

Ex 1**ADVANCED LINUX COMMANDS****Date: 18.08.20****Aim:**

To study and implement the linux commands

Description:

Sl. No.	Command Name	Meaning	options
1.	ls	List files and/or directories.	-a, --all do not ignore entries starting with . -A, --almost-all do not list implied . and .. --author with -l, print the author of each file -b, --escape print C-style escapes for nongraphic characters --block-size=SIZE
2.	Who am i	This command reveals the user who is currently logged in.	-a, --all =same as -b -d --login -p -r -t -T -u -b, --boot time of last system boot -d, --dead print dead processes -H, --heading print line of column headings -l, --login print system login processes --lookup attempt to canonicalize hostnames via DNS
3.	pwd	prints the absolute path to current working directory	-L, --logical use PWD from environment, even if it contains symlinks -P, --physical avoid all

			symlinks
4.	cal	Displays the calendar of the current month	<p>-1, --one Display single month output. (This is the default.)</p> <p>-3, --three Display prev/current/next month output.</p> <p>-s, --sunday Display Sunday as the first day of the week.</p> <p>-m, --monday Display Monday as the first day of the week.</p> <p>-j, --julian Display Julian dates (days one-based, numbered from January 1)</p> <p>-y, --year</p>
5.	echo	This command will echo whatever you provide it.	<p>-n do not output the trailing newline</p> <p>-e enable interpretation of backslash escapes</p> <p>-E disable interpretation of backslash escapes (default)</p>
6.	date	Displays current time and date.	<p>-d, --date=STRING display time described by STRING, not 'now'</p> <p>-f, --file=DATEFILE like --date once for each line of DATEFILE</p>
7.	tty	Displays current terminal.	

8.	id	This command prints user and groups (UID and GID) of the current user.	<p>-a ignore, for compatibility with other versions</p> <p>-Z, --context print only the security context of the current user</p> <p>-g, --group print only the effective group ID</p> <p>-G, --groups print all group IDs</p> <p>-n, --name print a name instead of a number, for</p> <p>-ugG</p>
9.	clear	This command clearsthe screen.	
10.	man	To show manual page	
11.	cd	Change the current working directory to the directory provided as argument.	
12.	mkdir	To create a directory, the 'mkdir' commandis used.	
13.	touch	For creating an empty file, use the touchcommand.	
14.	cp	Copy files anddirectories	
15.	mv	Move files or directories. The 'mv' command works like 'cp' command, except that the original file is removed. But, the mv command can be used to rename the files (or directories).	
16.	rmdir	command removes any empty directories, but cannot delete a directory if a file is present in it.	
17.	file	The file commanddetermines the file type of a given file.	
18.	cat	The 'cat' command is actually a concatenator but can be used to view the contents of a file.	

19.	head	Displays the first few lines of a file. By default, the 'head' command displays the first 10 lines of a file.	
20.	tail	the 'tail' command shows the last 10 lines by default	-c, --bytes=[-]K print the first K bytes of each file -n, --lines=[-]K print the first K lines instead of the first 10 -q, --quiet, --silent never print headers giving file names
21.	wc	This command counts lines, words and letters of the input given to it.	
22.	grep	The 'grep' command searches for a pattern in a file (or standard input).	
23.	vi	Visual editor	
24.	alias	The 'alias' is another name for a command.	
25.	history	shows the commands you have entered on your terminal so far.	
26.	passwd	To change your password	
27.	help	With almost every command, '--help' option shows usage summary for that command.	
28.	chmod	The <i>chmod</i> command lets you change access permissions for a file.	
29.	stat	To check the status of a file. This provides more detailed information about a file than 'ls -l' output.	-L, --dereference follow links -f, --file-system display file system status instead of file status -c --format=FORMAT use the specified FORMAT instead of the default; output a newline after each use of FORMAT --printf=FORMAT
30.	ln	command is used in linux to create links.	

