## Question no.1

What is the difference between du and df? Please show the difference with an example.

- ⇒The "du" and "df" both are the most used Unix/Linux commands that provide information about disk usage, but they differ in what they report and how they display the result.
- ⇒"du" reports the disk space used by the individual files and directories in a specified directory tree. It is often used to identify the large files or directories that are using up disk space.

For example, to list the disk usage of all files and directories in the current directory,

Command: du -h

The -h option displays the sizes in a "human-readable format making it easier to understand.

```
[19706@ip-172-26-2-101:~$ du -h
4.0K
        ./B
4.0K
        ./C1
4.0K
        ./B2
4.0K
        ./.cache
4.0K
        ./dir2
4.0K
        ./.local/share/nano
8.0K
12K
        ./.local/share
16K
        ./.local
        ./C
4.0K
4.0K
        ./Dir3
4.0K
        ./Dir2
4.0K
        ./B1
4.0K
        ./Dir1
        ./D/ABCD
4.0K
8.0K
       ./D
200K
19706@ip-172-26-2-101:~$
```

⇒"df" reports the amount of free and used disk space on a file system. It is often used to check how much space is available on a disk or partition.

For example, to list the disk space usage of all mounted file systems.

Command: df -h

The -h option displays the sizes in a "human-readable" format.

```
19706@ip-172-26-2-101:~$ df -h
Filesystem
                 Size
                       Used Avail Use% Mounted on
/dev/root
                  39G
                       2.9G
                              36G
                                     8% /
                 486M
                             486M
                                     0% /dev
devtmpfs
                          0
                             490M
tmpfs
                 490M
                                     0% /dev/shm
                  98M
                              98M
                                     1% /run
tmpfs
                       860K
                                     0% /run/lock
tmpfs
                 5.0M
                          0
                             5.0M
                 490M
                             490M
                                     0% /sys/fs/cgroup
tmpfs
/dev/loop3
                                 0 100% /snap/amazon-ssm-agent/2012
                  29M
                        29M
/dev/loop5
                                 0 100% /snap/core/14447
                 117M
                       117M
/dev/loop6
                        64M
                                 0 100% /snap/core20/1778
                  64M
/dev/loop7
                  25M
                        25M
                                 0 100% /snap/amazon-ssm-agent/6312
/dev/loop8
                                 0 100% /snap/lxd/24323
                 145M
                       145M
                                 0 100% /snap/core18/2679
/dev/loop0
                  56M
                        56M
/dev/loop1
                                 0 100% /snap/core20/1822
                  64M
                        64M
/dev/loop9
                                 0 100% /snap/core/14784
                 117M
                       117M
/dev/loop10
                  56M
                        56M
                                 0 100% /snap/core18/2697
/dev/loop4
                                 0 100% /snap/lxd/24483
                 143M
                       143M
19706@ip-172-26-2-101:~$
```

## Question no.2

In a file with 2 columns, how do you extract the first column and save it in a file called col2? How do you extract the second column and save it in a file called col2?

⇒To extract the first column and save it in a file column, we need to use the command: cut -f1 myfile.txt > col2.

```
[19706@ip-172-26-2-101:~$ vi myfile.txt
[19706@ip-172-26-2-101:~$ cat myfile.txt
apple red
banana yellow
orange blue
[19706@ip-172-26-2-101:~$ cut -f1 myfile.txt > col2
[19706@ip-172-26-2-101:~$ cat col2
apple
banana
orange
19706@ip-172-26-2-101:~$
```

⇒To extract the first column and save it in a file column, we need to use the command: cut -f2 myfile.txt > col2.

```
[19706@ip-172-26-2-101:~$ vi myfile.txt
[19706@ip-172-26-2-101:~$ cat myfile.txt
apple
        red
banana yellow
orange blue
[19706@ip-172-26-2-101:~$ cut -f1 myfile.txt > col2
[19706@ip-172-26-2-101:~$ cat col2
apple
banana
orange
[19706@ip-172-26-2-101:~$ cut -f2 myfile.txt > col2
[19706@ip-172-26-2-101:~$ cat col2
red
vellow
blue
19706@ip-172-26-2-101:~$
```

## Question no.3

What are the common extensions for a tar file? What about zip files?

⇒the common extensions for a tar file, with examples:

a) tar: A tar file without compression.

