

Lab 4 Report

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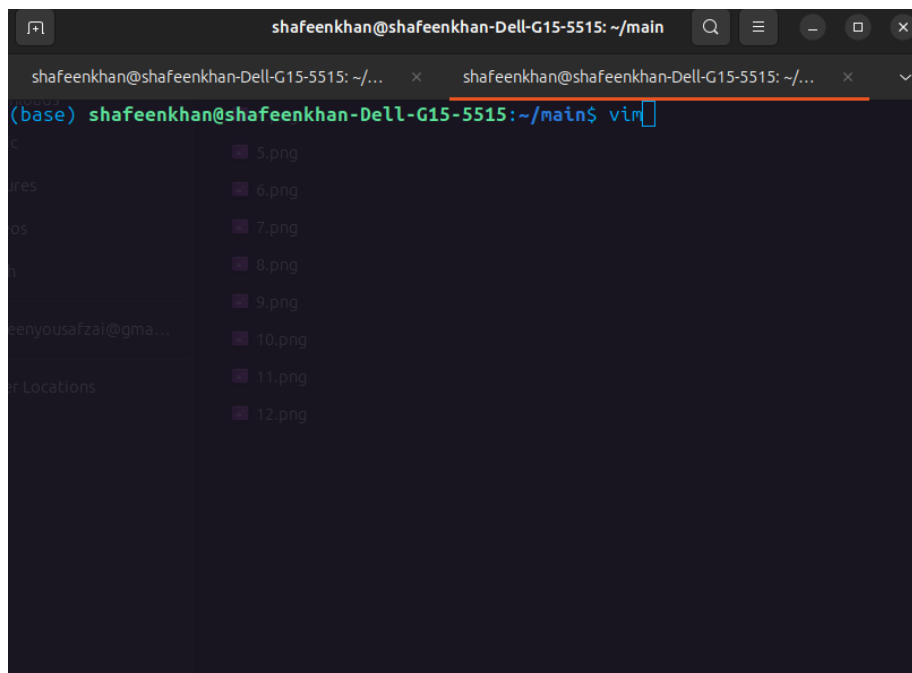
1 Introduction

This document is about Lab task 4 in Operating System Labs at FAST NUCES PWR taught by Sir.Saad Ahmad.

2 Commands and Outputs

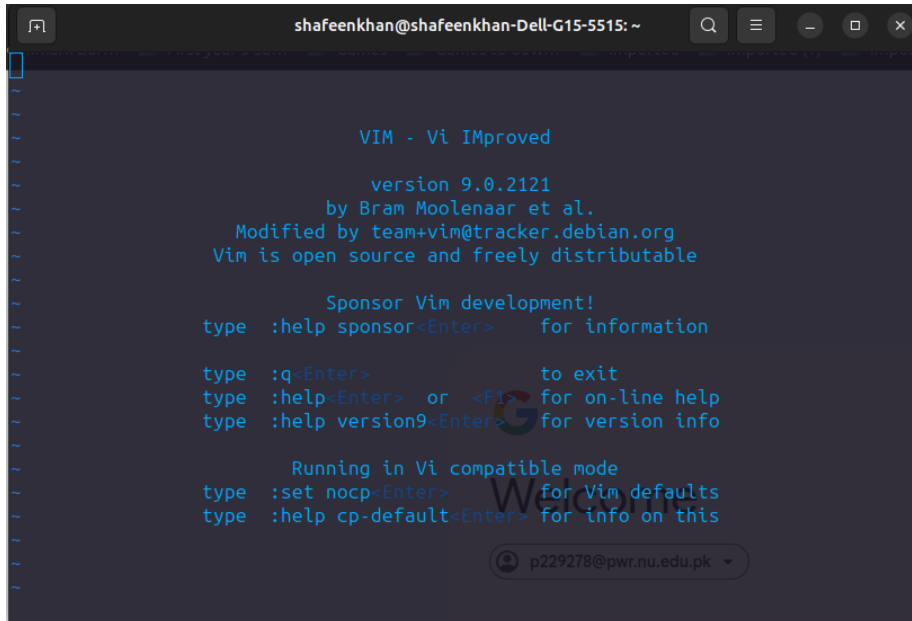
2.1 Command: vim

Vim is a text editor used on terminal on linux .



