Task1.Part1

1 – 2) passwd changes /etc/passwd (user account information), /*etc/*shadow (secure user account information, real data about passwords) and /etc/pam.d/password (PAM configuration for passwd – for dynamic authentification users in apps or services).

```
user@ubuntu:~$ sudo su
[sudo] password for user:
root@ubuntu:/home/user# grep -Po '^sudo.+:\K.*$' /etc/group
user
root@ubuntu:/home/user# passwd -h
Usage: passwd [options] [LOGIN]

Options:
  -a, --all                     report password status on all accounts
  -d, --delete                  delete the password for the named account
  -e, --expire                  force expire the password for the named account
  -h, --help                    display this help message and exit
  -k, --keep-tokens             change password only if expired
  -i, --inactive INACTIVE       set password inactive after expiration
                                to INACTIVE
  -l, --lock                    lock the password of the named account
  -n, --mindays MIN_DAYS        set minimum number of days before password
                                change to MIN_DAYS
  -q, --quiet                   quiet mode
  -r, --repository REPOSITORY   change password in REPOSITORY repository
  -R, --root CHROOT_DIR         directory to chroot into
  -S, --status                  report password status on the named account
  -u, --unlock                  unlock the password of the named account
  -w, --warndays WARN_DAYS      set expiration warning days to WARN_DAYS
  -x, --maxdays MAX_DAYS        set maximum number of days before password
                                change to MAX_DAYS
```

3) Command cat /etc/passwd shows all users registered in system.
"w" shows list of currently active users including time and what command they recently ran.

```
user@ubuntu:~$ w
 00:16:42 up  1:42,  2 users,  load average: 0.08, 0.28, 0.14
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
user     :0       :0               22:35   ?xdm?   2:04   0.01s /usr/lib/gdm3/gdm-x-session --run-script env GNOME_SHELL_SESSION_MODE=ubuntu /usr/bin/gnome-session --systemd --session=ubuntu
testman  tty3     -                00:13   15.00s  0.09s  0.07s top
```

Information about login time, login name, the tty name, the remote host, idle time, JCPU, PCPU can be also gleaned.

The JCPU time is the time used by all processes attached to the tty. It does not include past background jobs, but does include currently running background jobs.

The PCPU time is the time used by the current process, named in the "what" field.

4) Change personal information about yourself.

```
root@ubuntu:/home/user# chfn testman
Changing the user information for testman
Enter the new value, or press ENTER for the default
        Full Name []: Oleksii
        Room Number []: 55
        Work Phone []: +380993737377
        Home Phone []: +380447766777
        Other []: It is a test user
root@ubuntu:/home/user#
```

5) man and info
info pages usually give more detailed information about a command then its respective **man** page.
w -h, --no-header
Don't print the header.
w -o, --old-style
Old style output. Prints blank space for idle times less than one minute.
chfn -f, --full-name FULL_NAME
Change the user's full name.
chfn -h, --home-phone HOME_PHONE
Change the user's home phone number

```
root@ubuntu:/home/user# chfn testman -h +37903
root@ubuntu:/home/user# finger testman
Login: testman                          Name: Oleksii
Directory: /home/testman                Shell: /bin/sh
Office: 55, +380993737377               Home Phone: +37903
On since Thu Dec  2 00:13 (PST) on tty3   1 hour 14 minutes idle
     (messages off)
No mail.
No Plan.
root@ubuntu:/home/user# chfn testman -f Testman Ivanovich
root@ubuntu:/home/user# finger testman
Login: testman                          Name: Testman
Directory: /home/testman                Shell: /bin/sh
Office: 55, +380993737377               Home Phone: +37903
On since Thu Dec  2 00:13 (PST) on tty3   1 hour 14 minutes idle
     (messages off)
No mail.
No Plan.
root@ubuntu:/home/user#
```

