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DW1E

**Exercises about file and directory
permission**

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

```
daniel@daniel-VirtualBox:~$ ls -la
total 108
drwxr-xr-x 16 daniel daniel 4096 ene 13 15:26 .
drwxr-xr-x  3 root   root   4096 dic  9 16:31 ..
-rw-----  1 daniel daniel  111 ene  4 19:30 .bash_history
-rw-r--r--  1 daniel daniel  220 dic  9 16:31 .bash_logout
-rw-r--r--  1 daniel daniel 3771 dic  9 16:31 .bashrc
drwx----- 14 daniel daniel 4096 ene 13 15:55 .cache
drwx----- 12 daniel daniel 4096 ene 13 15:55 .config
drwxr-xr-x  2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x  2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x  2 daniel daniel 4096 dic  9 16:40 Downloads
drwx-----  3 daniel daniel 4096 dic  9 16:40 .gnupg
drwxr-xr-x  3 daniel daniel 4096 dic  9 16:40 .local
-rw-r--r--  1 root   root    154 dic 16 16:56 main.java
-rw-r--r--  1 root   root    154 dic 16 17:03 Main.java
drwx-----  5 daniel daniel 4096 dic  9 16:41 .mozilla
drwxr-xr-x  2 daniel daniel 4096 dic  9 16:40 Music
drwxrwxr-x  3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x  2 daniel daniel 4096 dic  9 16:40 Pictures
-rw-r--r--  1 daniel daniel  807 dic  9 16:31 .profile
```

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

```
daniel@daniel-VirtualBox:~$ touch perm1.txt
daniel@daniel-VirtualBox:~$ ls *.txt
perm1.txt
daniel@daniel-VirtualBox:~$ ls -l
total 48
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root   root    154 dic 16 16:56 main.java
-rw-r--r-- 1 root   root    154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-rw-r-- 1 daniel daniel    0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
-rw-rw-r-- 1 daniel daniel  290 ene  4 19:18 script.sh
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos
```

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

```

daniel@daniel-VirtualBox:~$ chmod a=r,u+w perm1.txt
daniel@daniel-VirtualBox:~$ ls -l
total 48
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root   root   154 dic 16 16:56 main.java
-rw-r--r-- 1 root   root   154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-r--r-- 1 daniel daniel    0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
-rw-rw-r-- 1 daniel daniel 290 ene  4 19:18 script.sh
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos

daniel@daniel-VirtualBox:~$ chmod 644 perm1.txt
daniel@daniel-VirtualBox:~$ ls-l
ls-l: command not found
daniel@daniel-VirtualBox:~$ ls -l
total 48
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root   root   154 dic 16 16:56 main.java
-rw-r--r-- 1 root   root   154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-r--r-- 1 daniel daniel    0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
-rw-rw-r-- 1 daniel daniel 290 ene  4 19:18 script.sh
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos

daniel@daniel-VirtualBox:~$ chmod ugo=r,u+w perm1.txt
daniel@daniel-VirtualBox:~$ ls-l
ls-l: command not found
daniel@daniel-VirtualBox:~$ ls -l
total 48
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root   root   154 dic 16 16:56 main.java
-rw-r--r-- 1 root   root   154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-r--r-- 1 daniel daniel    0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
-rw-rw-r-- 1 daniel daniel 290 ene  4 19:18 script.sh
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos
daniel@daniel-VirtualBox:~$

```

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

```
#!/bin/bash
```

```
clear
```

```
Who
```

```
daniel@daniel-VirtualBox:~$ nano script2.sh
daniel@daniel-VirtualBox:~$ ls -l
total 52
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root   root   154 dic 16 16:56 main.java
-rw-r--r-- 1 root   root   154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-r--r-- 1 daniel daniel    0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
-rw-rw-r-- 1 daniel daniel  22 ene 13 16:09 script2.sh
-rw-rw-r-- 1 daniel daniel 290 ene  4 19:18 script.sh
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos
```

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

```
daniel@daniel-VirtualBox:~$ chmod u-r script2.sh
daniel@daniel-VirtualBox:~$ nano script2.sh

[ Error reading script2.sh: Permission denied ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace  ^U Paste Text ^T To Spell  ^_ Go To Line
```

6. Remove the write permission from the owner on the file script1.sh. Add the line below. Is it possible? Why?

```
daniel@daniel-VirtualBox:~$ chmod u-w script2.sh
daniel@daniel-VirtualBox:~$ nano script2.sh

[ Error reading script2.sh: Permission denied ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace  ^U Paste Text ^T To Spell  ^_ Go To Line
```

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.

```

daniel@daniel-VirtualBox:~$ chmod u=rwx,go=- script2.sh
daniel@daniel-VirtualBox:~$ ls -l
total 52
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root    root    154 dic 16 16:56 main.java
-rw-r--r-- 1 root    root    154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-r--r-- 1 daniel daniel   0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
-rwx----- 1 daniel daniel  22 ene 13 16:09 script2.sh
-rw-rw-r-- 1 daniel daniel  290 ene  4 19:18 script.sh
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos

```

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

```

daniel  :0          2022-01-13 15:25 (:0)
./script2.sh: line 4: new: command not found
daniel@daniel-VirtualBox:~$ ./script2.sh

