Green University of Bangladesh
Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering

Semester: (Summer, Year: 2024), B.Sc. in CSE (Day)

Lab Report NO 01

Course Title: Operating System Lab

Course Code: CSE 310 Section: 213D3

Lab Experiment Name: Linux/Unix Commands for Beginners.

Student Details

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Lab Date : 15-03-2023

Submission Date : 23-03-2024

Course Teacher's Name : Abdullah Al Farhad

Lab Report Status

Marks: ………………………………… **Signature:.....................**

Comments:... **Date:..............................**

Title: Introduction to Linux/Unix command for Beginners

Objectives:

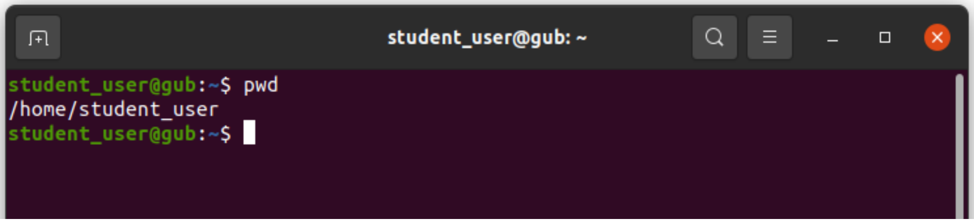
1. Understand the basic Linux commands for file manipulation.
2. Learn about Wildcards and their use in Linux.
3. Grasp the concept of permissions in Linux.
4. Understand the use of filters in Linux.
5. Learn about regular expressions and their usage.
6. Understand the concept of piping and redirection in Linux.
7. Learn about process management in Linux.

Procedure:

1. Start your Ubuntu system.
2. Open the terminal application.
3. Input the necessary Linux commands in the terminal.
4. Execute the commands to perform your desired actions.

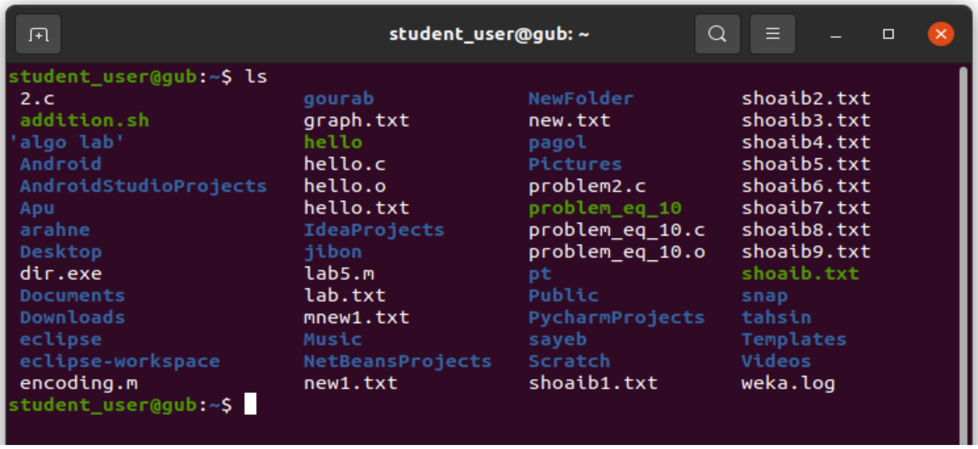
Implementation:

Pwd command: for print work directory



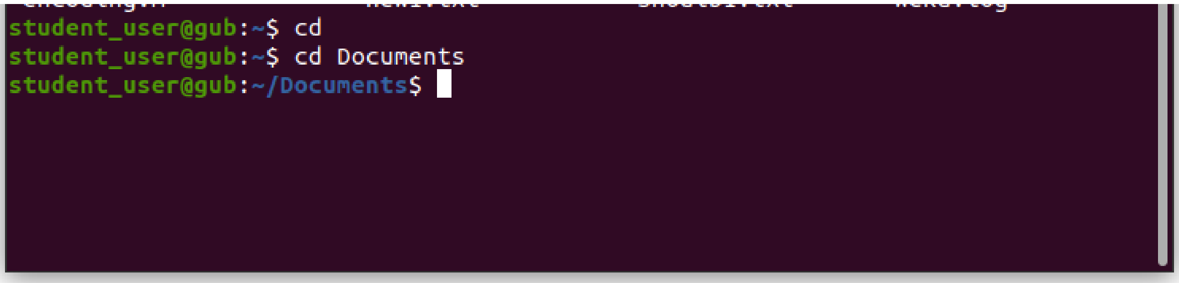
```
student_user@gub:~$ pwd
/home/student_user
student_user@gub:~$
```

ls: for print the items of a director



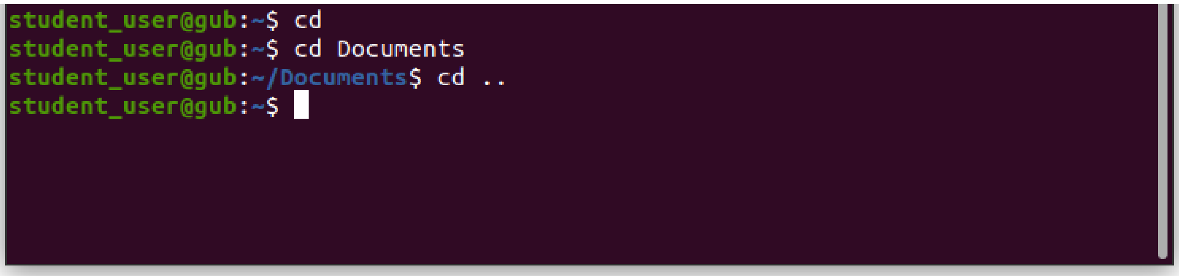
```
student_user@gub:~$ ls
 2.c                      gourab             NewFolder          shoaib2.txt
 addition.sh              graph.txt          new.txt            shoaib3.txt
'algo lab'                hello              pagol              shoaib4.txt
 Android                  hello.c            Pictures           shoaib5.txt
 AndroidStudioProjects    hello.o            problem2.c         shoaib6.txt
 Apu                      hello.txt          problem_eq_10      shoaib7.txt
 arahne                   IdeaProjects       problem_eq_10.c    shoaib8.txt
 Desktop                  jibon              problem_eq_10.o    shoaib9.txt
 dir.exe                  lab5.m             pt                 shoaib.txt
 Documents                lab.txt            Public             snap
 Downloads                mnew1.txt          PycharmProjects    tahsin
 eclipse                  Music              sayeb              Templates
 eclipse-workspace        NetBeansProjects   Scratch            Videos
 encoding.m               new1.txt           shoaib1.txt        weka.log
student_user@gub:~$
```