6) Main difference between **more** and **less** is that **less** command is faster because it does not load the entire file at once and allows navigation though file using page **up**/**down** keys.

```
     1 tmux ls
     2 tmux attach-session -t 0
     3 tmux ls
     4 tmux new -s mysession2
     5 mc
     6 vimtutor
     7 vim
     8 sudo apt install vim
     9 vimtutor
    10
    11 git clone https://github.com/Bilohur/DevOps_online_Kyiv_2021Q4/blob/master/m2/task2.1/readme.
    11 md
    12 ls
    13 git clone
    14 git clone https://github.com/Bilohur/DevOps_online_Kyiv_2021Q4/tree/master/m2/task2.1
    15 find 2021Q4
    16 git clone https://github.com/Bilohur/DevOps_online_Kyiv_2021Q4
    17 ls
    18 sudo usermod -aG vboxusers user
    19 sudo apt-get update
    20 top
    21 history | grep "git"
    22 history | grep git
    23 ifconfig
    24 history
    25 ls
    26 mc
    27 history | grep hit
    28 history | grep git
    29 putty
    30 ifconfig
    31 mc
    32 git push
    33 git add -A
    34 git commit "table of connections"
    35 git commit -m "table of connections"
    36 git push
    37 history | grep git
    38 git push
    39 git config -l
    40 git add -A
    41 git push
    42 git checkout master
    43 git branch
    44 git push
    45 git config --global credential.helper cache
    46 git pull -v
    47 git push -v
    48 git branch
    49 git checkout box_vagrant
    50 vagrant init hashicorp/precise64
    51 vagrant up
    52 vagrant ssh
    53 vagvagrant ssh
.bash_history
```

7)

```
r                    me/user# echo "I'm currently working on lab 5.1"  > ~/.plan
root@ubuntu:/home/user# finger root
Login: root                             Name: root
Directory: /root                        Shell: /bin/bash
Never logged in.
No mail.
Plan:
I'm currently working on lab 5.1
root@ubuntu:/home/user#
```

8)

```
user@ubuntu:~$ ls -la
total 104
drwxr-xr-x 17 user user 4096 Nov 29 01:40 .
drwxr-xr-x  3 root root 4096 Jan 16  2021 ..
-rw-------  1 user user 4415 Dec  2 02:28 .bash_history
-rw-r--r--  1 user user  220 Jan 16  2021 .bash_logout
-rw-r--r--  1 user user 3771 Jan 16  2021 .bashrc
drwx------ 16 user user 4096 Jan 18  2021 .cache
-rw-rw-r--  1 user user    0 Nov 25 05:46 cars_backup.sql
-rw-rw-r--  1 user user 4109 Nov 29 01:40 cars_dump_from_rds.sql
-rw-rw-r--  1 user user 3835 Nov 25 05:43 cars_dump.sql
drwx------ 16 user user 4096 Nov 25 00:41 .config
drwxr-xr-x  2 user user 4096 Jan 16  2021 Desktop
drwxr-xr-x  2 user user 4096 Jan 18  2021 Documents
drwxr-xr-x  5 user user 4096 Jan 20  2021 Downloads
drwx------  3 user user 4096 Jan 25  2021 .gnupg
drwxr-xr-x  3 user user 4096 Jan 16  2021 .local
drwx------  5 user user 4096 Jan 16  2021 .mozilla
drwxr-xr-x  2 user user 4096 Jan 16  2021 Music
-rw-------  1 user user 1284 Nov 29 01:38 .mysql_history
drwxrwxr-x  5 user user 4096 Jan 18  2021 .npm
drwxr-xr-x  2 user user 4096 Dec  2 01:34 Pictures
-rw-r--r--  1 user user  807 Jan 16  2021 .profile
drwxr-xr-x  2 user user 4096 Jan 16  2021 Public
-rw-rw-r--  1 user user    0 Jan 16  2021 .selected_editor
drwx------  2 user user 4096 Jan 16  2021 .ssh
-rw-r--r--  1 user user    0 Jan 16  2021 .sudo_as_admin_successful
drwxr-xr-x  2 user user 4096 Jan 16  2021 Templates
drwxr-xr-x  2 user user 4096 Jan 16  2021 Videos
```

Task1.Part2

1)Display all files that contain a character c

Display files that contain a specific sequence of characters

```
user@ubuntu:~$ tree -P '*18.png'  /home/user/Pictures
/home/user/Pictures
└── Screenshot from 2021-11-25 02-13-18.png
```

```
user@ubuntu:~$ tree -P '*c*'  /home/user/Pictures
/home/user/Pictures
├── Screenshot from 2021-11-24 23-42-23.png
├── Screenshot from 2021-11-24 23-55-30.png
├── Screenshot from 2021-11-25 00-03-46.png
├── Screenshot from 2021-11-25 00-04-40.png
├── Screenshot from 2021-11-25 00-37-46.png
├── Screenshot from 2021-11-25 00-41-26.png
├── Screenshot from 2021-11-25 01-07-03.png
├── Screenshot from 2021-11-25 02-13-18.png
├── Screenshot from 2021-11-29 01-36-13.png
├── Screenshot from 2021-11-29 01-37-27.png
├── Screenshot from 2021-11-29 01-41-15.png
├── Screenshot from 2021-11-29 01-42-01.png
├── Screenshot from 2021-12-02 01-34-21.png
└── Screenshot from 2021-12-02 02-28-36.png
```

