

EmbedUR- Linux Training Program 2025

Module -1 Assignment

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Question -1

To Create a file and add executable permission to all users (user, group and others)

Solution:

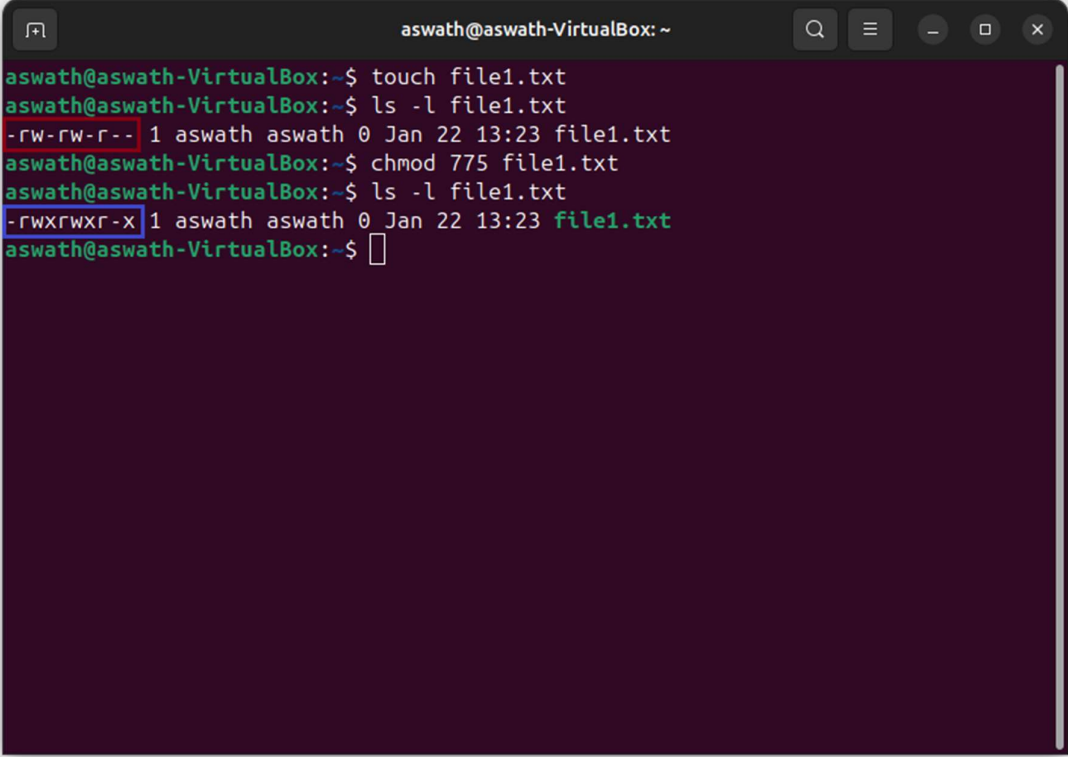
Step 1: A new Empty file called file1.txt is created using the touch file1.txt Command

Step 2: For Checking the permission of User, Group and Other, we use **ls -l file1.txt**

Step 3: To add the Executable permissions to all the user, we can use **Absolute method** for changing the permissions - **chmod 775 file1.txt**.

Here **User- 7 – Read + Write + Execute, Group – 7 – Read + Write + Execute, Others - 5 – Read + Execute.**

Step 4: To check the modified permission, we again use **ls -l file1.txt**

A terminal window titled 'aswath@aswath-VirtualBox: ~' with standard window controls. It shows a sequence of commands and their outputs: 1. 'touch file1.txt' is executed. 2. 'ls -l file1.txt' is executed, showing '-rw-rw-r-- 1 aswath aswath 0 Jan 22 13:23 file1.txt', with the permissions highlighted in a red box. 3. 'chmod 775 file1.txt' is executed. 4. 'ls -l file1.txt' is executed again, showing '-rwxrwxr-x 1 aswath aswath 0 Jan 22 13:23 file1.txt', with the new permissions highlighted in a blue box. The prompt is currently at the end of the last line.

```
aswath@aswath-VirtualBox:~$ touch file1.txt
aswath@aswath-VirtualBox:~$ ls -l file1.txt
-rw-rw-r-- 1 aswath aswath 0 Jan 22 13:23 file1.txt
aswath@aswath-VirtualBox:~$ chmod 775 file1.txt
aswath@aswath-VirtualBox:~$ ls -l file1.txt
-rwxrwxr-x 1 aswath aswath 0 Jan 22 13:23 file1.txt
aswath@aswath-VirtualBox:~$
```

Question -2

To Create a file and remove write permission for group user alone.

