Task1.Part2

1) Examine the **tree** command. Master the technique of applying a template, for example, display all files that contain a character **c**, or files that contain a specific sequence of characters. List subdirectories of the root directory up to and including the second nesting level.

contain a specific sequence of characters

```
yaroslav@nitro-5:~/Downloads/VirtualMachine/Ubuntu-20210617T154229Z-001$ tree -P VBox*
.
└── Ubuntu
    ├── Logs
    │   ├── VBoxHardening.log
    │   ├── VBox.log
    │   ├── VBox.log.1
    │   ├── VBox.log.2
    │   └── VBox.log.3
    └── Snapshots

3 directories, 5 files
yaroslav@nitro-5:~/Downloads/VirtualMachine/Ubuntu-20210617T154229Z-001$
```

second nesting level

```
root@nitro-5:~# tree -L 2
.
└── snap
    ├── snap-store
    └── telegram-desktop

3 directories, 0 files
```

2) What command can be used to determine the type of file (for example, text or binary)? Give an example.

```
yaroslav@nitro-5:~/Desktop$ file basic.py
basic.py: Python script, ASCII text executable
```

3) Master the skills of navigating the file system using relative and absolute paths. How can you go back to your home directory from anywhere in the filesystem?

cd/cd~/cd $HOME command to go back to your home directory

```
yaroslav@nitro-5:~$ cd Downloads/VirtualMachine/Ubuntu-20210617T154229Z-001/
yaroslav@nitro-5:~/Downloads/VirtualMachine/Ubuntu-20210617T154229Z-001$ cd
yaroslav@nitro-5:~$ ls
 Desktop   Documents   Downloads   Music   Pictures   Public   python_projects   snap   Templates   Videos   'VirtualBox VMs'
yaroslav@nitro-5:~$
```

4) Become familiar with the various options for the **ls** command. Give examples of listing directories using different keys. Explain the information displayed on the terminal using the **-l** and **-a** switches.

ls -i command shows inodes of files in directory

ls -a command shows files starting with . (hidden filles) additionally to others

ls -l command shows detailed list of files including information about file permissions, owner, group, date of creation and size of files in directory

```
yaroslav@nitro-5:~$ ls -a
 .                .bashrc     Downloads    .java       .pam_environ
 ..               .cache      .gitconfig   .keras      Pictures
 .1.py.swp        .config     .gnupg       .local      .pki
 .bash_history    Desktop     .gphoto      .mozilla    .profile
 .bash_logout     Documents   .ipython     Music       Public
yaroslav@nitro-5:~$ ls -l
total 44
drwxr-xr-x 4 yaroslav yaroslav 4096 фев 15 21:49  Desktop
drwxr-xr-x 2 yaroslav yaroslav 4096 фев 15 19:59  Documents
drwxr-xr-x 4 yaroslav yaroslav 4096 фев 15 19:23  Downloads
drwxr-xr-x 2 yaroslav yaroslav 4096 окт  9 01:07  Music
drwxr-xr-x 2 yaroslav yaroslav 4096 фев 15 22:07  Pictures
drwxr-xr-x 2 yaroslav yaroslav 4096 окт  9 01:07  Public
drwxrwxr-x 8 yaroslav yaroslav 4096 фев 12 11:38  python_projects
drwx------ 5 yaroslav yaroslav 4096 окт  9 20:35  snap
drwxr-xr-x 2 yaroslav yaroslav 4096 окт  9 01:07  Templates
drwxr-xr-x 2 yaroslav yaroslav 4096 окт  9 01:07  Videos
drwxrwxr-x 4 yaroslav yaroslav 4096 фев 15 13:03 'VirtualBox VMs'
```

5) Perform the following sequence of operations:
- create a subdirectory in the home directory;

```
yaroslav@nitro-5:~$ cd
yaroslav@nitro-5:~$ mkdir subdirectory
```

- in this subdirectory create a file containing information about directories located in the root directory (using I/O redirection operations);

```
yaroslav@nitro-5:~/subdirectory$ ls -a /home/yaroslav > root_info.txt
```

- view the created file;

```
yaroslav@nitro-5:~/subdirectory$ cat root_info.txt
.
..
.1.py.swp
.bash_history
.bash_logout
.bashrc
.cache
```

- copy the created file to your home directory using relative and absolute addressing.

```
yaroslav@nitro-5:~/subdirectory$ cp root_info.txt /home/yaroslav/
```

```
yaroslav@nitro-5:~/subdirectory$ cp root_info.txt ../
```

- delete the previously created subdirectory with the file requesting removal;

```
yaroslav@nitro-5:~$ sudo rm -rf subdirectory/
[sudo] password for yaroslav:
```