List subdirectories of the root directory up to and including the second nesting level

```
user@ubuntu:/$ tree -L 2 /boot
/boot
├── config-5.11.0-40-generic
├── config-5.8.0-38-generic
├── efi [error opening dir]
├── grub
│   ├── fonts
│   ├── gfxblacklist.txt
│   ├── grub.cfg
│   ├── grubenv
│   ├── i386-pc
│   └── unicode.pf2
├── initrd.img -> initrd.img-5.11.0-40-generic
├── initrd.img-5.11.0-40-generic
├── initrd.img-5.8.0-38-generic
├── initrd.img.old -> initrd.img-5.8.0-38-generic
├── memtest86+.bin
├── memtest86+.elf
├── memtest86+_multiboot.bin
├── System.map-5.11.0-40-generic
├── System.map-5.8.0-38-generic
├── vmlinuz -> vmlinuz-5.11.0-40-generic
├── vmlinuz-5.11.0-40-generic
├── vmlinuz-5.8.0-38-generic
└── vmlinuz.old -> vmlinuz-5.8.0-38-generic

4 directories, 19 files
```

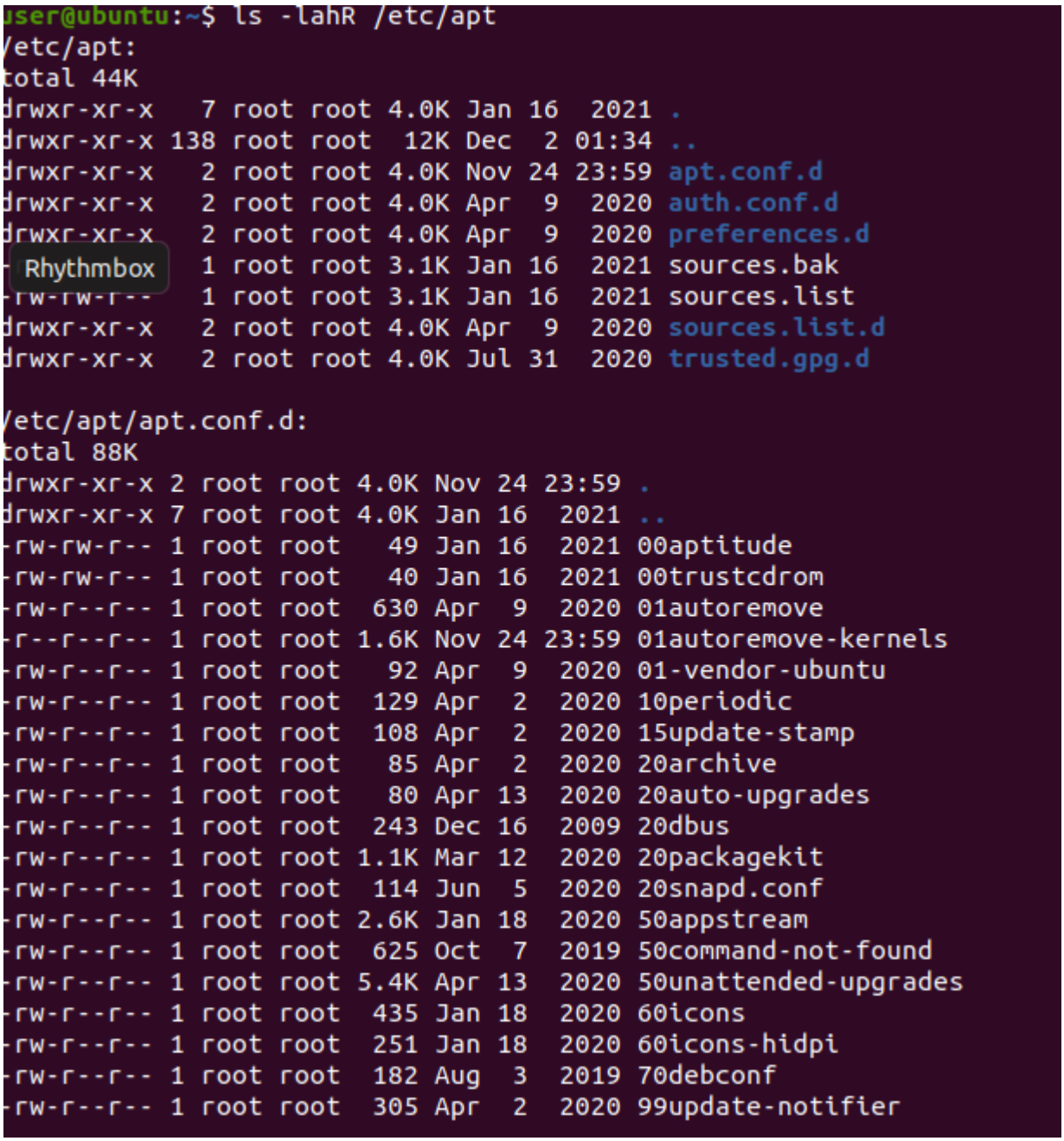
2) Determination of file type

```
user@ubuntu:~/Pictures$ file 'Screenshot from 2021-11-24 23-42-23.png'
Screenshot from 2021-11-24 23-42-23.png: PNG image data, 1837 x 937, 8-bit/color RGBA, non-
interlaced
user@ubuntu:~/Pictures$ file -b ~/cars_dump.sql
ASCII text
```

