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Date of Performance:18-01-2022 Date of Submission : 24-01-2022

Aim: Explore usage of basic Linux Commands and system calls for file,directory and process management. For eg: (pwd,touch,cat,cp,rm,mv,mkdir, rmdir, cd, ls, chown, chmod, chgrp, ps. system calls: open, read, write, close, getpid, getppid, sort, grep, awk, etc.)

Theory:

1) touch: Create a new file or update its timestamp.
Syntax: touch [OPTION]...[FILE]
Example: Create empty files called ‘file1’ and ‘file2’

```
-$ touch file1 file2
```

2) cat: Concatenate files and print to stdout.
Syntax: cat [OPTION]...[FILE]
Example: Create file1 with entered content

```
- $ cat &gt; file1 - Hello
- ^D
```

3) cp: Copy files
Syntax: cp [OPTION]source destination
Example: Copies the contents from file1 to file2 and contents of file1 is retained

```
- cp file1 file2
```

4) mv: Move files or rename files
Syntax: mv [OPTION]source destination
Example: Create empty files called ‘file1’ and ‘file2’

```
-$ mv file1 file2
```

5) rm: Remove files and directories
Syntax: rm [OPTION]...[FILE]
Example: Delete file1

```
- $ rm file1
```

6) mkdir: Make directory
Syntax: mkdir [OPTION] directory
Example: Create directory called dir1

```
$ mkdir dir1
```

7) rmdir: Remove a directory

Syntax: rmdir [OPTION] directory
Example: Create empty files called ‘file1’ and ‘file2’

```
- $ rmdir dir1
```

8) cd: Change directory
Syntax: cd [OPTION] directory
Example: Change working directory to dir1

```
- $ cd dir1
```

9) pwd: Print the present working directory
Syntax: pwd [OPTION]
Example: Print ‘dir1’ if a current working directory is dir1

```
-$ pwd
```

10) ls: ls is the list command in Linux. It will show the full list or content of your directory. Type ls and press the enter key. The whole content will be shown.
Syntax: ls Example: - $ ls

11) chown: Linux chown command is used to change a file&#39;s ownership, directory, for a user or group.
The chown stands for change owner.
Syntax: chown [OPTION]... [OWNER][:[GROUP]] FILE... sudo chown &lt;username&gt; &lt;File name&gt;

12) chmod: Linux chmod command is used to change the access permissions of files and directories. It stands for change mode.
Syntax: chmod &lt;options&gt; &lt;permissions&gt; &lt;file name&gt;
Example : To set the read and write permission for other users.

```
-$ chmod o+w *.txt
```

13) ps: The ps command is used to view currently running processes on the system. It helps us to determine which process is doing what in our system, how much memory it is using, how much CPU space it occupies, user ID, command name, etc
Example: - $ ps
14) open: To open a particular file.

15) read: To read the contents in a file.

16) write: To write in a file.

17) close: To close the opened file.

18) getpid: It prints the process id of the current process running.

19) setpid: User can manually set process ID using setpid command in LINUX terminal.

20) getppid: If user has created a child process using a ‘fork’ system calls then using getppid command you can return its ID.

21) getuid : Linux users are assigned with certain unique id getuid command returns user ID .

22) sort: SORT command is used to sort a file, arranging the records in a particular order. By default, the sort command sorts file assuming the contents are ASCII. Using options in sort command, it can also be used to sort numerically. The sort command is a command line utility for sorting lines of text files. It supports sorting alphabetically, in reverse order, by number and can also remove duplicates.
Steps to be followed for carrying out above commands:

Create a sample file of text data as below and a file of only numerical data
Create file ‘document1’ cat&gt;document1.txt Abhishek
Pooja
Omkar
Divya
Priya
Bani
Rajesh
Shilpa
SORT command.:
$ sort document1.txt
//output will get printed here (list in ascending order) $ sort -r

document1.txt

//output will get printed here (list in descending order)

Sort numerical data using another sample file which consist of numbers

$ sort -n document2.txt

//output will get printed here (list in ascending order)

$ sort -nr document2.txt

//output will get printed here (list in descending order)

23) grep: grep searches the named input FILEs (or standard input if no files are named, or if a single hyphen-minus (-) is given as file name) for lines containing a match to the given PATTERN. By default, grep prints the matching lines.

