



LEARN AND BUILD

# LINUX PERMISSIONS

PRESENTED BY:  
**ASMIT PANDEY**

PRESENTED TO:  
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# VIEWING LINUX PERMISSIONS

## 1. Using "ls -l" or "ll"

```
total 0
[ec2-user@ip-172-31-41-195 asmit]$ mkdir d{1..4}
[ec2-user@ip-172-31-41-195 asmit]$ ls
d1 d2 d3 d4
[ec2-user@ip-172-31-41-195 asmit]$ touch f{5..9}
[ec2-user@ip-172-31-41-195 asmit]$ ls
d1 d2 d3 d4 f5 f6 f7 f8 f9
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$ _
```

## 2. Using "stat"

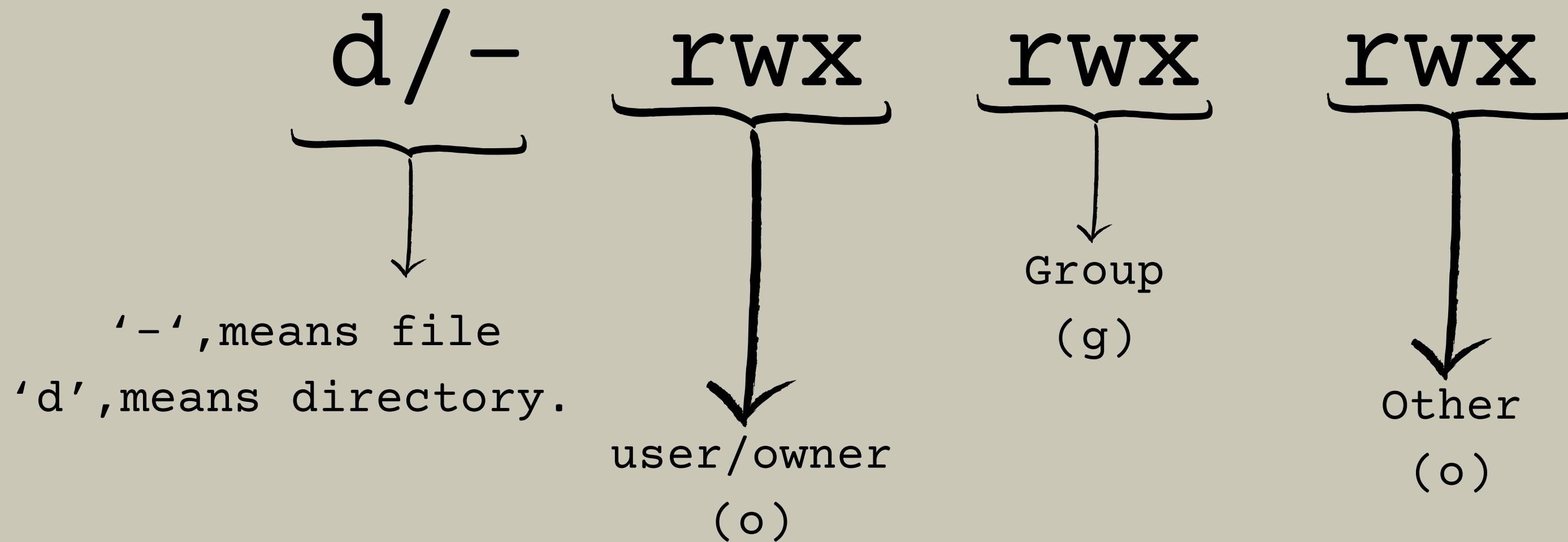
```
[ec2-user@ip-172-31-41-195 asmit]$ ls
d1  d2  d3  d4  f5  f6  f7  f8  f9
[ec2-user@ip-172-31-41-195 asmit]$ stat d1
  File: d1
  Size: 6                Blocks: 0          IO Block: 4096   directory
Device: ca01h/51713d     Inode: 8749294    Links: 2
Access: (0755/drwxr-xr-x)  Uid: ( 1000/ec2-user)   Gid: ( 1000/ec2-user)
Context: unconfined_u:object_r:user_home_t:s0
Access: 2023-07-24 07:22:21.768214432 +0000
Modify: 2023-07-24 07:22:21.768214432 +0000
Change: 2023-07-24 07:22:21.768214432 +0000
 Birth: 2023-07-24 07:22:21.768214432 +0000
[ec2-user@ip-172-31-41-195 asmit]$ stat f1
stat: cannot statx 'f1': No such file or directory
[ec2-user@ip-172-31-41-195 asmit]$ stat f5
  File: f5
  Size: 0                Blocks: 0          IO Block: 4096   regular empty file
Device: ca01h/51713d     Inode: 1772540    Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/ec2-user)   Gid: ( 1000/ec2-user)
Context: unconfined_u:object_r:user_home_t:s0
Access: 2023-07-24 07:22:43.648300782 +0000
Modify: 2023-07-24 07:22:43.648300782 +0000
Change: 2023-07-24 07:22:43.648300782 +0000
 Birth: 2023-07-24 07:22:43.648300782 +0000
[ec2-user@ip-172-31-41-195 asmit]$
```

