EXPERIMENT NO – 2 Date: 17-03-2023

LINUX COMMANDS

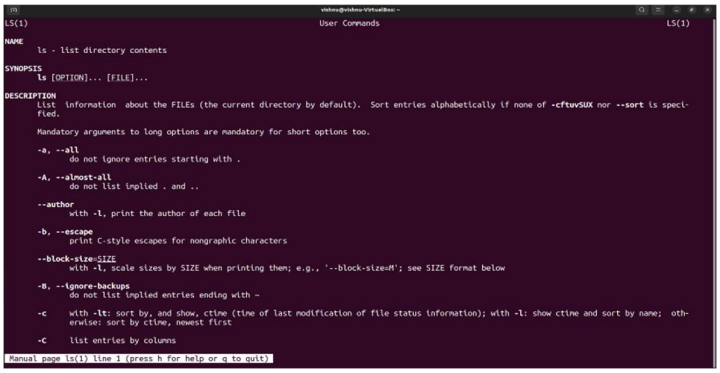
AIM

Familiarising basic Linux commands.

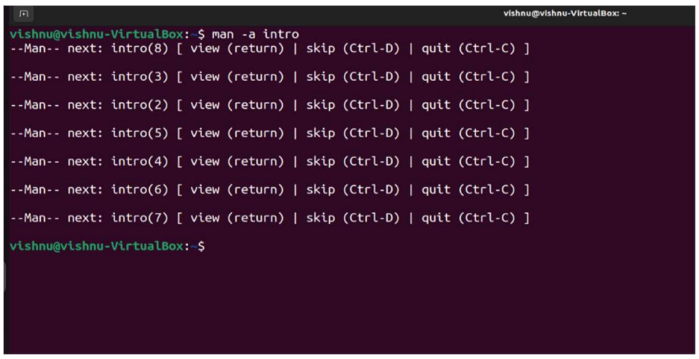
1. Man

man command in Linux is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command which includes NAME, SYNOPSIS, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUES, ERRORS, FILES, VERSIONS, EXAMPLES, AUTHORS and SEE ALSO.

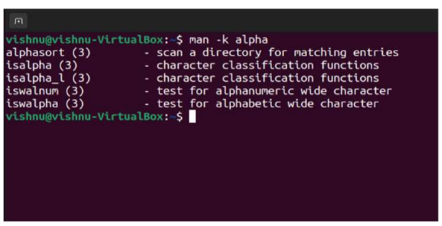
man ls : Open manual for list command.



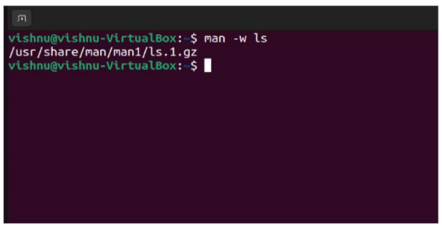
man -a : This option helps us to display all the available intro manual pages in succession.



man -k : This option searches the given command as a regular expression in all the manuals and it returns the manual pages with the section number in which it is found.



man -w : This option returns the location in which the manual page of a given command is present.



2. ls

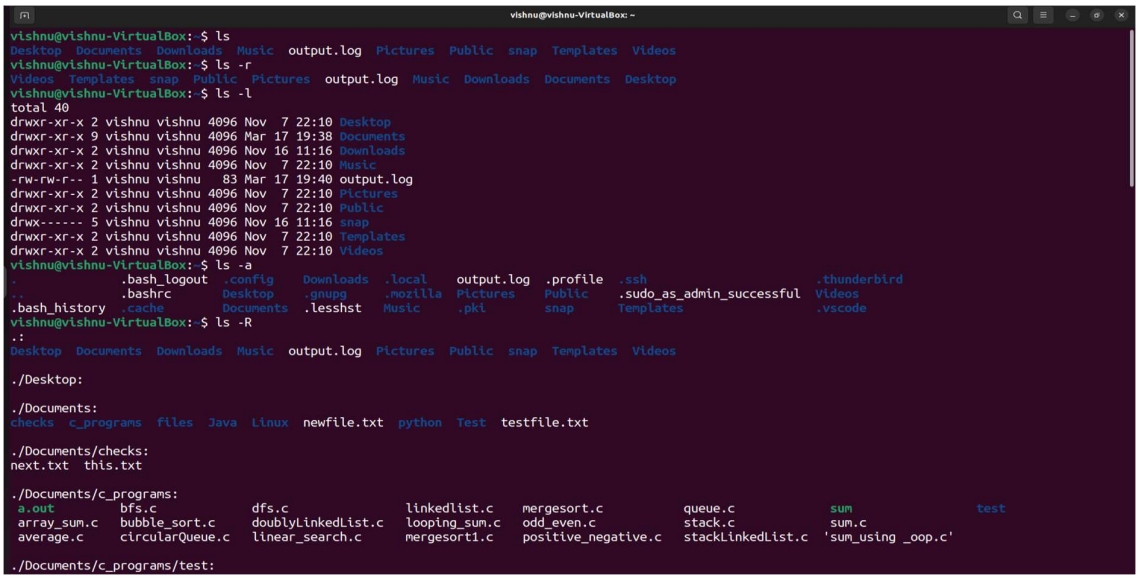
The command is used in listing contents inside a directory, The ls command without any options lists files and directories in a plain format without displaying much information like file types, permissions, modified date and time to mention just but a few.

ls -r : To list files in reverse order, append the -r flag .

ls -l : using the -l flag, you can list the permissions of the files and directories as well as other attributes such as folder names, file and directory sizes, and modified date and time.

ls -a : To view hidden files by appending the -a flag. Hidden files are usually system files that begin with a full stop or a period.