Program:

Create file ‘demo_file’ cat demo_file

“THIS LINE IS THE 1ST UPPER CASE LINE IN THIS FILE. this line is the 1st lower case line in this file.

This Line Has All Its First Character Of The Word With Upper Case. Two lines above this line is empty. And this is the last line” //command to execute on the terminal to Search word ‘this’ ”; $grep &quot;this&quot; document5.txt

//output

$ grep -i “this” document5.txt

//output (case insensitive search)

$grep -n “last” document5.txt

//output (prints line number of searched string)

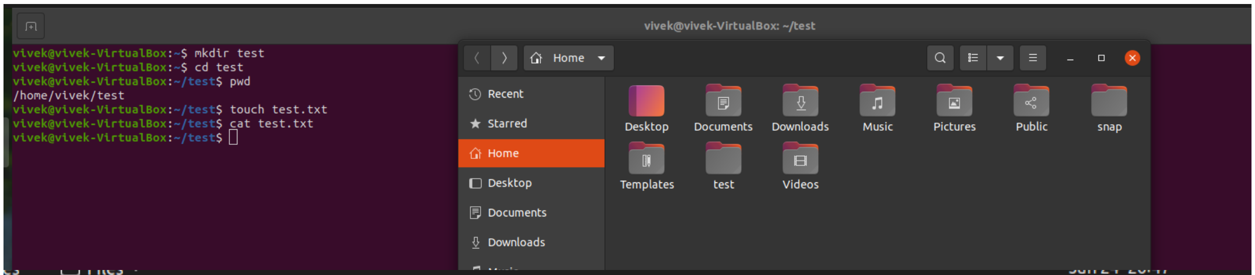
24) awk : The awk command is used for text processing in Linux. Although, the sed command is also used for text processing, but it has some limitations, so the awk command becomes a handy option for text processing. It provides powerful control to the data.The Awk is a

powerful scripting language used for text scripting. It searches and replaces the texts and sorts, validates, and indexes the database.

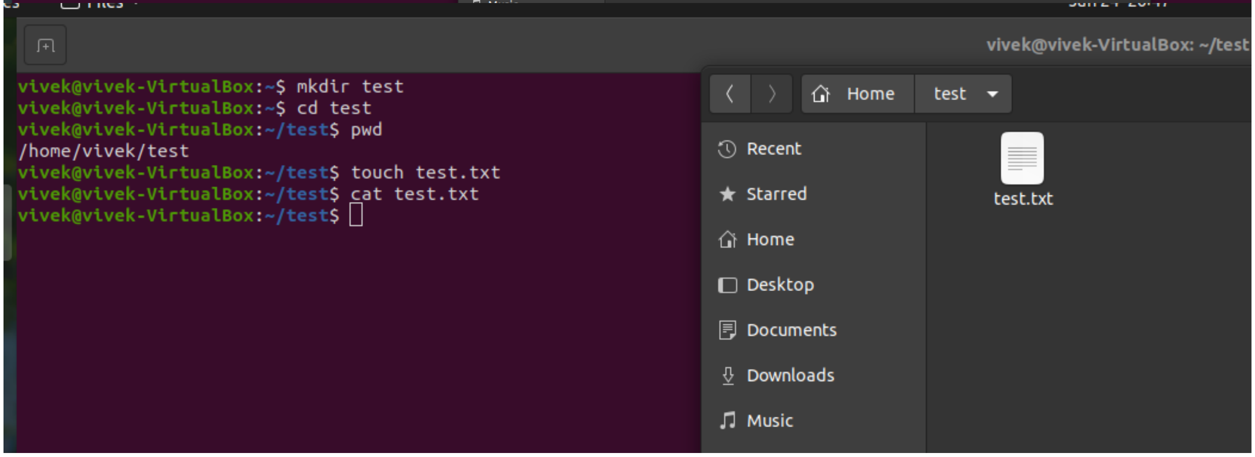
Syntax: awk options &#39;selection _criteria {action}&#39; input-file &gt; output-file

Example: awk ‘{print”Welcome to Awk command”};

