



Exercise 12.1 Working with File Attributes

1. With your normal user account use **touch** to create an empty file named `/tmp/appendit`.
2. Use **cat** to append the contents of `/etc/hosts` to `/tmp/appendit`.
3. Compare the contents of `/tmp/appendit` with `/etc/hosts`; there should not be any differences.
4. Try to add the append-only attribute to `/tmp/appendit` by using **chattr**. You should see an error here. Why?
5. As root, retry adding the append-only attribute; this time it should work. Look at the file's extended attributes by using **lsattr**.
6. As a normal user, try and use **cat** to copy over the contents of `/etc/passwd` to `/tmp/appendit`. You should get an error. Why?
7. Try the same thing again as root. You should also get an error. Why?
8. As the normal user, again use the append redirection operator (`>>`) and try appending the `/etc/passwd` file to `/tmp/appendit`. This should work. Examine the resulting file to confirm.
9. As root, set the immutable attribute on `/tmp/appendit`, and look at the extended attributes again.
10. Try appending output to `/tmp/appendit`, try renaming the file, creating a hard link to the file, and deleting the file as both the normal user and as root.
11. We can remove this file by removing the extended attributes. Do so.

Solution 12.1

1.

```
$ cd /tmp
$ touch appendit
$ ls -l appendit
-rw-rw-r-- 1 coop coop 0 Oct 23 19:04 appendit
```
2.

```
$ cat /etc/hosts > appendit
```
3.

```
$ diff /etc/hosts appendit
```
4.

```
$ chattr +a appendit
chattr: Operation not permitted while setting flags on appendit
```
5.

```
$ sudo chattr +a appendit
$ lsattr appendit
-----a-----e-- appendit
```
6.

```
$ cat /etc/passwd > appendit
bash: appendit: Operation not permitted
```
7.

```
$ sudo su
$ cat /etc/passwd > appendit
bash: appendit: Operation not permitted
$ exit
```
8.

```
$ cat /etc/passwd >> /tmp/appendit
$ cat appendit
```
9.

```
$ sudo chattr +i appendit
$ lsattr appendit
-----ia-----e- appendit
```

```
10. $ echo hello >> appendit
-bash: appendit: Permission denied
$ mv appendit appendit.rename
mv: cannot move 'appendit' to 'appendit.rename': Operation not permitted
$ ln appendit appendit.hardlink
ln: creating hard link 'appendit.hardlink' => 'appendit': Operation not permitted
$ rm -f appendit
rm: cannot remove 'appendit': Operation not permitted

$ sudo su
$ echo hello >> appendit
-bash: appendit: Permission denied
$ mv appendit appendit.rename
mv: cannot move 'appendit' to 'appendit.rename': Operation not permitted
$ ln appendit appendit.hardlink
ln: creating hard link 'appendit.hardlink' => 'appendit': Operation not permitted
$ rm -f appendit
rm: cannot remove 'appendit': Operation not permitted
$ exit

11. $ sudo su
$ lsattr appendit
----ia-----e- appendit
$ chattr -ia appendit
$ rm appendit
rm: remove regular file 'appendit'? y
$ ls appendit
ls: cannot access appendit: No such file or directory
```