Example: myfile.tar.

```
19706@ip-172-26-2-101:~$ ls

A B1 C D Dir2 a c dir2 file2 myfile

B B2 C1 Dir1 Dir3 b col2 file1 file3 myfile.txt

19706@ip-172-26-2-101:~$ tar -cvf myfile.tar file1 file2 file3

file1

file2

file3

19706@ip-172-26-2-101:~$ ls

A B1 C D Dir2 a c dir2 file2 myfile myfile.txt

B B2 C1 Dir1 Dir3 b col2 file1 file3 myfile.tar

19706@ip-172-26-2-101:~$
```

b).tar.gz or .tgz: A tar file compressed with gzip. Example: myfile.tar.gz.

```
19706@ip-172-26-2-101:~$ ls
A B1 C D
             Dir2 a c
                             dir2
                                   file2 myfile
                                                    myfile.txt
B B2 C1 Dir1 Dir3 b col2 file1 file3 myfile.tar
19706@ip-172-26-2-101:~$ tar -czvf myfile.tar.gz file1 file2 file3
file2
file3
19706@ip-172-26-2-101:~$ ls
A B1 C D
              Dir2 a c
                            dir2
                                   file2 myfile
                                                    myfile.tar.gz
B B2 C1 Dir1 Dir3 b col2 file1 file3 myfile.tar myfile.txt
19706@ip-172-26-2-101:~$
```

c) .tar.bz2: A tar file compressed with bzip2.

Example: myfile.tar.bz2.

```
19706@ip-172-26-2-101:~$ ls
                 Dir2 a c
A B1 C D
                                 dir2
                                        file2 myfile
                                                            myfile.tar.gz
 B2 C1 Dir1 Dir3 b col2 file1 file3 myfile.tar myfile.txt
19706@ip-172-26-2-101:~$ tar -cjvf myfile.tar.bz2 file1 file2 file3
file1
file2
file3
19706@ip-172-26-2-101:~$ ls
   B2 D Dir3 c file1
C Dir1 a col2 file2
C1 Dir2 b dir2 file3
                                  myfile
                                                  myfile.tar.gz
                                  myfile.tar
                                                  myfile.txt
B1 C1 Dir2 b
                                  myfile.tar.bz2
19706@ip-172-26-2-101:~$
```

d).tar.xz: A tar file compressed with xz.

Example: myfile.tar.xz.

```
[19706@ip-172-26-2-101:~$ ls
  B2 D
            Dir3 c
                      file1 myfile
                                           myfile.tar.gz
                  col2 file2 myfile.tar
  C Dir1 a
                                           myfile.txt
                 dir2 file3 myfile.tar.bz2
B1 C1 Dir2 b
19706@ip-172-26-2-101:~$ tar -cJvf myfile.tar.xz file1 file2 file3
file1
file2
file3
[19706@ip-172-26-2-101:~$ ls
A B2 D Dir3 c file1 myfile
                                           myfile.tar.gz
 C Dir1 a col2 file2 myfile.tar
                                           myfile.tar.xz
B1 C1 Dir2 b
                 dir2 file3 myfile.tar.bz2 myfile.txt
19706@ip-172-26-2-101:~$
```

e).tar.Z: A tar file compressed with the compress command.

Example: myfile.tar.Z.

```
19706@ip-172-26-2-101:~$ ls
    B2 D
              Dir3 c
                               file1 myfile
                                                           myfile.tar.gz
                       col2 file2 myfile.tar myfile.tar
dir2 file3 myfile.tar.bz2 myfile.txt
                                                          myfile.tar.xz
B C Dir1 a
B1 C1 Dir2 b
19706@ip-172-26-2-101:~$ tar -cZvf myfile.tar.Z file1 file2 file3
file1
file2
file3
/bin/sh: 1: compress: not found
tar: Child returned status 127
tar: Error is not recoverable: exiting now
19706@ip-172-26-2-101:~$ ls
  B2 D Dir3 c file1 myfile myfile.tar.bz
C Dir1 a col2 file2 myfile.tar myfile.tar.gz
C1 Dir2 b dir2 file3 myfile.tar.Z myfile.tar.xz
                                                        myfile.tar.bz2 myfile.txt
B1 C1 Dir2 b
19706@ip-172-26-2-101:~$
```

I have already used the above command gzip or bzip2 compression method with the appropriate file extension (.gz or .bz2), so I don't need to use the. Z extension and the compress command.

f) .tar.lz: A tar file compressed with Izma.

Example: myfile.tar.lz.

```
19706@ip-172-26-2-101:~$ ls
             Dir3 c
                         file1 myfile
                                              myfile.tar.bz2 myfile.txt
                   col2 file2 myfile.tar
        Dir1 a
                                              myfile.tar.gz
B1 C1 Dir2 b
                   dir2 file3 myfile.tar.Z myfile.tar.xz
19706@ip-172-26-2-101:~$ tar -c --lzma -f myfile.tar.lz file1 file2 file3
[19706@ip-172-26-2-101:~$ ls
    B2 D Dir3 c
                        file1 myfile
                                              myfile.tar.bz2 myfile.tar.xz
   C Dir1 a col2 file2 myfile.tar
C1 Dir2 b dir2 file3 myfile.tar 7
                                             myfile.tar.gz
                                                              myfile.txt
B1 C1 Dir2 b
                   dir2 file3 myfile.tar.Z myfile.tar.lz
19706@ip-172-26-2-101:~$
```

g) .tar.lz4: A tar file compressed with lz4.