- delete the file copied to the home directory.

```
yaroslav@nitro-5:~$ sudo rm root_info.txt
```

6) Perform the following sequence of operations:

- create a subdirectory **test** in the home directory;
- copy the **.bash_history** file to this directory while changing its name to **labwork2**;

```
yaroslav@nitro-5:~$ mkdir test
yaroslav@nitro-5:~$ cp ~/.bash_history test/labwork2
```

- create a hard and soft link to the **labwork2** file in the test subdirectory; - how to define soft and hard link, what do these concepts;

hard link points to the exact same spot on the hard drive

soft link points to file’s name, so it doesn't point to a spot on the hard drive

```
yaroslav@nitro-5:~/test$ ls -l
total 72
-rw------- 2 yaroslav yaroslav 34666 фев 15 23:01 hard_link_labwork2
-rw------- 2 yaroslav yaroslav 34666 фев 15 23:01 labwork2
lrwxrwxrwx 1 yaroslav yaroslav     8 фев 15 22:55 soft_link_labwork2 -> labwork2
```

- change the data by opening a symbolic link. What changes will happen and why

in case of changing files soft links are similar to hardlinks as any changes to the data in either file is reflected in the other

```
yaroslav@nitro-5:~/test$ vim soft_link_labwork2
yaroslav@nitro-5:~/test$ cat labwork2
changing data
sudo apt-get install google-chrome
```

- rename the hard link file to **hard_lnk_labwork2**;

```
yaroslav@nitro-5:~/test$ mv hard_link_labwork2 hard_lnk_labwork2
```

- rename the soft link file to **symb_lnk_labwork2 file**;

```
yaroslav@nitro-5:~/test$ mv soft_link_labwork2 symb_lnk_labwork2_file
yaroslav@nitro-5:~/test$ ls
hard_lnk_labwork2  labwork2  symb_lnk_labwork2_file
yaroslav@nitro-5:~/test$ ls -l
total 72
-rw------- 2 yaroslav yaroslav 34688 фев 15 23:15 hard_lnk_labwork2
-rw------- 2 yaroslav yaroslav 34688 фев 15 23:15 labwork2
lrwxrwxrwx 1 yaroslav yaroslav     8 фев 15 23:17 symb_lnk_labwork2_file -> labwork2
```

- then delete the **labwork2**. What changes have occurred and why?

file exists till the last hard link exists
symb_lnk file is empty as it was a pointer to a file’s name which was deleted, so it points to nothing

```
yaroslav@nitro-5:~/test$ rm labwork2
yaroslav@nitro-5:~/test$ ls
hard_lnk_labwork2  symb_lnk_labwork2_file
yaroslav@nitro-5:~/test$ ls -l
total 36
-rw------- 1 yaroslav yaroslav 34688 фев 15 23:15 hard_lnk_labwork2
lrwxrwxrwx 1 yaroslav yaroslav     8 фев 15 23:17 symb_lnk_labwork2_file -> labwork2
```

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

```
root@nitro-5:/home/yaroslav# updatedb
/usr/bin/find: '/run/user/1000/doc': Permission denied
/usr/bin/find: '/run/user/1000/gvfs': Permission denied
root@nitro-5:/home/yaroslav# locate squid
/usr/share/vim/vim81/syntax/squid.vim
root@nitro-5:/home/yaroslav# locate traceroute
/etc/alternatives/traceroute6
/etc/alternatives/traceroute6.8.gz
/usr/bin/traceroute6
/usr/bin/traceroute6.iputils
/usr/share/man/man8/traceroute6.8.gz
/usr/share/man/man8/traceroute6.iputils.8.gz
/usr/share/remmina/external_tools/remmina_traceroute.sh
/usr/src/linux-hwe-5.13-headers-5.13.0-27/tools/testing/selftests/net/traceroute.sh
/usr/src/linux-hwe-5.13-headers-5.13.0-28/tools/testing/selftests/net/traceroute.sh
/var/lib/dpkg/alternatives/traceroute6
```

8) Determine which partitions are mounted in the system, as well as the types of these partitions.

```
yaroslav@nitro-5:~$ mount -l
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,noexec,relatime,size=3956212k,nr_inodes=989053,mode=755,inode64)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,nodev,noexec,relatime,size=797936k,mode=755,inode64)
```

9) Count the number of lines containing a given sequence of characters in a given file

```
yaroslav@nitro-5:~/Desktop$ less basic.py | grep -c "def"
28
```