### 3. Using "getfacl"

```
ec2-user@ip-172-31-41-195:~/asmit
[ec2-user@ip-172-31-41-195 asmit]$ whatis getfacl
getfacl (1)                - get file access control lists
[ec2-user@ip-172-31-41-195 asmit]$ ls
d1  d2  d3  d4  f5  f6  f7  f8  f9
[ec2-user@ip-172-31-41-195 asmit]$ getfacl d1
# file: d1
# owner: ec2-user
# group: ec2-user
user::rwx
group::r-x
other::r-x

[ec2-user@ip-172-31-41-195 asmit]$ getfacl f6
# file: f6
# owner: ec2-user
# group: ec2-user
user::rw-
group::r--
other::r--

[ec2-user@ip-172-31-41-195 asmit]$
```



- "r" : "read" the file's contents.
- "w" : "write", or modify, the file's contents.
- "x" : "execute" the file. This permission is given only if the file is a program.

### **Reading the security permissions**

- "r-x": This means that the members of the group can only read and execute the files.
- "rw-": This means that the owner of the file can "read" and "write" it and not execute it.

# CHANGING PERMISSIONS

Using "chmod" => change mode

- Add or remove permissions of "user/owner" for a file or directory.

```
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-r d1
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-w d2
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-x d3
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
d-wxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw-r-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$
```

- Add or remove permissions of "group" for a file or directory.

```
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
d-wxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw-r-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$ chmod g-x d1
[ec2-user@ip-172-31-41-195 asmit]$ chmod g+rw d2
[ec2-user@ip-172-31-41-195 asmit]$ chmod g-rwx d3
[ec2-user@ip-172-31-41-195 asmit]$ chmod g-rx f5
[ec2-user@ip-172-31-41-195 asmit]$ chmod g+rx f6
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
d-wxr--r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xrwxr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw----r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw----r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r-xr--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$
```

- Add or remove permissions of "other" for a file or directory.

```
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
d-wxr--r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xrwxr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw----r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw----r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$ chmod o-r d1
[ec2-user@ip-172-31-41-195 asmit]$ chmod o+rx d2
[ec2-user@ip-172-31-41-195 asmit]$ chmod o+rw f5
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
d-wxr---x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xrwxr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw----r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
-rw----rwx. 1 ec2-user ec2-user 0 Jul 24 07:22 f5
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f6
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f7
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f8
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 07:22 f9
[ec2-user@ip-172-31-41-195 asmit]$
```



Using : "chmod u=rwx file\_name"

```
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
d-wxr---x. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xrwxr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw----r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
```

```
[ec2-user@ip-172-31-41-195 asmit]$ chmod u=rwx d1
[ec2-user@ip-172-31-41-195 asmit]$ chmod g=rwx d1
[ec2-user@ip-172-31-41-195 asmit]$ chmod o=rwx d1
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
drwxrwxrwx. 2 ec2-user ec2-user 6 Jul 24 07:22 d1
dr-xrwxr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d2
drw----r-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d3
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 07:22 d4
```