Ls -R: To display the directory tree of files and folders



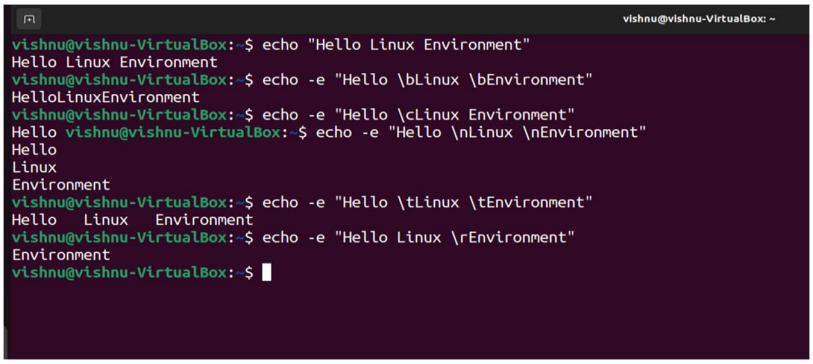
3.echo

echo command in Linux is used to display line of text/string that are passed as an argument . This is a built in command that is mostly used in shell scripts and batch files to output status text to the screen or a file.

echo -e: here enables the interpretation of backslash escapes

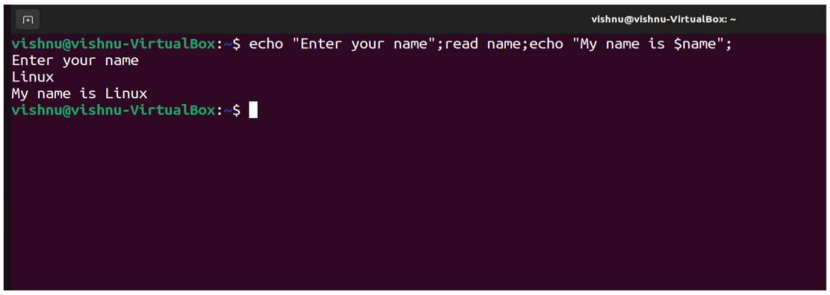
i. \b : it removes all the spaces in between the text

ii. \n : this option creates new line from where it is used
iii. \t : this option is used to create horizontal tab spaces.
iv. \r : carriage return with backspace interpreter '-e' to have specified carriage return in output.



4. read

Linux system is used to read from a file descriptor. Basically, this command read up the total number of bytes from the specified file descriptor into the buffer. If the number or count is zero then this command may detect the errors. But on success, it returns the number of bytes read. Zero indicates the end of the file. If some errors found then it returns -1.



5. more

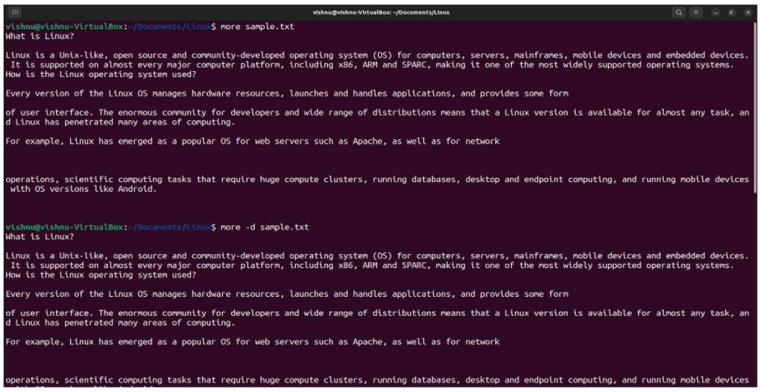
more command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large. The more command also allows the user do scroll up and down through the page.

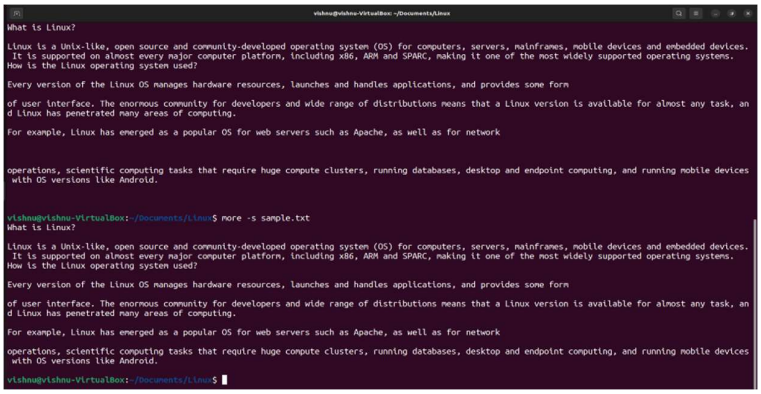
-d : Use this command in order to help the user to navigate. It displays "[Press space to continue, 'q' to quit.]" and displays "[Press 'h' for instructions.]" when wrong key is pressed.

-f : This option does not wrap the long lines and displays them as such.

-c : This command is used to display the pages on the same area by overlapping the previously displayed text.