```

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

```

daniel@daniel-VirtualBox:~$ chmod u-r script2.sh
daniel@daniel-VirtualBox:~$ ./script2.sh
/bin/bash: ./script2.sh: Permission denied
daniel@daniel-VirtualBox:~$ 

```

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

```

daniel@daniel-VirtualBox:~$ mkdir systems
daniel@daniel-VirtualBox:~$ u-r systems

daniel@daniel-VirtualBox:~$ cp script2.sh systems
cp: cannot create regular file 'systems/script2.sh': Permission denied
daniel@daniel-VirtualBox:~$ 

```

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

```
daniel@daniel-VirtualBox:~$ chmod u+w systems
daniel@daniel-VirtualBox:~$ cp script2.sh systems
cp: cannot create regular file 'systems/script2.sh': Permission denied
```

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

```
daniel@daniel-VirtualBox:~$ chmod u-r systems
daniel@daniel-VirtualBox:~$ ls systems
ls: cannot open directory 'systems': Permission denied
daniel@daniel-VirtualBox:~$
```

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

```
daniel@daniel-VirtualBox:~$ chmod 744 systems
daniel@daniel-VirtualBox:~$ ls -l
total 56
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Desktop
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Documents
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Downloads
-rw-r--r-- 1 root    root    154 dic 16 16:56 main.java
-rw-r--r-- 1 root    root    154 dic 16 17:03 Main.java
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Music
-rw-r--r-- 1 daniel daniel    0 ene 13 15:56 perm1.txt
drwxrwxr-x 3 daniel daniel 4096 ene 12 18:30 permissions
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Pictures
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Public
--wx----- 1 daniel daniel  31 ene 13 16:25 script2.sh
-rw-rw-r-- 1 daniel daniel 290 ene  4 19:18 script.sh
drwxr--r-- 2 daniel daniel 4096 ene 13 16:35 systems
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Templates
drwxr-xr-x 2 daniel daniel 4096 dic  9 16:40 Videos
```

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

```
daniel@daniel-VirtualBox:~$ chmod u-x systems
daniel@daniel-VirtualBox:~$ systems/script2.sh
bash: systems/script2.sh: Permission denied
daniel@daniel-VirtualBox:~$
```

15. Assign the execute permission to the directory again


```
daniel@daniel-VirtualBox:~$ chmod u+x systems
daniel@daniel-VirtualBox:~$
```

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

```
daniel@daniel-VirtualBox:~/systems$ chmod o+wx charles
daniel@daniel-VirtualBox:~/systems$
```

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.

```
daniel@daniel-VirtualBox:~/systems$ chmod u=rx,g=rw,o=w lucy
daniel@daniel-VirtualBox:~/systems$ chmod 562 lucy
daniel@daniel-VirtualBox:~/systems$ ls-l
ls-l: command not found
daniel@daniel-VirtualBox:~/systems$ ls -l
total 4
-rw-rw-rwx 1 daniel daniel 0 ene 13 16:59 charles
-r-xrw--w- 1 daniel daniel 0 ene 13 16:58 lucy
-r-x----- 1 daniel daniel 31 ene 13 16:35 script2.sh
```

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? Why?

```
daniel@daniel-VirtualBox:~/systems$ sudo su
[sudo] password for daniel:
root@daniel-VirtualBox:/home/daniel/systems# chown root charles
root@daniel-VirtualBox:/home/daniel/systems# exit
exit
daniel@daniel-VirtualBox:~/systems$ cd ..
daniel@daniel-VirtualBox:~$ cd systems
daniel@daniel-VirtualBox:~/systems$ chmod o=w charles
chmod: changing permissions of 'charles': Operation not permitted
```

You cannot change the permissions, because the owner is root

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

```
daniel@daniel-VirtualBox:~/systems$ sudo su
root@daniel-VirtualBox:/home/daniel/systems# chmod 777 charles
root@daniel-VirtualBox:/home/daniel/systems#
```

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?

```
root@daniel-VirtualBox:/home/daniel/systems# chmod 060 lucy
```

[Error reading lucy: Permission denied]

^G Get Help	^O Write Out	^W Where Is	^K Cut Text	^J Justify	^C Cur Pos
^X Exit	^R Read File	^_ Replace	^U Paste Text	^T To Spell	^_ Go To Line

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

```
root@daniel-VirtualBox:/home/daniel/systems# chown root:newgroup lucy
root@daniel-VirtualBox:/home/daniel/systems# ls -l lucy
ls: cannot access 'l': No such file or directory
lucy
root@daniel-VirtualBox:/home/daniel/systems# ls -l lucy
----rw---- 1 root newgroup 0 ene 13 16:58 lucy
```

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

```
root@daniel-VirtualBox:/home/daniel/systems# usermod -a -G newgroup student
```

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

```
root@daniel-VirtualBox:/home/daniel/systems# chmod a+r lucy
root@daniel-VirtualBox:/home/daniel/systems#
```

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

```
root@daniel-VirtualBox:/home/daniel# chmod -R 744 systems
root@daniel-VirtualBox:/home/daniel#
```

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

```
root@daniel-VirtualBox:/home/daniel# chgrp -R root systems
root@daniel-VirtualBox:/home/daniel#
```