Solution:

Step 1: A new file called file2.txt is created using the `cat>file2.txt` Command

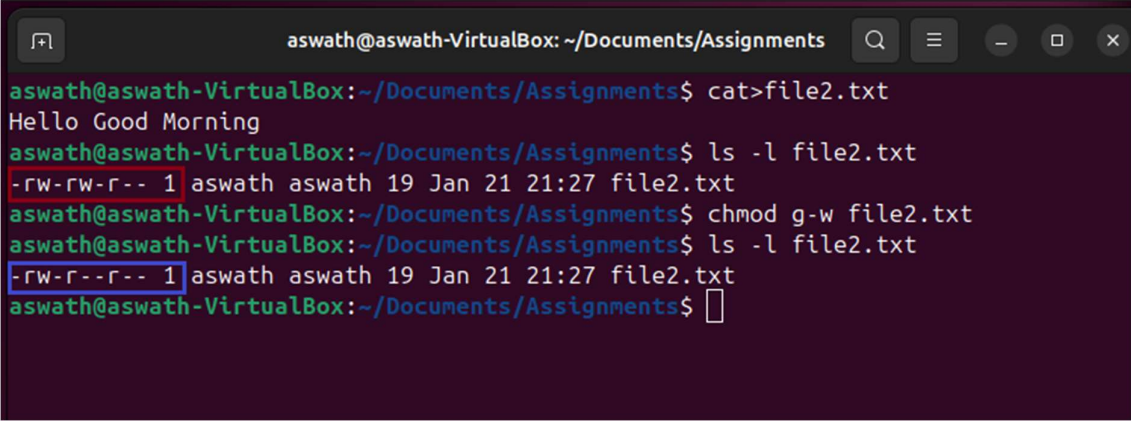
Step 2: Enter the Text, and `ctrl + D` to save the content entered in the file2.txt

Step 3: For Checking the permission of User, Group and Other, we use `ls -l file2.txt`

Step 4: To remove write permission for group user alone, we can use Symbolic method for changing the permission - `chmod g-w file2.txt`.

Here, **g** denotes the group, **-** denotes to remove a permission, **w** denotes the Write.

Step 5: To check the modified permission, we again use `ls -l file2.txt`



```
aswath@aswath-VirtualBox: ~/Documents/Assignments
aswath@aswath-VirtualBox:~/Documents/Assignments$ cat>file2.txt
Hello Good Morning
aswath@aswath-VirtualBox:~/Documents/Assignments$ ls -l file2.txt
-rw-rw-r-- 1 aswath aswath 19 Jan 21 21:27 file2.txt
aswath@aswath-VirtualBox:~/Documents/Assignments$ chmod g-w file2.txt
aswath@aswath-VirtualBox:~/Documents/Assignments$ ls -l file2.txt
-rw-r--r-- 1 aswath aswath 19 Jan 21 21:27 file2.txt
aswath@aswath-VirtualBox:~/Documents/Assignments$
```

Question-3

To Create a file and add a soft link to the file in different directory (Eg : Create a file in dir1/dir2/file and create a soft link for file inside dir1)

Solution:

Step 1: A new directory is created using **mkdir** command Since I have used **mkdir -p Directory1/Directory2** because **-p indicates parents** and Directory 2 is a **sub-directory** of Directory1.