Exercise

1. List the contents of user's home directory including the hidden files.

```
[urk17cs039@code ~]$ ls -a
.          .ana.cpp.swp  .config      .cricketer.cpp.swo  display2.txt  file          info.sh       .note.cpp.swp  .ro.cpp.swo  .student.cpp.swp
..         a.out        .conv.cpp.swn .cricketer.cpp.swp  display.txt   file.sh       .ipython_checkpoints  odd.sh        sample       sum1.sh
\          .bank.cpp.swm .conv.cpp.swo  decbin.sh         .dsmc.cpp.swp .friend.cpp.swn .ipython      .ope.cpp.swm  sample10    sum.sh
3          .bank.cpp.swn .conv.cpp.swp  dechex.sh         .emacs        .friend.cpp.swo .k5login      .ope.cpp.swn  sample2.txt table.sh
7a.c      .bank.cpp.swp .conversion.cpp.swk demo2.sh          exp4          .friend.cpp.swp lex.yy.c      .pal1.sh     .server.c.swp .temp2.cpp.swp
7b.c      .bash_history .conversion.cpp.swm demo.sh           exp.txt       f.sh         .local        .pop.cpp.swp .sibi        test
81.c      .bash_logout .conversion.cpp.swn .depa.cpp.swl    f1.txt       great.sh     log.sh       .power.cpp.swn sort.cpp     test1.txt
82.c      .bash_profile .conversion.cpp.swp .depa.cpp.swm    f2.txt       her2.c      .marks.cpp.swn .power.cpp.swo sort.sh     todayhistory.txt
83.c      .bashrc      conversion.sh   .depa.cpp.swo    f3.txt       her3.c      .marks.cpp.swo pow.sh       sort.sh.save  Untitled.ipynb
91b.c     ^C           cre.c          dir2             f4.txt       her.c       .marks.cpp.swp .pro.cpp.swm .spi.cpp.swo .viminfo
92.c      cal.sh       cre.c.save     dirname          fact.sh       .hidden     .mozilla     .pro.cpp.swo .spi.cpp.swp word.txt
9a.c      classname   .cricketer.cpp.swn display1.txt     fibo.sh       hisibi.txt  .note.cpp.swo .pro.cpp.swp .star.cpp.swo
```

2. List the content of /var directory?

```
[urk17cs039@code ~]$ cd /var
[urk17cs039@code var]$ ls
adm  cache  centrifyd  centrifydc  crash  db  empty  games  gopher  kerberos  lib  local  lock  log  mail  nis  opt  preserve  run  spool  tmp  yp
```

3. Create two directories named dir1 & dir2

```
[urk17cs039@code ~]$ mkdir dir1
[urk17cs039@code ~]$ mkdir dir2
[urk17cs039@code ~]$ ls
\          82.c  a.out  cre.c  demo.sh
3          83.c  ^C    cre.c.save  dir1
7a.c      91b.c  cal.sh  decbin.sh  dir2
7b.c      92.c  classname  dechex.sh  dirname
81.c      9a.c  conversion.sh  demo2.sh  display1.txt
```

4. Create a hidden directory with your name?

```
[urk17cs039@code ~]$ mkdir .sibi
[urk17cs039@code ~]$ ls -a
.          .ana.cpp.swp  .config      .cricketer.cpp.swo  display1.txt  fibo.sh       hisibi.txt    .note.cpp.swo  .pro.cpp.swp
..         a.out        .conv.cpp.swn .cricketer.cpp.swp  display2.txt  file          info.sh       .note.cpp.swp  .ro.cpp.swo
\          .bank.cpp.swm .conv.cpp.swo  decbin.sh         display.txt   file.sh       .ipython_checkpoints  odd.sh        sample
3          .bank.cpp.swn .conv.cpp.swp  dechex.sh         .dsmc.cpp.swp .friend.cpp.swn .ipython      .ope.cpp.swm  sample10
7a.c      .bank.cpp.swp .conversion.cpp.swk demo2.sh          .emacs        .friend.cpp.swo .k5login      .ope.cpp.swn  sample2.txt
7b.c      .bash_history .conversion.cpp.swm demo.sh           exp4          .friend.cpp.swp lex.yy.c      pali.sh       .server.c.swp
81.c      .bash_logout .conversion.cpp.swn .depa.cpp.swl    exp.txt       f.sh         .local        .pop.cpp.swp .sibi
```

5. Display the content of a hidden directory.

```
[urk17cs039@code ~]$ cd .sibi
[urk17cs039@code .sibi]$ ls
file1  file2
```