-s : This option squeezes multiple blank lines into one single blank line.





6. less

Less command is a Linux utility that can be used to read the contents of a text file one page(one screen) at a time. It has faster access because if file is large it doesn't access the complete file, but accesses it page by page.

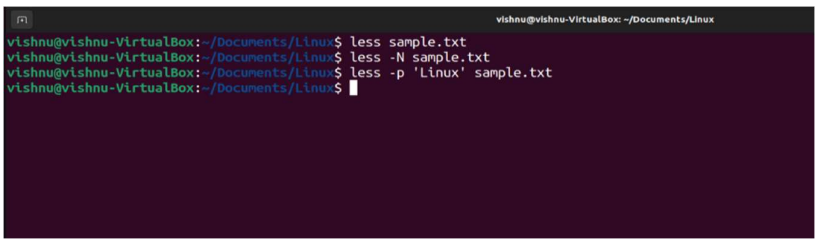
-p : it tells less to start at the first occurrence of pattern in the file

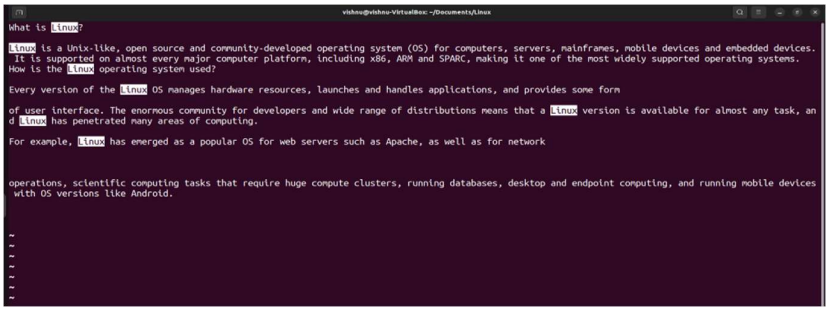
-N : It will show output along with line numbers

-F : causes less to exit if entire file can be displayed on first screen

-g : highlight the string which was found by last search command

-G : suppresses all highlighting of strings found by search commands





7. cat

Cat(concatenate) command is very frequently used in Linux. It reads data from the file and gives their content as output. It helps us to create, view, concatenate files.

cat filename : to view a file.

cat > filename.txt : to create a new text file

cat file1 >> file2 : can append the contents of one file to the end of another file.

cat [filename-whose-contents-is-to-be-copied] > [destination-filename] : Copy the contents of one file to another file

tac : Cat command can display content in reverse order using tac command.

-E : Highlight end of the file

-s : suppress repeated empty lines in output

-n : view contents of a file preceding with line numbers.

```
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat > test.txt
Hello, Welcome to Linux
Linux is an open source OS
^C
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat test.txt
Hello, Welcome to Linux
Linux is an open source OS
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat > new.txt
test file
^C
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat test.txt >> new.txt
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat new.txt
test file
Hello, Welcome to Linux
Linux is an open source OS
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat test.txt > new.txt
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat test.txt
Hello, Welcome to Linux
Linux is an open source OS
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat new.txt
Hello, Welcome to Linux
Linux is an open source OS
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat -n new.txt
     1  Hello, Welcome to Linux
     2  Linux is an open source OS
vishnu@vishnu-VirtualBox:~/Documents/Linux$ tac new.txt
Linux is an open source OS
Hello, Welcome to Linux
vishnu@vishnu-VirtualBox:~/Documents/Linux$
```

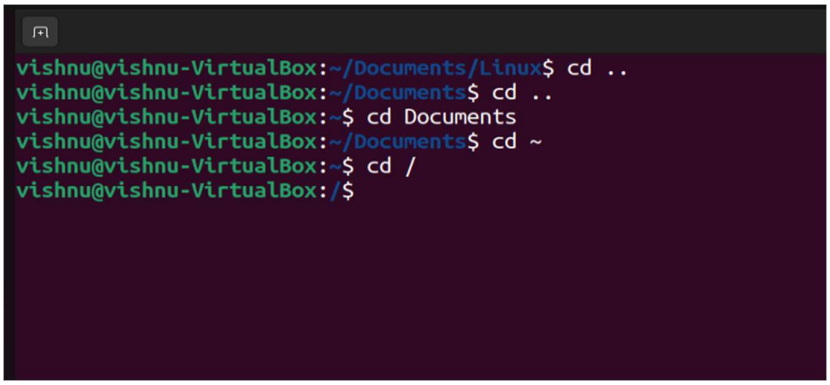
8.cd

cd command in Linux known as change directory command. It is used to change current working directory.

cd /: this command is used to change directory to the root directory, The root directory is the first directory in your filesystem hierarchy.

cd ~ : this command is used to change directory to the home directory.

cd .. : this command is used to move to the parent directory of current directory, or the directory one level up from the current directory. “..” represents parent directory.



