ASSIGNMENT 4

ASSIGNMENT 4: BASIC LINUX COMMANDS

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wc

Linux wc command helps in counting the lines, words, and characters in a file. It displays the number of lines, number of characters, and the number of words in a file. Mostly, it is used with pipes for counting operation.

Syntax:

1. wc [OPTION]... [FILE]...
2. wc [OPTION]... --files0-from=F

Options:

Some useful command line options supported by the wc command are as following:

-c, --bytes: It is used to print the byte counts.

-m, --chars: It is used to print the character counts.

-l, --lines: It is used to print the newline counts.

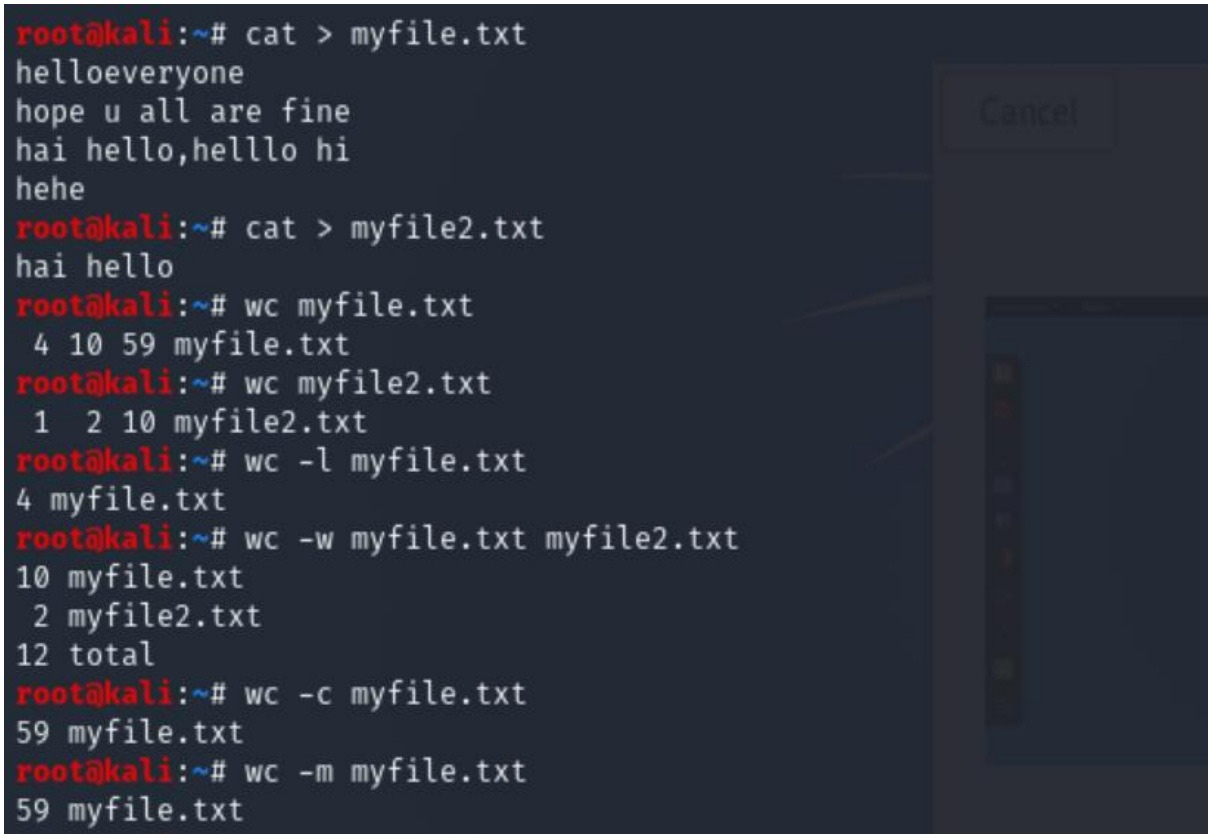
--files0-from=F: It is used to read input from specified files.

-L, --max-line-length: It is used to print the maximum display width.

-w, --words: It is used to print the word counts.

--help: It is used to display the help manual.

--version: It is used to display the version information.



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.