6. Display the calendar of 2020.

```
[urk17cs039@code .sibi]$ cal 2020
2020

    January                      February                      March
Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa
    1  2  3  4              1                1  2  3  4  5  6  7
  5  6  7  8  9 10 11      2  3  4  5  6  7  8      8  9 10 11 12 13 14
12 13 14 15 16 17 18      9 10 11 12 13 14 15      15 16 17 18 19 20 21
19 20 21 22 23 24 25      16 17 18 19 20 21 22      22 23 24 25 26 27 28
26 27 28 29 30 31        23 24 25 26 27 28 29      29 30 31

    April                        May                        June
Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa
    1  2  3  4              1  2                1  2  3  4  5  6
  5  6  7  8  9 10 11      3  4  5  6  7  8  9      7  8  9 10 11 12 13
12 13 14 15 16 17 18      10 11 12 13 14 15 16      14 15 16 17 18 19 20
19 20 21 22 23 24 25      17 18 19 20 21 22 23      21 22 23 24 25 26 27
26 27 28 29 30            24 25 26 27 28 29 30      28 29 30
                          31

    July                        August                      September
Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa
    1  2  3  4              1                1  2  3  4  5
  5  6  7  8  9 10 11      2  3  4  5  6  7  8      6  7  8  9 10 11 12
12 13 14 15 16 17 18      9 10 11 12 13 14 15      13 14 15 16 17 18 19
19 20 21 22 23 24 25      16 17 18 19 20 21 22      20 21 22 23 24 25 26
26 27 28 29 30 31        23 24 25 26 27 28 29      27 28 29 30
                          30 31

    October                     November                    December
Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa      Su Mo Tu We Th Fr Sa
    1  2  3              1  2  3  4  5  6  7      1  2  3  4  5
  4  5  6  7  8  9 10      8  9 10 11 12 13 14      6  7  8  9 10 11 12
11 12 13 14 15 16 17      15 16 17 18 19 20 21      13 14 15 16 17 18 19
18 19 20 21 22 23 24      22 23 24 25 26 27 28      20 21 22 23 24 25 26
25 26 27 28 29 30 31      29 30                        27 28 29 30 31
```

7. Copy the file /etc/passwd file to current directory with sample.txt as the filename

```
[urk17cs039@code .sibi]$ cp /etc/passwd .
[urk17cs039@code .sibi]$ cd
[urk17cs039@code ~]$ cp /etc/passwd .
[urk17cs039@code ~]$ mv sample.txt
mv: missing destination file operand after 'sample.txt'
Try 'mv --help' for more information.
[urk17cs039@code ~]$ mv passwd sample.txt
[urk17cs039@code ~]$ cat sample.txt
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
games:x:12:100:games:/usr/games:/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/sbin/nologin
nobody:x:99:99:Nobody:/:/sbin/nologin
systemd-network:x:192:192:systemd Network Management:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:999:998:User for polkitd:/:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/var/empty/sshd:/sbin/nologin
postfix:x:89:89:/var/spool/postfix:/sbin/nologin
chrony:x:998:996:/var/lib/chrony:/sbin/nologin
ntp:x:38:38::/etc/ntp:/sbin/nologin
tss:x:59:59:Account used by the trousers package to sandbox the tcsd daemon:/dev/null:/sbin/nologin
nginx:x:997:995:Nginx web server:/var/lib/nginx:/sbin/nologin
rpc:x:32:32:Rpcbind Daemon:/var/lib/rpcbind:/sbin/nologin
rpcuser:x:29:29:RPC Service User:/var/lib/nfs:/sbin/nologin
nfsnobody:x:65534:65534:Anonymous NFS User:/var/lib/nfs:/sbin/nologin
```

