.d/K01avahi-daemon
/etc/rc1.d/K01irqbalance
/etc/rc1.d/K01gdm3
/etc/rc1.d/K01whoopsie
/etc/rc1.d/K01spice-vdagent
/etc/rc1.d/K01open-vm-tools
/etc/rc1.d/K01cups
/etc/rc1.d/K01pulseaudio-enable-autospawn
/etc/rc1.d/K01openvpn
/etc/e2scrub.conf
/etc/appstream.conf
tar: /etc/.pwd.lock: Cannot open: Permission denied
```

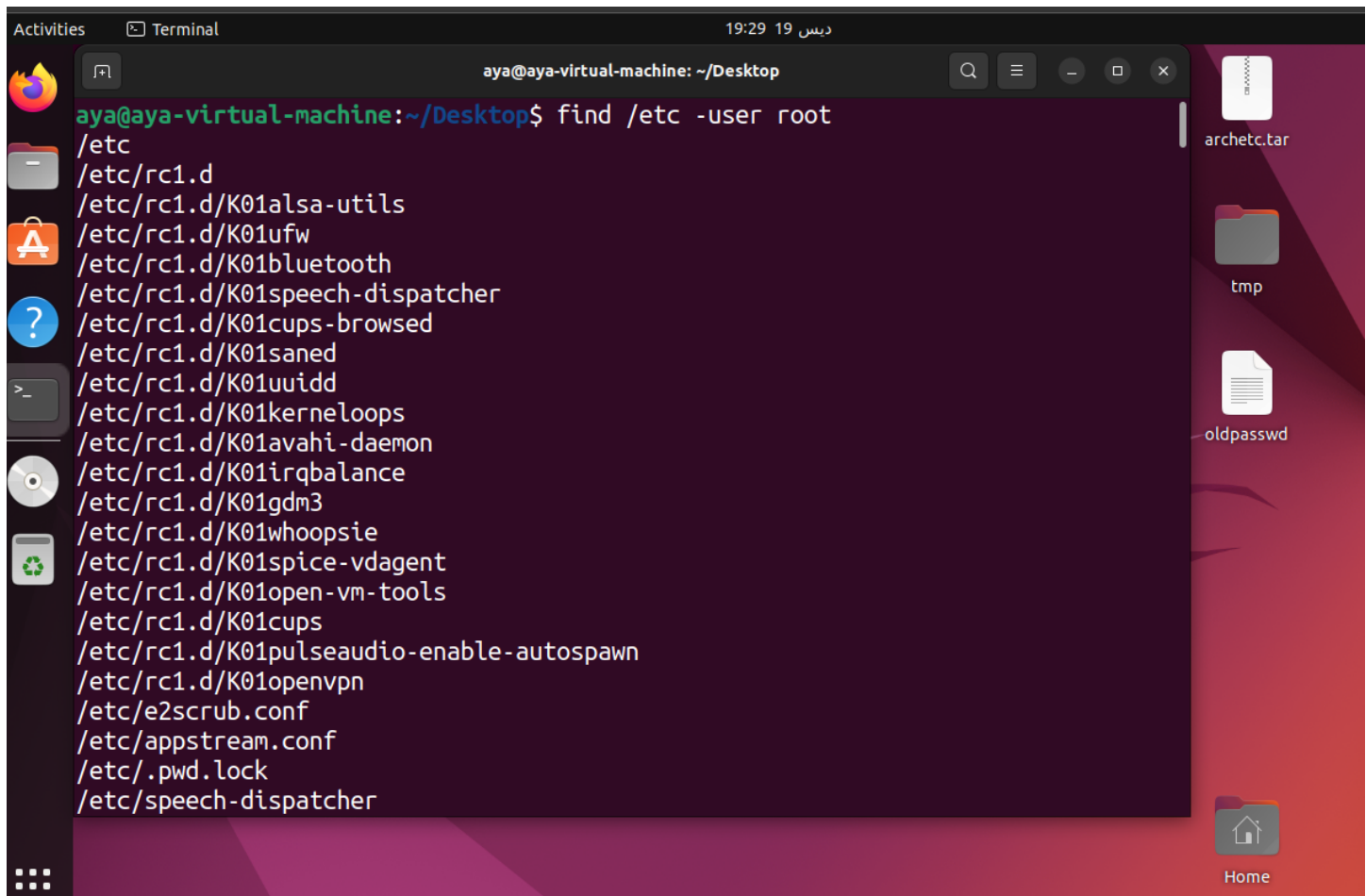
12. Remove package neocompress and ksh.
13. Create a symbolic link of `/etc/passwd` in `/boot`.
14. Create a hard link of `/home/iti/f1.txt` in `/home/iti/Desktop`.

7. Starting from your home directory, find all files that were modified in the last two day.



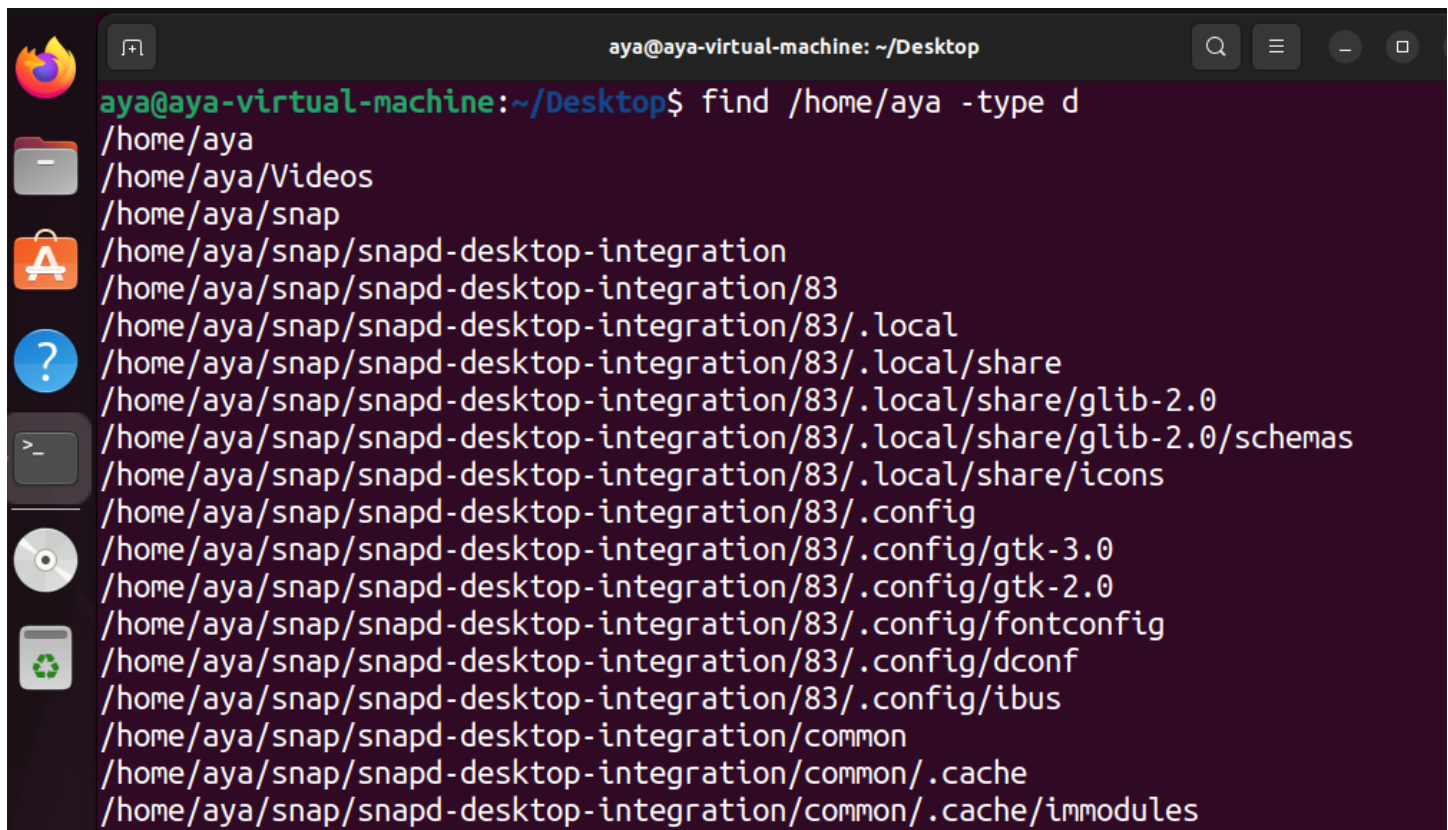
```
aya@aya-virtual-machine: ~$ find /home/aya -mtime 2