Options:
-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

Bzip2

```
root@kali:~# ls
Desktop                          f3.txt.gz    myfile2.txt.xz
Documents                        f3.txt.xz    myfile.txt.gz
Downloads                        file1.gz     new.tar
embedded-browser-no-sandbox.json file2.gz     Pictures
f1.txt                           file3.gz     Public
f2.txt.gz                        Music        Templates
f3.txt                           myfile2.txt  Videos
root@kali:~# bzip2 f1.txt
root@kali:~# bzip2 -cc f3.txt > f3.txt.bz
root@kali:~# ls
Desktop                          f3.txt.gz       myfile.txt.gz
Documents                        f3.txt.xz       new.tar
Downloads                        file1.gz        Pictures
embedded-browser-no-sandbox.json file2.gz        Public
f1.txt.bz2                       file3.gz        Templates
f2.txt.gz                        Music           Videos
f3.txt                           myfile2.txt
f3.txt.bz                        myfile2.txt.xz
```

```
Desktop    embedded-browser-no-sandbox.json  f3.txt     f3.txt.xz  file1.gz  Music          myfile.txt.gz  Public
Documents  f1.txt                            f3.txt.bz  ff1.bz2    file2.gz  myfile2.txt    new.tar        Templates
Downloads  f2.txt.gz                         f3.txt.gz  ff2.bz2    file3.gz  myfile2.txt.xz Pictures       Videos
root@kali:~# bzip2 -d ff1.bz2
root@kali:~# bunzip2 -c ff2.txt.bz2 > ff2.txt
bunzip2: Can't open input file ff2.txt.bz2: No such file or directory.
root@kali:~# bunzip2 -c ff2.bz2 > ff2
root@kali:~# ls
Desktop    embedded-browser-no-sandbox.json  f3.txt     f3.txt.xz  ff2.bz2   file2.gz  myfile2.txt    new.tar   Templates
Documents  f1.txt                            f3.txt.bz  ff1        ff2.txt   file3.gz  myfile2.txt.xz Pictures  Videos
Downloads  f2.txt.gz                         f3.txt.gz  ff2        file1.gz  Music     myfile.txt.gz  Public
root@kali:~#
```

gzip

```
root@kali:~# apt-get install gzip
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
gzip is already the newest version (1.10-2).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@kali:~# ls
Desktop                          f2.txt       new.tar
Documents                        f3.txt       Pictures
Downloads                        Music        Public
embedded-browser-no-sandbox.json myfile2.txt  Templates
f1.txt.gz                        myfile.txt.gz Videos
root@kali:~# gzip f2.txt
root@kali:~# ls
Desktop                          f2.txt.gz    new.tar
Documents                        f3.txt       Pictures
Downloads                        Music        Public
embedded-browser-no-sandbox.json myfile2.txt  Templates
f1.txt.gz                        myfile.txt.gz Videos
root@kali:~# touch file1 file2 file3
root@kali:~# gzip file1.txt file2.txt file3.txt
gzip: file1.txt: No such file or directory
gzip: file2.txt: No such file or directory
gzip: file3.txt: No such file or directory
root@kali:~# gzip file1 file2 file3
root@kali:~# ls
Desktop                          f3.txt       myfile.txt.gz
Documents                        file1.gz     new.tar
Downloads                        file2.gz     Pictures
embedded-browser-no-sandbox.json file3.gz     Public
f1.txt.gz                        Music        Templates
```

```
root@kali:~# gzip -c f3.txt > f3.txt.gz
root@kali:~# ls
Desktop                           f3.txt.gz       new.tar
Documents                         file1.gz        Pictures
Downloads                         file2.gz        Public
embedded-browser-no-sandbox.json  file3.gz        Templates
f1.txt.gz                         Music           Videos
f2.txt.gz                         myfile2.txt
f3.txt                            myfile.txt.gz
root@kali:~# gzip -d f1.txt.gz
root@kali:~# ls
Desktop                           f3.txt.gz       new.tar
Documents                         file1.gz        Pictures
Downloads                         file2.gz        Public
embedded-browser-no-sandbox.json  file3.gz        Templates
f1.txt                            Music           Videos
f2.txt.gz                         myfile2.txt
f3.txt                            myfile.txt.gz
root@kali:~# gzip -c f2.txt > f2.txt.gz
gzip: f2.txt: No such file or directory
root@kali:~# gzip -c f2.txt.gz  > f2.txt.gz
root@kali:~# ls
Desktop                           f3.txt.gz       new.tar
Documents                         file1.gz        Pictures
Downloads                         file2.gz        Public
embedded-browser-no-sandbox.json  file3.gz        Templates
f1.txt                            Music           Videos
f2.txt.gz                         myfile2.txt
f3.txt                            myfile.txt.gz
root@kali:~#
```

