EXPERIMENT 2

AIM:

Study of a terminal based text editor such as Vim or Emacs. (By the end of the course, students are expected to acquire following skills in using the editor: cursor operations, manipulate text, search for patterns, global search and replace) Basic Linux commands, familiarity with following commands/operations expected

- 1 man
- 2 ls, echo, read
- 3 more, less, cat
- 4 cd, mkdir, pwd, find
- 5 mv, cp, rm, tar
- 6 wc, cut, paste
- 7 head, tail, grep, expr
- 8 chmod, chown
- 9 Redirections & Piping
- 10 useradd, usermod, userdel, passwd
- 11 df,top, ps
- 12 ssh, scp, ssh-keygen, ssh-copy-id

Text Editor

Text editors are software programs used for creating and editing plain text files. They're essential tools for programmers, writers, and anyone who works with text-based documents.

Unix text editors are:

• VIM

- EMACS
- NANO
- PICO

VIM

Vim is an acronym for Vi IMproved. It is a free and open-source cross-platform text editor. It was first released by Bram Moolenaar in 1991 for UNIX variants. Vim is based on the original Vi editor, which was created by Bill Joy in 1976.

Vim Modes:

There are 4 most important modes in Vim:

- Command Mode
- Command-Line Mode
- Insert Mode
- Visual Mode

Vim Installation:

- sudo apt-get update
- t-get install vim

```
mahi@Shadow: $ sudo apt install vim
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
ttf-mscorefonts-installer vim-common vim-runtime vim-tiny
Suggested packages:
ctags vim-doc vim-scripts indent
The following NEW packages will be installed:
vim vim-runtime
The following new packages will be upgraded:
ttf-mscorefonts-installer vim-common vim-tiny
3 upgraded, 2 newly installed, 0 to remove and 251 not upgraded.
1 not fully installed or removed.
Need to get 0 B/9,387 kB of archives.
After this operation, 37.7 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Preconfiguring packages ...
```

• vim



To invoke the vim editor, execute the vim command with the file name:.

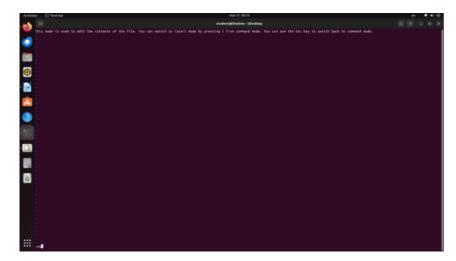


■ Command Mode: This is the default mode (also called Normal mode) in Vim. Whenever Vim starts, you'll be in this mode. You can switch to any mode from this mode.

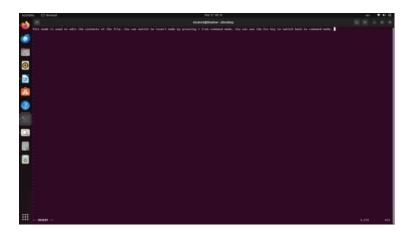


• Command-Line Mode: You can use this mode to play around with some commands.But the commands in this mode are pefixed with a

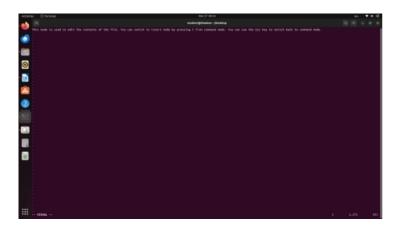
colon(:). You can switch to this mode by pressing :(colon) in commaand mode.



■ Insert Mode: This mode is used to edit the contents of the file. You can switch to insert mode by pressing i from command mode. You can use the Esc key to switch back to command mode.



■ Visual Mode: You use this mode to visually select some text and run commands over that section of code. You can switch to this mode by pressing v from the command mode.



Basic Linux Commands

• whoami: Display the user.

• pwd : Present working directory

• mkdir: Create a new directory (folder).

• cd : It is used to navigate through the linux files and directories.

• ls : List the directory(folder) system.

ls -a: Will show the hidden file.