# SIGNIFICANCE OF PERMISSIONS

## 1. In case of Directories

- Read(r) permission in case of directory :-

```
[ec2-user@ip-172-31-41-195 asmit]$ mkdir d1
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 08:54 d1
[ec2-user@ip-172-31-41-195 asmit]$ cd d1/
[ec2-user@ip-172-31-41-195 d1]$ mkdir d2
[ec2-user@ip-172-31-41-195 d1]$ ls -l
total 0
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 08:54 d2
[ec2-user@ip-172-31-41-195 d1]$ cd ..
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-r d1
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
d-wxr-xr-x. 3 ec2-user ec2-user 16 Jul 24 08:54 d1
[ec2-user@ip-172-31-41-195 asmit]$ cd d1/
[ec2-user@ip-172-31-41-195 d1]$ ls
ls: cannot open directory '.': Permission denied
[ec2-user@ip-172-31-41-195 d1]$
```

Able to open  
and read "d1"

Cannot open  
"d1"

- Write(w) permission in case of directory :-

```
ec2-user@ip-172-31-41-195 asmit]$ mkdir dir2
ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
drwxr-xr-x. 3 ec2-user ec2-user 16 Jul 24 08:54 d1
drwxr-xr-x. 2 ec2-user ec2-user  6 Jul 24 09:00 dir2
ec2-user@ip-172-31-41-195 asmit]$ cd dir2
ec2-user@ip-172-31-41-195 dir2]$ mkdir dir3
ec2-user@ip-172-31-41-195 dir2]$ ls
dir3
ec2-user@ip-172-31-41-195 dir2]$ cd ..
ec2-user@ip-172-31-41-195 asmit]$ chmod u-w dir2
ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
drwxr-xr-x. 3 ec2-user ec2-user 16 Jul 24 08:54 d1
dr-xr-xr-x. 3 ec2-user ec2-user 18 Jul 24 09:02 dir2
ec2-user@ip-172-31-41-195 asmit]$ cd dir2/
ec2-user@ip-172-31-41-195 dir2]$ mkdir dir4
mkdir: cannot create directory 'dir4': Permission denied
ec2-user@ip-172-31-41-195 dir2]$
```

Able to create  
"dir3" inside dir2

Cannot create  
"dir4" inside dir2

- Execute(x) permission in case of directory :-

```
[ec2-user@ip-172-31-41-195 asmit]$ mkdir d1
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
drwxr-xr-x. 2 ec2-user ec2-user 6 Jul 24 09:39 d1
[ec2-user@ip-172-31-41-195 asmit]$ cd d1
[ec2-user@ip-172-31-41-195 d1]$ cd ..
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-x d1
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
drw-r-xr-x. 2 ec2-user ec2-user 6 Jul 24 09:39 d1
[ec2-user@ip-172-31-41-195 asmit]$ cd d1
-bash: cd: d1: Permission denied
[ec2-user@ip-172-31-41-195 asmit]$
```

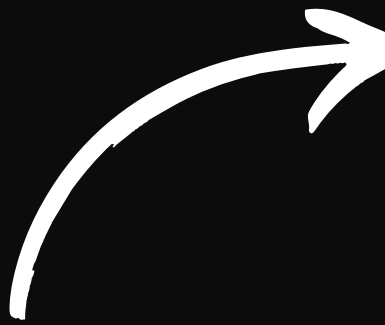
Allowed to execute  
"cd d1/"

Not allowed to  
execute  
"cd d1/"