Cd : change directory



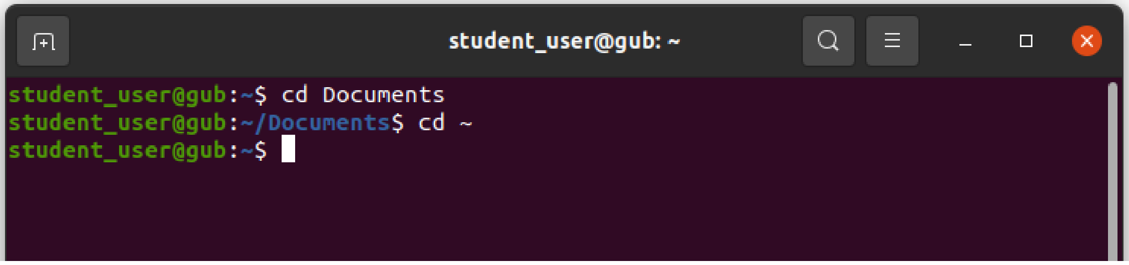
```
student_user@gub:~$ cd
student_user@gub:~$ cd Documents
student_user@gub:~/Documents$
```

cd .. : change directory one level up



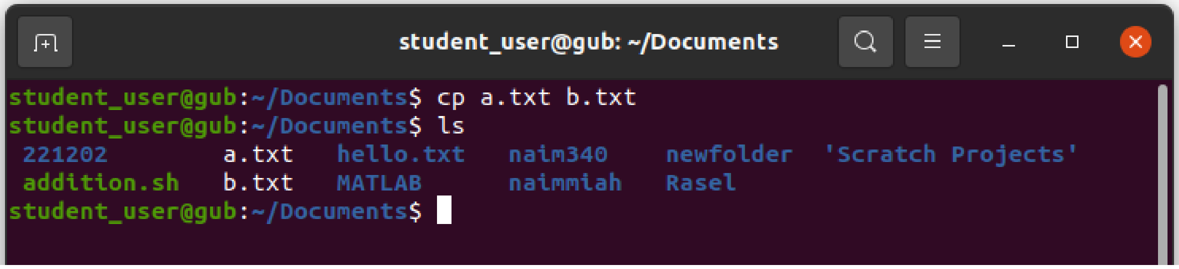
```
student_user@gub:~$ cd
student_user@gub:~$ cd Documents
student_user@gub:~/Documents$ cd ..
student_user@gub:~$
```

cd~ : change to home directory



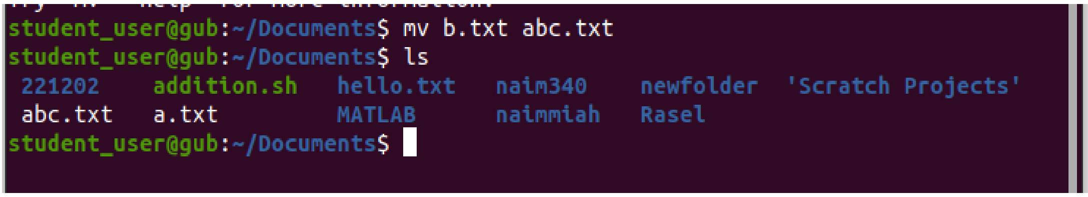
```
student_user@gub:~$ cd Documents
student_user@gub:~/Documents$ cd ~
student_user@gub:~$
```

cp : copy a file or directory



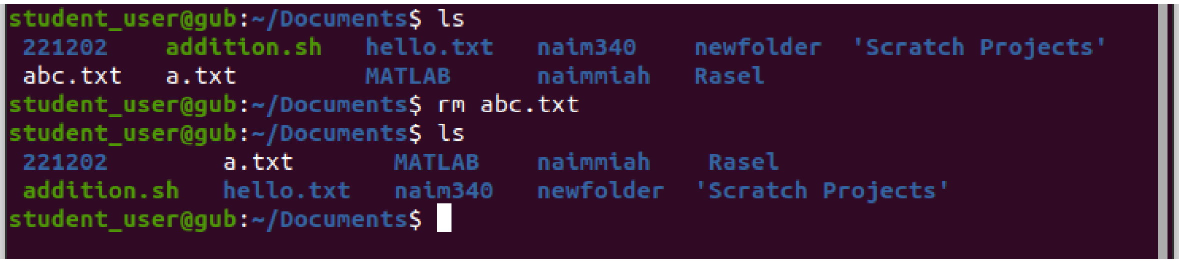
```
student_user@gub:~/Documents$ cp a.txt b.txt
student_user@gub:~/Documents$ ls
 221202         a.txt    hello.txt   naim340    newfolder  'Scratch Projects'
 addition.sh    b.txt    MATLAB      naimmiah   Rasel
student_user@gub:~/Documents$ 
```

mv: move or rename file



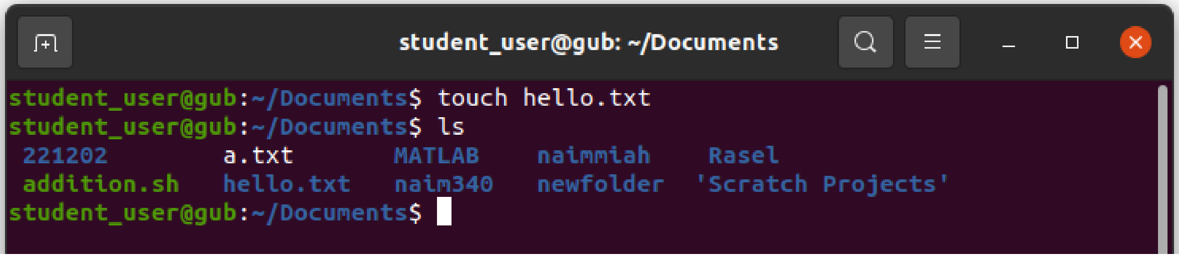
```
student_user@gub:~/Documents$ mv b.txt abc.txt
student_user@gub:~/Documents$ ls
 221202    addition.sh   hello.txt   naim340    newfolder  'Scratch Projects'
 abc.txt   a.txt         MATLAB      naimmiah   Rasel
student_user@gub:~/Documents$ 
```

**rm : **remove file or directory



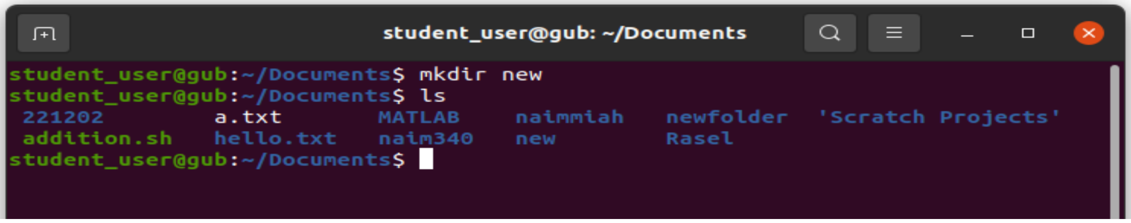
```
student_user@gub:~/Documents$ ls
 221202    addition.sh   hello.txt   naim340    newfolder  'Scratch Projects'
 abc.txt   a.txt         MATLAB      naimmiah   Rasel
student_user@gub:~/Documents$ rm abc.txt
student_user@gub:~/Documents$ ls
 221202         a.txt       MATLAB    naimmiah    Rasel
 addition.sh    hello.txt   naim340   newfolder  'Scratch Projects'
student_user@gub:~/Documents$ 
```

**touch : **Create a single empty file



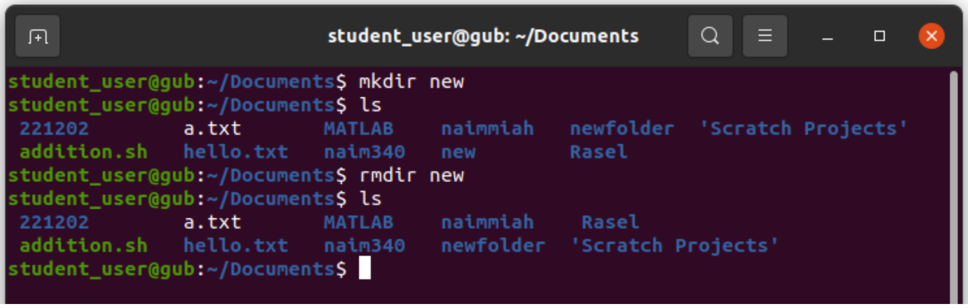
```
student_user@gub:~/Documents$ touch hello.txt
student_user@gub:~/Documents$ ls
 221202         a.txt       MATLAB    naimmiah    Rasel
 addition.sh    hello.txt   naim340   newfolder  'Scratch Projects'
student_user@gub:~/Documents$ 
```

