Recourses:

VirtualBox Graphical User Interface. Version 6.1.18 r142142 (Qt5.6.2)

mv Ubuntu 20

sb_release -a

```
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 20.04.2 LTS
Release:        20.04
Codename:       focal
```

Exercises about file and directory permission

1. List the permissions in your current directory, including hidden files.

   ls -la

```
zeus@zeus-VirtualBox:~$ ls -la
total 2380
drwxr-xr-x 39 zeus zeus    4096 feb  5 14:31  .
drwxr-xr-x  4 root root    4096 ene 30 17:08  ..
-rw-rw-r--  1 zeus zeus 1289200 ene 14 15:48  apt_2.0.4_amd64.deb
-rw-------  1 zeus zeus   44304 feb  5 14:23  .bash_history
-rw-r--r--  1 zeus zeus     220 ago 15 19:33  .bash_logout
-rw-r--r--  1 zeus zeus    3771 ago 15 19:33  .bashrc
drwxrwxr-x 22 zeus zeus    4096 feb  5 14:31  .cache
drwxrwxr-x  3 zeus zeus    4096 nov 13 23:22  .codeintel
drwxr-xr-x 21 zeus zeus    4096 feb  4 09:22  .config
drwxrwxr-x  2 zeus zeus    4096 feb  4 18:34  config
```

2. Create a file called perm1. Now, check the default permissions and user and group ownership

   touch perm1
   cd exercises/
   ls -la perm1

```
zeus@zeus-VirtualBox:~$ cd exercises/
zeus@zeus-VirtualBox:~/exercises$ ls -la perm1
-rw-r--r-- 1 zeus zeus 0 feb  4 18:44 perm1
zeus@zeus-VirtualBox:~/exercises$
```

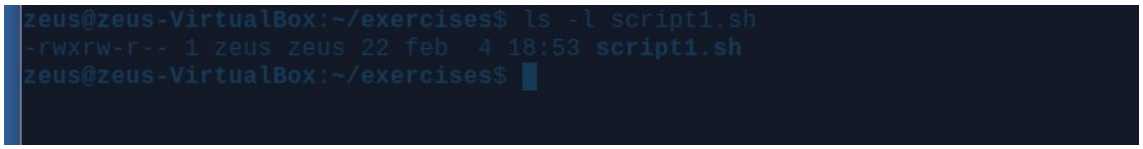
3. Change permissions of perm1 so that everyone can read and only the owner user can write. Specify the command in all possible ways.

   chmod 644 perm1
   ls -l perm1
   chmod u=rw,go=r perm1
   ls -l perm1
   chmod a=r,u=rw perm1
   ls -l perm1
   chmod a=r,u+w perm1 # adding all read permission and user also write permission
   ls -l perm1

4. Create a file called script1.sh, including the content below. List the default permissions.

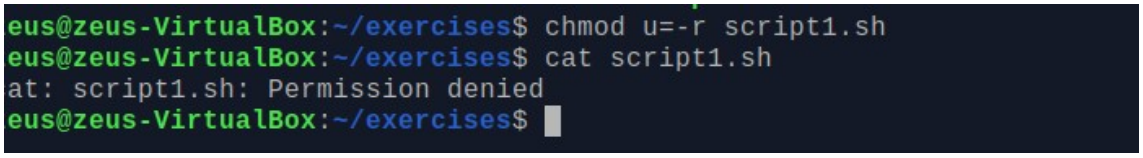
```
#!/bin/bash
clear who
```

nano script1.sh
cat script1.sh
ls -l script1.sh



5. Remove the read permission from the owner and try to open the file

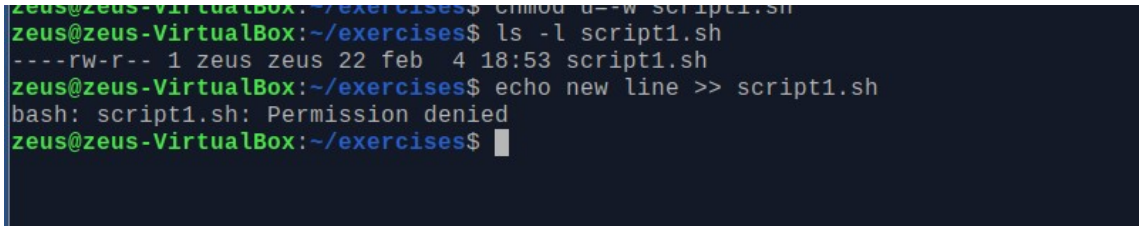
chmod u=-r script1.sh
cat script1.sh



6. Remove the write permission from the owner on the file script.sh. Add the line below. Is it possible? Why?

```
new line
```

chmod u=-w script1.sh
ls -l script1.sh
echo new line >> script1.sh



7. Change the permissions on the file script1.sh so that the owner can read, write and execute, but you deny all the permissions from the group and others.