8. Create a file test1.txt using Vim editor with the following contents to it

Name	Register Number	Research Interest
------	-----------------	-------------------

a. Display the student names who are having Research Interest as Grid Computing

```
[urk17cs039@code ~]$ awk '{print $1,$3}' test1.txt | grep GridComputing
Melvin GridComputing
Binu GridComputing
Arun GridComputing
```

b. List all the student names & RegNo in the class

```
[urk17cs039@code ~]$ awk '{print $1,$2}' test1.txt
NAME REG
Melvin 07af501
Mithin 07af502
James 07af503
Jane 07af504
Caroline 07af505
Binu 07af506
Aaron 07af507
Selvin 07af508
Jerwin 07af509
Arun 07af510
```

c. List the count of students who have interest as Image Processing and store the

```
[urk17cs039@code ~]$ cat test1.txt | grep ImageProcessing > test1
[urk17cs039@code ~]$ cat test1
James      07af503      ImageProcessing
Aaron      07af507      ImageProcessing
```

result in another file.

d. Display the first two rows and last two and store into another file

```
[urk17cs039@code ~]$ (head -n 2 test1.txt && tail -2 test1.txt) > test1
[urk17cs039@code ~]$ cat test1
NAME      REG NO      Resarch Interest
Melvin     07af501     GridComputing
Jerwin     07af509     WirelessNetworks
Arun       07af510     GridComputing
```

9. Display the contents of the file test1.txt without any blank lines

```
[urk17cs039@code ~]$ cat test1.txt
NAME      REG NO    Resarch Interest
Melvin     07af501   GridComputing
Mithin     07af502   Clustercomputing

James      07af503   ImageProcessing
Jane       07af504   Networking
Caroline   07af505   ClusterComputing


Binu       07af506   GridComputing
Aaron      07af507   ImageProcessing
Selvin     07af508   Networking


Jerwin     07af509   WirelessNetworks


Arun       07af510   GridComputing
[urk17cs039@code ~]$ cat test1.txt | grep . test1.txt
NAME      REG NO    Resarch Interest
Melvin     07af501   GridComputing
Mithin     07af502   Clustercomputing
James      07af503   ImageProcessing
Jane       07af504   Networking
Caroline   07af505   ClusterComputing
Binu       07af506   GridComputing
Aaron      07af507   ImageProcessing
Selvin     07af508   Networking
Jerwin     07af509   WirelessNetworks
Arun       07af510   GridComputing
```


10. Move the file sample.txt from dir1 directory to dir2 directory

```
[urk17cs039@code dir2]$ mv /data/urk17cs039/dir1/sample.txt .  
[urk17cs039@code dir2]$ ls  
sample.txt  
[urk17cs039@code dir2]$
```

11. Change directory into dir2 directory

```
[urk17cs039@code ~]$ ls  
\      82.c  a.out      cre.c      demo.sh  
3      83.c  ^C         cre.c.save  dir1  
7a.c   91b.c  cal.sh     decbin.sh   dirname  
7b.c   92.c  classname  dechex.sh   display1.txt  
81.c   9a.c   conversion.sh demo2.sh     display2.txt  
[urk17cs039@code ~]$ mv dir1 dir2  
[urk17cs039@code ~]$ ls  
\      82.c  a.out      cre.c      demo.sh  
3      83.c  ^C         cre.c.save  dir2
```

12. Check whether the file sample.txt is present their

```
[urk17cs039@code ~]$ find sample.txt  
sample.txt
```

13. Rename the file sample.txt to new.txt and check whether sample.txt is there or not?

```
[urk17cs039@code ~]$ find sample.txt  
sample.txt  
[urk17cs039@code ~]$ mv sample.txt new.txt  
[urk17cs039@code ~]$ find sample.txt  
find: 'sample.txt': No such file or directory
```

14. Remove the directory dir1

```
[urk17cs039@code ~]$ ls  
\      82.c  a.out      cre.c      demo.sh  
3      83.c  ^C         cre.c.save  dir1  
7a.c   91b.c  cal.sh     decbin.sh   dir2  
7b.c   92.c  classname  dechex.sh   dirname  
81.c   9a.c   conversion.sh demo2.sh     display1.txt  
[urk17cs039@code ~]$ rm -r dir1  
[urk17cs039@code ~]$ ls  
\      82.c  a.out      cre.c      demo.sh  
3      83.c  ^C         cre.c.save  dir2  
7a.c   91b.c  cal.sh     decbin.sh   dirname
```

