

Assignment 10

Hard link and Soft Link

How do we create Soft links?

1) Make a directory HardSoft and create one file in it i.e source_file. Let us view the data of the source_file

```
bhushan@ubuntu:~$ pwd
/home/bhushan
bhushan@ubuntu:~$ mkdir Hardsoft
bhushan@ubuntu:~$ ls
demo      Documents  f1.txt  Hardsoft  output.txt  Public  snap      Third
Desktop   Downloads  First   Music     Pictures     Second  Templates  Videos
bhushan@ubuntu:~$ sudo touch source_file
[sudo] password for bhushan:
bhushan@ubuntu:~$ vi source_file
bhushan@ubuntu:~$ vi /home/bhushan/source_file
bhushan@ubuntu:~$ cat /home/bhushan/source_file
Welcome !
bhushan@ubuntu:~$
```

2) Now create a symbolic or soft link to the source.file.

```
bhushan@ubuntu:~$ sudo ln -s source_file soft_file

bhushan@ubuntu:~$ ls -la | grep source_file
lrwxrwxrwx  1 root    root      11 Feb 10 10:13 soft_file -> source_file
-rw-r--r--  1 bhushan bhushan   10 Feb 10 10:10 source_file
```

3) Let us compare the data of both source_file and soft1_file1.

```
bhushan@ubuntu:~$ sudo cat source_file
Welcome !
bhushan@ubuntu:~$ sudo cat soft_file
Welcome !
```

4) If we modify the source_file then soft_file also updates.

```
bhushan@ubuntu:~$ vi /home/bhushan/source_file
bhushan@ubuntu:~$ sudo cat source_file
Welcome !
Welcome in Codemind Technology!
bhushan@ubuntu:~$ sudo cat soft_file
Welcome !
Welcome in Codemind Technology!
```

5) If we remove the source_file then soft_file will also be removed.

```
bhushan@ubuntu:~$ sudo rm source_file
bhushan@ubuntu:~$ cat soft_file
cat: soft_file: No such file or directory
bhushan@ubuntu:~$
```

Use CAse 1: Create a use case for linking using --arg --backup.

When you create a new link (if another file exist already with the same name as the new link name), you can instruct ln command to take a backup of the original file before creating the new link using the --backup option.

```
bhushan@ubuntu:~$ sudo ln --backup -s source_file soft_file
bhushan@ubuntu:~$ ls -la | grep soft_file
lrwxrwxrwx 1 root root 11 Feb 10 10:30 soft_file -> source_file
lrwxrwxrwx 1 root root 11 Feb 10 10:27 soft_file~ -> source_file
bhushan@ubuntu:~$ ls
demo      Downloads  Hardsoft  Pictures  snap      Templates
Desktop    f1.txt     Music     Public    soft_file Third
Documents  First      output.txt Second    soft_file~ Videos
bhushan@ubuntu:~$
```

Use CAse 2: Create a use case for linking using --arg --suffix

It is used to override the usual backup suffix

```
bhushan@ubuntu:~$ sudo ln --backup --suffix=# -s source_file soft_file
bhushan@ubuntu:~$ ls -la | grep soft_file
lrwxrwxrwx 1 root root 11 Feb 10 10:49 soft_file -> source_file
lrwxrwxrwx 1 root root 11 Feb 10 10:30 soft_file# -> source_file
lrwxrwxrwx 1 root root 11 Feb 10 10:27 soft_file~ -> source_file
bhushan@ubuntu:~$
```

Use CAse 3:- Create a use case for linking using --arg --relative

It is used to create symbolic link relative to link location.

```
bhushan@ubuntu:~$ sudo ln --relative -s source_file soft_file1
bhushan@ubuntu:~$ ls -la | grep soft_file1
lrwxrwxrwx 1 root root 11 Feb 10 10:57 soft_file1 -> source_file
bhushan@ubuntu:~$ pwd
/home/bhushan
bhushan@ubuntu:~$ cd /home/bhushan/
bhushan@ubuntu:~$ ls
demo  Documents  f1.txt  Hardsoft  output.txt  Public  snap  soft_file#  soft_file1  Third
Desktop  Downloads  First   Music     Pictures    Second  soft_file  soft_file~  Templates  Videos
```

Use CAse 4:- Create a use case for linking using --arg --logical

It is used if -s is not in effect and the source file is a symbolic link. Creates a hard link to the file referred by symbolic link rather than symbolic link itself.

How we create Har Link?

1) Create a file called source.file with some contents

```
bhushan@ubuntu:~$ echo "Welcome in Hi-Tech">source.file
bhushan@ubuntu:~$ ls
demo    Documents  f1.txt    Hardsoft  Music     Pictures  Second  soft_file  soft_file~  source.file  Third
Desktop Downloads  First    h_link.txt output.txt Public     snap    soft_file#  soft_file!  Templates  Videos
bhushan@ubuntu:~$
```

2) Lets verify the content

```
bhushan@ubuntu:~$ cat /home/bhushan/source.file
Welcome in Hi-Tech
bhushan@ubuntu:~$
```

3) let us create the hard link to the source.file and check the content of both file. The hardlink.file displays the same data as source.file.

```
bhushan@ubuntu:~$ ln source.file harlink.file
bhushan@ubuntu:~$ sudo cat /home/bhushan/source.file
Welcome in Hi-Tech
bhushan@ubuntu:~$ sudo cat /home/bhushan/harlink.file
Welcome in Hi-Tech
bhushan@ubuntu:~$
```

4) Check the inode and permissions of hardlink.file and source.file.

```
bhushan@ubuntu:~$ ls -lia | grep hardlink.file
bhushan@ubuntu:~$ ls -lia | grep source.file
296738 lrwxrwxrwx 1 root root 11 Feb 10 10:49 soft_file -> source_file
296563 lrwxrwxrwx 1 root root 11 Feb 10 10:30 soft_file# -> source_file
294376 lrwxrwxrwx 1 root root 11 Feb 10 10:27 soft_file~ -> source_file
296739 lrwxrwxrwx 1 root root 11 Feb 10 10:57 soft_file1 -> source_file
296723 -rw-rw-r-- 2 bhushan bhushan 19 Feb 10 11:12 source.file
bhushan@ubuntu:~$ ls -lia | grep harlink.file
296723 -rw-rw-r-- 2 bhushan bhushan 19 Feb 10 11:12 harlink.file
bhushan@ubuntu:~$ ls -lia | grep source.file
296738 lrwxrwxrwx 1 root root 11 Feb 10 10:49 soft_file -> source_file
296563 lrwxrwxrwx 1 root root 11 Feb 10 10:30 soft_file# -> source_file
294376 lrwxrwxrwx 1 root root 11 Feb 10 10:27 soft_file~ -> source_file
296739 lrwxrwxrwx 1 root root 11 Feb 10 10:57 soft_file1 -> source_file
296723 -rw-rw-r-- 2 bhushan bhushan 19 Feb 10 11:12 source.file
bhushan@ubuntu:~$
```

Note:- Both files have the same in-node number and file permission.

5) Now, remove the original file (i.e source.file)even if I deleted the source file, I can view the contents of the hardlink.file. Hence, it is proved that Hard link shares the same inode number, the permissions and data of the original file.

```
bhushan@ubuntu:~$ rm source.file
bhushan@ubuntu:~$ cat harlink.file
Welcome in Hi-Tech
bhushan@ubuntu:~$
```