**Mkdir : **create a new directory



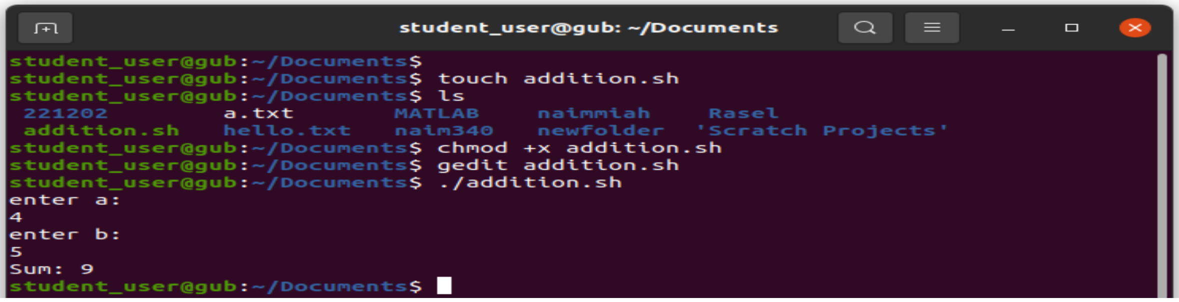
```
student_user@gub:~/Documents$ mkdir new
student_user@gub:~/Documents$ ls
 221202         a.txt       MATLAB    naimmiah   newfolder  'Scratch Projects'
 addition.sh    hello.txt   naim340   new        Rasel
student_user@gub:~/Documents$ 
```

Rmdir: To remove directory



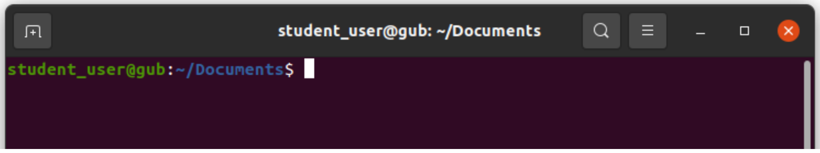
```
student_user@gub:~/Documents$ mkdir new
student_user@gub:~/Documents$ ls
 221202        a.txt       MATLAB    naimmiah    newfolder   'Scratch Projects'
 addition.sh   hello.txt   naim340   new         Rasel
student_user@gub:~/Documents$ rmdir new
student_user@gub:~/Documents$ ls
 221202        a.txt       MATLAB    naimmiah     Rasel
 addition.sh   hello.txt   naim340   newfolder   'Scratch Projects'
student_user@gub:~/Documents$ 
```

chmod : Used to change file permission



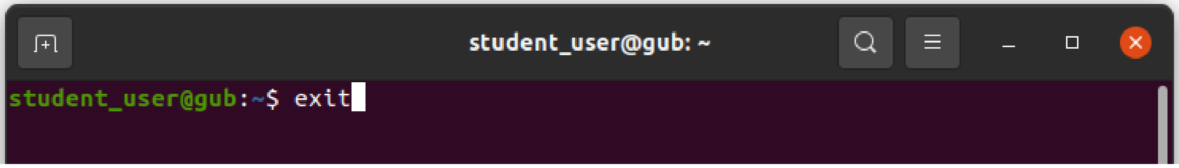
```
student_user@gub:~/Documents$
student_user@gub:~/Documents$ touch addition.sh
student_user@gub:~/Documents$ ls
 221202        a.txt       MATLAB    naimmiah     Rasel
 addition.sh   hello.txt   naim340   newfolder   'Scratch Projects'
student_user@gub:~/Documents$ chmod +x addition.sh
student_user@gub:~/Documents$ gedit addition.sh
student_user@gub:~/Documents$ ./addition.sh
enter a:
4
enter b:
5
Sum: 9
student_user@gub:~/Documents$ 
```

clear : clean Screen



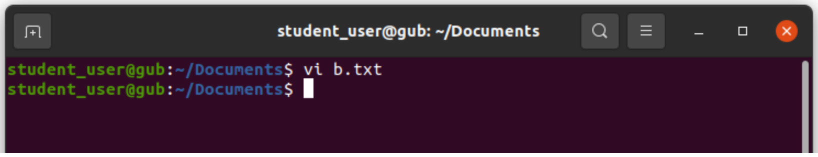
```
student_user@gub:~/Documents$ 
```

Exit: to exit the bash

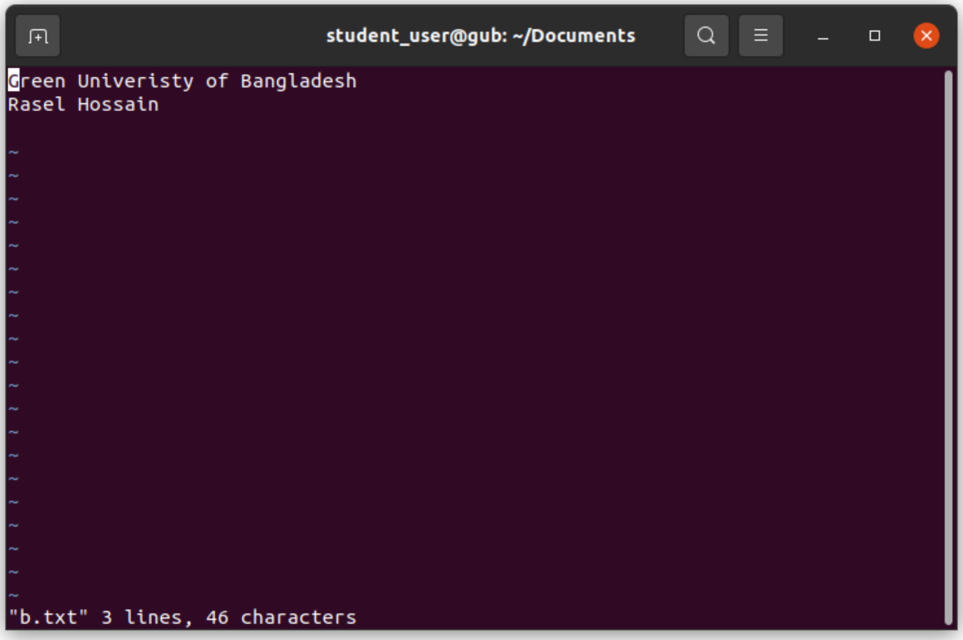


```
student_user@gub:~$ exit
```

Vi b.txt: command line text editor.



```
student_user@gub:~/Documents$ vi b.txt
student_user@gub:~/Documents$ 
```



```
Green Univeristy of Bangladesh
Rasel Hossain

~
~
~
~
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~
"b.txt" 3 lines, 46 characters
```
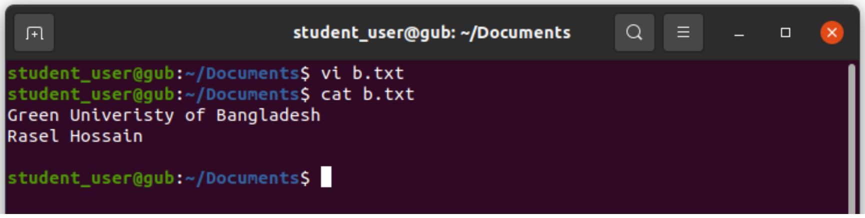
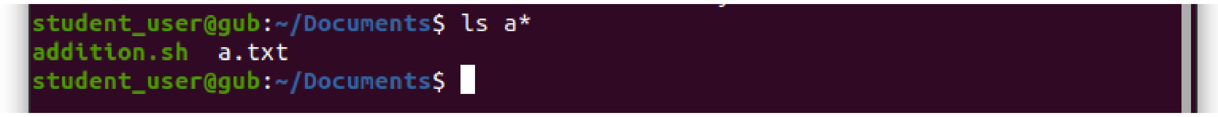

cat : To view the editing text in shell



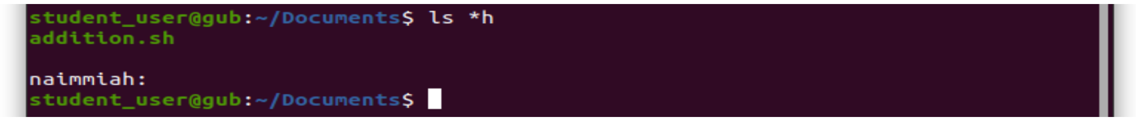
```
student_user@gub:~/Documents$ vi b.txt
student_user@gub:~/Documents$ cat b.txt
Green Univeristy of Bangladesh
Rasel Hossain

student_user@gub:~/Documents$ 
```

