File permissions in Linux

Project description

The goal is to learn how to see and change access permissions to certain files and to directories. Following the guideline that access should only be granted if needed, this exercise is to help me understand how to manage and support that aspect.

Check file and directory details

Using ls -l I was able to list all the files and directories in the folder, along with access permissions. The permissions also showed the level of access and what groups that had access.
By adding the -a variable to the end of the command, I was able to see the same information with hidden files added to the list.

```
researcher2@19cac54a334b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:33 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:39 ..
-rw--w---- 1 researcher2 research_team   46 Jul 14 21:33 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
```

Describe the permissions string

There are 10 characters that represent the permissions.
- The first placeholder informs whether it is a file or a directory.
    - A dash meaning it's a file, and a "d" meaning it's a directory
- Placeholders 2,3,4, indicate the permissions of the user that owns the file
- Placeholder 5,6,7 indicate the permissions that of the group
- PLaceholder 8,9,10 indicate the permissions of anyone besides the user and groups, or "others"
"r" = read, "w" = write, and "x" = execute

Change file permissions

```
researcher2@19cac54a334b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:33 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:39 ..
-rw--w---- 1 researcher2 research_team   46 Jul 14 21:33 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
researcher2@19cac54a334b:~/projects$ chmod o-w project_k.txt
researcher2@19cac54a334b:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
```

Since "others" should not have access to write, I used the chmod to change the permissions
and remove that access.

Change file permissions on a hidden file

```
researcher2@19cac54a334b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:33 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:39 ..
-r-------- 1 researcher2 research_team   46 Jul 14 21:33 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw------- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
researcher2@19cac54a334b:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@19cac54a334b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:33 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:39 ..
-r--r----- 1 researcher2 research_team   46 Jul 14 21:33 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw------- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
researcher2@19cac54a334b:~/projects$ 
```

Using chmod again, I was able to change the permissions of the hidden file ".project_x.txt" so
that no one has access to write to it since it's an archived file and should not be changed

Change directory permissions

```
researcher2@19cac54a334b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:33 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:39 ..
-r--r----- 1 researcher2 research_team   46 Jul 14 21:33 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw------- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
researcher2@19cac54a334b:~/projects$ chmod g-x drafts/
researcher2@19cac54a334b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:33 .
drwxr-xr-x 3 researcher2 research_team 4096 Jul 14 21:39 ..
-r--r----- 1 researcher2 research_team   46 Jul 14 21:33 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Jul 14 21:33 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_k.txt
-rw------- 1 researcher2 research_team   46 Jul 14 21:33 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Jul 14 21:33 project_t.txt
researcher2@19cac54a334b:~/projects$ █
```

The "drafts" directory belongs to "researcher2" and should only be accessible to them. The group "research_team" had access. Using the same method above, I was able to remove the "executable" permission, thereby removing access into that folder.

Summary

Through this lesson, I was able to learn about file permissions in a linux environment. I learned how to see and manage such permissions, using ls -l and chmod.