15. Display last 3 lines of the file test1.txt

```
[urk17cs039@code ~]$ tail -n 3 test1.txt
Selvin      07af508      Networking
Jerwin      07af509      WirelessNetworks
Arun        07af510      GridComputing
```

16. Display all the commands you have executed so far and save the list into a file named todayshistory.txt

```
[urk17cs039@code ~]$ history > todayhistory.txt
```

17. How many files are present under your home directory?

```
[urk17cs039@code ~]$ ls |wc -l
53
```

18. Perform sorting of three files and store the sorted file in the fourth file

```
[urk17cs039@code dir2]$ sort display.txt todayhistory.txt new.txt > sorted.txt
```

19. Change the permission of your newly created file such that the group users and others don't access any type of access.

```
[urk17cs039@code ~]$ chmod 700 dir2
[urk17cs039@code ~]$ ls -al | grep dir2
drwx-----  2 urk17cs039 urk17cs039    78 Aug 22 14:18 dir2
```

20. Display the network status on the shell.

```
[urk17cs039@code ~]$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 code.karunya.edu:53648  code.karunya.edu:hbc1  ESTABLISHED
tcp      0      0 code.karunya.edu:nfs    192.168.0.32:ftps-data  ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53588  ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.50.229:31234    ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.50.249:29002    ESTABLISHED
tcp      0      0 code.karunya.edu:nfs    192.168.0.34:790       ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53612  ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.50.249:29398    ESTABLISHED
tcp      0      0 code.karunya.edu:53198  code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53550  ESTABLISHED
tcp      0      0 code.karunya.edu:53516  code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:53752  code.karunya.edu:hbc1   TIME_WAIT
tcp      0    142 code.karunya.edu:41368  192.168.2.27:ldap      FIN_WAIT1
tcp      0      0 code.karunya.edu:https  162.158.50.217:65320    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53648  ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.165.57:50492    ESTABLISHED
tcp      0      0 code.karunya.edu:53758  code.karunya.edu:hbc1   TIME_WAIT
tcp      0    55 code.karunya.edu:https  162.158.50.246:27662    ESTABLISHED
tcp      0      0 code.karunya.edu:53670  code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53750  ESTABLISHED
tcp      0      0 code.karunya.edu:53612  code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:https  172.68.146.207:58006    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53198  ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.31.163:42240    ESTABLISHED
tcp      0      0 code.karunya.edu:https  172.69.135.227:9438     ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53388  ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.165.106:46666    ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.50.199:42900    ESTABLISHED
tcp      0      0 code.karunya.edu:53550  code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:53748  code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:https  172.69.135.95:26120     ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.165.38:33860    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1   code.karunya.edu:53670  ESTABLISHED
tcp      0      0 code.karunya.edu:53754  code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:53688  code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:53588  code.karunya.edu:hbc1   ESTABLISHED
```

21. Compares any two files and search for both common and exclusive features

```
[urk17cs039@code ~]$ diff -y fact.sh fibo.sh
echo "enter a number"
read num
fact=1
while [ $num -gt 1 ]
do
fact=$((fact * num))
num=$((num - 1))

done
echo $fact
[urk17cs039@code ~]$ comm fact.sh fibo.sh
      a=1
      b=1
echo "enter a number"
      num=10
comm: file 2 is not in sorted order
      i=0
read num
comm: file 1 is not in sorted order
fact=1
      while [ $i -lt $num ]
      do
      c=$((a + b))
      echo $c
      a=$b
      b=$c
      i=$((i + 1))
      done
while [ $num -gt 1 ]
do
fact=$((fact * num))
num=$((num - 1))
done
echo $fact
| a=1
| b=1
| num=10
| i=0
| while [ $i -lt $num ]
| do
| c=$((a + b))
> echo $c
> a=$b
> b=$c
> i=$((i + 1))
  done
<
```