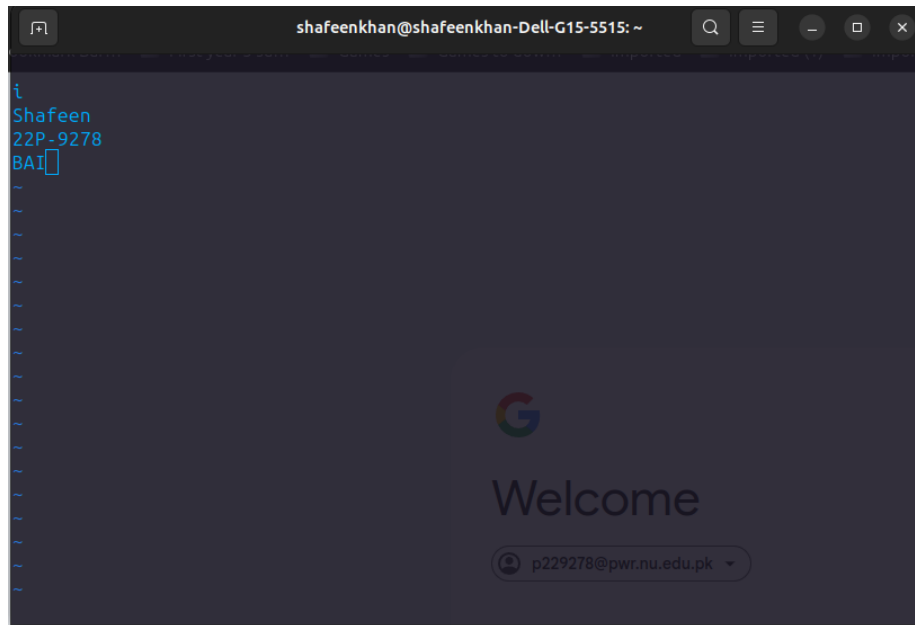
2.2

This is the interface of Vim



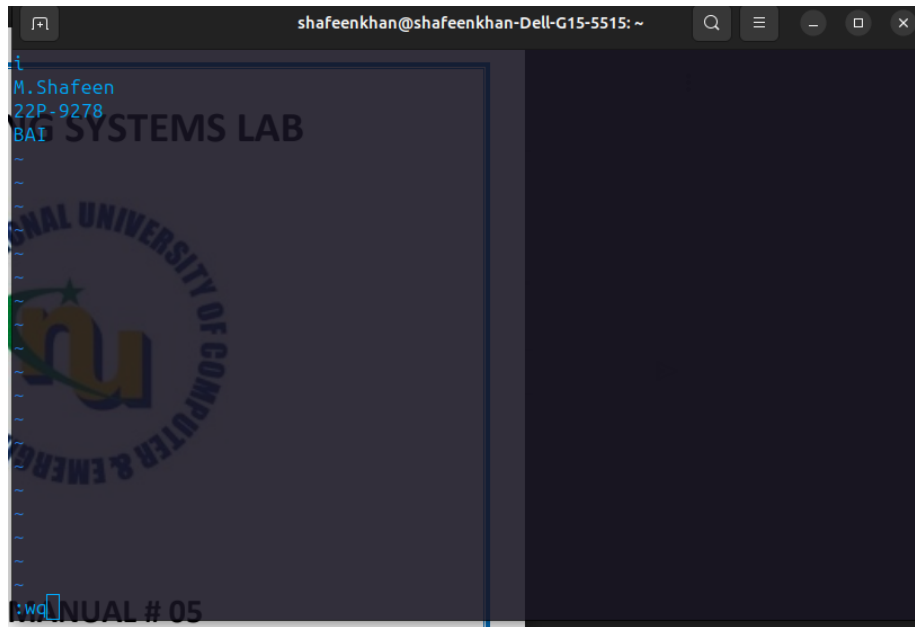
2.3 Command: i

Inside the Vim interface , Press i and enter " Insert " mode then press enter and type what you want to type



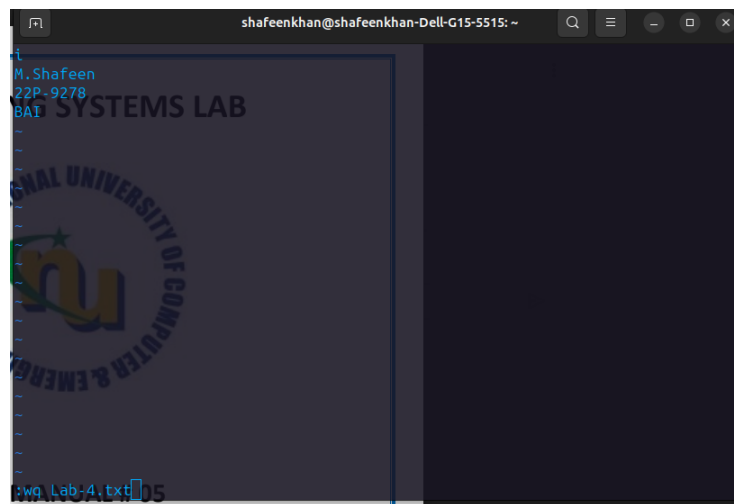
2.4 Command: wq

First press "Enter" after completing typing in text file then press "ESC" key on keyboard. Then press "SHIFT + :" you will enter this small command line interface at the bottom. By Pressing wq you will write the command followed by a name of the textfile and