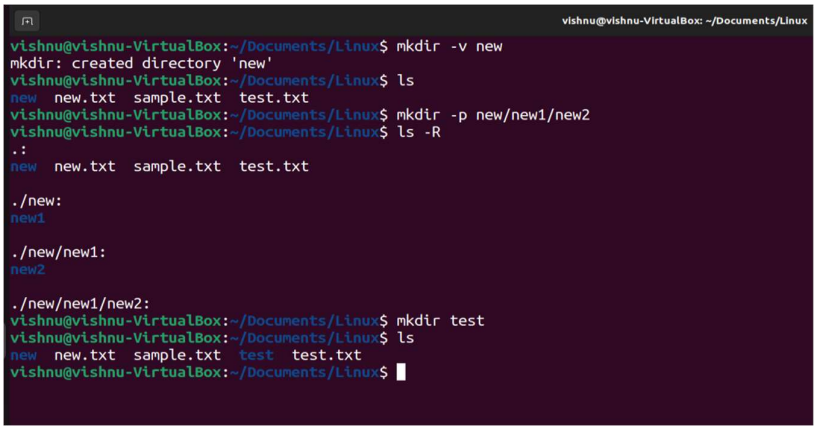
9. mkdir

mkdir command in Linux allows the user to create directories (also referred to as folders in some operating systems). This command can create multiple directories at once as well as set the permissions for the directories. It is important to note that the user executing this command must have enough permissions to create a directory in the parent directory, or he/she may receive a ‘permission denied’ error.

-v or –verbose: It displays a message for every directory created.

-p: A flag which enables the command to create parent directories as necessary.

-m : This option is used to set the file modes, i.e. permissions, etc. for the created directories.

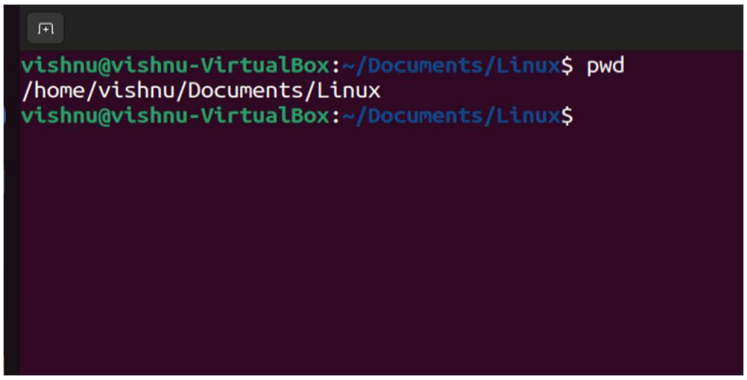


10. pwd

pwd stands for Print Working Directory. It prints the path of the working directory, starting from the root.

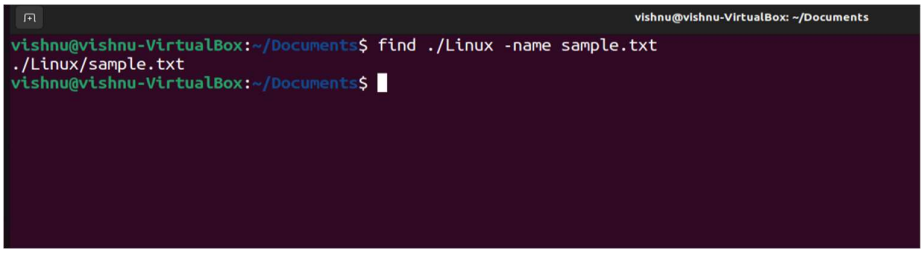
pwd -L: Prints the symbolic path.

pwd -P: Prints the actual path.



11. find

The find command in UNIX is a command line utility for walking a file hierarchy. It can be used to find files and directories and perform subsequent operations on them. It supports searching by file, folder, name, creation date, modification date, owner and permissions.



12. mv

mv is used to move one or more files or directories from one place to another in a file system like UNIX. It has two distinct functions:

(i) It renames a file or folder.

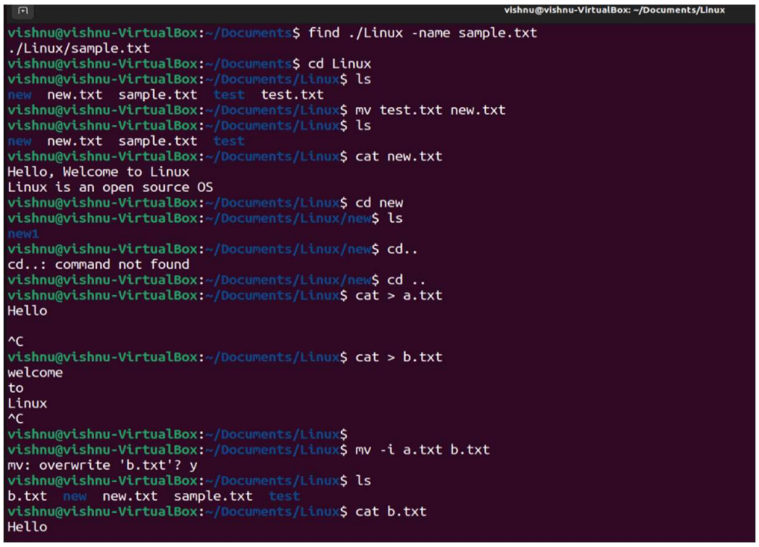
(ii) It moves a group of files to a different directory.

-i (Interactive): Like in cp, the -i option makes the command ask the user for confirmation before moving a file that would overwrite an existing file, you have to press y for confirm moving, any other key leaves the file as it is.

-f (Force): mv prompts for confirmation overwriting the destination file if a file is write-protected.

-n (no-clobber): With -n option, mv prevent an existing file from being overwritten.

-b(backup): With this option, it is easier to take a backup of an existing file that will be overwritten as a result of the mv command.