/home/aya
/home/aya/.bash_history
/home/aya/f1.txt
/home/aya/.local/share/keyrings
/home/aya/.local/share/gnome-shell
/home/aya/.local/share/gnome-shell/application_state
/home/aya/.local/share/gvfs-metadata
/home/aya/.local/share/gvfs-metadata/home
/home/aya/.local/share/gvfs-metadata/home-743cc140.log
/home/aya/.local/share/gvfs-metadata/root
```

8. Starting from /etc, find files owned by root user.\



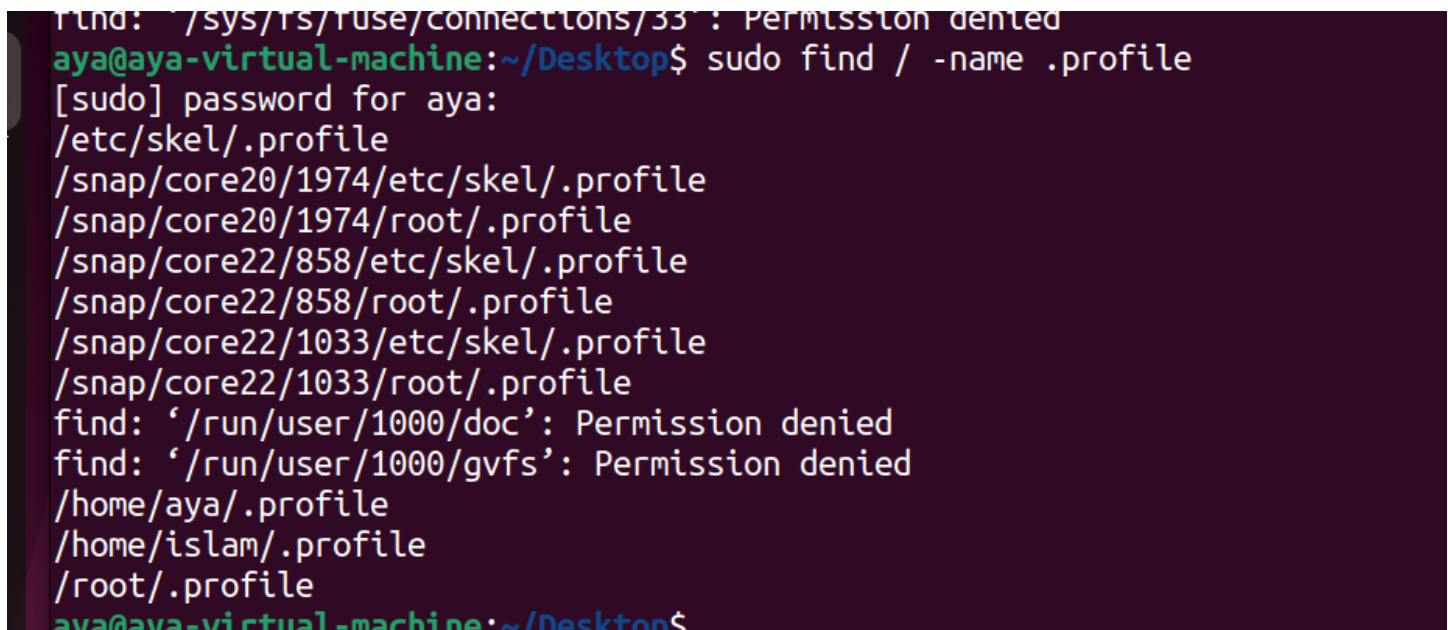
```
aya@aya-virtual-machine: ~/Desktop$ find /etc -user root
/etc
/etc/rc1.d
/etc/rc1.d/K01alsa-utils
/etc/rc1.d/K01ufw
/etc/rc1.d/K01bluetooth
/etc/rc1.d/K01speech-dispatcher
/etc/rc1.d/K01cups-browsed
/etc/rc1.d/K01saned
/etc/rc1.d/K01uuidd
/etc/rc1.d/K01kerneloops