chmod 700 script1.sh

8. Add the line indicated in exercise 6, in case it was not possible. Try to run the file like a command.

ls -l script1.sh
echo new line >> script1.sh
./script.sh

```
-rwx------ 1 zeus zeus 22 feb  4 18:53 script1.sh
zeus@zeus-VirtualBox:~/exercises$ echo new line >> script1.sh
zeus@zeus-VirtualBox:~/exercises$ ./script.sh
File  Edit  View  Terminal  Tabs  Help
zeus     tty7         2021-02-05 14:28 (:0)
./script1.sh: line 4: new: command not found
zeus@zeus-VirtualBox:~/exercises$
```

9. Remove the read permission from the owner on the file script1.sh. Try to run the file. Is it possible?

   chmod u=-r script1.sh
   ls -l script1.sh

```
zeus@zeus-VirtualBox:~/exercises$ chmod u=-r script1.sh
zeus@zeus-VirtualBox:~/exercises$ ls -l script1.sh
---------- 1 zeus zeus 31 feb  5 14:50 script1.sh
zeus@zeus-VirtualBox:~/exercises$ ./script1.sh
bash: ./script1.sh: Permission denied
zeus@zeus-VirtualBox:~/exercises$
```

   No

10. Create a directory called “systems”. Remove the write permission from it and try to copy script1.sh inside.

    mkdir systems
    chmod u=-w systems # removing only write
    cp scripts systems/*

11. If you were not able to copy the file, add the write permission again and copy the file inside.

    chmod u+w   script1.sh
    cp scr ipts systems/*

```
zeus@zeus-VirtualBox:~/exercises$ mkdir systems
zeus@zeus-VirtualBox:~/exercises$ chmod u=-w   systems
zeus@zeus-VirtualBox:~/exercises$ cp script1.sh systems/
cp: cannot stat 'systems/script1.sh': Permission denied
zeus@zeus-VirtualBox:~/exercises$
```

12. Remove the read permission from the user on the directory “systems” and try to list its contents.

    chmod u-r   script1.sh
    ls –l systems   //for lis if systems exists in the present directory

```
zeus@zeus-VirtualBox:~/exercises$ mkdir systems
zeus@zeus-VirtualBox:~/exercises$ chmod u=-w   systems
zeus@zeus-VirtualBox:~/exercises$ cp script1.sh systems/
cp: cannot stat 'systems/script1.sh': Permission denied
zeus@zeus-VirtualBox:~/exercises$ chmod u=-r    systems
zeus@zeus-VirtualBox:~/exercises$ ls -l systems
ls: cannot access '-l': No such file or directory
ls: cannot open directory 'systems': Permission denied
zeus@zeus-VirtualBox:~/exercises$ grep systems .
grep: .: Is a directory
zeus@zeus-VirtualBox:~/exercises$ ls -l
ls: cannot access '-l': No such file or directory
zeus@zeus-VirtualBox:~/exercises$ ls -l
total 32
drwxrwxr-x 4 zeus zeus 4096 ene 14 21:07 Africa
drwxrwxr-x 6 zeus zeus 4096 ene 22 13:49 Asia
drwxrwxr-x 2 zeus zeus 4096 ene 21 21:31 filemanipulation
-rw-rw-r-- 1 zeus zeus    0 ene 16 12:50 luggage
drwxrwxr-x 3 zeus zeus 4096 ene 16 12:10 ONE
-rw-r--r-- 1 zeus zeus    0 feb  4 18:44 perm1
drwxrwxr-x 2 zeus zeus 4096 ene 16 11:37 pro-c
---------- 1 zeus zeus   31 feb  5 14:50 script1.sh
```

13. Change the permissions from “sytems” so that the owner can read, write and execute, but the group and others can only read.

    chmod 744 systems
    ls –l systems
        drwxr--r-- 2 zeus zeus 4096 feb 6 09:57 systems

```
zeus@zeus-VirtualBox:~/exercises$ chmod 744    systems
zeus@zeus-VirtualBox:~/exercises$ ls -l systems/
total 0
zeus@zeus-VirtualBox:~/exercises$
```

14. Remove the execute permission from “systems”. Can you execute systems/script1.sh? Is it possible to acces the directory to execute the file?

    chmod 444 systems/script.sh
    bash systems/script.sh
    ls –l systems

```
zeus@zeus-VirtualBox:~/exercises$ chmod 444    systems
zeus@zeus-VirtualBox:~/exercises$ bash  systems/script.sh
bash: systems/script.sh: Permission denied
zeus@zeus-VirtualBox:~/exercises$ ls -l systems
ls: cannot access '-l': No such file or directory
systems:
```