3) cd ~ - back to home directory

```
user@ubuntu:/$ ls
bin   cdrom  etc   lib    lib64   lost+found  mnt  proc  run   snap  swapfile  tmp  var
boot  dev    home  lib32  libx32  media       opt  root  sbin  srv   sys       usr
user@ubuntu:/$ cd ~
user@ubuntu:~$ ls
cars_backup.sql        cars_dump.sql  Documents  Music      Public     Videos
cars_dump_from_rds.sql  Desktop       Downloads  Pictures   Templates
user@ubuntu:~$ pwd
/home/user
```

4) ls command examples using different keys:
ls -h – human readable format for file sizes
ls -R – list directories recursively
ls -t – newest files by modification type will be first



ls -la
-a, --all - do not ignore entries starting with .
 -l - use a long listing format

5) mkdir subdirectory
tree -d ~ > subdirectory/dirs_in_root_dir.txt
ls -lh subdirectory/dirs_in_root_dir.txt
cp ~/subdirectory/dirs_in_root_dir.txt ~/dirs_in_dir_copy.txt
cp subdirectory/dirs_in_root_dir.txt dirs_in_dir_copy.txt
rm -Ri subdirectory
rm dirs_in_dir_copy.txt

```
user@ubuntu:~$ mkdir subdirectory
user@ubuntu:~$ tree -d ~ > subdirectory/dirs_in_root_dir.txt
user@ubuntu:~$ ls -lh subdirectory/dirs_in_root_dir.txt
-rw-rw-r-- 1 user user 414K Dec  2 06:04 subdirectory/dirs_in_root_dir.txt
user@ubuntu:~$ cp ~/subdirectory/dirs_in_root_dir.txt ~/dirs_in_dir_copy.txt
user@ubuntu:~$ cp subdirectory/dirs_in_root_dir.txt dirs_in_dir_copy.txt
user@ubuntu:~$ rm -Ri subdirectory/
rm: descend into directory 'subdirectory/'? y
rm: remove regular file 'subdirectory/dirs_in_root_dir.txt'? y
rm: remove directory 'subdirectory/'? y
user@ubuntu:~$ rm dirs_in_dir_copy.txt
user@ubuntu:~$ ls
cars_backup.sql         cars_dump.sql  Documents  Music     Public     Videos
cars_dump_from_rds.sql  Desktop        Downloads  Pictures  Templates
user@ubuntu:~$
```

6) mkdir test
cp .bash_history /test/labwork2
ln test/labwork2 hardlink
ln -s test/labwork2 softlink