/etc/rc1.d/K01avahi-daemon
/etc/rc1.d/K01irqbalance
/etc/rc1.d/K01gdm3
/etc/rc1.d/K01whoopsie
/etc/rc1.d/K01spice-vdagent
/etc/rc1.d/K01open-vm-tools
/etc/rc1.d/K01cups
/etc/rc1.d/K01pulseaudio-enable-autospawn
/etc/rc1.d/K01openvpn
/etc/e2scrub.conf
/etc/appstream.conf
/etc/.pwd.lock
/etc/speech-dispatcher
```

9. Find all directories in your home directory.



```
aya@aya-virtual-machine: ~/Desktop
aya@aya-virtual-machine:~/Desktop$ find /home/aya -type d
/home/aya
/home/aya/Videos
/home/aya/snap
/home/aya/snap/snapd-desktop-integration
/home/aya/snap/snapd-desktop-integration/83
/home/aya/snap/snapd-desktop-integration/83/.local
/home/aya/snap/snapd-desktop-integration/83/.local/share
/home/aya/snap/snapd-desktop-integration/83/.local/share/glib-2.0
/home/aya/snap/snapd-desktop-integration/83/.local/share/glib-2.0/schemas
/home/aya/snap/snapd-desktop-integration/83/.local/share/icons
/home/aya/snap/snapd-desktop-integration/83/.config
/home/aya/snap/snapd-desktop-integration/83/.config/gtk-3.0
/home/aya/snap/snapd-desktop-integration/83/.config/gtk-2.0
/home/aya/snap/snapd-desktop-integration/83/.config/fontconfig
/home/aya/snap/snapd-desktop-integration/83/.config/dconf
/home/aya/snap/snapd-desktop-integration/83/.config/ibus
/home/aya/snap/snapd-desktop-integration/common
/home/aya/snap/snapd-desktop-integration/common/.cache
/home/aya/snap/snapd-desktop-integration/common/.cache/immodules
```