Example: myfile.tar.lz4.

```
[19706@ip-172-26-2-101:~$ ls
   B2 D
             Dir3 c
                         file1 myfile
                                              myfile.tar.bz2
                                                              myfile.tar.xz
   C Dir1 a
                   col2 file2 myfile.tar
                                              myfile.tar.gz
                                                              myfile.txt
B C Dirl a
B1 C1 Dir2 b
                   dir2 file3 myfile.tar.Z myfile.tar.lz
19706@ip-172-26-2-101:~$ tar -c --lz4 -f myfile.tar.lz4 file1 file2 file3
tar: unrecognized option '--lz4'
Try 'tar --help' or 'tar --usage' for more information.
19706@ip-172-26-2-101:~$
```

This version of tar is not supported by my terminal.

⇒The common extensions for zip files:

a) .zip: A zip file without compression. Example: zip myfile1.zip file1 file2 file3

```
[19706@ip-172-26-2-101:~$ ls myfile1
myfile1
19706@ip-172-26-2-101:~$ zip myfile.zip file1 file2 file3

Command 'zip' not found, but can be installed with:

apt install zip
Please ask your administrator.

19706@ip-172-26-2-101:~$
```

b).zipx: A zip file compressed with advanced compression methods.

Example: zip -r myfile1.zipx file1 file2 file3

```
19706@ip-172-26-2-101:~$ zip -r myfile1.zipx file1 file2 file3

Command 'zip' not found, but can be installed with:

apt install zip
Please ask your administrator.

19706@ip-172-26-2-101:~$
19706@ip-172-26-2-101:~$
```

c) .jar: A zip file format used for Java archives. Example: jar cvf myfile1.jar file1 file2 file3

```
19706@ip-172-26-2-101:~$ jar cvf myfile1.jar file1 file2 file3

Command 'jar' not found, but can be installed with:

apt install openjdk-11-jdk-headless # version 11.0.17+8-1ubuntu2~20.04, or apt install default-jdk # version 2:1.11-72

apt install fastjar # version 2:0.98-6build1

apt install openjdk-13-jdk-headless # version 13.0.7+5-0ubuntu1~20.04

apt install openjdk-16-jdk-headless # version 16.0.1+9-1~20.04

apt install openjdk-17-jdk-headless # version 17.0.5+8-2ubuntu1~20.04

apt install openjdk-8-jdk-headless # version 8u352-ga-1~20.04

Ask your administrator to install one of them.

19706@ip-172-26-2-101:~$
```

d).war: A zip file format used for web application archives.

Example: jar cvf myfile1.war file1 file2 file3

```
19706@ip-172-26-2-101:~$ jar cvf myfile1.war file1 file2 file3

Command 'jar' not found, but can be installed with:

apt install openjdk-11-jdk-headless # version 11.0.17+8-1ubuntu2~20.04, or apt install default-jdk # version 2:1.11-72

apt install fastjar # version 2:0.98-6build1

apt install openjdk-13-jdk-headless # version 13.0.7+5-0ubuntu1~20.04

apt install openjdk-16-jdk-headless # version 16.0.1+9-1~20.04

apt install openjdk-17-jdk-headless # version 17.0.5+8-2ubuntu1~20.04

apt install openjdk-8-jdk-headless # version 8u352-ga-1~20.04

Ask your administrator to install one of them.

19706@ip-172-26-2-101:~$
```

e).ear: A zip file format used for enterprise application archives.

Example: jar cvf myfile1.ear file1 file2 file3

```
19706@ip-172-26-2-101:~$ jar cvf myfile1.ear file1 file2 file3

Command 'jar' not found, but can be installed with:

apt install openjdk-11-jdk-headless # version 11.0.17+8-1ubuntu2~20.04, or apt install default-jdk # version 2:1.11-72

apt install fastjar # version 2:0.98-6build1

apt install openjdk-13-jdk-headless # version 13.0.7+5-0ubuntu1~20.04

apt install openjdk-16-jdk-headless # version 16.0.1+9-1~20.04

apt install openjdk-17-jdk-headless # version 17.0.5+8-2ubuntu1~20.04

apt install openjdk-8-jdk-headless # version 8u352-ga-1~20.04

Ask your administrator to install one of them.

19706@ip-172-26-2-101:~$

19706@ip-172-26-2-101:~$
```

f) .apk: A zip file format used for Android application packages.

Example: zip myfile.apk file1 file2 file3

```
19706@ip-172-26-2-101:~$ zip myfile.apk file1 file2 file3

Command 'zip' not found, but can be installed with:

apt install zip

Please ask your administrator.

19706@ip-172-26-2-101:~$
```

None of the commands is working on my terminal because my terminal does not support zip file.