Wildcards:

*** command :** represent zero or more characters.

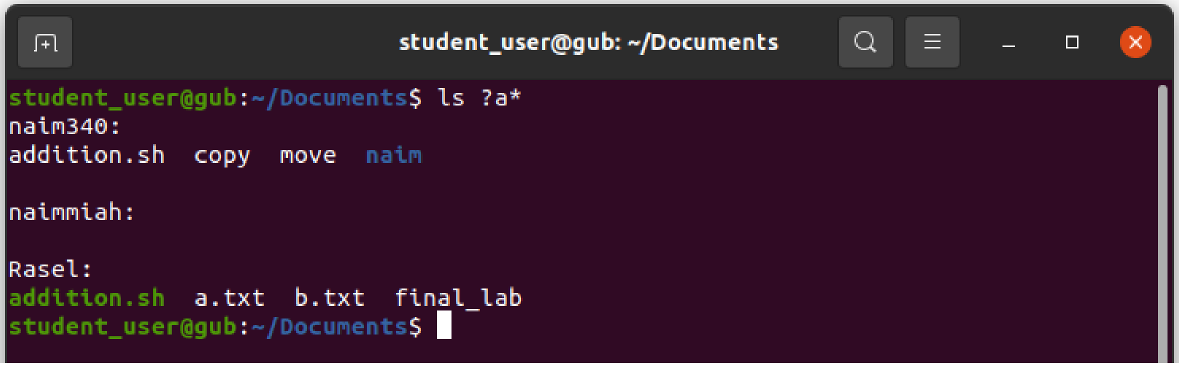


```
student_user@gub:~/Documents$ ls a*
addition.sh  a.txt
student_user@gub:~/Documents$ 
```



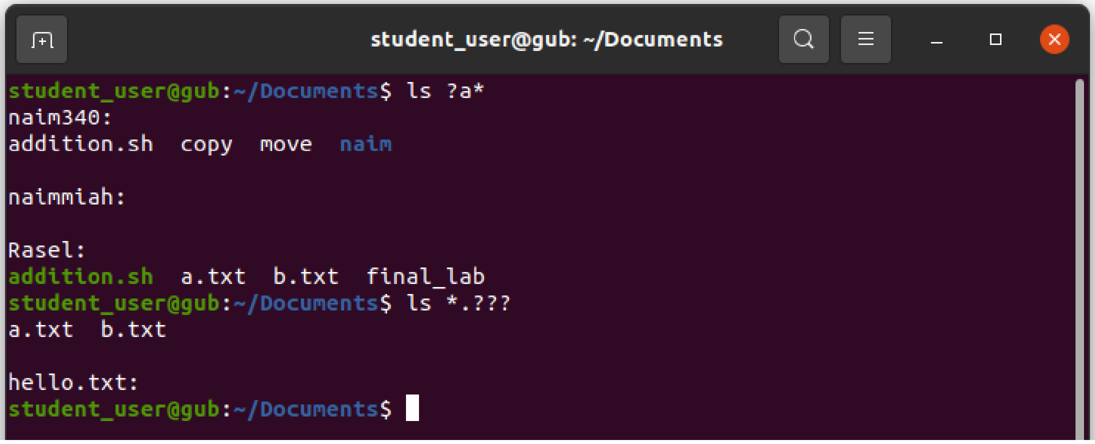
```
student_user@gub:~/Documents$ ls *h
addition.sh

naimmiah:
student_user@gub:~/Documents$ 
```

? command : represents a single character



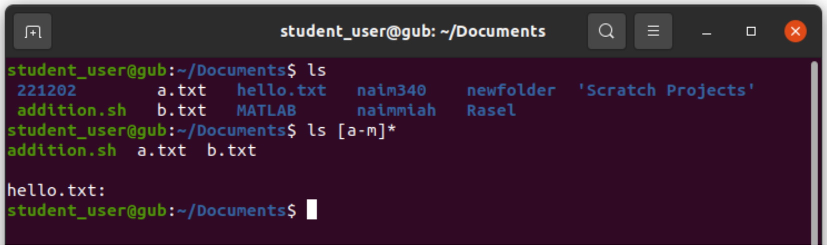
```
student_user@gub:~/Documents$ ls ?a*
naim340:
addition.sh  copy  move  naim

naimmiah:

Rasel:
addition.sh  a.txt  b.txt  final_lab
student_user@gub:~/Documents$ 
```

?.* command :



```
student_user@gub:~/Documents$ ls ?a*
naim340:
addition.sh  copy  move  naim

naimmiah:

Rasel:
addition.sh  a.txt  b.txt  final_lab
student_user@gub:~/Documents$ ls *.???
a.txt  b.txt

hello.txt:
student_user@gub:~/Documents$ 
```

[] command : represent a range of characters

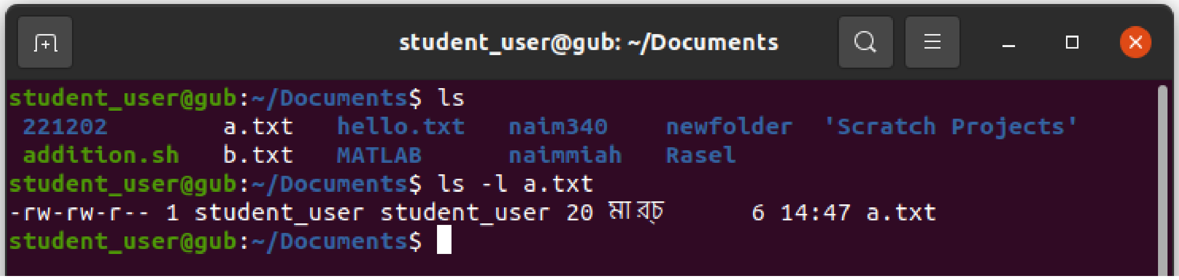


```
student_user@gub:~/Documents$ ls
 221202         a.txt   hello.txt   naim340    newfolder  'Scratch Projects'
 addition.sh    b.txt   MATLAB      naimmiah   Rasel
student_user@gub:~/Documents$ ls [a-m]*
addition.sh  a.txt  b.txt

hello.txt:
student_user@gub:~/Documents$ 
```

File Permission:

r read - view the contents of the file.