15. Assign the execute permission to the directory again

    chmod a+x systems
    ls -ld systems
        drwxr-xr-x 2 zeus zeus 4096 feb 6 09:57 systems

```
zeus@zeus-VirtualBox:~/exercises$ chmod a+x    systems/
zeus@zeus-VirtualBox:~/exercises$ ls -l systems/
total 0
zeus@zeus-VirtualBox:~/exercises$
```

16. Create two files called “lucy” and “charles” into “systems”. Change permissions of “charles”, so that others can write and execute.

    touch systems {lucy, charles}
    ls -l systems
        -rw-rw-r-- 1 zeus zeus 0 feb 5 15:04 charles
        -rw-rw-r-- 1 zeus zeus 18 feb 6 09:57 lucy
    chmod o+wx systems/Charles
    ls -ld systems/ charles
        total 4
        -rw-rw-rwx 1 zeus zeus 0 feb 5 15:04 charles

17. Change permissions of “lucy” so that the owner can read and execute, the group can read and write and others can only write. Specify the command in all possible ways.

        -rw-rw-r-- 1 zeus zeus 18 feb 6 09:57 lucy
    chmod u=rx,g=rw,o=w systems/lucy
    ls -ld systems/lucy
        -r-xrw--w- 1 zeus zeus 18 feb 6 09:57 systems/lucy

    chmod 562 systems/lucy
    chmod u+rx-w,g=rw,o+w-r systems/lucy

```
chmod u=rx,g=rw,o=w    systems/lucy
```

18. Log in as root. Change the ownership of “charles” to “root”. Exit the root session. Now, try to change the permission so that others cannot read and execute. Is it possible? No Why? Because only owner can set permissions

```
ls -l systems
      -rw-rw-r-- 1 zeus zeus  0 feb  5 15:04 charles
sudo chown root systems/charles
ls -l systems/
       chmod: changing permissions of 'systems/charles': Operation not permitted
```

19. Change the permissions of “charles” so that everybody can do everything

```
sudo chown zeus:zeus systems/charles
ls -l charles
       -rw-rw-r-- 1 zeus zeus 0 feb  5 15:04 charles
chmod 777 systems/charles  # chmod a=rwx systems/charles
ls -l charles
       -rwxrwxrwx 1 zeus zeus 0 feb  5 15:04 charles
```

20. Change the permissions of “lucy” so that the group can read and write, but the owner and others cannot do anything. Can you open the file? No

```
sudo chmod 060 systems/lucy
ls -l systems/lucy
       ----rw---- 1 zeus zeus 18 feb  6 09:57 systems/lucy
cat  systems/lucy
       cat: systems/lucy: Permission denied
```

21. Create a group called “newgroup”. Set the group as the owner of the file “lucy” and “root” as the owner user.

```
sudo addgroup newgroup
       Adding group `newgroup' (GID 1002) ...
       Done.
chgrp newgroup systems/lucy
ls -l systems/lucy
       ----rw---- 1 zeus newgroup 18 feb  6 09:57 systems/lucy

chown root systems/lucy
chown: changing ownership of 'lucy': Operation not permitted
sudo chown root systems/lucy
ls -l
       total 0
       -rwxrwxrwx 1 zeus zeus     0 feb  5 15:04 charles
       ----rw----   1 root newgroup 18 feb  6 09:57 systems/lucy
```

22. Add your user to the secondary group “newgroup”. Try to open the file “lucy” now. Is it possible? Yes

```
sudo usermod -G newgroup -a zeus
id zeus
```

```
        uid=1000(zeus) gid=1000(zeus)
        groups=1000(zeus),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),121(lpadmin),1
        31(lxd),132(sambashare),998(vboxsf),1002(newgroup)
    cat systems/lucy
        Lucy is available
```

23. Change permissions of “lucy” so that everybody can read.

```
sudo chmod a+r systems/lucy
cat  systems/lucy
        r--r--r-- 1 root newgroup 18 feb  6 09:57 systems/lucy
```

24. Do exercise 13 again, but this time granting permissions to the folder “systems” including files and subfolders

```
chmod 777 -R systems/
        chmod: changing permissions of 'systems/lucy': Operation not permitted
```

25. Change the group owner of “systems” to “root” including files and subfolders.

```
chgrp  root -R systems/
chgrp: changing group of 'systems/lucy': Operation not permitted
chgrp: changing group of 'systems/charles': Operation not permitted
chgrp: changing group of 'systems/': Operation not permitted
```