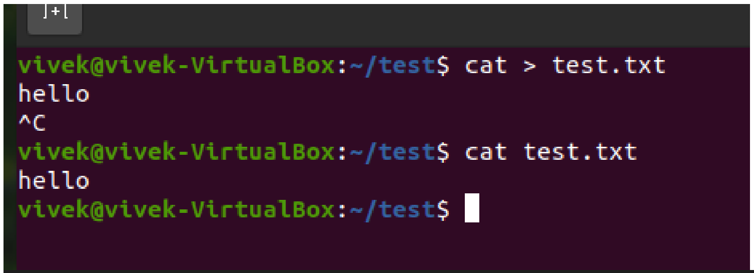
OUTPUTS:



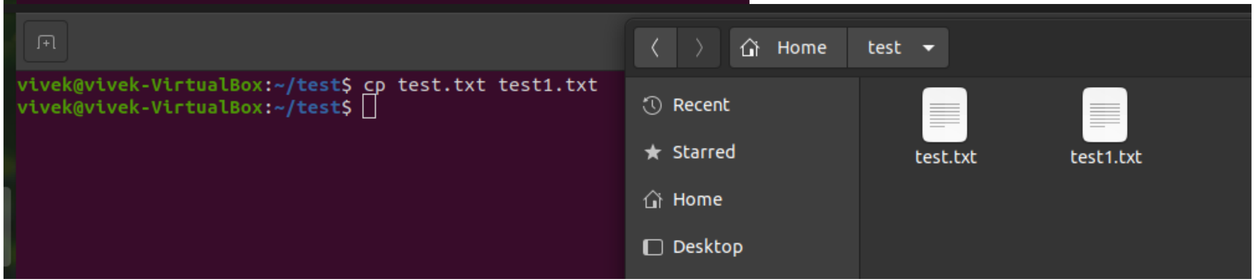
```
vivek@vivek-VirtualBox:~$ mkdir test
vivek@vivek-VirtualBox:~$ cd test
vivek@vivek-VirtualBox:~/test$ pwd
/home/vivek/test
vivek@vivek-VirtualBox:~/test$ touch test.txt
vivek@vivek-VirtualBox:~/test$ cat test.txt
vivek@vivek-VirtualBox:~/test$ 
```



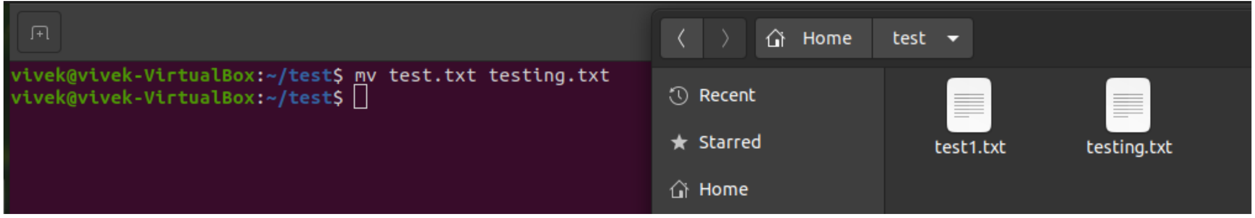
```
vivek@vivek-VirtualBox:~$ mkdir test
vivek@vivek-VirtualBox:~$ cd test
vivek@vivek-VirtualBox:~/test$ pwd
/home/vivek/test
vivek@vivek-VirtualBox:~/test$ touch test.txt
vivek@vivek-VirtualBox:~/test$ cat test.txt
vivek@vivek-VirtualBox:~/test$ 
```