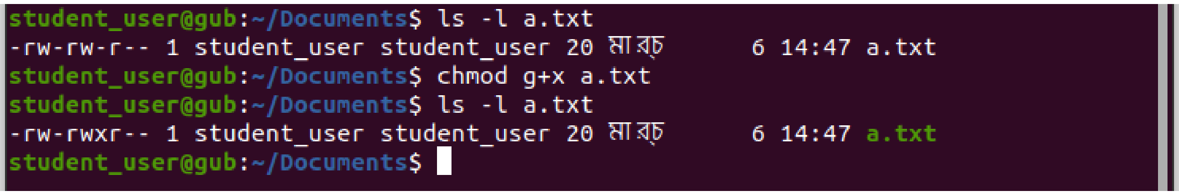
w write - change the contents of the file.
x execute - execute or run the file if it is a program or script.
g group - every file belongs to a single group.
o other- everyone else who is not in the group or the owner.
u user - a single person who owns the file.
ls -l path : to view permissions for a file we use the long listing option for the command ls.



student_user@gub: ~/Documents

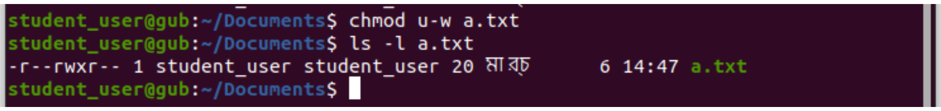
```
student_user@gub:~/Documents$ ls
 221202         a.txt    hello.txt    naim340     newfolder   'Scratch Projects'
 addition.sh    b.txt    MATLAB       naimmiah    Rasel
student_user@gub:~/Documents$ ls -l a.txt
-rw-rw-r-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ 
```

Chmode g+x a.txt: to change the permission a.txt to execute with group



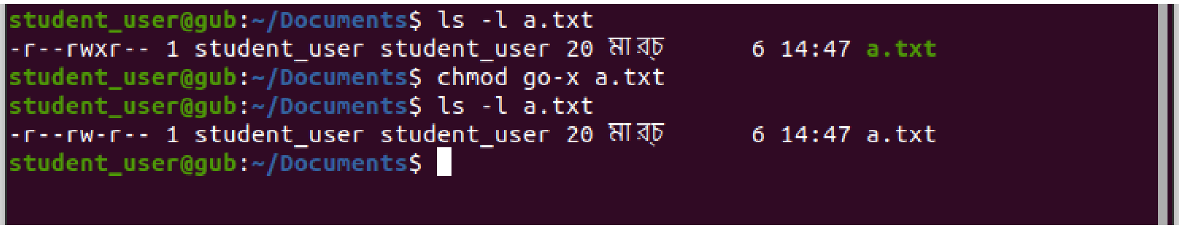
```
student_user@gub:~/Documents$ ls -l a.txt
-rw-rw-r-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ chmod g+x a.txt
student_user@gub:~/Documents$ ls -l a.txt
-rw-rwxr-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ 
```

Chmod u-w : to change permission user write only



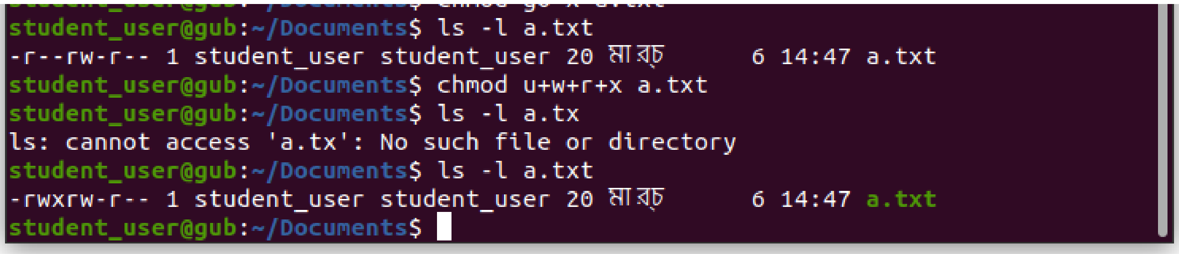
```
student_user@gub:~/Documents$ chmod u-w a.txt
student_user@gub:~/Documents$ ls -l a.txt
-r--rwxr-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ 
```

chmod go-x a.txt: to change permission execute with group and other



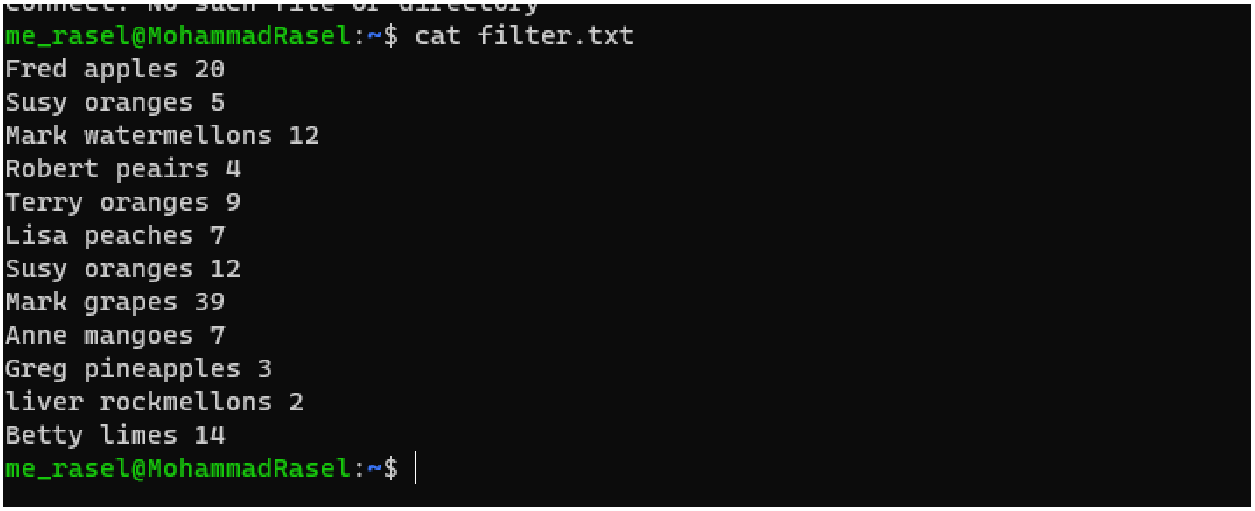
```
student_user@gub:~/Documents$ ls -l a.txt
-r--rwxr-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ chmod go-x a.txt
student_user@gub:~/Documents$ ls -l a.txt
-r--rw-r-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ 
```

chmod u+w+r+x command : to multiple permission change



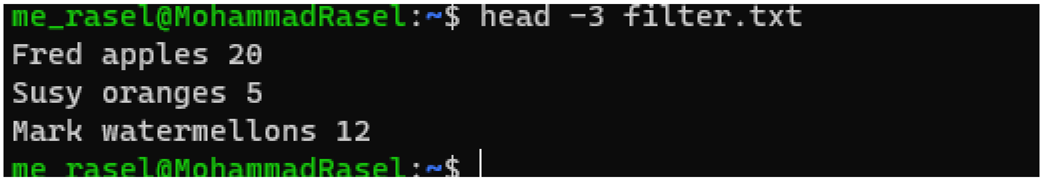
```
student_user@gub:~/Documents$ chmod go-x a.txt
student_user@gub:~/Documents$ ls -l a.txt
-r--rw-r-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$ chmod u+w+r+x a.txt
student_user@gub:~/Documents$ ls -l a.tx
ls: cannot access 'a.tx': No such file or directory
student_user@gub:~/Documents$ ls -l a.txt
-rwxrw-r-- 1 student_user student_user 20 মার্চ      6 14:47 a.txt
student_user@gub:~/Documents$
```

Filter:



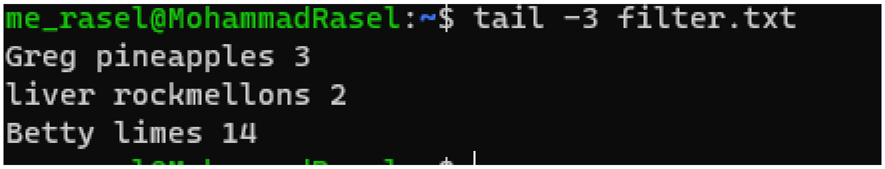
```
connect: No such file or directory
me_rasel@MohammadRasel:~$ cat filter.txt
Fred apples 20
Susy oranges 5
Mark watermellons 12
Robert peairs 4
Terry oranges 9
Lisa peaches 7
Susy oranges 12
Mark grapes 39
Anne mangoes 7
Greg pineapples 3
liver rockmellons 2
Betty limes 14
me_rasel@MohammadRasel:~$
```

head [−number of lines to print] [path]: to print from head



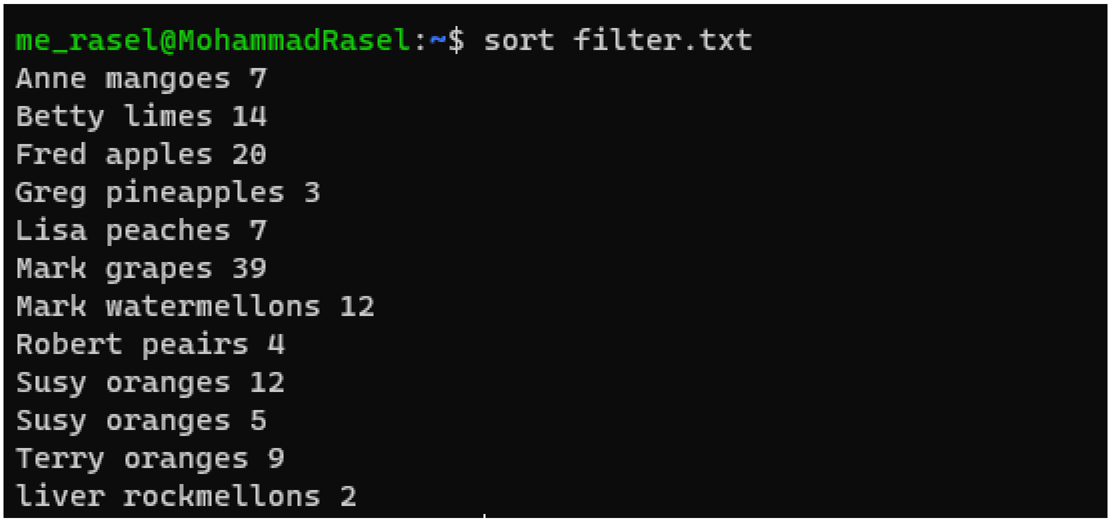
```
me_rasel@MohammadRasel:~$ head -3 filter.txt
Fred apples 20
Susy oranges 5
Mark watermellons 12
me_rasel@MohammadRasel:~$
```

tail [−number of lines to print] [path]; to print from down same like tail



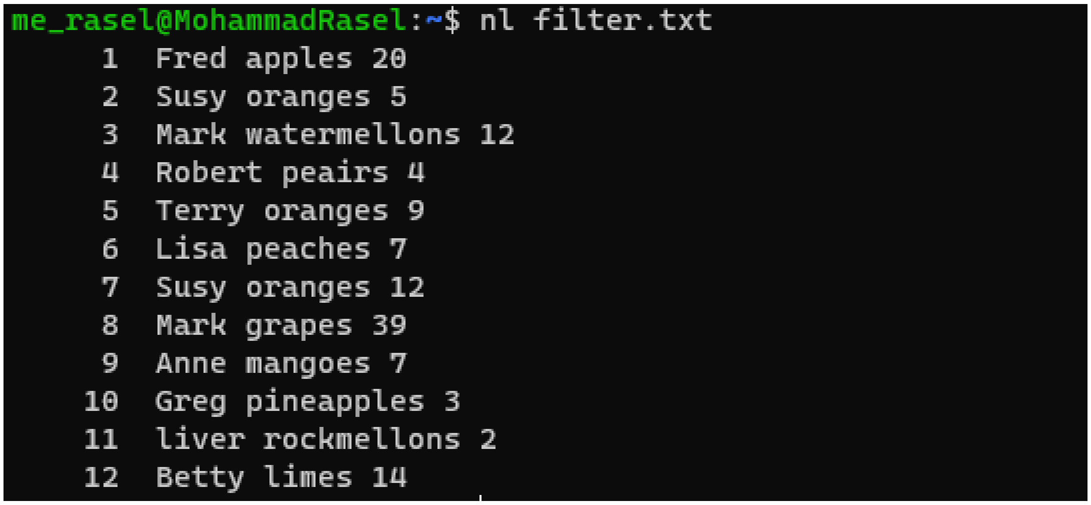
```
me_rasel@MohammadRasel:~$ tail -3 filter.txt
Greg pineapples 3
liver rockmellons 2
Betty limes 14
me_rasel@MohammadRasel:~$
```

sort [−options] [path]: Sorted file



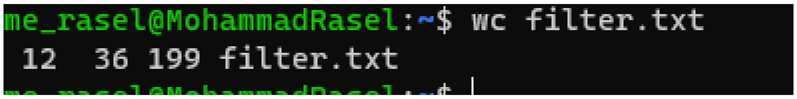
```
me_rasel@MohammadRasel:~$ sort filter.txt
Anne mangoes 7
Betty limes 14
Fred apples 20
Greg pineapples 3
Lisa peaches 7
Mark grapes 39
Mark watermellons 12
Robert peairs 4
Susy oranges 12
Susy oranges 5
Terry oranges 9
liver rockmellons 2
```

nl: nl stands for number lines.



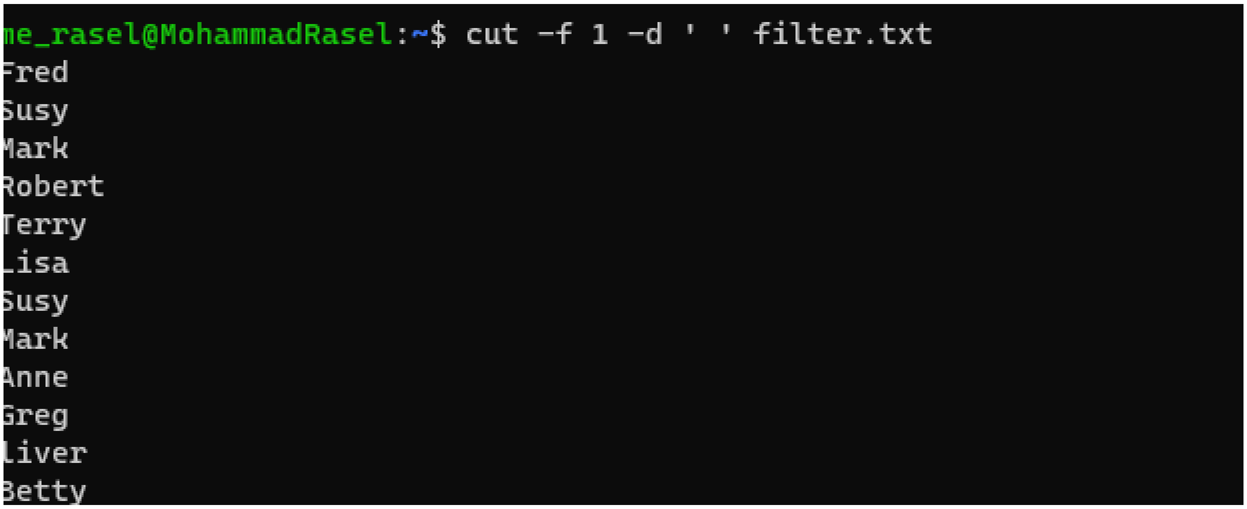
```
me_rasel@MohammadRasel:~$ nl filter.txt
     1  Fred apples 20
     2  Susy oranges 5
     3  Mark watermellons 12
     4  Robert peairs 4
     5  Terry oranges 9
     6  Lisa peaches 7
     7  Susy oranges 12
     8  Mark grapes 39
     9  Anne mangoes 7
    10  Greg pineapples 3
    11  liver rockmellons 2
    12  Betty limes 14
```

Wc: word count and **cut** is separted into columns.