10. Write a command to search for all files on the system that, its name is “.profile”.



```
find: '/sys/fs/ruse/connections/33': Permission denied
aya@aya-virtual-machine:~/Desktop$ sudo find / -name .profile
[sudo] password for aya:
/etc/skel/.profile
/snap/core20/1974/etc/skel/.profile
/snap/core20/1974/root/.profile
/snap/core22/858/etc/skel/.profile
/snap/core22/858/root/.profile
/snap/core22/1033/etc/skel/.profile
/snap/core22/1033/root/.profile
find: '/run/user/1000/doc': Permission denied
find: '/run/user/1000/gvfs': Permission denied
/home/aya/.profile
/home/islam/.profile
/root/.profile
aya@aya-virtual-machine:~/Desktop$
```

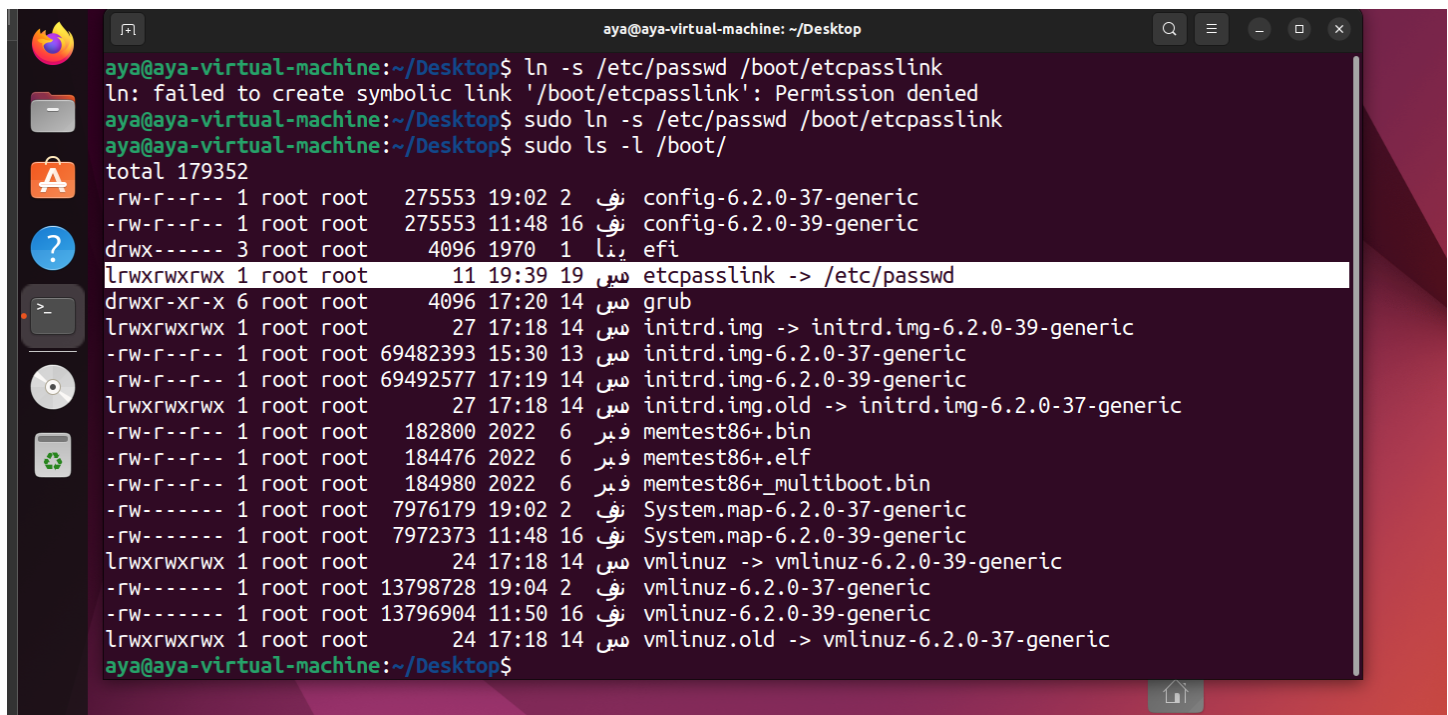
11. List the directories that have 777 Permissions in the system.

```
aya@aya-virtual-machine:~$ sudo find / -perm 777 -type d
find: '/proc/3267': No such file or directory
find: '/run/user/1000/doc': Permission denied
find: '/run/user/1000/gvfs': Permission denied
aya@aya-virtual-machine:~$
```

12. Remove package ncompress and ksh

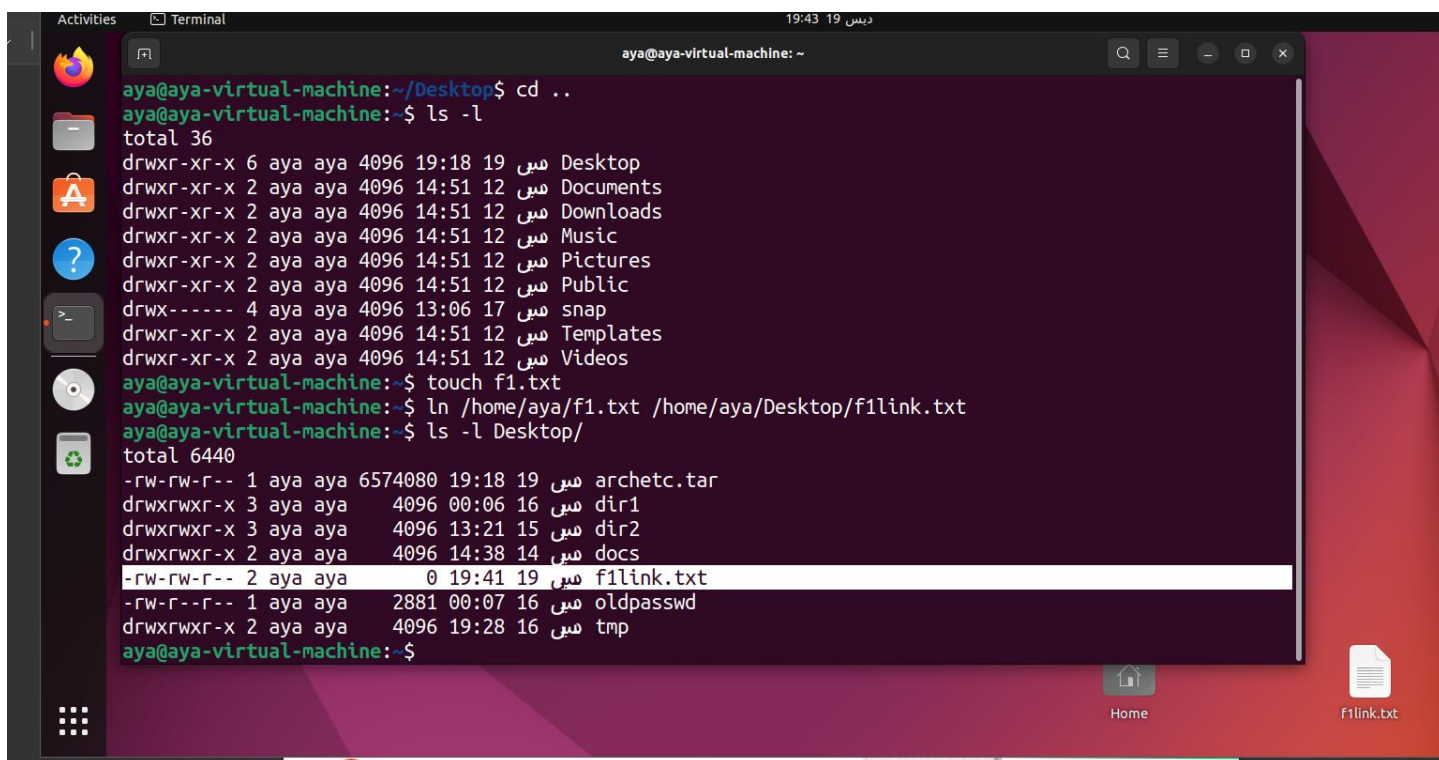
```
aya@aya-virtual-machine:~$ sudo apt remove nocompress ksh
[sudo] password for aya:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
```