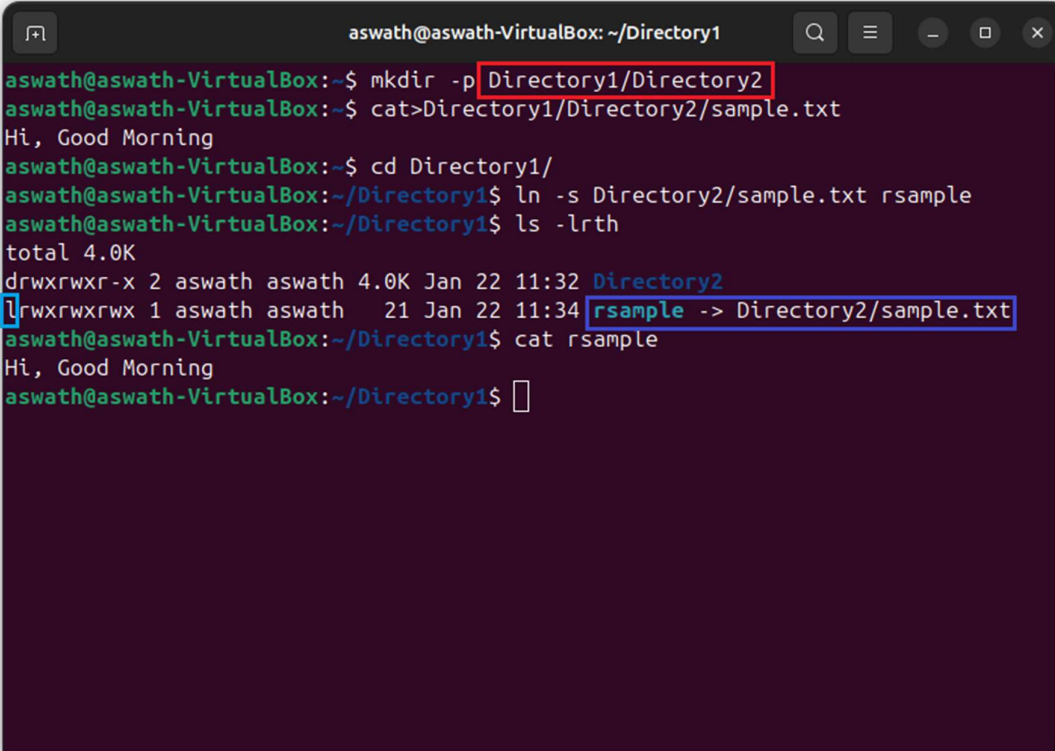
Step 2: Creating a file in Directory2 using cat command and enter the input text –
cat>Directory1/Directory2/sample.txt

Step 3: Since we need to create a **soft link file** inside the Directory1 so, **cd Directory1/**

Step 4: Command for **creating the soft link file - ln -s <target_file_location> <sym_link_file_name>**. So, **ln -s Directory2/sample.txt rsample** .

Step 5: To list the files in Directory1, I have used **ls -lrth**, Here we can clearly see the soft link file generated **rsample** and it is indicating the target file location and the permission of Soft link file starting with **l** denotes it is **soft link file**.

Step 6: To verify the soft link file is working we use, **cat rsample** it prints the contents stored in Directory2/sample.txt



```
aswath@aswath-VirtualBox: ~/Directory1
aswath@aswath-VirtualBox:~$ mkdir -p Directory1/Directory2
aswath@aswath-VirtualBox:~$ cat>Directory1/Directory2/sample.txt
Hi, Good Morning
aswath@aswath-VirtualBox:~$ cd Directory1/
aswath@aswath-VirtualBox:~/Directory1$ ln -s Directory2/sample.txt rsample
aswath@aswath-VirtualBox:~/Directory1$ ls -lrth
total 4.0K
drwxrwxr-x 2 aswath aswath 4.0K Jan 22 11:32 Directory2
lrwxrwxrwx 1 aswath aswath 21 Jan 22 11:34 rsample -> Directory2/sample.txt
aswath@aswath-VirtualBox:~/Directory1$ cat rsample
Hi, Good Morning
aswath@aswath-VirtualBox:~/Directory1$
```

Question -4

Use ps command with options to display all active process running on the system

Solution:

Command used **ps -aux**

-aux – it lists the currently running processes in full format.