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

```
yaroslav@nitro-5:~$ find /etc -type f -name "*host*"
find: ‘/etc/polkit-1/localauthority’: Permission denied
find: ‘/etc/ssl/private’: Permission denied
/etc/hosts.deny
/etc/host.conf
/etc/hosts.allow
/etc/hostname
/etc/hosts
find: ‘/etc/cups/ssl’: Permission denied
/etc/ssh/ssh_host_ecdsa_key
/etc/ssh/ssh_host_rsa_key
/etc/ssh/ssh_host_ed25519_key.pub
/etc/ssh/ssh_host_ecdsa_key.pub
/etc/ssh/ssh_host_rsa_key.pub
/etc/ssh/ssh_host_ed25519_key
/etc/avahi/hosts
/etc/hostid
/etc/X11/Xsession.d/60x11-common_localhost
/etc/X11/Xsession.d/35x11-common_xhost-local
```

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

```
yaroslav@nitro-5:~$ find /etc -name '*ss*'
/etc/rc5.d/S01ssh
/etc/dbus-1/system.d/net.hadess.SwitcherooControl.conf
/etc/dbus-1/system.d/net.hadess.SensorProxy.conf
/etc/dbus-1/session.d
```

with grep

```
yaroslav@nitro-5:~$ find /etc | grep ss
find: ‘/etc/polkit-1/localauthority’: Permission denied
/etc/rc5.d/S01ssh
/etc/dbus-1/system.d/net.hadess.SwitcherooControl.conf
/etc/dbus-1/system.d/net.hadess.SensorProxy.conf
```

12) Organize a screen-by-screen print of the contents of the /etc directory. Hint: You must use stream redirection operations.

```
yaroslav@nitro-5:~$ ls -al /etc | less
```

13) What are the types of devices and how to determine the type of device? Give examples.

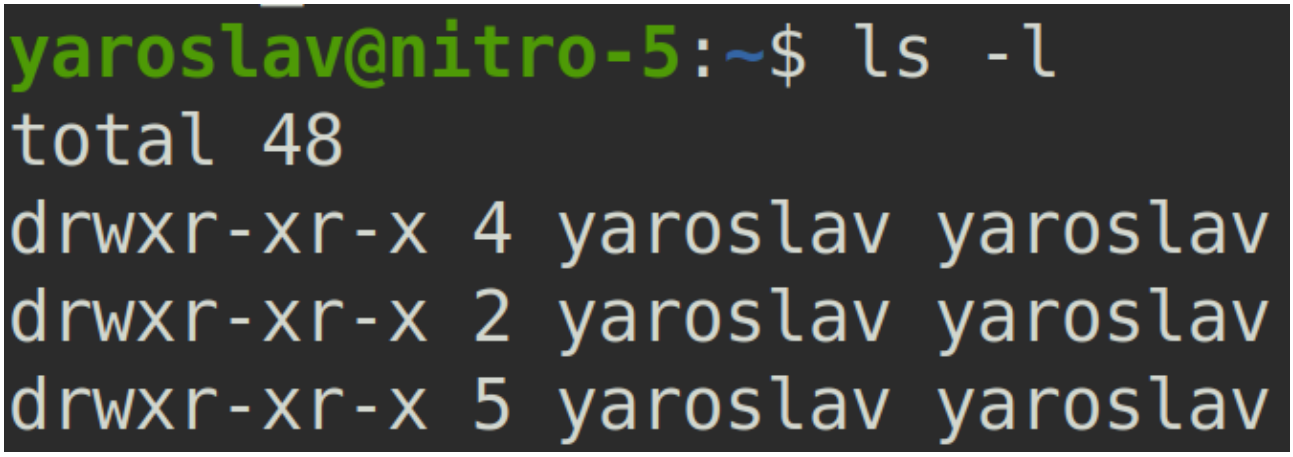
it's stored in /dev, e.g. /dev/fd0 – the floppy drive zero, /dev/sda - the first hard drive, etc

lspci command

```
yaroslav@nitro-5:~$ lspci
00:00.0 Host bridge: Intel Corporation 8th
00:01.0 PCI bridge: Intel Corporation Xeon
00:02.0 VGA compatible controller: Intel C
00:08.0 System peripheral: Intel Corporati
00:12.0 Signal processing controller: Inte
00:14.0 USB controller: Intel Corporation
00:14.2 RAM memory: Intel Corporation Cann
```

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

first character indicates the file type
- - regular
d – directory
b – block device
c – character device
l – soft link
p – pipe
s - socket



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

```
root@nitro-5:/etc# ls -t | head -n 5
cups
alternatives
cron.daily
ssh
rc2.d
```

with find command

```
yaroslav@nitro-5:~$ find . -type f -mmin -10 -ls | head -n 5
```