# Operating Systems – OS

Lab Task 04 (OS-004)

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**Submitted to:**

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**Dated:**

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# RIPHAH International University

# Fall 2025
# Faculty of Computing

# Lab Activities

```
muhammadroshaanidrees56177@Ubuntu: ~/lab04

muhammadroshaanidrees56177@Ubuntu:~$ ls
Desktop    Downloads  Pictures  snap      Videos
Documents  Music      Public    Templates
muhammadroshaanidrees56177@Ubuntu:~$ mkdir lab04
muhammadroshaanidrees56177@Ubuntu:~$ cd lab04
muhammadroshaanidrees56177@Ubuntu:~/lab04$ touch file.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat>file.txt
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 1.
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat<file.txt
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 1.
muhammadroshaanidrees56177@Ubuntu:~/lab04$ touch file2.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat>file2.txt
^C
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat<file2.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat>file2.txt
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 2.
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat<file2.txt
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 2.
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat file.txt file2.txt>file3.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat<file3.txt
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 1.
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 2.
muhammadroshaanidrees56177@Ubuntu:~/lab04$ sudo head file3.txt
[sudo] password for muhammadroshaanidrees56177:
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 1.
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 2.
muhammadroshaanidrees56177@Ubuntu:~/lab04$ sudo tail file3.txt
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 1.
My name is Muhammad Roshaan Idrees and i'm doing lab 04. This is file 2.

muhammadroshaanidrees56177@Ubuntu:~/lab04$ touch unsorted.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat>unsorted.txt
Abrar Ali, Muhammad Roshaan Idrees, Waqas, Mahmood, Saad Ali Jutt, Haroon Abbas, Ghazanfar, Anees, Hamza Ahsan, Shahzaib

muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat<sorted.txt
Abrar Ali, Anees, Ghazanfar, Hamza Ahsan, Haroon Abbas, Mahmood, Muhammad Roshaan Idrees, Saad Ali Jutt, Shahzaib, Waqas

muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l
total 20
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  73 Sep 16 11:54 file2.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 146 Sep 16 11:57 file3.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  73 Sep 16 11:52 file.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  73 Sep 16 12:13 new.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 121 Sep 16 12:22 sorted.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   0 Sep 16 12:31 unsorted.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod 766 new.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l
total 20
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  73 Sep 16 11:54 file2.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 146 Sep 16 11:57 file3.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  73 Sep 16 11:52 file.txt
-rwxrw-rw- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  73 Sep 16 12:13 new.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 121 Sep 16 12:22 sorted.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   0 Sep 16 12:31 unsorted.txt
```

# Lab Tasks

# Question No: 01

### Task 01

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~$ ls
Desktop    Downloads  Music      Public  Templates
Documents  lab04      Pictures   snap    Videos
muhammadroshaanidrees56177@Ubuntu:~$ cd lab04
muhammadroshaanidrees56177@Ubuntu:~/lab04$ touch roshaan.txt
```

### Task 02

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ touch roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ mkdir student
```

### Task 03

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cd student
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cp ../roshaan.txt .
```

### Task 04

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 000 roshaan.txt
```

### Task 05

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 0
---------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 0 Sep 16 20:39 roshaan.txt
```

### Task 06

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ echo "This is for testing purpose" >roshaan.txt
bash: roshaan.txt: Permission denied
```

The error "Permission Denied" exists because with 000 permissions, no one (not even the owner) can read, write, or execute the file.

## Task 07

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=w roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 200 roshaan.txt
```

## Task 08

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 0
--w------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 0 Sep 16 20:39 roshaan.txt
```

## Task 09

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat>roshaan.txt
My name is Muhammad Roshaan Idrees. I'm a Software Engineering student. I'm currently learning Linux commands. I enjoy working with computers and prob
lem solving. My goal is to improve my technical skills. I also like reading and exploring new technologies. My lab instructor is Mr. Shahzad Ahmed Kh
an.
```

## Task 10

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat>roshaan.txt
My name is Muhammad Roshaan Idrees. I'm a Software Engineering student. I'm currently learning Linux commands. I enjoy working with computers and prob
lem solving. My goal is to improve my technical skills. I also like reading and exploring new technologies. My lab instructor is Mr. Shahzad Ahmed Kh
an.
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat roshaan.txt
cat: roshaan.txt: Permission denied
```

File only has write permission. We can write but not read.

## Task 11

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=r roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 400 roshaan.txt
```

## Task 12

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-r-------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
```

## Task 13

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat roshaan.txt
My name is Muhammad Roshaan Idrees. I'm a Software Engineering student. I'm currently learning Linux commands. I enjoy working with computers and prob
lem solving. My goal is to improve my technical skills. I also like reading and expploring new technologies. My lab instructor is Mr. Shahzad Ahmed Kh
an.
```

## Task 14

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=rx roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 500 roshaan.txt
```

## Task 15

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-r-x------ 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
```

## Task 16

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=rw roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 600 roshaan.txt
```

## Task 17

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-rw------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
```

## Task 18

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=rwx roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 700 roshaan.txt
```

## Task 19

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-rwx------ 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
```

### Task 20

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod g=rx roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 750 roshaan.txt
```

### Task 21

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-rwxr-x--- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
```

### Task 22

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod a=rwx roshaan.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 777 roshaan.txt
```

### Task 23

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-rwxrwxrwx 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
```

# Question No: 02

### Task 01

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ touch students.txt pstudent.txt fstudent.txt
```