13. Create a symbolic link of /etc/passwd in /boot.



```
aya@aya-virtual-machine: ~/Desktop
aya@aya-virtual-machine:~/Desktop$ ln -s /etc/passwd /boot/etcpasslink
ln: failed to create symbolic link '/boot/etcpasslink': Permission denied
aya@aya-virtual-machine:~/Desktop$ sudo ln -s /etc/passwd /boot/etcpasslink
aya@aya-virtual-machine:~/Desktop$ sudo ls -l /boot/
total 179352
-rw-r--r-- 1 root root 275553 19:02 2 نيف config-6.2.0-37-generic
-rw-r--r-- 1 root root 275553 11:48 16 نيف config-6.2.0-39-generic
drwx----- 3 root root 4096 1970 1 بنا efi
lrwxrwxrwx 1 root root 11 19:39 19 سبي etcpasslink -> /etc/passwd
drwxr-xr-x 6 root root 4096 17:20 14 سبي grub
lrwxrwxrwx 1 root root 27 17:18 14 سبي initrd.img -> initrd.img-6.2.0-39-generic
-rw-r--r-- 1 root root 69482393 15:30 13 سبي initrd.img-6.2.0-37-generic
-rw-r--r-- 1 root root 69492577 17:19 14 سبي initrd.img-6.2.0-39-generic
lrwxrwxrwx 1 root root 27 17:18 14 سبي initrd.img.old -> initrd.img-6.2.0-37-generic
-rw-r--r-- 1 root root 182800 2022 6 فيبر memtest86+.bin
-rw-r--r-- 1 root root 184476 2022 6 فيبر memtest86+.elf
-rw-r--r-- 1 root root 184980 2022 6 فيبر memtest86+_multiboot.bin
-rw----- 1 root root 7976179 19:02 2 نيف System.map-6.2.0-37-generic
-rw----- 1 root root 7972373 11:48 16 نيف System.map-6.2.0-39-generic
lrwxrwxrwx 1 root root 24 17:18 14 سبي vmlinuz -> vmlinuz-6.2.0-39-generic
-rw----- 1 root root 13798728 19:04 2 نيف vmlinuz-6.2.0-37-generic
-rw----- 1 root root 13796904 11:50 16 نيف vmlinuz-6.2.0-39-generic
lrwxrwxrwx 1 root root 24 17:18 14 سبي vmlinuz.old -> vmlinuz-6.2.0-37-generic
aya@aya-virtual-machine:~/Desktop$
```

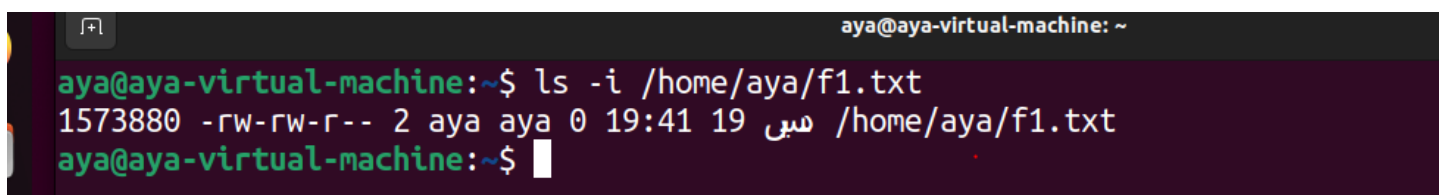
14. Create a hard link of /home/iti/f1.txt in /home/iti/Desktop.



A terminal window on a Linux desktop. The user is in the directory ~/Desktop. They run 'cd ..' to go to their home directory. Then they run 'ls -l' showing a list of files and directories. Next, they run 'touch f1.txt' to create a new file. Then they run 'ln /home/aya/f1.txt /home/aya/Desktop/f1link.txt' to create a hard link. Finally, they run 'ls -l Desktop/' showing the contents of the desktop, including the newly created 'f1link.txt' file.

```
aya@aya-virtual-machine:~/Desktop$ cd ..
