

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

To study and implement the linux commands

Description:

Sl. No.	COMMAND	DESCRIPTION	ATTRIBUTES/OPTIONS
1.	ls	List all the contents in the directory	Filesystem
2.	ls -a	List all the hidden files in the directory	Filesystem
3.	vdircd	List the contents in the directory	Filesystem
4.	cd	Changes directory	Filesystem
5.	mkdir	Makes/creates directory	Filesystem
6.	rmdir	Removes directory	Filesystem
7.	cat	Concatenate and print files	Filesystem
8.	cat -T	Prints file contents without space	Filesystem
9.	vim	View content	Filesystem
10.	cut	Cuts out selected fields of each line of s file	Text processing
11.	grep	Search text for a pattern	Misc
12.	wc	Line , word and byte or character count	Text processing
13.	cp	Copy content	File system
14.	mv	Move content	Filesystem
15.	cal	Extract current calendar	Misc
16.	cal -j	Extract Julian calendar	Misc
17.	netstat	Extract network statistics	Network troubleshoot
18.	netstat -i	Obtain interface configurations	Network troubleshoot
19.	netstat -s	Obtain port configurations	Network troubleshoot
20.	netstat -listen	Obtain listening ports	Network troubleshoot
21.	netstst -a	Obtain all the IP information	Network troubleshoot
22.	netstat -all	Obtain all the IP information	Network troubleshoot
23.	head	Copy the first part of files	Text processing
24.	tail	Copy the last part of file	Text processing
25.	sort	Sort in an order	Text processing
26.	w	Obtain user information	System administration
27.	who	Obtain current user information	System administration
28.	chmod	Change mode	System administration
29.	cmp	Compare file contents	Filesystem
30.	diff	Differentiate file contents	Filesystem
31.	comm	Extract common/unique features of files	Filesystem
32.	id	Obtain user id	System administration
33.	free		

Exercise

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

OUTPUT:

```
[urk17cs178@code ~]$ ls -la
.                  .bash_history      bubblesort.cpp     dir5               Flames.cpp         logical.c          prime.cpp          star9.cpp          transpose.cpp
..                 .bash_logout       calculator.cpp     dir6               fourth.txt         matrix.cpp        Python Ex1.ipynb  stars.cpp          triangle.c
10.1.cpp           .bash_profile     cal.sh            dir7               in.cpp            mobile.cpp        Python Ex2.ipynb  string2.c         twomat.cpp
10.2.cpp           .bashrc           cat               dir8               increment.c        mozilla           python_exp4_1.txt  student.cpp        unique.cpp
10.3.cpp           batch1            cal.y             dir9               input3.txt         nCr.c            python_exp4_2a.txt student.cpppy       Untitled1.ipynb
aby               batch2            cc.add.c          doublearray.c      instence.cpppy    new1.txt          python_exp4_2b.txt student.cpppy       Untitled2.ipynb
add.c             batch3            cc.welcome.c      duplicate.cpp       intrest.c          new2.txt          quadratic.c        swap.c             Untitled3.ipynb
addition.c        batch3cse        circle.c          .emacs             inventory.cpp      new3.txt          reverse.cpp        swap.cpp           Untitled4.ipynb
addmat.cpp        batch4            comexp3.sh        Ex6a.ipynb         .ipynb_checkpoints new4.txt          samayam.cpp        test1.txt          untitled.txt
amax.cpp          batch4mech       conditional.c     Exp 2.ipynb        .ipython           number.cpp        samayam.cpp.save  text1.txt          vehicle.cpp
amstrong.c        .batch4mech      .config          exp3.ipynb        .jigsaw            palindrome.c      shape2.cpp         .text1.txt.swp    .viminfo
amstrong.c.save   batch5cse        customer.c        exp3.1.save        .jupyter           palindrome.c      shape.cpp          size.c             vowel.cpp
anagram.cpp       batch6mech       days.cpp          .exp3.1.swp        .k5login           palindrom.c.save sortby.c           sort.cpp           time.cpp           welcome
another.txt1.txt  batch3cse        diagonal.cpp      exp4.ipynb         lex.yy.c           pichakaran.cpp   sort.cpp           sort.cpp.save      time.cpp.save     welcome.c
another.txt        bitwise.c        dir0              fibonacci.c         file.sh            library.cpp       positive.cpp       star3.cpp          workers.cpp
a.out             body.c           dir00             .file.sh.swp       library.cpp????    power.c           star8.cpp          touch              y.tab.c
area.cpp          book.cpp         dir2              flames.cpp          .local             power.cpp         star8.cpp          touch
array.c
```