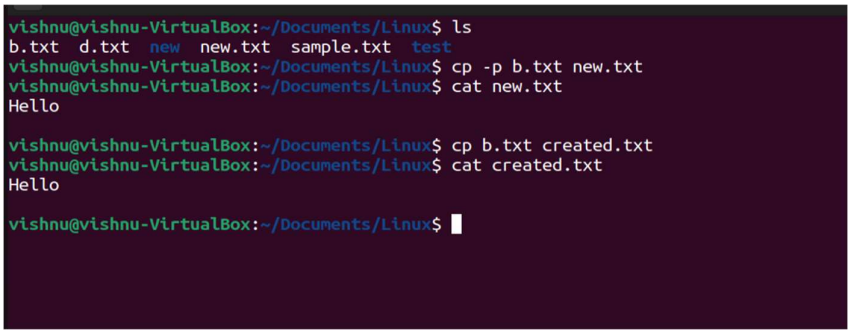
13. cp

cp stands for copy. This command is used to copy files or group of files or directory. It creates an exact image of a file on a disk with different file name. cp command require at least two filenames in its arguments.

-r or -R: Copying directory structure. With this option cp command shows its recursive behaviour by copying the entire directory structure recursively.

-p : option cp preserves the following characteristics of each source file in the corresponding destination file: the time of the last data modification and the time of the last access, the ownership (only if it has permissions to do this), and the file permission-bits.

-b(backup): With this option cp command creates the backup of the destination file in the same folder with the different name and in different format.

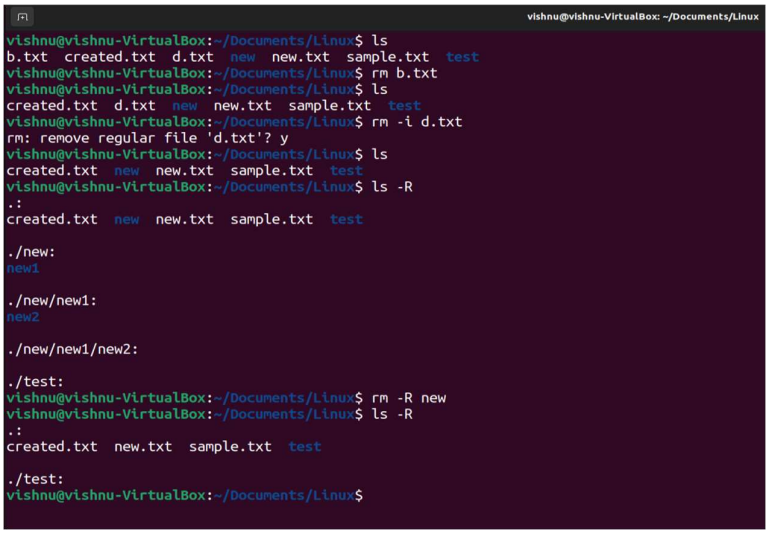


14. rm

rm command is used to remove objects such as files, directories, symbolic links and so on from the file system like Linux. rm stands for remove here. rm command is used to remove objects such as files, directories, symbolic links and so on from the file system like UNIX.

-r (Recursive Deletion): With -r(or -R) option rm command performs a tree-walk and will delete all the files and sub-directories recursively of the parent directory.

-f: option overrides this minor protection and removes the file forcefully.



15. tar

The Linux ‘tar’ stands for tape archive, is used to create Archive and extract the Archive files. tar command in Linux is one of the important command which provides archiving functionality in Linux. We can use Linux tar command to create compressed or uncompressed Archive files and also maintain and modify them.

