

Linux-Exercise 7-File permissions

1. Create a new file first.txt and a new directory second to your home directory. What are the permissions for newly created file and directory?

```
jean@jean:~$ touch first.txt
jean@jean:~$ mkdir second
jean@jean:~$ ls -l
total 9200
drwxrwxrwx 11 jean jean      4096 Jun 18 18:07 extracted_apache
-rw-rw-r-- 1 jean jean         0 Jun 24 08:54 first.txt
-rwxrwxrwx 1 jean jean    36229 Jun 18 18:22 funetpage.html
drwxrwxrwx 5 root root      4096 Jun 17 10:11 11
-rwxrwxrwx 1 jean jean   9363314 Aug  5 2020 httpd-2.4.46.tar.gz
-rw-r--r-- 1 Mike testers     0 Jun 21 09:48 jani_file.txt
-rwxrwxrwx 1 jean jean       45 Jun 17 10:20 jean.txt
-rwxrwxrwx 1 jean jean       46 Jun 17 10:23 jean_renamed.txt
drwxrwxr-x 2 jean jean      4096 Jun 24 08:55 second
jean@jean:~$ _
```

2. Change file (first.txt) permissions using numerical format in the following way: owner → all permissions, group → read and write permissions and other → no permissions. Return original permissions for the file using symbolic format.

```
jean@jean:~$ sudo chmod 760 first.txt
[sudo] password for jean:
jean@jean:~$ ls -l first.txt
-rwxrw---- 1 jean jean 0 Jun 24 08:54 first.txt
jean@jean:~$ sudo chmod u-x,o+r first.txt
jean@jean:~$ ls -l first.txt
-rw-rw-r-- 1 jean jean 0 Jun 24 08:54 first.txt
jean@jean:~$
```

3. Change root or other user for the owner for the directory (second).

```
jean@jean:~$ sudo chown root second
jean@jean:~$ ls -l
total 9200
drwxrwxrwx 11 jean jean      4096 Jun 18 18:07 extracted_apache
-rw-rw-r-- 1 jean jean         0 Jun 24 08:54 first.txt
-rwxrwxrwx 1 jean jean    36229 Jun 18 18:22 funetpage.html
drwxrwxrwx 5 root root      4096 Jun 17 10:11 11
-rwxrwxrwx 1 jean jean   9363314 Aug  5 2020 httpd-2.4.46.tar.gz
-rw-r--r-- 1 Mike testers     0 Jun 21 09:48 jani_file.txt
-rwxrwxrwx 1 jean jean       45 Jun 17 10:20 jean.txt
-rwxrwxrwx 1 jean jean       46 Jun 17 10:23 jean_renamed.txt
drwxrwxr-x 2 root jean      4096 Jun 24 08:55 second
jean@jean:~$
```

4. Change directory permissions in a way that only owner has permissions for the directory.

```
jean@jean:~$ sudo chmod 700 second
jean@jean:~$ ls -l
total 9200
drwxrwxrwx 11 jean jean      4096 Jun 18 18:07 extracted_apache
-rw-rw-r--  1 jean jean         0 Jun 24 08:54 first.txt
-rwxrwxrwx  1 jean jean    36229 Jun 18 18:22 funetpage.html
drwxrwxrwx  5 root root      4096 Jun 17 10:11 .
-rwxrwxrwx  1 jean jean   9363314 Aug  5 2020 httpd-2.4.46.tar.gz
-rw-r--r--  1 Mike testers     0 Jun 21 09:48 jani_file.txt
-rwxrwxrwx  1 jean jean      45 Jun 17 10:20 jean.txt
-rwxrwxrwx  1 jean jean      46 Jun 17 10:23 jean_renamed.txt
drwx----- 2 root jean      4096 Jun 24 08:55 second
jean@jean:~$
```

5. Create a new file and set root or other user as a file owner.

```
jean@jean:~$ touch new_file.txt
jean@jean:~$ ls -l new_file.txt
-rw-rw-r-- 1 jean jean 0 Jun 24 09:03 new_file.txt
jean@jean:~$ sudo chown root:root new_file.txt
jean@jean:~$ ls -l new_file.txt
-rw-rw-r-- 1 root root 0 Jun 24 09:03 new_file.txt
jean@jean:~$
```