2. List the content of /var directory?

OUTPUT:

```
[urk17cs178@code ~]$ cd /var
[urk17cs178@code var]$ ls
adm cache centrify centrifyda 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

OUTPUT:

```
[urk17cs178@code ~]$ mkdir dir1 dir2
[urk17cs178@code ~]$ ls
.                  .bash_history      calculator.cpp     dir3               file.sh            matrix.cpp         power.cpp          sort.cpp           time2.cpp          vehicle.cpp
..                 .bash_logout       cal.sh            dir4               flames.cpp         mobile.cpp        Python Ex1.ipynb  sort.cpp.save     time.cpp           vowel.cpp
10.1.cpp           batch1            cal.y             dir5               Flames.cpp         nCr.c            Python Ex2.ipynb  star3.cpp         time.cpp.save     welcome
10.2.cpp           batch2            cat               dir6               fourth.txt         new1.txt          python_exp4_1.txt  star8.cpp         todayshistory.txt welcome.c
10.3.cpp           batch3            cc.add.c          dir7               in.cpp            new2.txt          python_exp4_2a.txt stars.cpp          touch              transpose.cpp      y.tab.c
add.c             batch3cse        cc.welcome.c      dir8               increment.c        new3.txt          python_exp4_2b.txt student.cpp         triangle.c
addition.c        batch4            comexp3.sh        dir9               instance.cpp      new4.txt          python_exp4_3.txt  student.cpppy     twomat.cpp
addmat.cpp        batch4mech       conditional.c     duplicate.cpp       intrest.c          number.cpp        reverse.cpp        student.cpppy     unique.cpp
amax.cpp          batch5cse        customer.c        doublearray.c      inventory.cpppy   palindrome.c      samayam.cpp        studlog           Untitled1.ipynb
amstrong.c        batch6mech       days.cpp          Exp 2.ipynb        .ipython          palindrome.c      samayam.cpp.save  swap.c            Untitled2.ipynb
anagram.cpp       .batch4mech      .config          exp3.ipynb        .jigsaw            palindrom.c.save shape2.cpp         swap.cpp           Untitled3.ipynb
another.txt1.txt  batch3cse        diagonal.cpp      exp3.1.save        .jupyter           pichakaran.cpp   shape.cpp          test1.txt         Untitled4.ipynb
another.txt        bitwise.c        dir0              fibonacci.c         lex.yy.c           library.cpp       positive.cpp       text1.txt         untitled.txt
a.out             body.c           dir00             .file.sh.swp       library.cpp????    power.c           sortby.c           text.sh
area.cpp          book.cpp         dir1              flames.cpp          .local             power.c           star8.cpp          touch
array.c          call.y           dir2              fibonacci.c         .local             power.c           star8.cpp          touch
```

4. Create a hidden directory with your name?

OUTPUT:

```
[urk17cs178@code ~]$ cd .am
[urk17cs178@code .am]$ ls
[urk17cs178@code .am]$
```

5. Display the content of a hidden directory.

OUTPUT:

```
[urk17cs178@code ~]$ mkdir .am
[urk17cs178@code ~]$ ls -a
.          array.c      bubblesort.cpp  dir4       Flames.cpp    matrix.cpp     Python Ex2.ipynb  student.cpp  Untitled1.ipynb
..         ascii.cpp      call.y          dir5       fourth.txt    mobile.cpp     python_exp4_1.txt  student.cppy  Untitled2.ipynb
10.1.cpp   .bash_history  calculator.cpp  dir6       in.cpp        .mozilla       python_exp4_2a.txt student.cppyy  Untitled3.ipynb
10.2.cpp   .bash_logout  cal.sh         dir7       increment.c   nCr.c          python_exp4_2b.txt studlog       Untitled4.ipynb
10.3.cpp   .bash_profile cal.y          dir8       input3.txt    new1            python_exp4_3.txt swap.c        Untitled.ipynb
.178       .bashrc       cat            dir9       instance.cpp  new1.txt       quadratic.c       swap.cpp     untitled.txt
.abby      batch1        cc.add.c       distance.c  instance.cppy new2.txt       reverse.cpp       test1.txt    vehicle.cpp
add.c      batch2        cc.welcome.c   doublearray.c intrest.c     new3.txt       samayam.cpp      text1.txt    .viminfo
add.cpp    batch3        circle.c       duplicate.cpp inventory.cpp  new4.txt       samayam.cpp.save .text1.txt.swp vowel.cpp
addition.c batch3cse     comexp3.sh     .emacs      .ipynb_checkpoints number.cpp     shape2.cpp       shape.cpp    time2.cpp    welcome
addmat.cpp batch4        conditional.c  Ex6a.ipynb .ipython      palindrome.c   shape.cpp        size.c       time.cpy.save workers.cpp
.am        batch4mech    .config       Exp 2.ipynb .jigsaw       palindrome.cpp  sortby.c        sort.cpy     todayshistory.txt y.tab.c
amax.cpp   .batch4mech  customer.c     exp3.ipynb  .jupyter      pichakaran.cpp sort.cpy.save   star3.cpy     touch        transpose.cpp
amstrong.c batch5cse     days.cpp      exp3.1.save .k5login      positivel.cpy  sort.cpy.save   star8.cpy    triangle.c
amstrong.c.save batch6mech    diagonal.cpp  .exp3.1.swp lex1.cpy     library.cpy     power.c          stars.cpy     twomat.cpy
anagram.cpp batch8cse     dir0          exp4.ipynb  lex.yy.c      library.cpy???? .local          prime.cpy     string2.c    unique.cpy
another.txt bitwise.c     dir00         fibonacci.c  file.sh        .file.sh.swp    Python Ex1.ipynb
a.out      body.c       dir1          file.sh      flames.cpp     logical.c       Python Ex1.ipynb
area.cpp   book.cpy     dir2          .file.sh.swp
[urk17cs178@code ~]$
```

6. Display the calendar of 2020.

OUTPUT:

```
[urk17cs178@code ~]$ 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

OUTPUT:

```
[urk17cs178@code ~]$ cp /etc/passwd dir3/sample.txt
[urk17cs178@code ~]$ cd dir3
[urk17cs178@code dir3]$ ls
sample.txt
[urk17cs178@code dir3]$
[urk17cs178@code dir3]$ 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
[urk17cs178@code dir3]$
```

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

Name Register Number Research Interest

OUTPUT:

```
[urk17cs178@code ~]$ #vim test1.txt
[urk17cs178@code ~]$ cat test1.txt
Name      RegNo     ResearchInterest
Melvin    07af501  GridComputing
Mithin    07af502  ClusterComputing
James     07af503  ImageProcessing
Jane      07af504  Networking
Carol     07af505  ClusterComputing
Binu      07af506  GridComputing
Aaron     07af507  ImageProcessing
Selvin    07af508  Networking
Jerwin    07af509  wirelessNetworks
arun      07af510  GridComputing
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ cut -f1 text1.txt | grep GridComputing text1.txt
Melvin 07af501 GridComputing
Binu    07af506 GridComputing
arun    07af510 GridComputing
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ cut -f1,2 text1.txt
Name    RegNo
Melvin  07af501
Mithin  07af502
James   07af503
Jane    07af504
Carol   07af505
Binu    07af506
Aaron   07af507
Selvin  07af508
Jerwin  07af509
arun    07af510
[urk17cs178@code ~]$
```

c. List the count of students who have interest as Image Processing and store the result in another file.