2.5 Command: wq

By Pressing wq you will write the command followed by a name of the textfile and



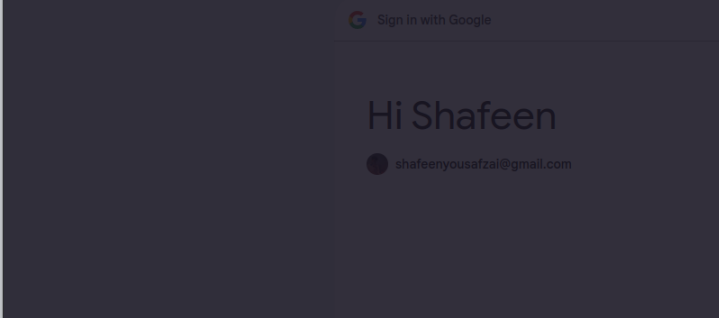
2.6 File Created Through Vim

As you can see on the Screen on line number 7

```
shafeenkhan@shafeenkhan-Dell-G15-5515: ~  
GitHubDesktop-linux-3.1.1-linux1.deb  
google-chrome-stable_current_and64.deb  
hello  
hello1.txt  
hello.txt  
kickthemout  
Lab-4.txt  
Landing-Page  
Latex-Stuff  
Magazine---CSS-GRID-BOX-  
main2  
miniconda3  
Miniconda3-latest-Linux-x86_64.sh  
multi-container-app  
Music  
NASM  
NASM_Original  
newfile  
newfile1  
newfile3  
OOP  
p220278_Lab#7.txt  
packages-microsoft-prod.deb  
Piano
```

2.7 Content in the File

```
shafeenkhan@shafeenkhan-Dell-G15-5515: ~  
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ cat Lab-4.txt  
t  
M.Shafeen  
22P-9278  
BAI  
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```



2.8 Command: `ls -i`

This command shows the location of the files present in this directory

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:/usr$ ls -i  
11796482 bin 11796485 lib 11796488 libexec 11796491 sbin  
11796483 games 11796486 lib32 11796489 libx32 11796492 share  
11796484 include 11796487 lib64 11796490 local 11796493 src  
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:/usr$
```

2.9 Command: mkdir main , touch lab4.txt , nano lab4 , cat lab4

Creating Directory Creating file editing file showing content

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ mkdir main
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ touch lab4.txt
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ nano lab4
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ man lab 4
No manual entry for lab4.
No manual entry for 4.
No manual entry for linked file will not work correctly (called
(Alternatively, what manual page do you want from section 4?)
For example, try 'man man'.
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ cat lab4
Muhammad Shafeen
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

2.10 Command: ln lab4 lab4link

Creating hard link for the file then editing soft link and showing the content of

```
shafeenkhan@shafeenkhan-Dell-G15-5515: ~/main
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ cd main/
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln lab4 lab4link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4 lab4link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ nano lab4link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat lab4link
Muhammad Shafeen
Making changes to know if hardlink changes the original
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat lab4
Muhammad Shafeen
Making changes to know if hardlink changes the original
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$
```

hard link

2.11 Command: rm lab4

Checking if deleting the original file disables the link or not it does not as you can see

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ rm lab4
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat lab4link
Muhammad Shafeen
Making changes to know if hardlink changes the original
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$
```

hard link

2.12 Command: `ln -s lab4link lab4linksoft`

making soft link of the file and link

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln -s lab4link lab4linksoft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4link  lab4linksoft  newfile2soft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ nano lab4linksoft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat lab4linksoft
Muhammad Shafeen
22P-9278
Original
Making Changes through Soft link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat lab4link
Muhammad Shafeen
22P-9278
Original
Making Changes through Soft link
```