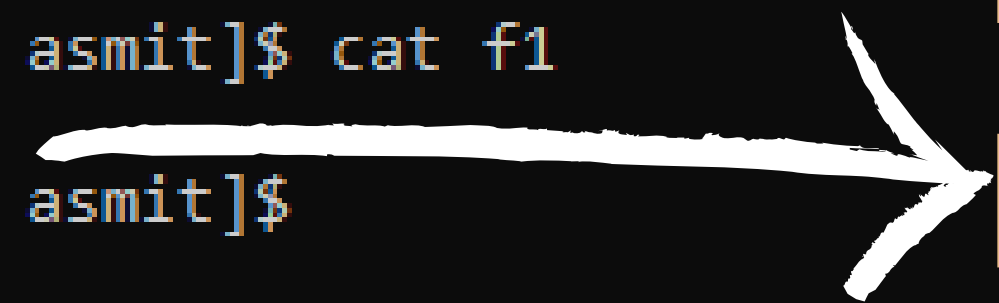
## 2. In case of Files

- Read(r) permission in case of files :-

```
[ec2-user@ip-172-31-41-195 asmit]$ touch f1
[ec2-user@ip-172-31-41-195 asmit]$ ll
total 0
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 09:43 f1
[ec2-user@ip-172-31-41-195 asmit]$ vi f1
[ec2-user@ip-172-31-41-195 asmit]$ cat f1
Hello all ! Its a presentation on Linux permissions , presented by ASMIT PANDEY.
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-r f1
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 4
--w-r--r--. 1 ec2-user ec2-user 81 Jul 24 09:45 f1
[ec2-user@ip-172-31-41-195 asmit]$ cat f1
cat: f1: Permission denied
[ec2-user@ip-172-31-41-195 asmit]$
```



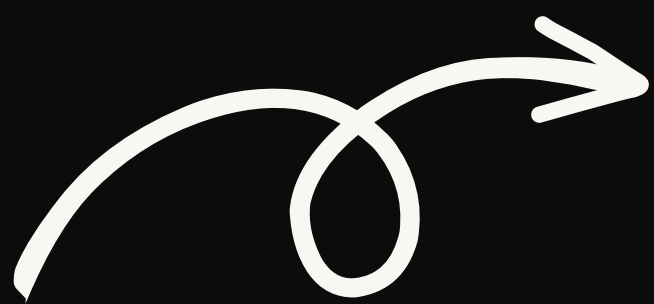
Allowed to read  
contents of f1



Not allowed to  
read contents  
of f1

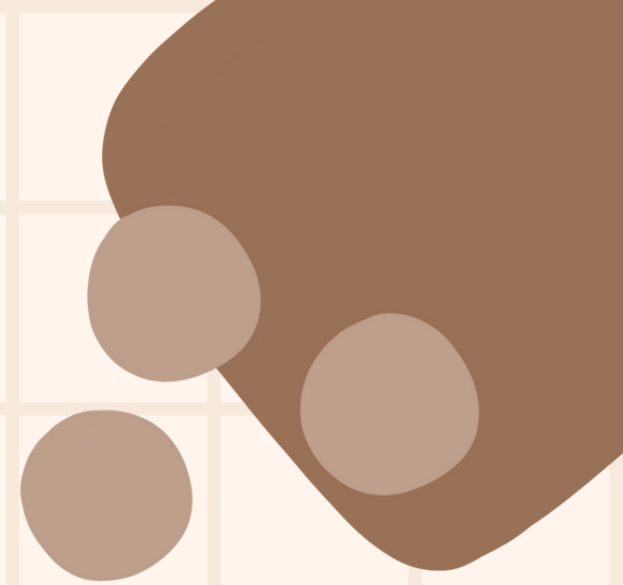
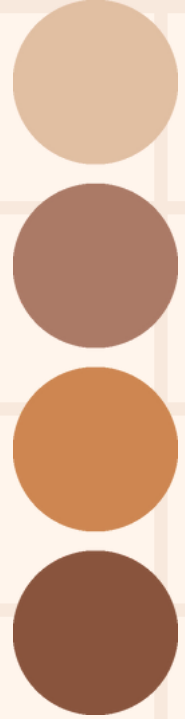
- Write(w) permission in case of files :-

```
[ec2-user@ip-172-31-41-195 asmit]$ touch f1
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 0
-rw-r--r--. 1 ec2-user ec2-user 0 Jul 24 09:54 f1
[ec2-user@ip-172-31-41-195 asmit]$ vi f1
[ec2-user@ip-172-31-41-195 asmit]$ chmod u-w f1
[ec2-user@ip-172-31-41-195 asmit]$ ls -l
total 4
-r--r--r--. 1 ec2-user ec2-user 16 Jul 24 09:55 f1
[ec2-user@ip-172-31-41-195 asmit]$ vi f1
[ec2-user@ip-172-31-41-195 asmit]$
```



Can't insert  
anything , read  
only file

```
-- INSERT -- W10: Warning: Changing a readonly file
```



THANK YOU  
SO MUCH!