6. Create two files: `hard_link.txt` and `soft_link.txt`. Create hard and soft link for these files according to file names. Check the results with `ls -l` command. What does the output of the command tell about the links and how do links differ? Remove the files you created and recheck the results with `ls -l` command. What differences do you notice?

```
jean@jean:~$ touch hard_link.txt soft_link.txt
jean@jean:~$ sudo ln hard_link.txt link_to-hard_link.txt
jean@jean:~$ sudo ln -s soft_link.txt link_to_soft_link.txt
jean@jean:~$ ls -l
total 9200
drwxrwxrwx 11 jean jean      4096 Jun 18 18:07 extracted_apache
-rw-rw-r-- 1 jean jean         0 Jun 24 08:54 first.txt
-rwxrwxrwx 1 jean jean    36229 Jun 18 18:22 funetpage.html
drwxrwxrwx 5 root root      4096 Jun 17 10:11 hi
-rw-rw-r-- 2 jean jean         0 Jun 24 09:32 hard_link.txt
-rwxrwxrwx 1 jean jean    9363314 Aug  5 2020 httpd-2.4.46.tar.gz
-rw-r--r-- 1 Mike testers     0 Jun 21 09:48 jani_file.txt
-rwxrwxrwx 1 jean jean       45 Jun 17 10:20 jean.txt
-rwxrwxrwx 1 jean jean       46 Jun 17 10:23 jean_renamed.txt
-rw-rw-r-- 2 jean jean         0 Jun 24 09:32 link_to-hard_link.txt
lrwxrwxrwx 1 root root       13 Jun 24 09:33 link_to_soft_link.txt -> soft_link.txt
-rw-rw-r-- 1 root root         0 Jun 24 09:03 new_file.txt
drwx----- 2 root jean     4096 Jun 24 08:55 second
-rw-rw-r-- 1 jean jean         0 Jun 24 09:32 soft_link.txt
jean@jean:~$ sudo rm hard_link.txt soft_link.txt
jean@jean:~$ ls -l
total 9200
drwxrwxrwx 11 jean jean      4096 Jun 18 18:07 extracted_apache
-rw-rw-r-- 1 jean jean         0 Jun 24 08:54 first.txt
-rwxrwxrwx 1 jean jean    36229 Jun 18 18:22 funetpage.html
drwxrwxrwx 5 root root      4096 Jun 17 10:11 hi
-rwxrwxrwx 1 jean jean    9363314 Aug  5 2020 httpd-2.4.46.tar.gz
-rw-r--r-- 1 Mike testers     0 Jun 21 09:48 jani_file.txt
-rwxrwxrwx 1 jean jean       45 Jun 17 10:20 jean.txt
-rwxrwxrwx 1 jean jean       46 Jun 17 10:23 jean_renamed.txt
-rw-rw-r-- 1 jean jean         0 Jun 24 09:32 link_to-hard_link.txt
lrwxrwxrwx 1 root root       13 Jun 24 09:33 link_to_soft_link.txt -> soft_link.txt
-rw-rw-r-- 1 root root         0 Jun 24 09:03 new_file.txt
drwx----- 2 root jean     4096 Jun 24 08:55 second
jean@jean:~$
```

7. Use `find` command to list `/etc` directory contents including only files with `.conf` extension and starting with letter `l` (small `l`, not capital `I`). Do not include files from subdirectories!

```
jean@jean:/$ sudo find /etc -maxdepth 1 -type f \( -name '*.conf' -and -name 'l*' \)
/etc/ld.so.conf
/etc/logrotate.conf
/etc/ltrace.conf
/etc/libaudit.conf
jean@jean:/$
```

8. Below is a presentation of a directory structure where temperature data from sensors s1, s2 and s3 has been saved for log files under sensor specific directories. Create this directory structure with files. Important: Check the location of this directory structure within the Linux filesystem!

```
jean@jean:/$ cd tmp/  
jean@jean:/tmp$ mkdir sensors  
jean@jean:/tmp$ cd sensors/  
jean@jean:/tmp/sensors$ mkdir s1 s2 s3  
jean@jean:/tmp/sensors$ cd s1  
jean@jean:/tmp/sensors/s1$ touch temp.log  
jean@jean:/tmp/sensors/s1$ cd ..  
jean@jean:/tmp/sensors$ cd s2  
jean@jean:/tmp/sensors/s2$ touch temp.log  
jean@jean:/tmp/sensors/s2$ cd ..  
jean@jean:/tmp/sensors$ cd s3  
jean@jean:/tmp/sensors/s3$ touch temp.log  
jean@jean:/tmp/sensors/s3$ cd ..  
jean@jean:/tmp/sensors$ ls  
s1 s2 s3  
jean@jean:/tmp/sensors$
```

```
jean@jean:/tmp$ tree  
.  
├── sensors  
│   ├── s1  
│   │   └── temp.log  
│   ├── s2  
│   │   └── temp.log  
│   └── s3  
│       └── temp.log
```

9. Users user (regular user) and root have been marked for the directory presentation below. Create the following permissions: user can only access the first sensor's temp.log file and root has access to the whole directory structure. User should have adequate permissions for reading and editing the temp.log file.

```
jean@ubuntu:/tmp$ sudo chmod 777 sensors  
[sudo] password for jean:  
jean@ubuntu:/tmp$ ls -l  
total 20  
drwxrwxrwx 5 jean jean 4096 Jun 29 06:32 sensors  
drwx----- 3 root root 4096 Jun 29 06:30 snap.lxd  
drwx----- 3 root root 4096 Jun 29 06:30 systemd-p  
drwx----- 3 root root 4096 Jun 29 06:30 systemd-p  
drwx----- 3 root root 4096 Jun 29 06:30 systemd-p  
jean@ubuntu:/tmp$
```

ubuntu [Running] - Oracle VM VirtualBox

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```
jean@ubuntu:/tmp/sensors$ ls -l
total 12
drwxrwxrwx 2 jean jean 4096 Jun 29 06:32 s1
drwxrwxrwx 2 jean jean 4096 Jun 29 06:32 s2
drwxrwxrwx 2 jean jean 4096 Jun 29 06:33 s3
jean@ubuntu:/tmp/sensors$ sudo chown root s2 s3
jean@ubuntu:/tmp/sensors$ ls -l
total 12
drwxrwxrwx 2 jean jean 4096 Jun 29 06:32 s1
drwxrwxrwx 2 root jean 4096 Jun 29 06:32 s2
drwxrwxrwx 2 root jean 4096 Jun 29 06:33 s3
jean@ubuntu:/tmp/sensors$ sudo chmod 700 s2 s3
jean@ubuntu:/tmp/sensors$ ls -l
total 12
drwxrwxrwx 2 jean jean 4096 Jun 29 06:32 s1
drwx----- 2 root jean 4096 Jun 29 06:32 s2
drwx----- 2 root jean 4096 Jun 29 06:33 s3
jean@ubuntu:/tmp/sensors$
```