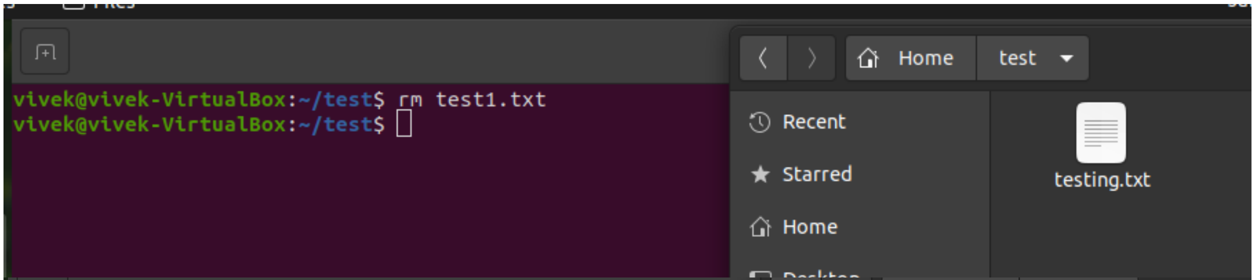
```
vivek@vivek-VirtualBox:~/test$ cat > test.txt
hello
^C
vivek@vivek-VirtualBox:~/test$ cat test.txt
hello
vivek@vivek-VirtualBox:~/test$ 
```



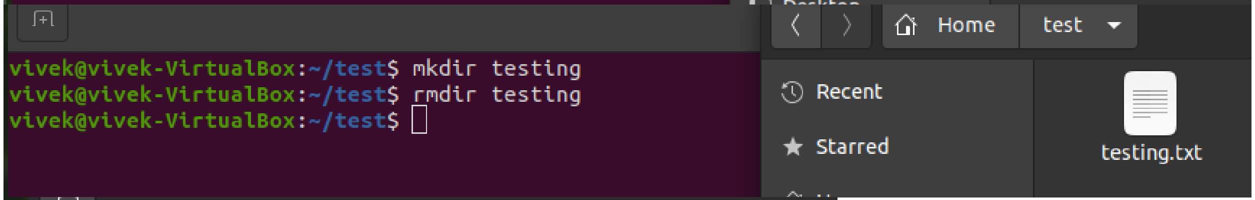
```
vivek@vivek-VirtualBox:~/test$ cp test.txt test1.txt
vivek@vivek-VirtualBox:~/test$ 
```



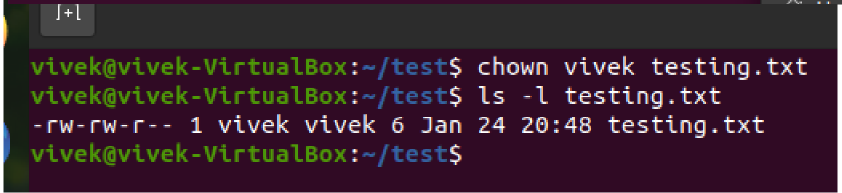
```
vivek@vivek-VirtualBox:~/test$ mv test.txt testing.txt
vivek@vivek-VirtualBox:~/test$ 
```



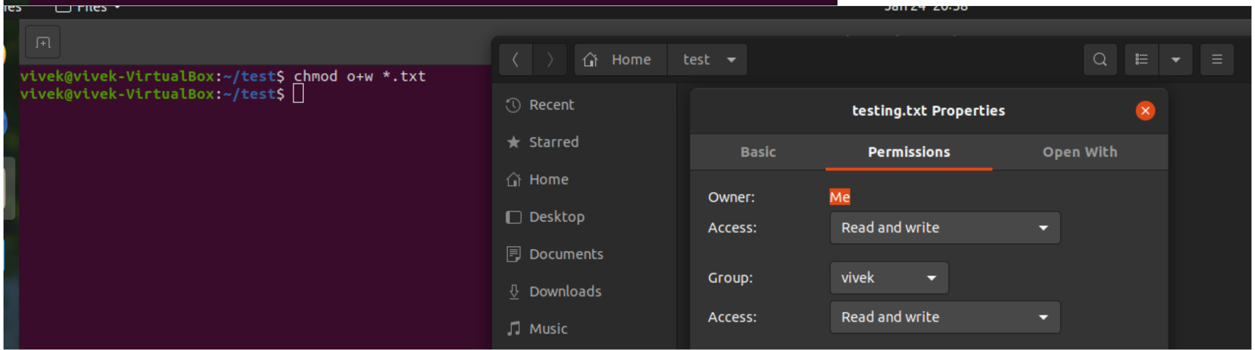
```
vivek@vivek-VirtualBox:~/test$ rm test1.txt
vivek@vivek-VirtualBox:~/test$ 
```



```
vivek@vivek-VirtualBox:~/test$ mkdir testing
vivek@vivek-VirtualBox:~/test$ rmdir testing
vivek@vivek-VirtualBox:~/test$ 
```