PID: It shows the number of a Process ID.

%CPU: It shows how much the process is using the CPU.

%MEM: It shows how much the process is using memory.

VSZ: It shows virtual memory usage.

RSS: It stands for Resident set size.

STAT: It shows the status code of the process.

START: It shows the time when a process started.

TIME: It shows the CPU time amount utilized by a process.

COMMAND: It shows the process name, including arguments if available.

```
aswath@aswath-VirtualBox: ~$ ps -aux
USER          PID  %CPU  %MEM    VSZ   RSS  TTY      STAT START   TIME COMMAND
root           1   0.1   0.2  23116 14032 ?        Ss   13:19   0:04 /sbin/init sp
root           2   0.0   0.0      0     0 ?        S    13:19   0:00 [kthreadd]
root           3   0.0   0.0      0     0 ?        S    13:19   0:00 [pool_workque
root           4   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/R-rc
root           5   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/R-rc
root           6   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/R-sl
root           7   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/R-ne
root          10   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/0:0H
root          11   0.0   0.0      0     0 ?        I    13:19   0:00 [kworker/u8:0
root          12   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/R-mm
root          13   0.0   0.0      0     0 ?        I    13:19   0:00 [rcu_tasks_kt
root          14   0.0   0.0      0     0 ?        I    13:19   0:00 [rcu_tasks_ru
root          15   0.0   0.0      0     0 ?        I    13:19   0:00 [rcu_tasks_tr
root          16   0.0   0.0      0     0 ?        S    13:19   0:00 [ksoftirqd/0]
root          17   0.0   0.0      0     0 ?        I    13:19   0:01 [rcu_preempt]
root          18   0.0   0.0      0     0 ?        S    13:19   0:00 [migration/0]
root          19   0.0   0.0      0     0 ?        S    13:19   0:00 [idle_inject/
root          20   0.0   0.0      0     0 ?        S    13:19   0:00 [cpuhp/0]
root          21   0.0   0.0      0     0 ?        S    13:19   0:00 [cpuhp/1]
root          22   0.0   0.0      0     0 ?        S    13:19   0:00 [idle_inject/
root          23   0.0   0.0      0     0 ?        S    13:19   0:00 [migration/1]
root          24   0.0   0.0      0     0 ?        S    13:19   0:00 [ksoftirqd/1]
root          26   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/1:0H
root          27   0.0   0.0      0     0 ?        S    13:19   0:00 [cpuhp/2]
root          28   0.0   0.0      0     0 ?        S    13:19   0:00 [idle_inject/
root          29   0.0   0.0      0     0 ?        S    13:19   0:00 [migration/2]
root          30   0.0   0.0      0     0 ?        S    13:19   0:00 [ksoftirqd/2]
root          31   0.0   0.0      0     0 ?        I    13:19   0:01 [kworker/2:0-
root          32   0.0   0.0      0     0 ?        I<   13:19   0:00 [kworker/2:0H
root          33   0.0   0.0      0     0 ?        S    13:19   0:00 [cpuhp/3]
root          34   0.0   0.0      0     0 ?        S    13:19   0:00 [idle_inject/
```

```
aswath@aswath-VirtualBox: ~
root 46 0.0 0.0 0 0 ? S 13:19 0:00 [kauditd]
root 47 0.0 0.0 0 0 ? S 13:19 0:00 [khungtaskd]
root 48 0.0 0.0 0 0 ? S 13:19 0:00 [oom_reaper]
root 50 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-wr
root 51 0.0 0.0 0 0 ? S 13:19 0:00 [kcompactd0]
root 52 0.0 0.0 0 0 ? SN 13:19 0:00 [ksmd]