hard link (base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main\$

2.13 Command: `ln -s lab4 , ls -lh`

The second command shows teh files and all of its links

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4link  newfile2soft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln -s lab4link lab4linksoft
ls: cannot access 'lab4linksoft': No such file or directory
4 lab4link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln -s lab4link lab4linksoft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4link  lab4linksoft  newfile2soft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ rm lab4link
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4linksoft  newfile2soft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls -lh
total 0
lrwxrwxrwx 1 shafeenkhan shafeenkhan 8 Sep 13 09:33 lab4linksoft -> lab4link
lrwxrwxrwx 1 shafeenkhan shafeenkhan 8 Sep 13 09:19 newfile2soft -> newfile2
```

hard link (base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main\$

2.14 Command: `cat lab4linksoft`

showing that deleting the original file deletes the file for softlink as well

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat lab4linksoft
cat: lab4linksoft: No such file or directory
```

hard link (base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main\$

2.15 Command: Soft link working

The second command shows teh files and all of its links

```

shafeenkhan@shafeenkhan-Dell-G15-5515: ~/main
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4linksoft  newfile2soft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ touch newfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ nano newfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln -s newfile newfilesoft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat newfile
Shafeen
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ rm newfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat newfilesoft
cat: newfilesoft: No such file or directory
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ touch newfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ nano newfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat newfile
22P-9278
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat newfilesoft
22P-9278
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$

```

hard link

2.16 Command: `ln -s lab4 , ls -lh`

The second command shows teh files and all of its links

```

shafeenkhan@shafeenkhan-Dell-G15-5515: ~/main
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
lab4linksoft  newfile  newfile2soft  newfilesoft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ touch blankfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ mkdir blankdir
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln blankdir dirpointer
ln: blankdir: hard link not allowed for directory
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ln blankfile filepointer
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat < blankfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat < filepointer
Hello Dear
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat < blankfile
Hello Dear
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ cat < filepointer
Hello Dear
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls
blankdir  blankfile  filepointer  lab4linksoft  newfile  newfile2soft  newfilesoft
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$ ls -lh
total 16K
-rwxrwxr-x 2 shafeenkhan shafeenkhan 4.0K Sep 13 09:44 blankdir
-rw-rw-r-- 2 shafeenkhan shafeenkhan 11 Sep 13 09:45 blankfile
-rw-rw-r-- 2 shafeenkhan shafeenkhan 11 Sep 13 09:45 filepointer
-rwxrwxrwx 1 shafeenkhan shafeenkhan 8 Sep 13 09:33 lab4linksoft -> lab4link
-rw-rw-r-- 1 shafeenkhan shafeenkhan 9 Sep 13 09:42 newfile
-rwxrwxrwx 1 shafeenkhan shafeenkhan 8 Sep 13 09:19 newfile2soft -> newfile2
-rwxrwxrwx 1 shafeenkhan shafeenkhan 7 Sep 13 09:41 newfilesoft -> newfile
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/main$

```

hard link

2.17 Command: `ls /etc -lh more`

It represents all the files in etc


```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ ls /etc -lh | more
total 1.4M
-rw-r--r-- 1 root root 3.4K Jul  5 2023 adduser.conf
-rw-r--r-- 1 root root 3.0K Feb 21 2024 adduser.conf.update-old
drwxr-xr-x 3 root root 4.0K Feb 21 2024 alsa
drwxr-xr-x 2 root root 12K Sep 13 10:26 alternatives
-rw-r--r-- 1 root root 335 Mar 23 2022 anacrontab
drwxr-xr-x 4 root root 4.0K Mar  7 2024 apache2
-rw-r--r-- 1 root root 433 Mar 23 2022 apg.conf
drwxr-xr-x 5 root root 4.0K Feb 21 2024 apm
drwxr-xr-x 3 root root 4.0K Mar  7 2024 apparmor
drwxr-xr-x 8 root root 4.0K Sep  6 08:25 apparmor.d
drwxr-xr-x 5 root root 4.0K Mar  7 2024 appport
-rw-r--r-- 1 root root 833 Apr 27 2023 appstream.conf
drwxr-xr-x 8 root root 4.0K Apr 24 07:13 apt
drwxr-xr-x 3 root root 4.0K Mar  7 2024 avahi
-rw-r--r-- 1 root root 2.3K Jan  6 2022 bash.bashrc
-rw-r--r-- 1 root root 45 Nov 11 2021 bash_completion
drwxr-xr-x 2 root root 4.0K May 29 07:54 bash_completion.d
-rw-r--r-- 1 root root 367 Dec 16 2020 bindresvport.blacklist
drwxr-xr-x 2 root root 4.0K Apr  8 2022 binfmt.d
drwxr-xr-x 2 root root 4.0K Mar  7 2024 bluetooth
-rw-r--r-- 1 root root 7.3K Dec  7 2021 bogofilter.cf
-rw-r--r-- 1 root root 33 Feb 21 2024 brlapi.key
```

hard link

2.18 Command: ls /etc -lh less

It represents all the files in etc but in a scrollable interface

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ ls /etc -lh | less
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

hard link

2.19 Command: ls /etc -lh > temp.txt

Save in temp.txt

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ ls /etc -lh > temp.txt
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

hard link

2.20 Command: less temp.txt

Scrollable interface

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ less temp.txt
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

hard link

2.21 Command: find Desktop -name hello

when in the parent folder you can search for a file in sub folder through this command