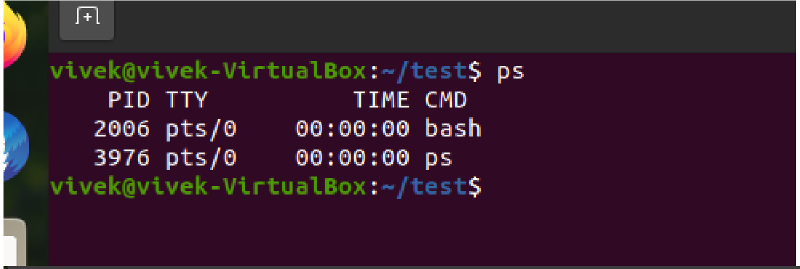
```
vivek@vivek-VirtualBox:~/test$ chown vivek testing.txt
vivek@vivek-VirtualBox:~/test$ ls -l testing.txt
-rw-rw-r-- 1 vivek vivek 6 Jan 24 20:48 testing.txt
vivek@vivek-VirtualBox:~/test$
```



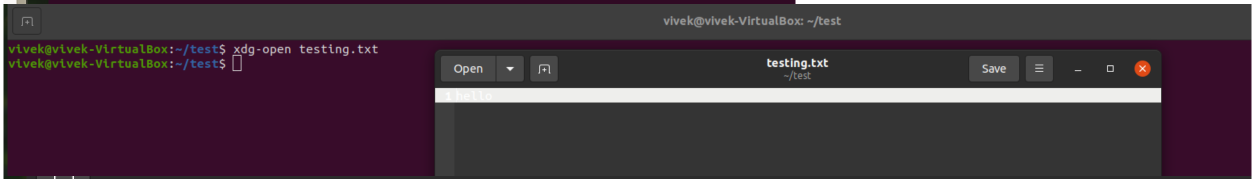
```
vivek@vivek-VirtualBox:~/test$ chmod o+w *.txt
vivek@vivek-VirtualBox:~/test$ 
```

testing.txt Properties

Owner: Me
Access: Read and write
Group: vivek
Access: Read and write



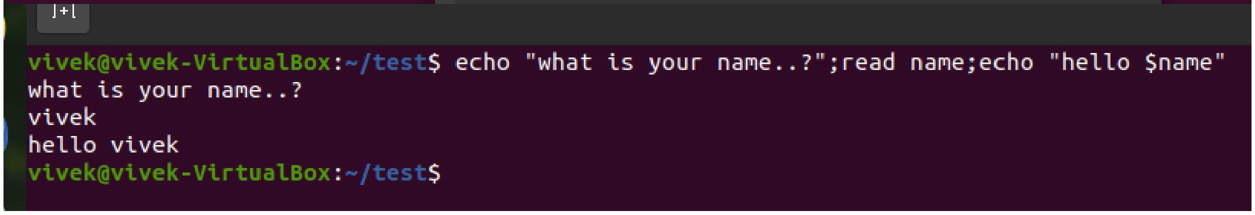
```
vivek@vivek-VirtualBox:~/test$ ps
    PID TTY          TIME CMD
   2006 pts/0    00:00:00 bash
   3976 pts/0    00:00:00 ps
vivek@vivek-VirtualBox:~/test$
```



