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Program: BS-Data Science

*Operating System – Lab 04*

## Hard & Soft Links

1. Create a directory CS\_link\_test in /home
2. Cd CS\_link\_test

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji$ mkdir CS_link_test
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji$ cd CS_link_test/
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$
```

3. In CS\_link\_test folder create 3 files as File\_A, File\_B & File\_C as:
  - a. `echo Banana > File_A`
  - b. `echo Apple > File_B`
  - c. `echo Orange > File_C`

What happens when above commands are executed

**Output:** three files are created with respective text.

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ echo Banana > File_A.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ echo Apple > File_B.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ echo Orange > File_C.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$
```

4. In CS\_link\_test create a new directory named as dirA

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ mkdir dirA
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ |
```

5. Mv File\_C into dirA

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ mv File_C.txt dirA
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ |
```

Name: Maimoona Khilji

## Program: BS-Data Science

6. See the inode numbers of individual files as

- a. `ls -li File_A`
- b. `ls -li File_B`
- c. `ls -li File_C`

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li File_A.txt
25051272927443160 File_A.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li File_B.txt
4222124650921375 File_B.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li dirA/File_C.txt
2814749767368098 dirA/File_C.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$
```

7. Now create hardlink named as hl\_FileA for File\_A in and check the inode number for created hardlink. Is it same as inode number of File\_A? if yes why?

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ln File_A.txt hl_FileA.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li
total 0
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 File_A.txt
4222124650921375 -rwxrwxrwx 1 maimoona maimoona 6 Apr 10 00:23 File_B.txt
32651097298628862 drwxrwxrwx 1 maimoona maimoona 512 Apr 10 00:27 dirA
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 hl_FileA.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$
```

8. What is the file type and permissions of created hard link?

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ln File_A.txt hl_FileA.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li
total 0
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 File_A.txt
4222124650921375 -rwxrwxrwx 1 maimoona maimoona 6 Apr 10 00:23 File_B.txt
32651097298628862 drwxrwxrwx 1 maimoona maimoona 512 Apr 10 00:27 dirA
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 hl_FileA.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$
```

Name: Maimoona Khilji

## Program: BS-Data Science

9. Now create softlink for File\_B named as sl\_fileb and check the inode number for created softlink. Is it same as inode number of File\_B? if yes why? If no why?

```
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ ln -s File_B.txt sl_fileb.txt
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li
total 0
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 File_A.txt
4222124650921375 -rwxrwxrwx 1 maimoona maimoona 6 Apr 10 00:23 File_B.txt
32651097298628862 drwxrwxrwx 1 maimoona maimoona 512 Apr 10 00:27 link
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 hl_FileA.txt
23643898043886689 lrwxrwxrwx 1 maimoona maimoona 10 Apr 10 00:41 sl_fileb.txt -> File_B.txt
```

10. What is the file type and permissions of created soft link?

```
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ ln -s File_B.txt sl_fileb.txt
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li
total 0
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 File_A.txt
4222124650921375 -rwxrwxrwx 1 maimoona maimoona 6 Apr 10 00:23 File_B.txt
32651097298628862 drwxrwxrwx 1 maimoona maimoona 512 Apr 10 00:27 link
25051272927443160 -rwxrwxrwx 2 maimoona maimoona 7 Apr 10 00:23 hl_FileA.txt
23643898043886689 lrwxrwxrwx 1 maimoona maimoona 10 Apr 10 00:41 sl_fileb.txt -> File_B.txt
```

11. Append content of hl\_FileA as "new Banana". Does it affect content of File\_A? If yes why ?

```
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ echo "new Banana">>hl_FileA.txt
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ cat hl_FileA.txt
Banana
new Banana
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$ cat File_A.txt
Banana
new Banana
maimoona@DESKTOP-3E3NBI6: /mnt/c/Users/Maimoona Khilji/CS_link_test$
```

Name: Maimoona Khilji

Program: BS-Data Science

12. Append content of sl\_FileB as "new Apple". Does it affect content of File\_B? If yes why ?

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ echo "new Apple">>sl_FileB.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ cat sl_FileB.txt
Apple
new Apple
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ cat File_B.txt
Apple
new Apple
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$
```

13. Unlink FileA from hl\_FileA? what happened?

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ unlink hl_FileA.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li
total 0
25051272927443160 -rwxrwxrwx 1 maimoona maimoona 18 Apr 10 00:47 File_A.txt
4222124650921375 -rwxrwxrwx 1 maimoona maimoona 16 Apr 10 00:49 File_B.txt
32651097298628862 drwxrwxrwx 1 maimoona maimoona 512 Apr 10 00:27 dirA
23643898043886689 lrwxrwxrwx 1 maimoona maimoona 10 Apr 10 00:41 sl_fileb.txt -> File_B.txt
```

14. Similarly delete softlink sl\_File\_B from File\_b.

```
maimoona@DESKTOP-3E3NBI6 x + v
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ unlink sl_fileB.txt
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ ls -li
total 0
25051272927443160 -rwxrwxrwx 1 maimoona maimoona 18 Apr 10 00:47 File_A.txt
4222124650921375 -rwxrwxrwx 1 maimoona maimoona 16 Apr 10 00:49 File_B.txt
32651097298628862 drwxrwxrwx 1 maimoona maimoona 512 Apr 10 00:27 dirA
maimoona@DESKTOP-3E3NBI6:/mnt/c/Users/Maimoona Khilji/CS_link_test$ |
```

Hardlink: In source\_file destined\_name

softlinkL In -s source\_file destined\_name