ls -l: Will list the file and directory with detailed information like the permission size, owner...etc.

```
student@Shadow:-$ whoani
student
student@Shadow:-$ pwd
/hone/student
student@Shadow:-$ ls
Desktop Documents Downloads Music Pictures Public snap Tenplates Videos
student@Shadow:-Desktop Rkdr sample
student@Shadow:-/Desktop Rkdr sample
student@Shadow:-/Desktop St
DNK DS_prgrm Java_Devika Java_Mahesh python_prgrm sample web_tech_prgrm
student@Shadow:-/Desktop Rkdr -p MCA/Student/Mark
student@Shadow:-/Desktop PkCA/Student/Mark
student@Shadow:-/Desktop PkCA/Student
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student@Shadow:-/Desktop/MCA/Student
student@Shadow:-/Desktop/MCA/Student
```

```
student@Shadow:-/Desktop/MCA/Student/Mark$ ls
pgm1.py pgm2.py pgm3.py pgm4.py pgm5.py RegistrationForm.html sum.c sumodd.c test1.txt test.txt WebPage.html
student@Shadow:-/Desktop/MCA/Student/Mark$ ls -a
. . . pgm1.py pgm2.py pgm3.py pgm4.py pgm5.py RegistrationForm.html sum.c sumodd.c test1.txt test.txt WebPage.html
student@Shadow:-/Desktop/MCA/Student/Mark$ ls -l
total 44
-rxxr-xr-x 1 student student 281 Dec 24 09:56 pgm1.py
-rxxr-xr-x 1 student student 813 Dec 25 12:19 pgm2.py
-rxxr-xr-x 1 student student 229 Dec 25 12:41 pgm3.py
-rxxr-xr-x 1 student student 330 Dec 25 12:41 pgm4.py
-rxxr-xr-x 1 student student 310 Dec 25 12:41 pgm4.py
-rxxr-xr-x 1 student student 1959 Jan 3 19:52 RegistrationForm.html
-rxxr-xr-x 1 student student 120 Nov 14 05:38 sum.c
-rxxr-xr-x 1 student student 120 Nov 14 05:48 sumodd.c
-rx-rx-rx-r-1 student student 120 Nov 14 05:45 test1.txt
-rx-rx-r-1 student student 120 Nov 5 10:01 WebPage.html
student@Shadow:-/Desktop/MCA/Student/Mark$
```

```
student@Shadow:-$ cd Desktop/McA/Student/Mark
student@Shadow:-/Desktop/McA/Student/Mark$ cd ..
student@Shadow:-\Desktop/McA/Student$ cd ~
student@Shadow:-$
```

• echo: echo "Hello, World!" - Prints "Hello, World!" to the command line

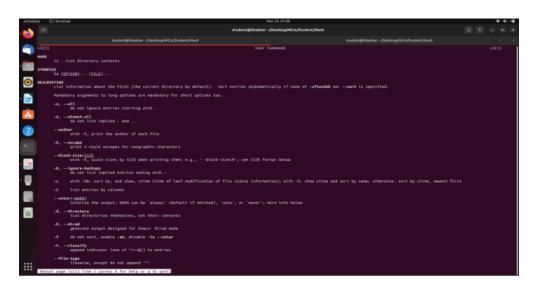
```
student@mca34:~/Desktop
student@mca34:~/Desktop$ echo "Hello World"
Hello World
student@mca34:~/Desktop$ read a
welcome
student@mca34:~/Desktop$ read b
CEV
student@mca34:~/Desktop$ echo $a $b
welcome CEV
student@mca34:~/Desktop$ |
```

- read:Reads a line from standard input into the variables.
- more: Displays text files one page at a time, waiting for user input to continue to the next page.
- less: Similar to more, but with additional features such as backward scrolling and searching within the displayed text.
- cat: The cat command in Unix-like operating systems stands for "concatenate".cat can concatenate the contents of multiple filesdisplay them. Its also used to create, modify, or display the contents of files.

```
studentgShadow:-/Desktop/MCA/Student/Mari$ cat >> test1.txt
cat can be used to append text to an existing file by using output redirection (>>).
^Z
[6]+ Stopped cat >> test1.txt
studentgShadow:-/Desktop/MCA/Student/Mari$ cat test1.txt
The cat command in Unix-like operating systems stands for "concatenate".
cat can be used to append text to an existing file by using output redirection (>>).
```

• man: Used to display the manual pages for other commands.

Eg: man ls

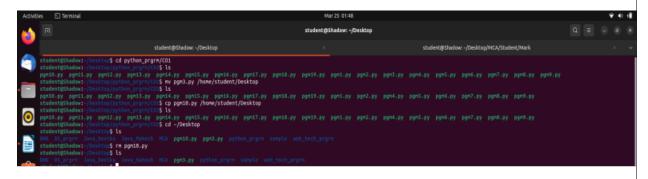


• find : Searches for files and directories in a directory hierarchy.

```
student@Shadow:~$ find . -name pgm1.py;
./Desktop/MCA/Student/Mark/pgm1.py
./Desktop/python_prgrm/CO1/pgm1.py
student@Shadow:~$
```

- mv: Moves a file or directory from one location to another. For example, mv file1.txt /path/to/new/location/ moves file1.txt to /path/to/new/location/.
- cp: Copies a file or directory from one location to another. For example, cp file1.txt file2.txt copies file1.txt to file2.txt.

- rm: Deletes (removes) a file or directory. For example, rm file.txt deletes file.txt.
- tar: Creates an archive of files and directories.