When softlink is defined, it acts as a pointer to the file name. On the other hand, hardlink acts as a mirrored copy of selected file and accesses the data available in it. Hardlink and file will have the same inode as they are in fact different names of the same file.

```
user@ubuntu:~$ cp .bash_history test/labwork2
user@ubuntu:~$ ln -s test/labwork2 softlink
user@ubuntu:~$ head -10 softlink
ifconfig
mc
shutdown -h now
sudo update
sudo apt update
sudo apt upgrade
ifconfig
sudo apt install net-tools
mc
sudo apt install mc
user@ubuntu:~$ vi softlink
user@ubuntu:~$ head -10 test/labwork2
fdadfasdfadferqwwwerreeeeeeeeeeee____df-asfasfjdasfjkdas;f
shutdown -h now
sudo update
sudo apt update
sudo apt upgrade
ifconfig
sudo apt install net-tools
mc
sudo apt install mc
mc
user@ubuntu:~$
```

Changing data with softlink also changes file, because in fact original file was opened by this link. But if I had deleted or changed attributes of softlink, file labwork2 would stay constant unlike hardlink.

```
user@ubuntu:~$ mv hardlink hard_lnk_labwork2
user@ubuntu:~$ mv softlink symb_lnk_labwork2 file
mv: target 'file' is not a directory
user@ubuntu:~$ mv softlink "symb_lnk_labwork2 file"
user@ubuntu:~$ ls
 cars_backup.sql          Documents           Pictures                  test
 cars_dump_from_rds.sql   Downloads           Public                    Videos
 cars_dump.sql            hard_lnk_labwork2  'symb_lnk_labwork2 file'
 Desktop                  Music               Templates
user@ubuntu:~$
user@ubuntu:~$ rm test/labwork2
```

```
user@ubuntu:~$ head -5 symb_lnk_labwork2\ file
head: cannot open 'symb_lnk_labwork2 file' for reading: No such file or directo
ry
user@ubuntu:~$ head -5 hard_lnk_labwork2
sudo update
sudo apt update
sudo apt upgrade
ifconfig
sudo apt install net-tools
```

If hardlink is deleted, linked file will exists till there will be only one link to it. Only directory where it exists will change. Symbolic link after removing file starts to point on non-existed element.

7) Using the locate utility, find all files that contain the squid and traceroute sequence.

```
user@pc:~$ locate -b squid
/home/user/.local/share/Google/AndroidStudio4.1/idea-multimarkdown/emojis/squid.
png
/usr/share/augeas/lenses/dist/squid.aug
/usr/share/augeas/lenses/dist/tests/test_squid.aug
/usr/share/vim/vim80/syntax/squid.vim
user@pc:~$ locate -b traceroute
/etc/alternatives/traceroute6
/etc/alternatives/traceroute6.8.gz
/home/user/Downloads/Facebook/com.facebook.orca/lib-superpack-xz/libtraceroute-j
ni.so
/home/user/Downloads/Facebook/com.facebook.orca/lib-superpack-xz/libxplat_tracer
oute_tracerouteAndroid.so
/home/user/Downloads/Facebook/lib-superpack-xz/libtraceroute-jni.so
/home/user/Downloads/Facebook/lib-superpack-xz/libxplat_traceroute_tracerouteAnd
roid.so
/lib/modules/4.15.0-162-generic/kernel/drivers/tty/n_tracerouter.ko
/lib/modules/4.15.0-163-generic/kernel/drivers/tty/n_tracerouter.ko
/usr/bin/traceroute6
/usr/bin/traceroute6.iputils
/usr/share/man/man8/traceroute6.8.gz
/usr/share/man/man8/traceroute6.iputils.8.gz
/usr/share/nmap/scripts/http-traceroute.nse
/usr/share/nmap/scripts/targets-traceroute.nse
/usr/share/nmap/scripts/traceroute-geolocation.nse
```