-c : Creates Archive

-x : Extract the archive

-f : creates archive with given filename

-t : displays or lists files in archived file

-u : archives and adds to an existing archive file

-v : Displays Verbose Information

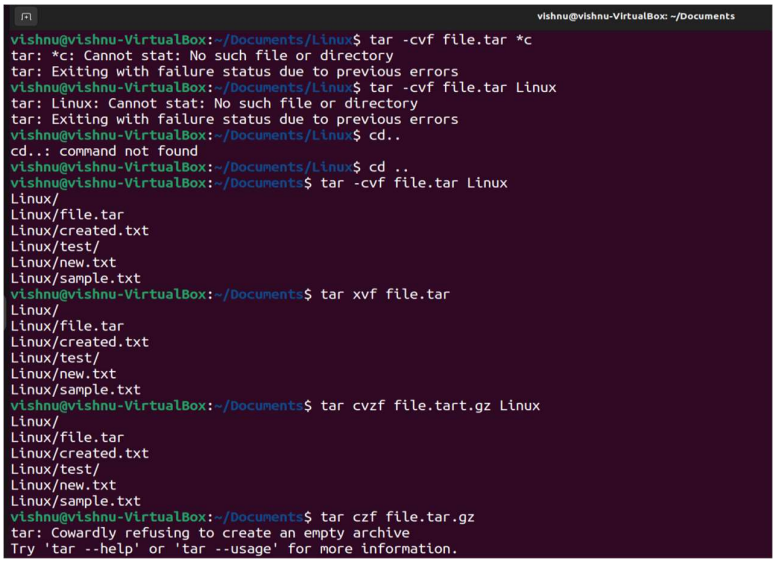
-A : Concatenates the archive files

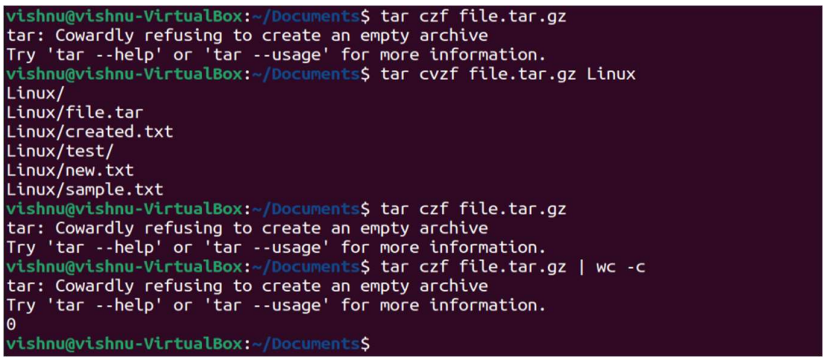
-z : zip, tells tar command that creates tar file using gzip

-j : filter archive tar file using tbzip

-W : Verify a archive file

-r : update or add file or directory in already existed .tar file





16. wc

wc stands for word count. As the name implies, it is mainly used for counting purpose.

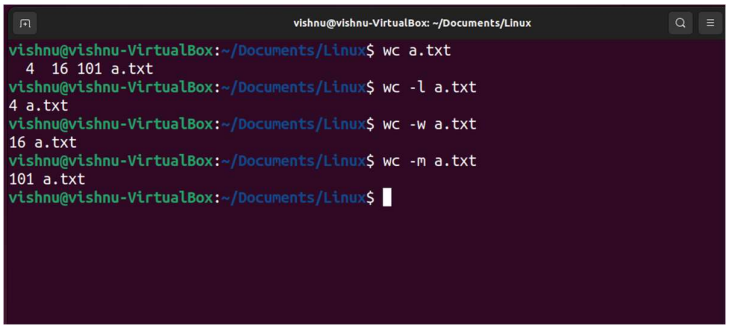
- It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.
- By default it displays four-columnar output.
- First column shows number of lines present in a file specified, second column shows number of words present in the file, third column shows number of characters present in file and fourth column itself is the file name which are given as argument.

-l: This option prints the number of lines present in a file.

-w: This option prints the number of words present in a file.

-c: This option displays count of bytes present in a file.

-m: Using -m option ‘wc’ command displays count of characters from a file.



17. cut

The cut command in Linux is a command for cutting out the sections from each line of files and writing the result to standard output. It can be used to cut parts of a line by byte position, character and field. Basically the cut command slices a line and extracts the text.

-b(byte): To extract the specific bytes, you need to follow -b option with the list of byte numbers separated by comma.

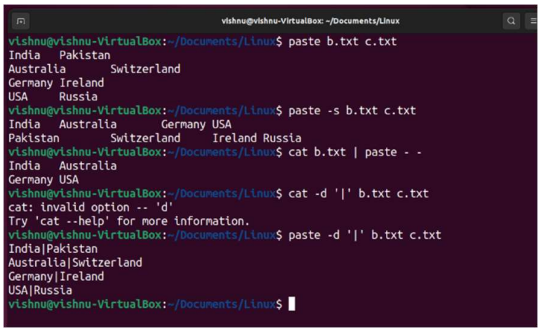
-c (column): To cut by character use the -c option.

18. paste

Paste command is one of the useful commands in Unix or Linux operating system. It is used to join files horizontally (parallel merging) by outputting lines consisting of lines from each file specified, separated by tab as delimiter, to the standard output.

-d : Paste command uses the tab delimiter by default for merging the files.

-s (serial): We can merge the files in sequentially manner using the -s option.



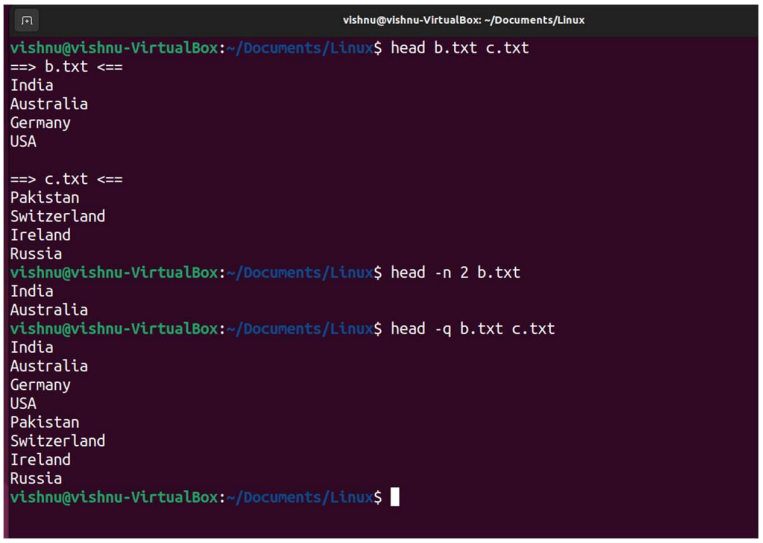
19. head

It is the complementary of Tail command. The head command, as the name implies, print the top N number of data of the given input. By default, it prints the first 10 lines of the specified files.

-n num: Prints the first 'num' lines instead of first 10 lines. num is mandatory to be specified in command otherwise it displays an error.