- wc: wc -l file.txt Counts the number of lines in file.txt.
- cut: Extracts specific fields from lines in a file based on a delimiter.
- paste: Merges lines from multiple files.

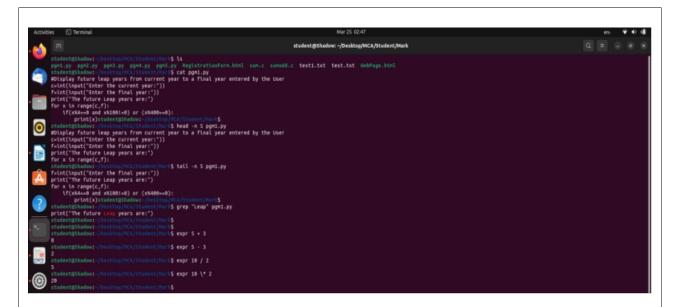


- head: head -n 5 file.txt Displays the first 5 lines offile.txt.
- tail: tail -n 5 file.txt Displays the last 5 lines of file.txt.
- grep: Grep command is used to search through all the text in a given file.

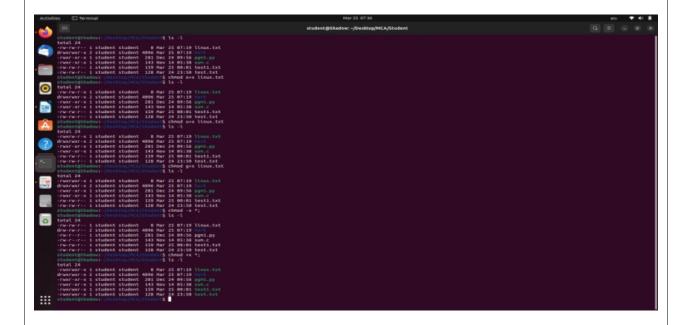
Eg: grep "pattern" file.txt - Searches for lines containing "pattern" in file.txt

 expr: It was used to evaluate a given expression and display its corresponding output.

Eg: expr 5 + 3 - Evaluates the expression 5 + 3



 chmod: It is used to change the access permissions of files and directories.



• chown: It is used to change the files ownership, directory,orsymbolic link for a user or group.

```
student@mca21:~$ cat >file3.txt
Hello,Good Morning
student@mca21:~$ ls -l file3.txt
-rw-rw-r-- 1 student student 19 Mar 25 11:42 file3.txt
student@mca22:-$ sudo chown -v mca file3.txt
changed ownership of 'file3.txt' from student to mca
student@mca21:-$
```

- redirection and piping: Pipe is used to combine two or more commends and in this the output of one command and act as input to the another command, and this command output may cut as input to the next command. Redirection in linux command refers to the ability of the linux operating system that allows as to change the standard input and standard output when executing a command on the terminal.
- useradd: It is used to for adding /creating user accounts in linux and other unix-like operating systems.

```
Thunderbird Mail

student@nca21:-$ sudo adduser cev

Adding user 'cev' (1005) ...

Adding new group 'cev' (1005) with group 'cev' ...

Creating home directory '/home/cev' ...

Copying files from '/etc/skel' ...

New password:

Retype new password:

passwd: password updated successfully

Changing the user information for cev

Enter the new value, or press ENTER for the default

Full Name []:

Room Number []:

Work Phone []:

Home Phone []:

Other []:

Is the information correct? [Y/n] y

student@nca21:-$
```

• usermod: It is used to modify existing user account details, such as username,password,home directory location,default shell,and more.

```
student@mca21:~$ sudo usermod -l CEV cev student@mca21:~$
```

• rdel: It is used to delete a user account and related files.

```
Thunderbird Mail

student@mca21:~$ sudo userdel cev1

student@mca21:~$
```

• swd: Passwd command used to change password for user accounts.

```
Thunderbird Mail

student@mca21:~$ sudo passwd cev

New password:
Retype new password:
passwd: password updated successfully
student@mca21:~$
```

• ssh: It instructs the system to establish an encrypted secure connection with the host machine.

To check the system containing ssh using the command:

\$ "ssh"

The installation command on ssh is:

\$ "sudo apt-get install open ssh-server"

To check the system IP address using the command:

\$ "ifconfig"

Ping command using to check working:

\$ "ping second system IP"

To login second system using the given command:

\$ "ssh second system user@second system IP

\$ "cd Desktop"

\$ "ls"

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To check the system IP address using the command:

```
$ "ifconfig"
```

Ping command using to check working:

```
$ "ping second system IP"
```

To login second system using the given command:

\$ "ssh second system user@second system IP

\$ "cd Desktop"