root 54 0.0 0.0 0 0 ? SN 13:19 0:00 [khugepaged]
root 55 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-ki
root 56 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-kb
root 57 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-bl
root 58 0.0 0.0 0 0 ? S 13:19 0:00 [irq/9-acpi]
root 59 0.0 0.0 0 0 ? I 13:19 0:00 [kworker/3:1-
root 60 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-tp
root 61 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-at
root 62 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-md
root 63 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-md
root 64 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-ed
root 65 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-de
root 66 0.0 0.0 0 0 ? S 13:19 0:00 [watchdogd]
root 67 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/2:1H
root 68 0.0 0.0 0 0 ? S 13:19 0:00 [kswapd0]
root 69 0.0 0.0 0 0 ? S 13:19 0:00 [ecryptfs-kth
root 70 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-kt
root 71 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-ac
root 72 0.0 0.0 0 0 ? I 13:19 0:00 [kworker/u12:
root 73 0.0 0.0 0 0 ? I 13:19 0:00 [kworker/u10:
root 74 0.0 0.0 0 0 ? I 13:19 0:00 [kworker/1:1-
root 75 0.0 0.0 0 0 ? S 13:19 0:00 [scsi_eh_0]
root 76 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-sc
root 77 0.0 0.0 0 0 ? S 13:19 0:00 [scsi_eh_1]
root 78 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-sc
root 80 0.0 0.0 0 0 ? I 13:19 0:00 [kworker/u12:
root 81 0.0 0.0 0 0 ? I< 13:19 0:00 [kworker/R-m]
```

```
aswath@aswath-VirtualBox: ~
aswath 3002 0.0 0.3 40556 19328 ? S 13:23 0:00 /usr/bin/pyth
aswath 3005 0.0 0.5 467596 28932 ? Sl 13:23 0:00 /usr/bin/gnom
aswath 3011 0.0 1.0 562656 52664 ? Ssl 13:23 0:01 /usr/libexec/
aswath 3018 0.0 0.1 19824 5248 pts/0 Ss 13:23 0:00 bash
aswath 3253 2.8 7.0 11459168 354808 ? Sl 13:24 1:16 /snap/firefox
root 3291 0.0 0.0 0 0 ? S 13:24 0:00 [psimon]
root 3337 0.0 0.0 0 0 ? I 13:24 0:00 [kworker/u9:4
root 3418 0.0 0.0 0 0 ? I 13:24 0:00 [kworker/u11:
aswath 3455 0.0 0.9 208024 49280 ? Sl 13:24 0:00 /snap/firefox
aswath 3508 0.2 2.5 2468560 131108 ? Sl 13:24 0:07 /snap/firefox
aswath 3549 0.0 0.4 1313340 20260 ? Sl 13:24 0:00 /usr/bin/snap
aswath 3718 0.0 1.7 2428932 90524 ? Sl 13:24 0:02 /snap/firefox
aswath 3937 0.0 0.9 206816 45696 ? Sl 13:24 0:00 /snap/firefox
aswath 4083 4.7 10.8 3084704 550496 ? Sl 13:24 2:06 /snap/firefox
aswath 4102 0.0 1.4 2392908 73188 ? Sl 13:24 0:01 /snap/firefox
aswath 4116 0.0 1.4 2392908 73448 ? Sl 13:24 0:01 /snap/firefox
root 4143 0.0 0.0 0 0 ? I 13:24 0:00 [kworker/3:0-
aswath 4163 0.0 1.4 2393492 73848 ? Sl 13:25 0:01 /snap/firefox
root 4257 0.0 0.7 486412 38732 ? Ssl 13:26 0:00 /usr/libexec/
root 4268 0.0 0.0 0 0 ? I 13:26 0:00 [kworker/0:0]
aswath 4303 0.0 0.1 470864 8576 ? Sl 13:27 0:00 /usr/libexec/
aswath 4320 0.0 0.1 399216 8832 ? Sl 13:27 0:00 /usr/libexec/
root 4503 0.0 0.0 0 0 ? I 13:36 0:00 [kworker/u12:
root 4549 0.0 0.0 0 0 ? I 13:40 0:00 [kworker/1:2]
root 4566 0.0 0.0 0 0 ? I 13:41 0:00 [kworker/u10:
root 4744 0.0 0.0 0 0 ? I 13:54 0:00 [kworker/u11:
root 4833 0.0 0.0 0 0 ? I 14:00 0:00 [kworker/2:1]
aswath 4942 0.1 1.2 2884712 61480 ? Sl 14:04 0:00 gjs /usr/shar
root 5005 0.0 0.0 0 0 ? I 14:04 0:00 [kworker/3:2-
root 5015 0.0 0.0 0 0 ? I 14:05 0:00 [kworker/u9:2
aswath 5053 0.0 0.1 23772 5504 pts/0 R+ 14:08 0:00 ps -aux
aswath@aswath-VirtualBox:~$
```