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$ find Desktop -name hello
Desktop/hello
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

hard link

2.22 Command: find / -name .pdf"

this command finds the file with any extension of pdf

```
/usr/share/texmf/doc/fonts/tex-gyre-math/test-lualatex-texgyre_pagella_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-context-texgyre_schola_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-xelatex-texgyre_dejavu_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-context-texgyre_dejavu_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-context-texgyre_bonum_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-word-texgyre_termes_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-lualatex-texgyre_termes_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-xelatex-texgyre_bonum_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-lualatex-texgyre_bonum_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-context-texgyre_pagella_math.pdf
/usr/share/texmf/doc/fonts/tex-gyre-math/test-word-texgyre_schola_math.pdf
find: '/lost+found': Permission denied
find: '/root': Permission denied
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

hard link

2.23 Command: sudo find / -name prog

Find files with pdf file extension and the paths

```
shafeenkhan@shafeenkhan-Dell-G15-5515:~$ sudo find / -name prog
[sudo] password for shafeenkhan:
find: '/run/user/1000/gvfs': Permission denied
find: '/run/user/1000/doc': Permission denied
/var/snap/docker/common/var-lib-docker/overlay2/6c34854a7e669852a82c3ceb4a411953b3dc511664c40
63837fcb84bfa0f9/diff/usr/share/doc/gawk/examples/prog
/var/lib/docker/overlay2/d2e503056a3ecb7e3bf11f33d79b289e85efa31aa98869bdc7f155f4b85eaff/diff
/usr/share/doc/gawk/examples/prog
find: '/tmp/.mount_jetbraqPjw7s': Permission denied
/usr/share/doc/texlive-doc/generic/c-pascal/prog
/usr/share/doc/gawk/examples/prog
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~$
```

hard link

2.24 Command: sudo find . -name "*.txt"

find all the files with extension of .txt and show its path in the current directory

```
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/Desktop/main$ sudo find . -name "*.txt"
./new.txt
./file.txt
./main2/new.txt
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/Desktop/main$
```

hard link

2.25 Command: locate *.pdf

It will locate all the files with the extension .pdf

```

See 'snap info <snapname>' for additional versions.
(base) shafeenkhan@shafeenkhan-Dell-G15-5515:~/Desktop/main$ locate *.pdf
/home/shafeenkhan/.local/share/JetBrains/Toolbox/apps/clion/help/ReferenceCard.pdf
/home/shafeenkhan/.local/share/JetBrains/Toolbox/apps/clion/help/ReferenceCardForMac.pdf
/home/shafeenkhan/.local/share/JetBrains/Toolbox/apps/phpstorm/help/ReferenceCard.pdf
/home/shafeenkhan/.local/share/JetBrains/Toolbox/apps/phpstorm/help/ReferenceCardForMac.pdf
/home/shafeenkhan/.local/share/JetBrains/Toolbox/apps/pycharm-community/help/ReferenceCard.pdf
/home/shafeenkhan/.local/share/JetBrains/Toolbox/apps/pycharm-community/help/ReferenceCardForMac.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/01-Lab/AI_Lab01.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/01-Lab/AL2002_outline.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/01-Lab/Lab_1_task.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/02-Lab/AI_Lab_02.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/02-Lab/JawadAhmed_20P-0165_BCS-6A.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/03-Lab/AI_Lab_03.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/03-Lab/JawadAhmed_20P-0165_(1).pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/04-Lab/JawadAhmed_20P-0165.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/05-Lab/JawadAhmed_20P-0165.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/06-Lab/AI_Lab_06.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/06-Lab/JawadAhmed_20P-0165_Lab06_Task.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/07-Lab/AI_Lab_07.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/07-Lab/JawadAhmed_20P-0165.pdf
/home/shafeenkhan/AL2002-Artificial-Intelligence---Lab/08-Lab/AI_Lab_08.pdf

```

hard link