aya@aya-virtual-machine:~$ ls -l
total 36
drwxr-xr-x 6 aya aya 4096 19:18 19 ھى Desktop
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Documents
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Downloads
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Music
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Pictures
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Public
drwx----- 4 aya aya 4096 13:06 17 ھى snap
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Templates
drwxr-xr-x 2 aya aya 4096 14:51 12 ھى Videos
aya@aya-virtual-machine:~$ touch f1.txt
aya@aya-virtual-machine:~$ ln /home/aya/f1.txt /home/aya/Desktop/f1link.txt
aya@aya-virtual-machine:~$ ls -l Desktop/
total 6440
-rw-rw-r-- 1 aya aya 6574080 19:18 19 ھى archetc.tar
drwxrwxr-x 3 aya aya 4096 00:06 16 ھى dir1
drwxrwxr-x 3 aya aya 4096 13:21 15 ھى dir2
drwxrwxr-x 2 aya aya 4096 14:38 14 ھى docs
-rw-rw-r-- 2 aya aya 0 19:41 19 ھى f1link.txt
-rw-r--r-- 1 aya aya 2881 00:07 16 ھى oldpasswd
drwxrwxr-x 2 aya aya 4096 19:28 16 ھى tmp
aya@aya-virtual-machine:~$
```

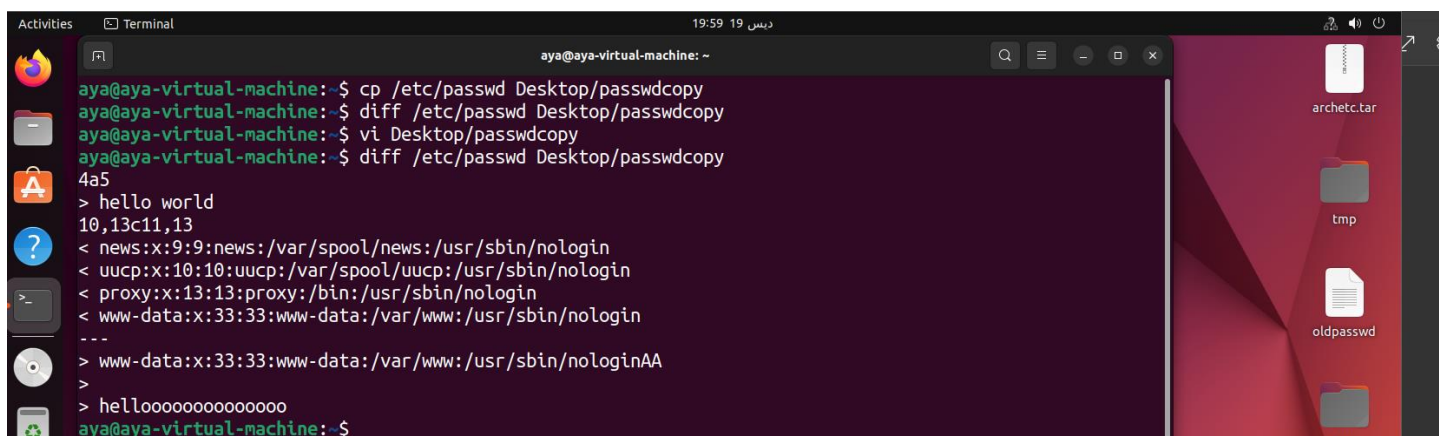
15. List the inode number of /home/iti/f1.txt



A terminal window showing the command 'ls -li /home/aya/f1.txt' being executed. The output shows the inode number 1573880 for the file /home/aya/f1.txt.

```
aya@aya-virtual-machine:~$ ls -li /home/aya/f1.txt
1573880 -rw-rw-r-- 2 aya aya 0 19:41 19 ھى /home/aya/f1.txt
aya@aya-virtual-machine:~$
```

16. Copy /etc/passwd to your home directory, use the commands diff, and Edit in the file you copied, and then use these command again, and check the output.



A terminal window showing a sequence of commands: copying /etc/passwd to Desktop/passwdcopy, running diff to show no differences, editing the file with vi, running diff again to show differences, and then making changes to the file. The desktop background shows icons for archetc.tar, tmp, oldpasswd, and disc.

```
aya@aya-virtual-machine:~$ cp /etc/passwd Desktop/passwdcopy
aya@aya-virtual-machine:~$ diff /etc/passwd Desktop/passwdcopy
aya@aya-virtual-machine:~$ vi Desktop/passwdcopy
aya@aya-virtual-machine:~$ diff /etc/passwd Desktop/passwdcopy
4a5
> hello world
10,13c11,13
< news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
< uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
< proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
< www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
---
> www-data:x:33:33:www-data:/var/www:/usr/sbin/nologinAA
>
> helloooooooooooooooooo
aya@aya-virtual-machine:~$
```