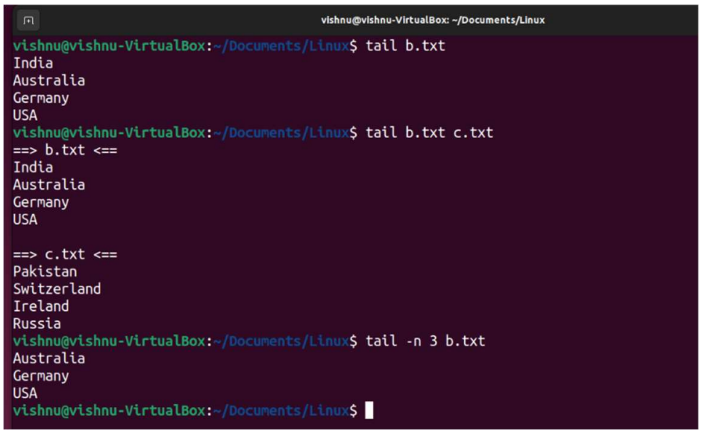
-c num: Prints the first 'num' bytes from the file specified. Newline count as a single character, so if head prints out a newline, it will count it as a byte.

-q: It is used if more than 1 file is given. Because of this command, data from each file is not precedes by its file name.



20. tail

It is the complementary of head command. The tail command, as the name implies, print the last N number of data of the given input. By default it prints the last 10 lines of the specified files. If more than one file name is provided then data from each file is precedes by its file name.



21. grep

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. The pattern that is searched in the file is referred to as the regular expression.

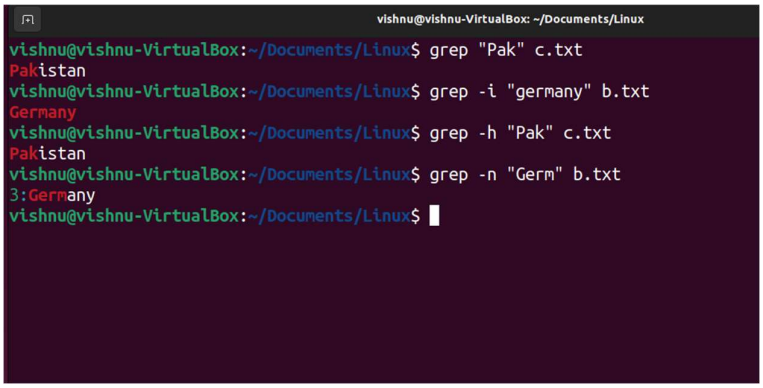
-c : This prints only a count of the lines that match a pattern

-h : Display the matched lines, but do not display the filenames.

-i : Ignores, case for matching

-l : Displays list of a filenames only.

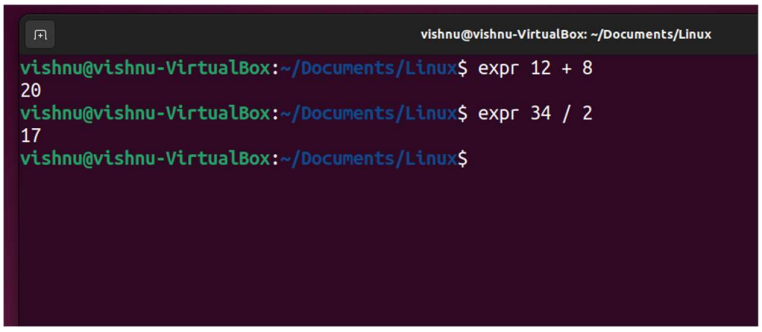
-n : Display the matched lines and their line numbers.



22. expr

The expr command in Unix evaluates a given expression and displays its corresponding output. It is used for:

- Basic operations like addition, subtraction, multiplication, division, and modulus on integers.
- Evaluating regular expressions, string operations like substring, length of strings etc.



23. chown

Different users in the operating system have ownership and permission to ensure that the files are secure and put restrictions on who can modify the contents of the files. In Linux there are different users who use the system:

Each user has some properties associated with them, such as a user ID and a home directory. We can add users into a group to make the process of managing users easier.

A group can have zero or more users. A specified user can be associated with a “default group”. It can also be a member of other groups on the system as well.

```
vishnu@vishnu-VirtualBox:~/Documents/Linux$ chown vishnu b.txt
vishnu@vishnu-VirtualBox:~/Documents/Linux$ chown root b.txt
chown: changing ownership of 'b.txt': Operation not permitted
vishnu@vishnu-VirtualBox:~/Documents/Linux$ ls -l b.txt
-rw-rw-r-- 1 vishnu vishnu 28 Mar 18 21:19 b.txt
vishnu@vishnu-VirtualBox:~/Documents/Linux$
```

23. Piping and Redirection

Piping is a mechanism that allows you to connect the output of one command as the input to another command. This is done using the vertical bar (|) character in the command line. When you use piping, the output of the first command is not printed to the terminal, but is instead passed as input to the second command.

```
vishnu@vishnu-VirtualBox: ~/Documents/Linux
vishnu@vishnu-VirtualBox:~/Documents/Linux$ ls -l | less
vishnu@vishnu-VirtualBox:~/Documents/Linux$ grep "India" b.txt | wc -l
1
vishnu@vishnu-VirtualBox:~/Documents/Linux$
```

Redirection is a way to change the input or output of a command from the default source or destination. In Linux, there are two main redirection operators: the greater than symbol (**>**) and the less than symbol (**<**). The greater than symbol (**>**) is used to redirect the output of a command to a file.

```
vishnu@vishnu-VirtualBox: ~/Documents/Linux
vishnu@vishnu-VirtualBox:~/Documents/Linux$ ls > t1.txt
vishnu@vishnu-VirtualBox:~/Documents/Linux$ cat t1.txt
a.txt
b.txt
created.txt
c.txt
file.tar
new.txt
sample.txt
t1.txt
test
vishnu@vishnu-VirtualBox:~/Documents/Linux$ grep "new.txt" < t1.txt
new.txt
vishnu@vishnu-VirtualBox:~/Documents/Linux$
```

24. useradd

The useradd command in Linux is used to create a new user account.