22. Display the user ID, process ID and parent process ID.

```
[urk17cs039@code ~]$ ps -efj
UID      PID  PPID  PGID  SID  C  STIME TTY      TIME CMD
root      1    0    1    1  0  Aug12 ?    00:02:55 /usr/lib/systemd/systemd --switched-root --system --deserialize 22
root      2    0    0    0  0  Aug12 ?    00:00:00 [kthreadd]
root      4    2    0    0  0  Aug12 ?    00:00:00 [kworker/0:0H]
root      6    2    0    0  0  Aug12 ?    00:00:16 [ksoftirqd/0]
root      7    2    0    0  0  Aug12 ?    00:00:02 [migration/0]
root      8    2    0    0  0  Aug12 ?    00:00:00 [rcu_bh]
root      9    2    0    0  0  Aug12 ?    00:08:01 [rcu_sched]
root     10    2    0    0  0  Aug12 ?    00:00:00 [lru-add-drain]
root     11    2    0    0  0  Aug12 ?    00:00:04 [watchdog/0]
root     12    2    0    0  0  Aug12 ?    00:00:04 [watchdog/1]
root     13    2    0    0  0  Aug12 ?    00:00:11 [migration/1]
root     14    2    0    0  0  Aug12 ?    00:00:02 [ksoftirqd/1]
root     16    2    0    0  0  Aug12 ?    00:00:00 [kworker/1:0H]
root     17    2    0    0  0  Aug12 ?    00:00:04 [watchdog/2]
root     18    2    0    0  0  Aug12 ?    00:00:02 [migration/2]
root     19    2    0    0  0  Aug12 ?    00:00:01 [ksoftirqd/2]
root     21    2    0    0  0  Aug12 ?    00:00:00 [kworker/2:0H]
root     22    2    0    0  0  Aug12 ?    00:00:04 [watchdog/3]
root     23    2    0    0  0  Aug12 ?    00:00:11 [migration/3]
root     24    2    0    0  0  Aug12 ?    00:00:02 [ksoftirqd/3]
root     26    2    0    0  0  Aug12 ?    00:00:00 [kworker/3:0H]
root     28    2    0    0  0  Aug12 ?    00:00:00 [kdevtmpfs]
root     29    2    0    0  0  Aug12 ?    00:00:00 [netns]
root     30    2    0    0  0  Aug12 ?    00:00:00 [khungtaskd]
root     31    2    0    0  0  Aug12 ?    00:00:00 [writeback]
root     32    2    0    0  0  Aug12 ?    00:00:00 [kintegrityd]
root     33    2    0    0  0  Aug12 ?    00:00:00 [bioset]
root     34    2    0    0  0  Aug12 ?    00:00:00 [bioset]
root     35    2    0    0  0  Aug12 ?    00:00:00 [bioset]
root     36    2    0    0  0  Aug12 ?    00:00:00 [kblockd]
root     37    2    0    0  0  Aug12 ?    00:00:00 [md]
root     38    2    0    0  0  Aug12 ?    00:00:00 [edac-poller]
```

23. Report disk usages of file system.

```
[urk17cs039@code ~]$ df
Filesystem            1K-blocks      Used Available Use% Mounted on
devtmpfs              3992636         0   3992636  0% /dev
tmpfs                 4004520         0   4004520  0% /dev/shm
tmpfs                 4004520  427272   3577248 11% /run
tmpfs                 4004520         0   4004520  0% /sys/fs/cgroup
/dev/mapper/centos_kitscode-root 68066844 3014196 65052648  5% /
/dev/sda1             1942528   334256   1608272 18% /boot
/dev/mapper/centos_kitscode-home 24404336   32992  24371344  1% /home
/dev/mapper/centos_kitscode-data 97609148 26097588 71511560 27% /data
/dev/mapper/centos_kitscode-var 10004480 9317148   687332 94% /var
tmpfs                  800908         0    800908  0% /run/user/1010884188
tmpfs                  800908         0    800908  0% /run/user/1010883060
tmpfs                  800908         0    800908  0% /run/user/1010875258
tmpfs                  800908         0    800908  0% /run/user/1010875256
tmpfs                  800908         0    800908  0% /run/user/1010883054
tmpfs                  800908         0    800908  0% /run/user/1010882169
tmpfs                  800908         0    800908  0% /run/user/1010875242
```