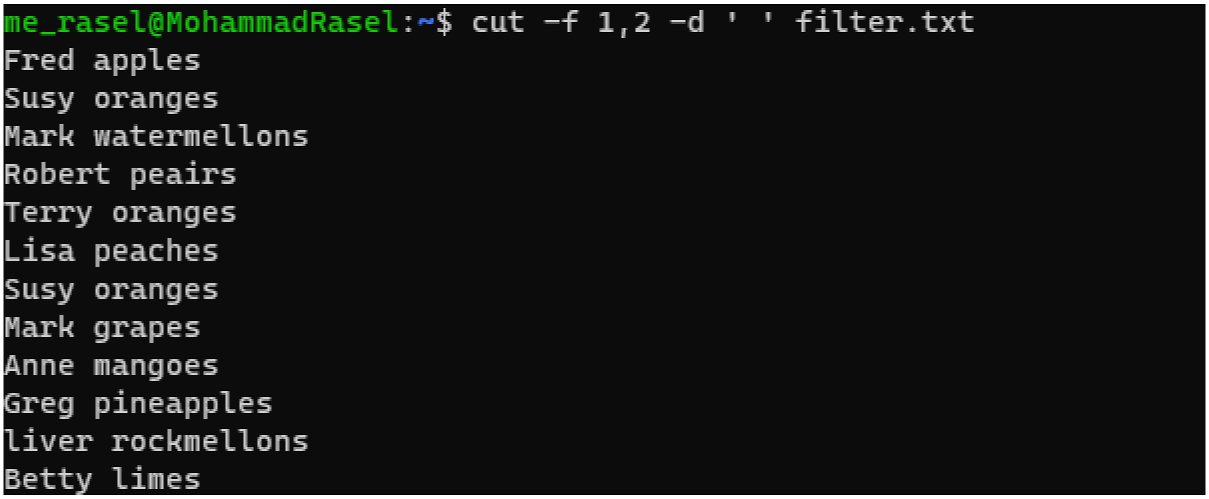
```
me_rasel@MohammadRasel:~$ wc filter.txt
 12  36 199 filter.txt
me_rasel@MohammadRasel:~$
```

Where found space sperate 1 word



```
me_rasel@MohammadRasel:~$ cut -f 1 -d ' ' filter.txt
Fred
Susy
Mark
Robert
Terry
Lisa
Susy
Mark
Anne
Greg
liver
Betty
```

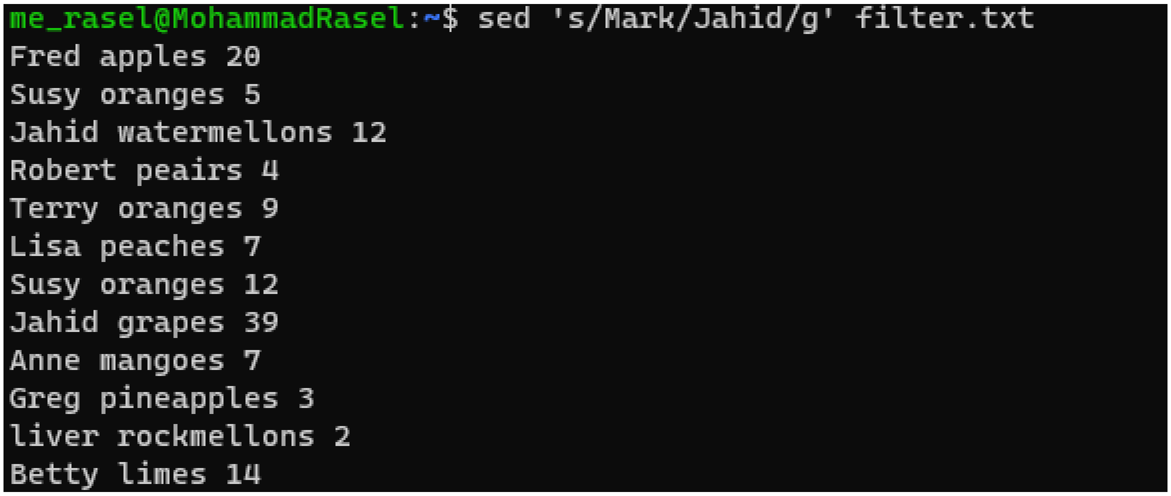
Where found space seprate two word



```
me_rasel@MohammadRasel:~$ cut -f 1,2 -d ' ' filter.txt
Fred apples
Susy oranges
Mark watermellons
Robert peairs
Terry oranges
Lisa peaches
Susy oranges
Mark grapes
Anne mangoes
Greg pineapples
liver rockmellons
Betty limes
```

Sed : stands for stream editor not permanent.

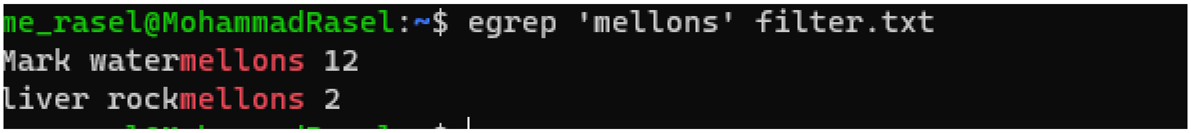
Replace mark with jahid in stream editor.



```
me_rasel@MohammadRasel:~$ sed 's/Mark/Jahid/g' filter.txt
Fred apples 20
Susy oranges 5
Jahid watermellons 12
Robert peairs 4
Terry oranges 9
Lisa peaches 7
Susy oranges 12
Jahid grapes 39
Anne mangoes 7
Greg pineapples 3
liver rockmellons 2
Betty limes 14
```

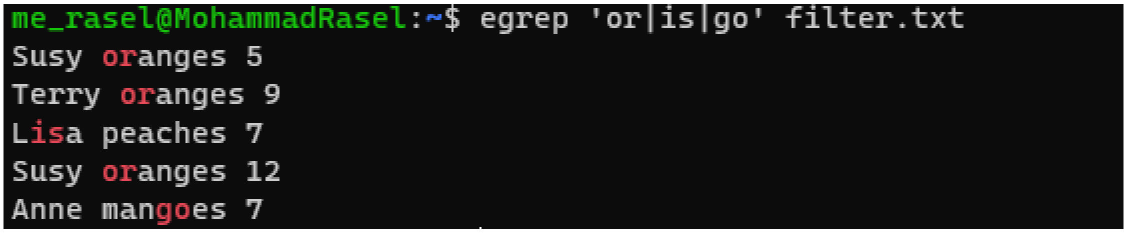
eGrep: search given set of data and print every line

search with mellons set



```
me_rasel@MohammadRasel:~$ egrep 'mellons' filter.txt
Mark watermellons 12
liver rockmellons 2
```