8) Partitions mounted in the system, as well as the types of these partitions.

```
user@ubuntu:~$ lsblk -f
NAME   FSTYPE   LABEL UUID                                 FSAVAIL FSUSE% MOUNTPOINT
loop0  squashfs                                                 0   100% /snap/bare/5
loop1  squashfs                                                 0   100% /snap/core18/1944
loop2  squashfs                                                 0   100% /snap/core18/2253
loop3  squashfs                                                 0   100% /snap/gnome-3-34-1804/77
loop4  squashfs                                                 0   100% /snap/core20/1242
loop5  squashfs                                                 0   100% /snap/gnome-3-38-2004/87
loop6  squashfs                                                 0   100% /snap/gnome-3-34-1804/66
loop7  squashfs                                                 0   100% /snap/gtk-common-themes/1514
loop8  squashfs                                                 0   100% /snap/snap-store/518
loop9  squashfs                                                 0   100% /snap/gtk-common-themes/1519
loop10 squashfs                                                 0   100% /snap/snap-store/558
loop11 squashfs                                                 0   100% /snap/snapd/14066
loop12 squashfs                                                 0   100% /snap/snapd/10707
sda
├─sda1 vfat           5D3B-13DA                               511M     0% /boot/efi
├─sda2
└─sda5 ext4           a2f0d0a3-8122-49af-b165-85be7d48404b    7.9G    53% /
sr0
user@ubuntu:~$ df -T
Filesystem     Type     1K-blocks     Used Available Use% Mounted on
udev           devtmpfs   1962360        0   1962360   0% /dev
tmpfs          tmpfs       399020     1816    397204   1% /run
/dev/sda5      ext4      19992176 10654320   8299264  57% /
tmpfs          tmpfs      1995092        0   1995092   0% /dev/shm
tmpfs          tmpfs         5120        4      5116   1% /run/lock
tmpfs          tmpfs      1995092        0   1995092   0% /sys/fs/cgroup
/dev/loop0     squashfs       128      128         0 100% /snap/bare/5
/dev/loop2     squashfs     56832    56832         0 100% /snap/core18/2253
/dev/loop1     squashfs     56832    56832         0 100% /snap/core18/1944
/dev/loop3     squashfs    224256   224256         0 100% /snap/gnome-3-34-1804/77
/dev/loop4     squashfs     63360    63360         0 100% /snap/core20/1242
/dev/loop5     squashfs    253952   253952         0 100% /snap/gnome-3-38-2004/87
/dev/loop6     squashfs    224256   224256         0 100% /snap/gnome-3-34-1804/66
/dev/loop7     squashfs     66432    66432         0 100% /snap/gtk-common-themes/1514
/dev/loop8     squashfs     52352    52352         0 100% /snap/snap-store/518
/dev/loop9     squashfs     66816    66816         0 100% /snap/gtk-common-themes/1519
/dev/loop10    squashfs     55552    55552         0 100% /snap/snap-store/558
/dev/loop11    squashfs     43264    43264         0 100% /snap/snapd/14066
/dev/loop12    squashfs     31872    31872         0 100% /snap/snapd/10707
/dev/sda1      vfat        523248        4    523244   1% /boot/efi
tmpfs          tmpfs       399016       24    398992   1% /run/user/1000
```

9) Count the number of lines containing a given sequence of characters in a given file. 19 lines in file labwork2 contains string “labwork2”.

```
user@ubuntu:~$ wc -l test/labwork2
412 test/labwork2
user@ubuntu:~$ gre
user@ubuntu:~$ grep -c labwork2 test/labwork2
19
user@ubuntu:~$
```

10) Using the find command, find all files in the /etc directory containing the host character sequence.

find /etc -type f -exec grep -l "host" {} \; - finding file containing string
find /etc -name hosts – to find files containing string in its names