24. Display the statistics of all ports connected to a network.

```
[urk17cs039@code ~]$ ss
Netid State Recv-Q Send-Q Local Address:Port Peer Address:Port
u_str ESTAB 0 0 * 38945 * 38944
u_str ESTAB 0 0 /run/systemd/journal/stdout 18183 * 19835
u_str ESTAB 0 0 /run/systemd/journal/stdout 18119 * 20622
u_str ESTAB 0 0 * 22162 * 22163
u_str ESTAB 0 0 * 22147 * 22148
u_str ESTAB 0 0 /run/dbus/system_bus_socket 17619 * 15207
u_str ESTAB 0 0 * 22132 * 22133
u_str ESTAB 0 0 * 22117 * 22118
u_str ESTAB 0 0 * 38943 * 38942
u_str ESTAB 0 0 * 22106 * 22107
u_str ESTAB 0 0 * 22228 * 21075
u_str ESTAB 0 0 /run/systemd/journal/stdout 16152 * 16151
u_str ESTAB 0 0 * 22166 * 22165
u_str ESTAB 0 0 * 22151 * 22150
u_str ESTAB 0 0 * 20622 * 18119
u_str ESTAB 0 0 * 17532 * 17531
u_str ESTAB 0 0 * 22104 * 22103
u_str ESTAB 0 0 * 22136 * 22135
u_str ESTAB 0 0 * 22121 * 22120
u_str ESTAB 0 0 * 17693 * 17694
u_str ESTAB 0 0 * 15016 * 15017
u_str ESTAB 0 0 /run/systemd/journal/stdout 16874 * 16105
u_str ESTAB 0 0 * 22159 * 22160
u_str ESTAB 0 0 * 16967 * 16966
u_str ESTAB 0 0 * 17538 * 17545
u_str ESTAB 0 0 /var/centrifysda/audit 4977656 * 4981842
u_str ESTAB 0 0 /run/dbus/system_bus_socket 15018 * 15009
u_str ESTAB 0 0 * 14316 * 14315
u_str ESTAB 0 0 * 22129 * 22130
u_str ESTAB 0 0 /run/dbus/system_bus_socket 19515 * 17292
u_str ESTAB 0 0 * 38946 * 38947
u_str ESTAB 0 0 * 22114 * 22113
u_str ESTAB 0 0 * 19835 * 18183
```

25. Display the uptime of the system and show the statistics of memory usage. Check if there is any malicious packets intrude the network.

```
[urk17cs039@code ~]$ uptime
16:21:25 up 10 days, 4:41, 140 users, load average: 0.00, 0.04, 0.05
```

```
[urk17cs039@code ~]$ free -m
              total          used          free      shared  buff/cache   available
Mem:           7821           801          4827           417        2191        6303
Swap:          7631              0          7631
```

```
[urk17cs039@code ~]$ top
```

```
top - 16:19:38 up 10 days, 4:39, 140 users, load average: 0.02, 0.05, 0.05
Tasks: 189 total, 1 running, 188 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.2 us, 0.1 sy, 0.0 ni, 99.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 8009044 total, 4942812 free, 821688 used, 2244544 buff/cache
KiB Swap: 7815164 total, 7815164 free, 0 used. 6454152 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
10925	root	20	0	66.4g	241236	13340	S	0.3	3.0	55:42.34	node
27691	urk18cs+	20	0	117908	2292	1772	S	0.3	0.0	0:00.11	bash
29142	urk17cs+	20	0	164356	2532	1740	R	0.3	0.0	0:00.10	top
1	root	20	0	192376	5248	2572	S	0.0	0.1	2:56.19	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.61	kthreadd
4	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/0:0H
6	root	20	0	0	0	0	S	0.0	0.0	0:16.83	ksoftirqd/0
7	root	rt	0	0	0	0	S	0.0	0.0	0:02.13	migration/0
8	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_bh
9	root	20	0	0	0	0	S	0.0	0.0	8:02.21	rcu_sched
10	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	lru-add-drain
11	root	rt	0	0	0	0	S	0.0	0.0	0:04.36	watchdog/0
12	root	rt	0	0	0	0	S	0.0	0.0	0:04.32	watchdog/1
13	root	rt	0	0	0	0	S	0.0	0.0	0:11.24	migration/1
14	root	20	0	0	0	0	S	0.0	0.0	0:02.36	ksoftirqd/1
16	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/1:0H
17	root	rt	0	0	0	0	S	0.0	0.0	0:04.16	watchdog/2
18	root	rt	0	0	0	0	S	0.0	0.0	0:02.33	migration/2
19	root	20	0	0	0	0	S	0.0	0.0	0:01.26	ksoftirqd/2
21	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/2:0H
22	root	rt	0	0	0	0	S	0.0	0.0	0:04.31	watchdog/3
23	root	rt	0	0	0	0	S	0.0	0.0	0:11.83	migration/3
24	root	20	0	0	0	0	S	0.0	0.0	0:02.77	ksoftirqd/3
26	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kworker/3:0H
28	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kdevtmpfs
29	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	netns
30	root	20	0	0	0	0	S	0.0	0.0	0:00.61	khungtaskd
31	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	writeback
32	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kintegrityd
33	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	bioaset
34	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	bioaset
35	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	bioaset
36	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	kblockd

26. Julian day.