-m: This option creates the home directory for the new user. Without this option, the home directory is not created.

-s: This option specifies the login shell for the new user.

-c: This option allows you to add a comment to the user account.

-u: This option allows you to set the user ID (UID) for the new user.

25. usermod

The usermod command in Linux is used to modify existing user accounts.

-c: This option allows you to change the comment associated with the user account.

-d: This option allows you to change the home directory for the user.

-e: This option allows you to set an expiration date for the user account.

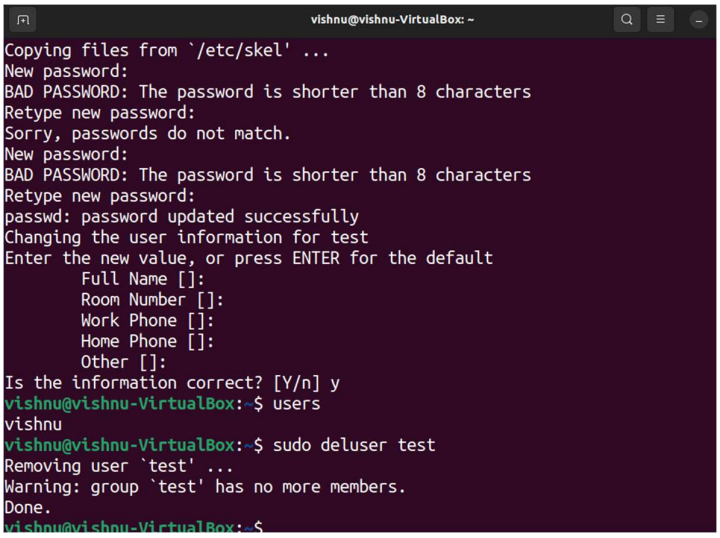
26. userdel

userdel command in Linux system is used to delete a user account and related files. This command basically modifies the system account files, deleting all the entries which refer to the username LOGIN.

-f: This option forces the removal of the specified user account. It doesn't matter that the user is still logged in. It also forces the userdel to remove the user's home directory and mail spool, even if another user is using the same home directory.

-r: Whenever we are deleting a user using this option then the files in the user's home directory will be removed along with the home directory itself and the user's mail spool.

-h : This option display help message and exit.



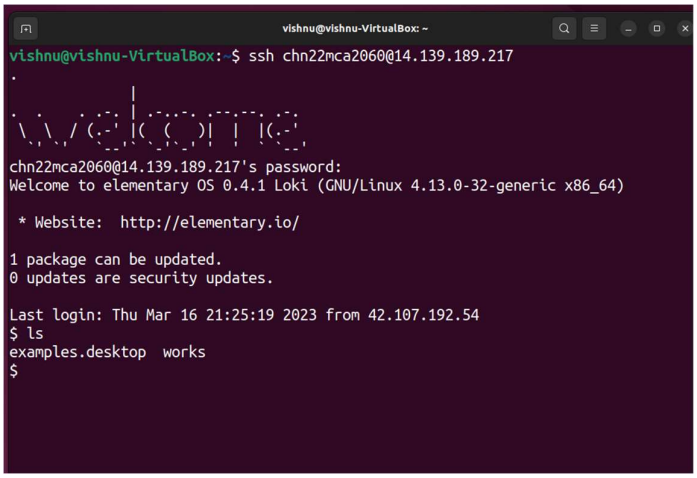
27. passwd

passwd command in Linux is used to change the user account passwords. The root user reserves the privilege to change the password for any user on the system, while a normal user can only change the account password for his or her own account.

passwd [options] [username]

28. ssh

ssh stands for “Secure Shell”. It is a protocol used to securely connect to a remote server/system. ssh is secure in the sense that it transfers the data in encrypted form between the host and the client. It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.



29. scp

scp (secure copy) command in Linux system is used to copy file(s) between servers in a secure way. The SCP command or secure copy allows secure transferring of files in between the local host and the remote host or between two remote hosts. It uses the same authentication and security as it is used in the Secure Shell (SSH) protocol. SCP is known for its simplicity, security and pre-installed availability.

port: Specifies the port to connect on the remote host.

–p: Preserves modification times, access times, and modes from the original file.

–q: Disables the progress meter.

–r: Recursively copy entire directories.

30. ssh-keygen

ssh-keygen is the utility used to generate, manage, and convert authentication keys for SSH. ssh-keygen comes installed with SSH in most of the operating systems.

31. **ssh-copy-id**

The ssh-copy-id command is a utility used on Linux and other Unix-based systems to copy a user's public key to a remote server's authorized_keys file, allowing for passwordless authentication.

ssh-copy-id [user]@[remote-host]