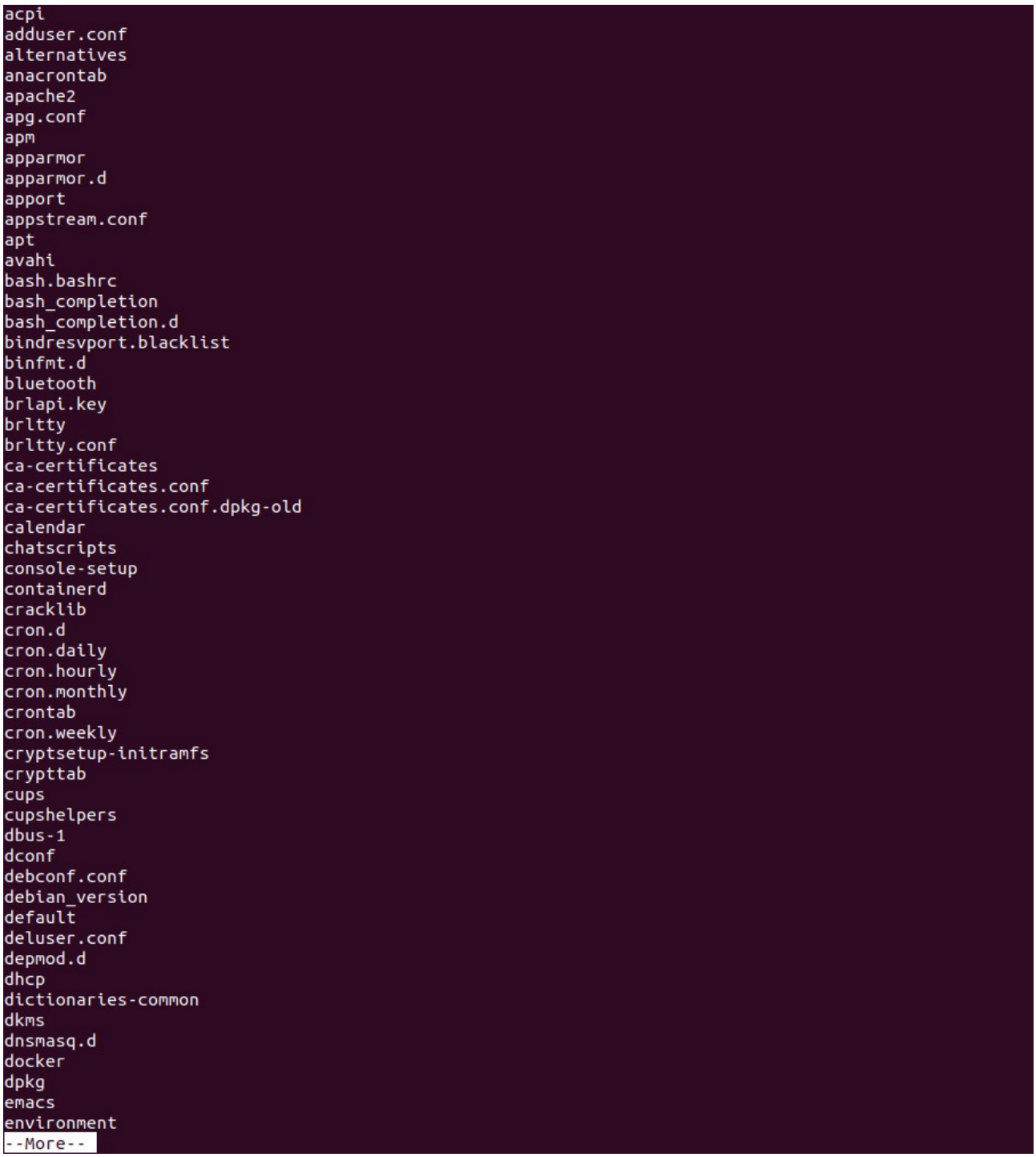
```
user@ubuntu:~$ find /etc -type f -exec grep -l "host" {} \;
/etc/avahi/avahi-daemon.conf
/etc/avahi/hosts
/etc/nsswitch.conf
/etc/mc/mc.menu
/etc/X11/Xsession.d/60x11-common_localhost
/etc/X11/Xsession.d/35x11-common_xhost-local
/etc/X11/rgb.txt
/etc/sane.d/dc240.conf
/etc/sane.d/dc210.conf
/etc/sane.d/dell1600n_net.conf
/etc/sane.d/net.conf
/etc/sane.d/saned.conf
/etc/sane.d/dc25.conf
grep: /etc/.pwd.lock: Permission denied
/etc/mysql/mysql.conf.d/mysqld.cnf
grep: /etc/mysql/debian.cnf: Permission denied
/etc/apache2/conf-available/php7.4-fpm.conf
/etc/apache2/conf-available/other-vhosts-access-log.conf
/etc/apache2/conf-available/security.conf
```

```
user@ubuntu:~$ find /etc -name hosts
/etc/avahi/hosts
/etc/hosts
find: ‘/etc/cups/ssl’: Permission denied
find: ‘/etc/ssl/private’: Permission denied
find: ‘/etc/polkit-1/localauthority’: Permission denied
user@ubuntu:~$ sudo find /etc -name hosts
[sudo] password for user:
/etc/avahi/hosts
/etc/hosts
```

11) List all objects in /etc that contain the ss character sequence. How can I duplicate a similar command using a bunch of grep?