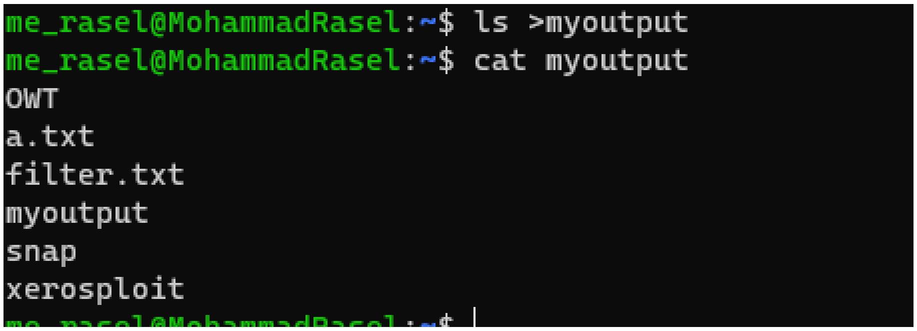
If there have is, or , go its print



```
me_rasel@MohammadRasel:~$ egrep 'or|is|go' filter.txt
Susy oranges 5
Terry oranges 9
Lisa peaches 7
Susy oranges 12
Anne mangoes 7
```

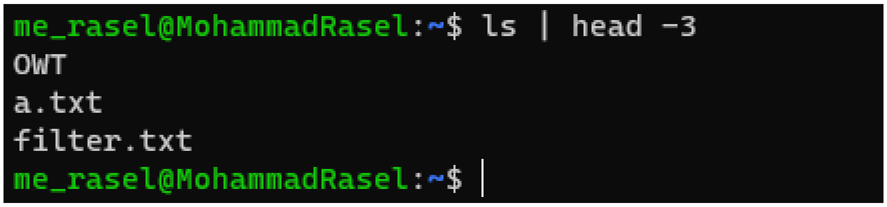
Piping:

We can instead get the new data to be appended to the file by using the double greater than operator (»
).



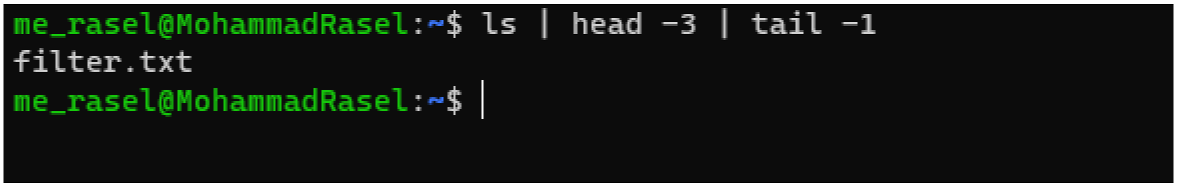
```
me_rasel@MohammadRasel:~$ ls >myoutput
me_rasel@MohammadRasel:~$ cat myoutput
OWT
a.txt
filter.txt
myoutput
snap
xerosploit
```

List of first 3 data



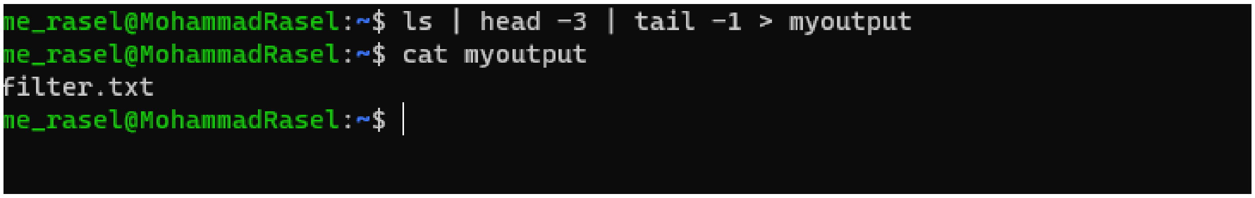
```
me_rasel@MohammadRasel:~$ ls | head -3
OWT
a.txt
filter.txt
me_rasel@MohammadRasel:~$
```

List first 3 data’s last data



```
me_rasel@MohammadRasel:~$ ls | head -3 | tail -1
filter.txt
me_rasel@MohammadRasel:~$
```

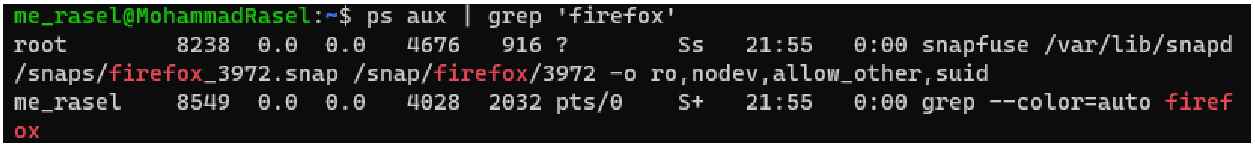
To text only have in myoutput is filter.txt



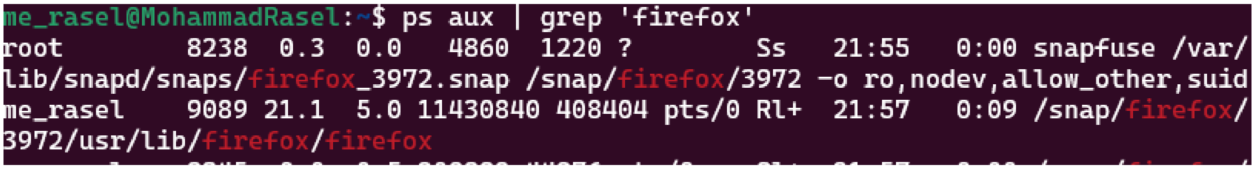
```
me_rasel@MohammadRasel:~$ ls | head -3 | tail -1 > myoutput
me_rasel@MohammadRasel:~$ cat myoutput
filter.txt
me_rasel@MohammadRasel:~$
```

Process Management:

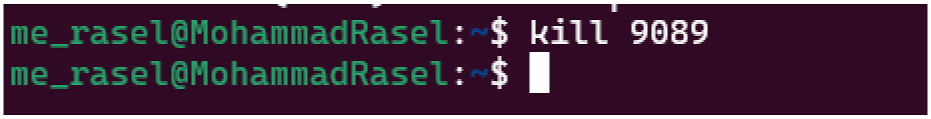
Ps: It does give quite a bit of output so people usually pipe the output to grep to filter out just the data they
are after.



```
me_rasel@MohammadRasel:~$ ps aux | grep 'firefox'
root         8238  0.0  0.0   4676   916 ?        Ss   21:55   0:00 snapfuse /var/lib/snapd
/snaps/firefox_3972.snap /snap/firefox/3972 -o ro,nodev,allow_other,suid
me_rasel     8549  0.0  0.0   4028  2032 pts/0    S+   21:55   0:00 grep --color=auto firef
ox
```



```
me_rasel@MohammadRasel:~$ ps aux | grep 'firefox'
root         8238  0.3  0.0   4860  1220 ?        Ss   21:55   0:00 snapfuse /var/
lib/snapd/snaps/firefox_3972.snap /snap/firefox/3972 -o ro,nodev,allow_other,suid
me_rasel     9089 21.1  5.0 11430840 408404 pts/0 Rl+  21:57   0:09 /snap/firefox/
3972/usr/lib/firefox/firefox
```



```
me_rasel@MohammadRasel:~$ kill 9089
me_rasel@MohammadRasel:~$
```

Discussion:

In Linux, file manipulation, wildcards, permissions, filters, regular expressions, piping and redirection, and process management are essential concepts for any user to master. These commands allow users to navigate, manipulate, and manage files and processes within the Linux environment effectively.

Summary:

In conclusion, understanding these Linux commands and concepts is crucial for anyone working in a Linux environment. They provide the user with the tools necessary to manipulate files, manage processes, and navigate the system with ease.