Question -5

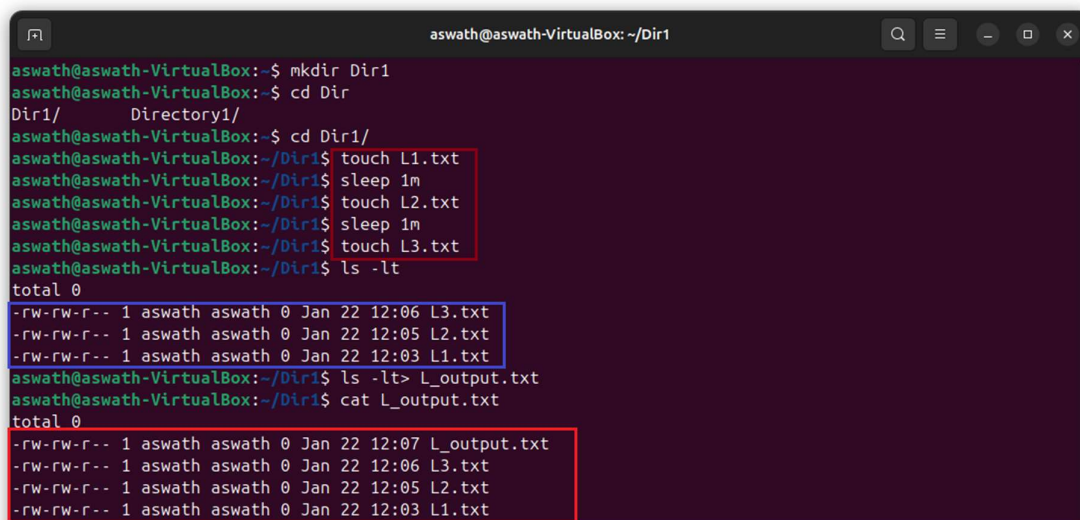
To Create 3 files in a dir1 and re-direct the output of list command with sorted by timestamp of the files to a file.

Solution:

Step 1: Creating a 3 files with a delay of 1minute – touch command for creating empty files and **sleep** command for creating delay or some other process would happen during this 1 minute.

Step 2: Command **ls -lt** is used to list the files with permissions in a sorted manner according to the timestamp of the file created. **-t** for sorting the files with respect to time stamp.

Step 3: Re-Directing the output of the **ls -lt** command to a new file called **L_output.txt**, **Command – ls -lt> L_output.txt**.



```
aswath@aswath-VirtualBox: ~/Dir1
aswath@aswath-VirtualBox:~$ mkdir Dir1
aswath@aswath-VirtualBox:~$ cd Dir
Dir1/
aswath@aswath-VirtualBox:~$ cd Dir1/
aswath@aswath-VirtualBox:~/Dir1$ touch L1.txt
aswath@aswath-VirtualBox:~/Dir1$ sleep 1m
aswath@aswath-VirtualBox:~/Dir1$ touch L2.txt
aswath@aswath-VirtualBox:~/Dir1$ sleep 1m
aswath@aswath-VirtualBox:~/Dir1$ touch L3.txt
aswath@aswath-VirtualBox:~/Dir1$ ls -lt
total 0
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:06 L3.txt
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:05 L2.txt
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:03 L1.txt
aswath@aswath-VirtualBox:~/Dir1$ ls -lt> L_output.txt
aswath@aswath-VirtualBox:~/Dir1$ cat L_output.txt
total 0
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:07 L_output.txt
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:06 L3.txt
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:05 L2.txt
-rw-rw-r-- 1 aswath aswath 0 Jan 22 12:03 L1.txt
```