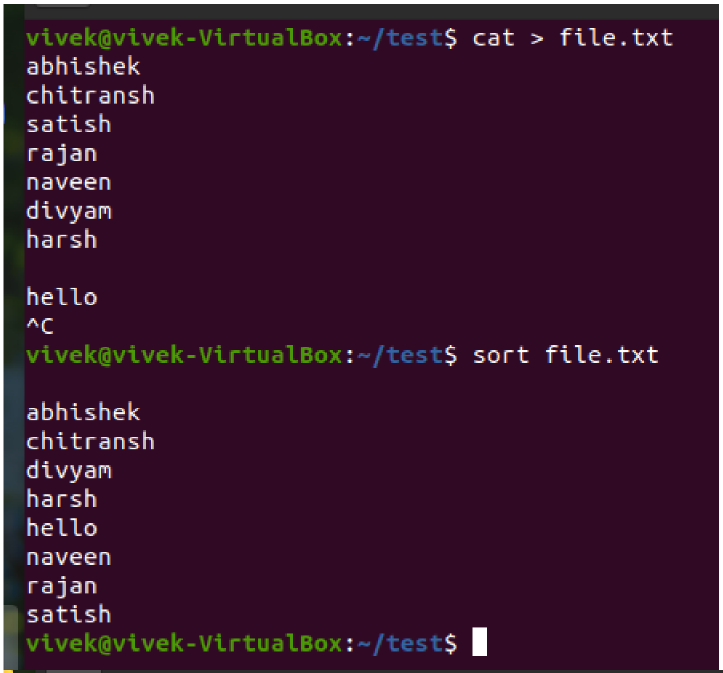
```
vivek@vivek-VirtualBox:~/test$ xdg-open testing.txt
vivek@vivek-VirtualBox:~/test$ 
```

testing.txt
~/test

```
1 hello
```



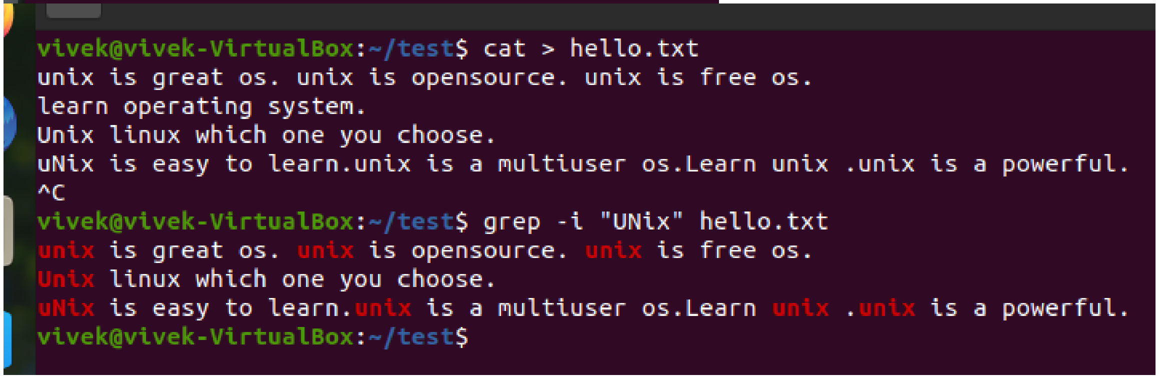
```
vivek@vivek-VirtualBox:~/test$ echo "what is your name..?";read name;echo "hello $name"
what is your name..?
vivek
hello vivek
vivek@vivek-VirtualBox:~/test$
```