```
[urk17cs039@code ~]$ cal -j
      August 2020
Sun Mon Tue Wed Thu Fri Sat
                214
215 216 217 218 219 220 221
222 223 224 225 226 227 228
229 230 231 232 233 234 235
236 237 238 239 240 241 242
243 244
```


27. Linux platform is infected over the network.

```
[urk17cs039@code ~]$ who
urk17ec058 pts/2      2020-08-24 11:07 (localhost)
urk18cs254 pts/4      2020-08-24 11:02 (localhost)
urk18cs240 pts/10     2020-08-24 11:08 (localhost)
urk17cs191 pts/8      2020-08-24 11:07 (localhost)
urk18cs277 pts/9      2020-08-24 10:48 (localhost)
urk17cs023 pts/12     2020-08-24 11:16 (localhost)
urk18cs083 pts/11     2020-08-24 10:54 (localhost)
urk18cs095 pts/3      2020-08-24 10:34 (localhost)
urk18cs021 pts/6      2020-08-24 10:50 (localhost)
urk17cs178 pts/14     2020-08-24 10:54 (localhost)
urk17cs039 pts/5      2020-08-24 11:28 (localhost)
urk17cs025 pts/0      2020-08-24 10:17 (localhost)
urk18cs228 pts/1      2020-08-24 10:59 (localhost)
```

28. Display only the free space.

```
[urk17cs039@code ~]$ df -h /
Filesystem                Size      Used Avail Use% Mounted on
/dev/mapper/centos_kitscode-root  65G   2.9G   63G   5% /
```

29. Display the configuration information of your network.

```
[urk17cs039@code etc]$ cat netconfig
#
# The network configuration file. This file is currently only used in
# conjunction with the TI-RPC code in the libtirpc library.
#
# Entries consist of:
#
#      <network_id> <semantics> <flags> <protofamily> <protoname> \
#                  <device> <nametoaddr_libs>
#
# The <device> and <nametoaddr_libs> fields are always empty in this
# implementation.
#
udp      tpi_clts      v      inet      udp      -      -
tcp      tpi_cots_ord  v      inet      tcp      -      -
udp6     tpi_clts      v      inet6     udp      -      -
tcp6     tpi_cots_ord  v      inet6     tcp      -      -
rawip    tpi_raw       -      inet      -        -      -
local    tpi_cots_ord  -      loopback  -        -      -
unix     tpi_cots_ord  -      loopback  -        -      -
[urk17cs039@code etc]$ cat networks
default 0.0.0.0
loopback 127.0.0.0
link-local 169.254.0.0
```


30. IP information.

```
[urk17cs039@code etc]$ ifconfig
ens32: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.29 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 fe80::1450:18ba:187f:1f02 prefixlen 64 scopeid 0x20<link>
    ether 00:50:56:93:66:93 txqueuelen 1000 (Ethernet)
    RX packets 15920454 bytes 1719798577 (1.6 GiB)
    RX errors 0 dropped 1286 overruns 0 frame 0
    TX packets 4506426 bytes 1038990278 (990.8 MiB)
    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<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 10245208 bytes 903253690 (861.4 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 10245208 bytes 903253690 (861.4 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Link:

<https://www.youtube.com/playlist?list=PLjBGv-zbUydsGMAHmxDuFm-1N1WWaTXe>

Results:

The linux commands are studied and executed.