xz

```
root@kali:~# xz -d f1.txt.xz
root@kali:~# unxz -k f2.txt.xz
unxz: f2.txt.xz: No such file or directory
root@kali:~#
root@kali:~# unxz -k f3.txt.xz
unxz: f3.txt: File exists
root@kali:~# ls
Desktop                           f3.txt.gz     myfile2.txt.xz
Documents                         f3.txt.xz     myfile.txt.gz
Downloads                         file1.gz      new.tar
embedded-browser-no-sandbox.json  file2.gz      Pictures
f1.txt                            file3.gz      Public
f2.txt.gz                         Music         Templates
f3.txt                            myfile2.txt   Videos
root@kali:~#
```

```
root@kali:~# apt-get install xz-utils
Reading package lists ... Done
Building dependency tree ... Done
Reading state information ... Done
xz-utils is already the newest version (5.2.5-1.0).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@kali:~# ls
Desktop                           f3.txt.gz       new.tar
Documents                         file1.gz        Pictures
Downloads                         file2.gz        Public
embedded-browser-no-sandbox.json  file3.gz        Templates
f1.txt                            Music           Videos
f2.txt.gz                         myfile2.txt
f3.txt                            myfile.txt.gz
root@kali:~# xz f1.txt
root@kali:~# xz -k f3.txt
root@kali:~# xz -c myfile2.txt > myfile2.txt.xz
root@kali:~# ls
Desktop                           f3.txt.gz     myfile2.txt.xz
Documents                         f3.txt.xz     myfile.txt.gz
Downloads                         file1.gz      new.tar
embedded-browser-no-sandbox.json  file2.gz      Pictures
f1.txt.xz                         file3.gz      Public
f2.txt.gz                         Music         Templates
f3.txt                            myfile2.txt   Videos
```