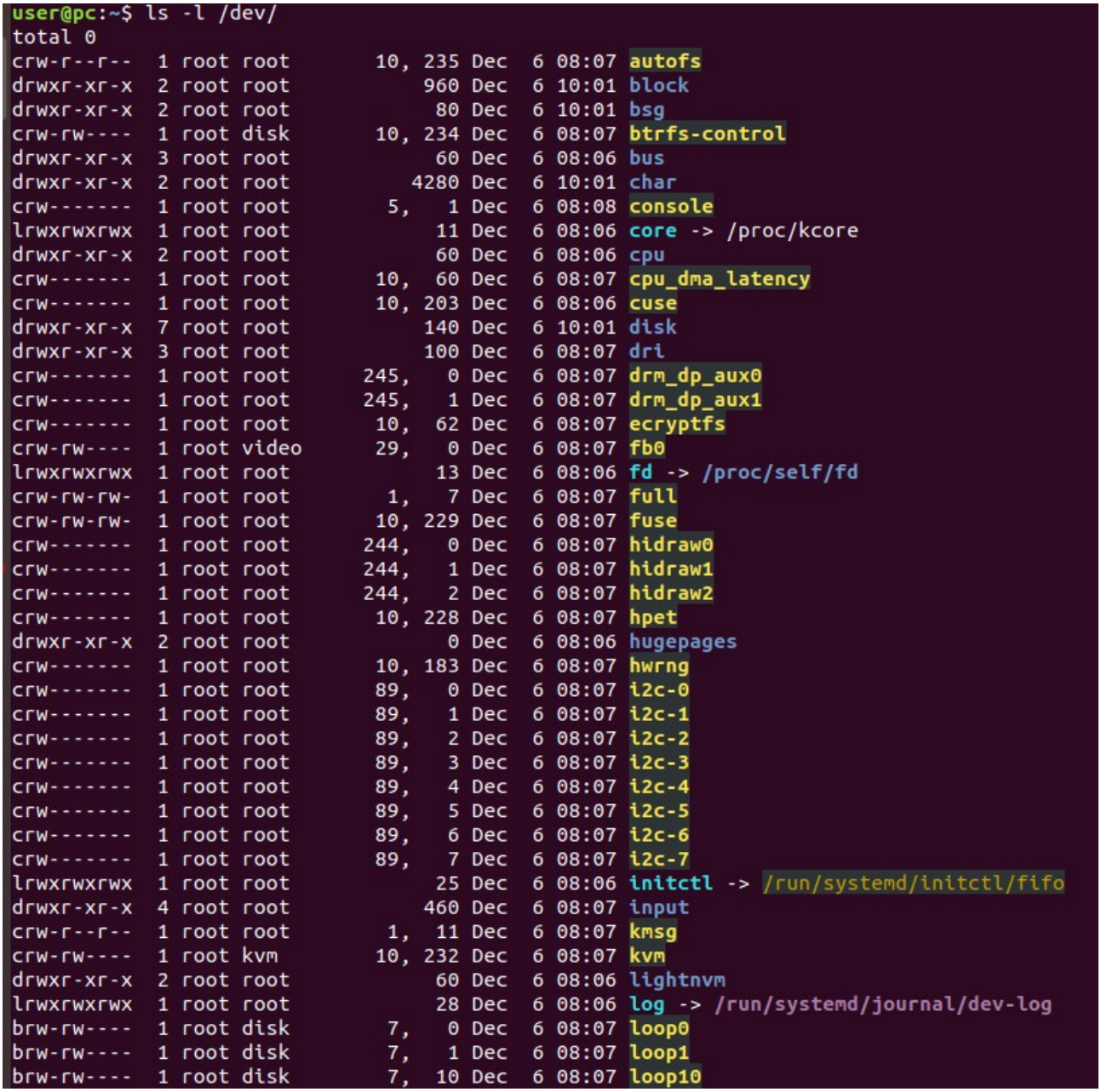
ls -al | grep “”
locate *etc*/*ss*
grep -ril “ss” /etc
grep -r /etc -e “ss”

12) Screen-by-screen print of the contents of the /etc directory.
ls -la /etc | more
Also less command can be used. SPACE usage will show output by pages.



13) Types of devices, determination of device type with examples.

There are two main types of devices in Linux kernel: character(transfer data by one a character at a time) and block (transfer data, but in large fixed-sized blocks). Also network devices can be distinguished – any device that is able to exchange data with other hosts. It's socket(facilitate communication between processes with many devices at once) pipe(allows two or more processes to communicate with each other) devices. First



Devices types described in first byte of ls -l listing.

14) How to determine the type of file in the system, what types of files are there?

Linux supports 7 file types:
- “-” regular
- “d” - directory files
special :
- “p” - named pipe file
- “l” - link
- “b” - block
- “c” - character
- “s” - socket
File types are also can be shown in first byte of ls -l listing.

15) List the first 5 directory files that were recently accessed in the /etc directory.