### Task 02

### Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=r students.txt pstudent.txt fstudent.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 400 students.txt pstudent.txt fstudent.txt
```

# Task 03

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat>pstudent.txt
bash: pstudent.txt: Permission denied
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat>fstudent.txt
bash: fstudent.txt: Permission denied
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 600 pstudent.txt fstudent.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 4
-rw------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   0 Sep 16 22:09 fstudent.txt
-rw------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   0 Sep 16 22:09 pstudent.txt
-rwxrwxrwx 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
-r-------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   0 Sep 16 22:09 students.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat>pstudent.txt
Ali
Ahmed
Aslam
Basit
Burhan
Abubakar
Danish
Daniyal
Ehtisham
Ehsan
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ cat>fstudent.txt
Amna
Alina
Bisma
Fatima
Gulzaar
Hania
Imaan
Javeria
Kinza
Laiba
```

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 400 pstudent.txt fstudent.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ ls -l
total 12
-r-------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  64 Sep 16 22:23 fstudent.txt
-r-------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  68 Sep 16 22:21 pstudent.txt
-rwxrwxrwx 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177 304 Sep 16 20:53 roshaan.txt
-r-------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   0 Sep 16 22:09 students.txt
```

# Task 04

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ mkdir RIPHAH
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod u=r,g=r RIPHAH
muhammadroshaanidrees56177@Ubuntu:~/lab04/student$ chmod 440 RIPHAH
```

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l
total 36
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:54 file2.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  146 Sep 16 11:57 file3.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:52 file.txt
--w------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   75 Sep 17 19:15 fstudent.txt
-rwxrw-rw- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 12:13 new.txt
--w------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   66 Sep 17 19:13 pstudent.txt
dr--r----- 2 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 17 19:19 RIPHAH
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 20:39 roshaan.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  121 Sep 16 12:22 sorted.txt
drwxrwxr-x 3 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 16 22:28 student
--w------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 17 19:04 students.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 12:31 unsorted.txt
```

## Task 05

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cp students.txt pstudent.txt fstudent.txt RIPHAH
cp: cannot stat 'RIPHAH/students.txt': Permission denied
cp: cannot stat 'RIPHAH/pstudent.txt': Permission denied
cp: cannot stat 'RIPHAH/fstudent.txt': Permission denied
```

## Task 06

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ sort pstudent.txt | head -5 > students.txt
sort: cannot read: pstudent.txt: Permission denied
muhammadroshaanidrees56177@Ubuntu:~/lab04$ sort fstudent.txt | tail -5 >> students.txt
sort: cannot read: fstudent.txt: Permission denied
```

## Task 07

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat RIPHAH/students.txt
cat: RIPHAH/students.txt: Permission denied
```

## Task 08

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod u=r,g=r students.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod 440 students.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l
total 36
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:54 file2.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  146 Sep 16 11:57 file3.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:52 file.txt
--w------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   75 Sep 17 19:15 fstudent.txt
-rwxrw-rw- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 12:13 new.txt
--w------- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   66 Sep 17 19:13 pstudent.txt
drw-rw---- 2 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 17 19:19 RIPHAH
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 20:39 roshaan.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  121 Sep 16 12:22 sorted.txt
drwxrwxr-x 3 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 16 22:28 student
-r--r----- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 17 19:44 students.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 12:31 unsorted.txt
```

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod u=rw,g=rw pstudent.txt fstudent.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod 664 pstudent.txt fstudent.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l
total 36
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:54 file2.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  146 Sep 16 11:57 file3.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:52 file.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   75 Sep 17 19:15 fstudent.txt
-rwxrw-rw- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 12:13 new.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   66 Sep 17 19:13 pstudent.txt
drw-rw---- 2 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 17 19:19 RIPHAH
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 20:39 roshaan.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  121 Sep 16 12:22 sorted.txt
drwxrwxr-x 3 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 16 22:28 student
-r--r----- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 17 19:44 students.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 12:31 unsorted.txt
```

## Task 09

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod u+w students.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ echo -e "Zeeshan" > students.txt
muhammadroshaanidrees56177@Ubuntu:~/lab04$ chmod 440 students.txt
```

## Task 10

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat students.txt
Zeeshan
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat pstudent.txt
Ali
Ahmed
Aslam
Basit
Burhan
Abubakar
Danish
Daniyal
Ehtisham
Ehsan
muhammadroshaanidrees56177@Ubuntu:~/lab04$ cat fstudent.txt
Amna
Alina
Bisma
Fatima
Gulzaar
Hania
Imaan
Javeria
Kinza
Laiba
```

# Task 11

## Solution:

```
muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l RIPHAH
total 0
muhammadroshaanidrees56177@Ubuntu:~/lab04$ ls -l
total 40
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:54 file2.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  146 Sep 16 11:57 file3.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 11:52 file.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   64 Sep 17 20:06 fstudent.txt
-rwxrw-rw- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   73 Sep 16 12:13 new.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177   69 Sep 17 20:05 pstudent.txt
drw-rw---- 2 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 17 19:19 RIPHAH
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 20:39 roshaan.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177  121 Sep 16 12:22 sorted.txt
drwxrwxr-x 3 muhammadroshaanidrees56177 muhammadroshaanidrees56177 4096 Sep 16 22:28 student
-r--r----- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    8 Sep 17 19:59 students.txt
-rw-rw-r-- 1 muhammadroshaanidrees56177 muhammadroshaanidrees56177    0 Sep 16 12:31 unsorted.txt
```

-----------------------------------------------------------