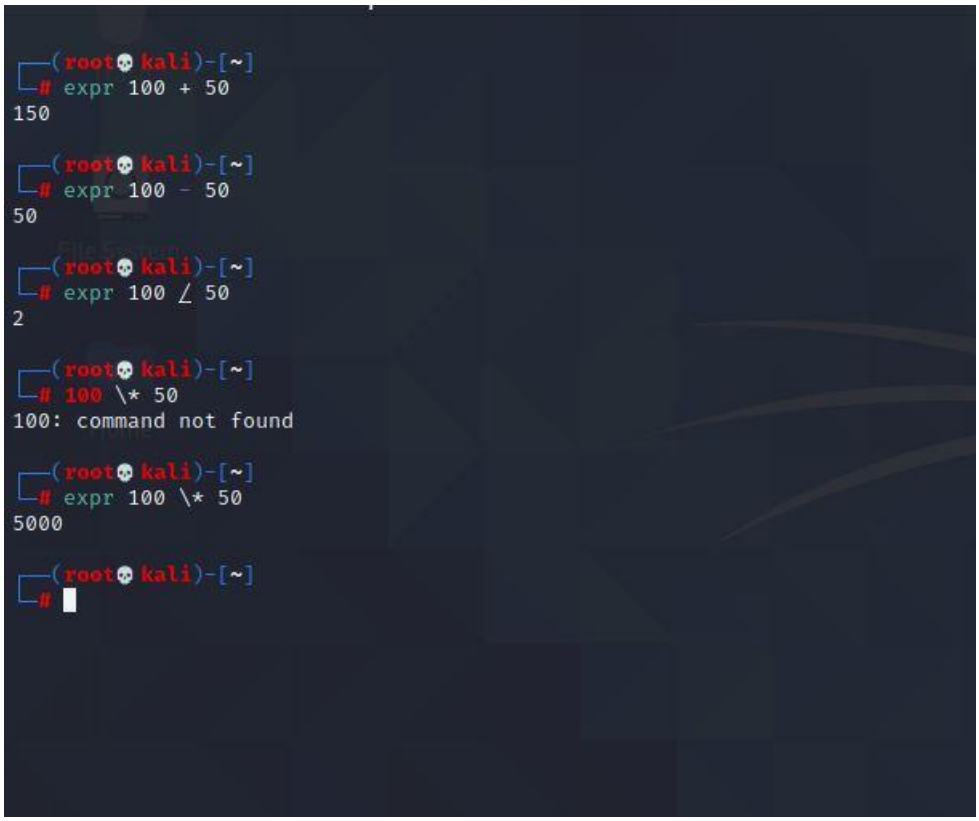
expr

The **expr command** is used to evaluate a given expression and display its standard output. Each separated expression is considered as an argument. These expressions could be integer and string expressions, including regular expressions. If expressions are not passed properly, it will prevent the execution of the command.

The expr command supports the following operators:

- **for integer:** addition, subtraction, multiplication, division, and modulus.
- **For strings:** regular expression, set of characters in a string.

It will be useful if we want to perform an operation while working on the terminal, such as searching for a substring in a string, searching its index, performing arithmetic operations, and more. So, the expr command allows us to perform all these tasks from the terminal.



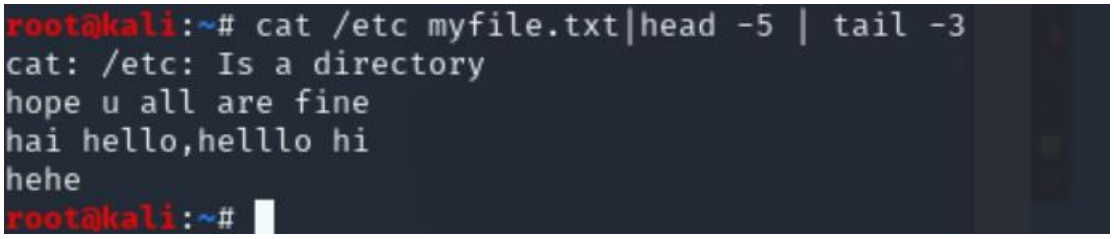
Redirections & Piping :

A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.

Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

#ls -l | wc - l

#cat /etc.passwd.txt | head -7 | tail -5



ssh

In Linux, ssh is a protocol, which stands for Secure Shell or Secure Socket Shell. The secure shell is useful for security while connecting to a remote server. The ssh command uses a ssh protocol, which is a secure protocol, as the data transfer between the client and the host takes place in encrypted form. It transfers the input through the client to the host and returns the output transferred by the host. It executes through TCP/IP port 22.

The encrypted connection is also used to run the commands on a Linux server, port forwarding, tunnelling, and more.

There are lots of SSH clients that are available for both commercial and free. The OpenSSH is its most widely used client. It is available for all the most used platforms such as Windows, Linux, macOS, OpenBSD, and more.

scp

- SCP (secure copy) is a command-line utility that allows you to securely
- copy files and directories between two locations.
- With scp, you can copy a file or directory:
- From your local system to a remote system.
- From a remote system to your local system.
- Between two remote systems from your local system.
- Remote file system locations are specified in format
- [user@]host:/path Syntax:

  scp [OPTION] [user@]SRC_HOST:]file1 [user@]DEST_HOST:]file2

  $scp/etc/yum.config/etc/hosts ServerX:/home/student

  $scp ServerX:/etc/hostname /home/student

ssh-keygen

ssh-keygen command to generate a public/private authentication key pair. Authentication keys allow a user to connect to a remote system without supplying a password. Keys must be generated for each user separately. If you generate key pairs as the root user, only the root can use the keys.

$ssh-keygen -t rsa

ssh-copy-id

- The ssh-copy-id command allows you to install an SSH key on a remote server's authorized keys.
- This command facilitates SSH key login, which removes the need for a password for each login, thus ensuring a password-less, automatic login process.
- $ssh-copy-id username@remote_host