\$ "1s"

```
student@mca-Veriton-M200-H81:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
    ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
    molly-guard monkeysphere ssh-askpass
The following NEW packages will be installed:
```

```
student@mca-Veriton-M200-M81:—$ ifconfig
enp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 172.16.5.210 netmask 255.255.254.0 broadcast 172.16.5.255
inet6 fe80::781:251d:4476:e182 prefixlen 64 scopeid 0x20ether f4:d0:30:f3:cf:92 txqueuelen 1000 (Ethernet)
RX packets 660 bytes 432816 (432.8 KB)
RX errors 0 dropped 8 overruns 0 frame 0
TX packets 374 bytes 34224 (34.2 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10</br>
loop txqueuelen 1000 (Local Loopback)
RX packets 81 bytes 7839 (7.8 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 81 bytes 7839 (7.8 KB)
NetworkLogin fors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
student@nca-Veriton-M200-H81:-5 ping 172.16.5.79
PING 172.16.5.79 (172.16.5.79) 56(84) bytes of data.
64 bytes fron 172.16.5.79: cnp_seq=1 title64 tine=0.232 ns
64 bytes fron 172.16.5.79: cnp_seq=2 title64 tine=0.181 ns
64 bytes fron 172.16.5.79: cnp_seq=3 title64 tine=0.175 ns
64 bytes fron 172.16.5.79: cnp_seq=3 title64 tine=0.175 ns
64 bytes fron 172.16.5.79: cnp_seq=5 title64 tine=0.171 ns
64 bytes fron 172.16.5.79: cnp_seq=6 title64 tine=0.171 ns
64 bytes fron 172.16.5.79: cnp_seq=0 title64 tine=0.178 ns
64 bytes fron 172.16.5.79: cnp_seq=0 title64 tine=0.188 ns
64 bytes fron 172.16.5.79: cnp_seq=0 title64 tine=0.188 ns
64 bytes fron 172.16.5.79: cnp_seq=0 title64 tine=0.188 ns
```

```
tudent@nca-Veriton-M200-H81:-$ ssh student@172.16.5.79
The authenticity of host '172.16.5.79 (172.16.5.79)' can't be established.
ECDSA key fingerprint is SHAZ56:76ajFyLbdJExxEV8FH7154PJZVFRT31ZCV3wZummAN8.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '172.16.5.79' (ECDSA) to the list of known hosts.
student@172.16.5.79's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-101-generic x86_64)

* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage

* Introducing Expanded Security Maintenance for Applications.
Receive updates to over 25,000 software packages with your
Ubuntu Pro subscription. Free for personal use.
https://ubuntu.com/pro
```

- scp: It is used to copy files between servers in a secure way. Command:
- \$ "scp 2nd system file path 1st system user@1st system IP:2nd system path"

To logout the connection using:

\$ "logout/cntrl+D"

```
student@nca-Veriton-M200-H81:~/Desktop$ scp student@172.16.5.79:/home/student/Desktop/1.txt /home/student/Desktop/
student@172.16.5.79's password:
1.txt 100% 7 2.4KB/s 00:00

student@nca-Veriton-M200-H81:~/Desktop$ scp /home/student/Desktop/share.txt student@172.16.5.79:/home/student/Desktop
student@172.16.5.79's password:
share.txt 100% 4 2.6KB/s 00:00
student@nca-Veriton-M200-H81:~/Desktop$
```

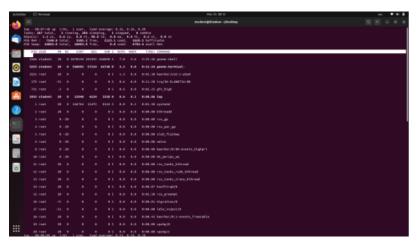
- ssh-keygen :It is used to generate,manage,and convert authentication keys for "ssh"
- ssh-copy-id: It uses the "ssh" protocol to connect to the target host and upload the "ssh" user key.
- df: It is used to display the disk space used in the file system

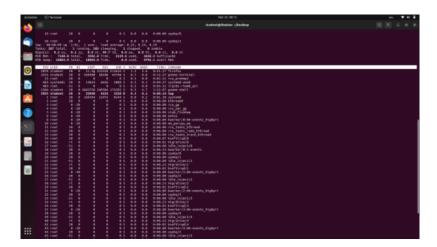
```
      student@Shadow:-/Desktop$ df;

      Filesystem
      IK-blocks
      Used Available Use% Mounted on tmpfs
      742280
      2120
      740160
      1% /run

      /dev/nvme0n1p5
      76319516
      10790016
      61606864
      15% /
      15% /
      15%
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```

 top: It shows the real-time view of running process in linux and displays and kernel managed tasks.





• ps: It is used to list the currently running processes and their PIDs along with some other information depends on different option.

```
    student@Shadow:-/Desktop$ ps;

    PID TTY
    TIME CMD

    3273 pts/0
    00:00:00 bash

    3326 pts/0
    00:00:00 cat

    3955 pts/0
    00:00:00 top

    4109 pts/0
    00:00:00 ps
```