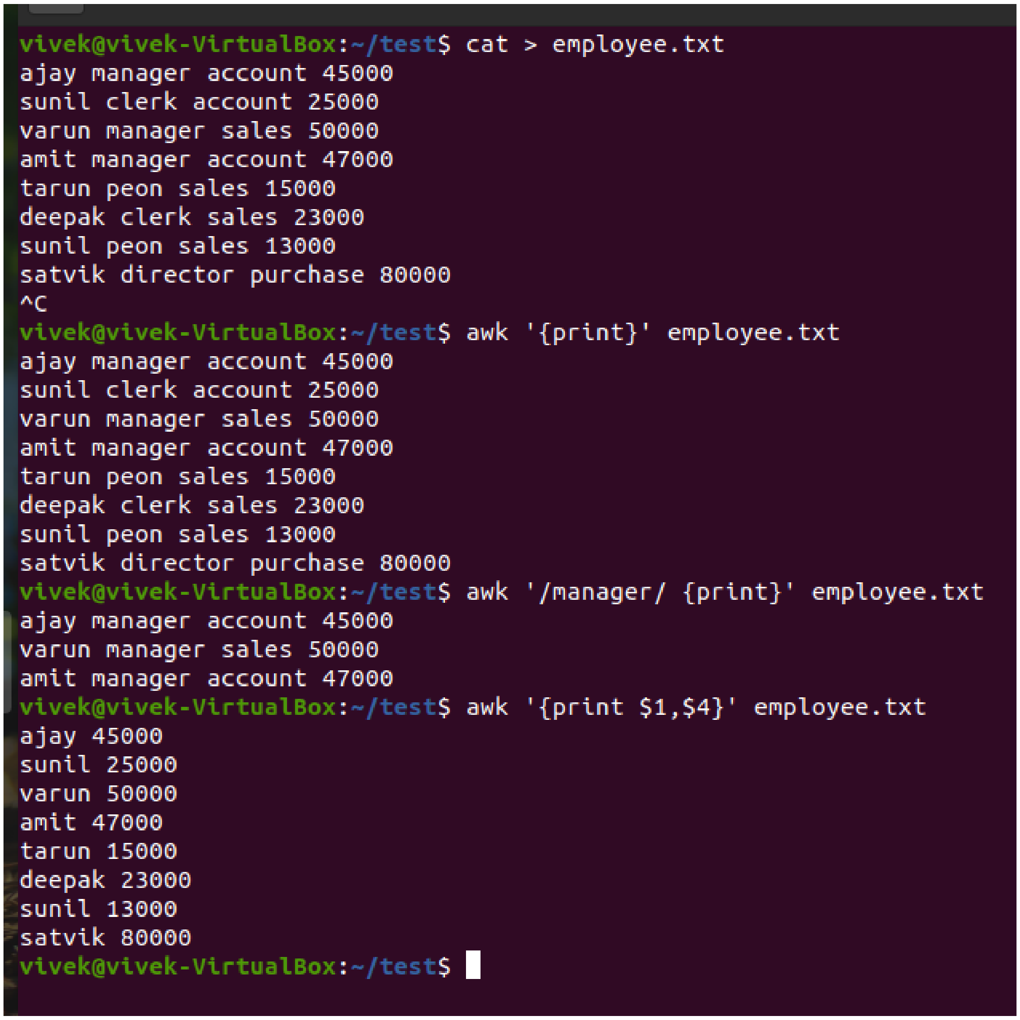
```
vivek@vivek-VirtualBox:~/test$ cat > file.txt
abhishek
chitransh
satish
rajan
naveen
divyam
harsh

hello
^C
vivek@vivek-VirtualBox:~/test$ sort file.txt

abhishek
chitransh
divyam
harsh
hello
naveen
rajan
satish
vivek@vivek-VirtualBox:~/test$ 
```



```
vivek@vivek-VirtualBox:~/test$ cat > hello.txt
unix is great os. unix is opensource. unix is free os.
learn operating system.
Unix linux which one you choose.
uNix is easy to learn.unix is a multiuser os.Learn unix .unix is a powerful.
^C
vivek@vivek-VirtualBox:~/test$ grep -i "UNix" hello.txt
unix is great os. unix is opensource. unix is free os.
Unix linux which one you choose.
uNix is easy to learn.unix is a multiuser os.Learn unix .unix is a powerful.
vivek@vivek-VirtualBox:~/test$
```



```
vivek@vivek-VirtualBox:~/test$ cat > employee.txt
ajay manager account 45000
sunil clerk account 25000
varun manager sales 50000
amit manager account 47000
tarun peon sales 15000
deepak clerk sales 23000
sunil peon sales 13000
satvik director purchase 80000
^C
vivek@vivek-VirtualBox:~/test$ awk '{print}' employee.txt
ajay manager account 45000
sunil clerk account 25000
varun manager sales 50000
amit manager account 47000
tarun peon sales 15000
deepak clerk sales 23000
sunil peon sales 13000
satvik director purchase 80000
vivek@vivek-VirtualBox:~/test$ awk '/manager/ {print}' employee.txt
ajay manager account 45000
varun manager sales 50000
amit manager account 47000
vivek@vivek-VirtualBox:~/test$ awk '{print $1,$4}' employee.txt
ajay 45000
sunil 25000
varun 50000
amit 47000
tarun 15000
deepak 23000
sunil 13000
satvik 80000
vivek@vivek-VirtualBox:~/test$ 
```

CONCLUSION : We have successfully completed the various Linux commands as pwd , touch, cat, cp, rm ,mv ,mkdir, rmdir, cd, ls, chown, chmod, chgrp, ps. system calls: open, read, write, close, getpid, getppid, sort, grep, awk, etc.