OUTPUT:

```
[urk17cs178@code ~]$ cut -f1,2,3 text1.txt | grep ImageProcessing | wc > imgp.txt
[urk17cs178@code ~]$ cat imgp.txt
      2      6     60
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ head -2 text1.txt
Name      RegNo    ResearchInterest
Melvin    07af501  GridComputing
[urk17cs178@code ~]$ tail -2 text1.txt
Jerwin    07af509  wirelessNetworks
arun      07af510  GridComputing
[urk17cs178@code ~]$ head -2 text1.txt | tail -2 text1.txt > storage.txt
[urk17cs178@code ~]$ cat storage.txt
Jerwin    07af509  wirelessNetworks
arun      07af510  GridComputing
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ cat -T text1.txt
Name^IRegNo^IResearchInterest
Melvin^I07af501^IGridComputing
Mithin^I07af502^IClusterComputing
James^I07af503^IImageProcessing
Jane^I07af504^INetworking
Carol^I07af505^IClusterComputing
Binu^I07af506^IGridComputing
Aaron^I07af507^IImageProcessing
Selvin^I07af508^INetworking
Jerwin^I07af509^IwirelessNetworks
arun^I07af510^IGridComputing
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ mv sample.txt dir2
[urk17cs178@code ~]$
```

11. Change directory into dir2 directory

OUTPUT:

```
[urk17cs178@code ~]$ cd dir2
[urk17cs178@code dir2]$
```

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

OUTPUT:

```
[urk17cs178@code dir2]$ ls
\      decioct.sh  fact.sh      hexoct.sh  king.sh    octdec.sh  oddeven.sh  seris.sh   serris.sh  square.s  tax.sh
cal.sh digit.sh      greater.sh  hour.sh    new.txt    othex.sh   sample.txt  seris.sh] sort.sh   square.sh
[urk17cs178@code dir2]$
```

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

OUTPUT:

```
[urk17cs178@code dir2]$ cp sample.txt new.txt
[urk17cs178@code dir2]$ rm sample.txt
[urk17cs178@code dir2]$ ls
\      decioct.sh  fact.sh      hexoct.sh  king.sh    octdec.sh  oddeven.sh  seris.sh] sort.sh   square.sh
cal.sh digit.sh      greater.sh  hour.sh    new.txt    othex.sh   seris.sh   serris.sh  square.s  tax.sh
```


14. Remove the directory dir1

OUTPUT:

```
[urk17cs178@code dir2]$ cd
[urk17cs178@code ~]$ rmdir dir1
[urk17cs178@code ~]$ ls
10.1.cpp      batch1      cal.y        dir7          in.cpp       new2.txt     python_exp4_2b.txt  string2.c     transpose.cpp
10.2.cpp      batch2      cat          dir8          increment.c  new3.txt     python_exp4_3.txt  student.cpp   triangle.c
10.3.cpp      batch3      cc.add.c     dir9          input3.txt   new4.txt     quadratic.c        student.cppy  twomat.cpp
add.c         batch3cse  cc.welcome.c distance.c    instance.cpp number.cpp   reverse.c         student.cppyy  unique.cpp
add.cpp       batch4      circle.c     doublearray.c instance.cppy palindrome.c  samayan.cpp     studlog       Untitled1.ipynb
addition.c    batch4mech comexp3.sh   duplicate.cpp intrest.c    palindrome.cpp samayan.cpp.save  swap.c        Untitled2.ipynb
addmat.cpp    batch5cse  conditional.c Ex6a.ipynb   inventory.cpp palindrone.c.save shape2.cpp       swap.cpp       Untitled3.ipynb
amax.cpp      batch6mech customer.c   Exp 2.ipynb  lexi.cpp     pichakaran.cpp shape.cpp       test1.txt      Untitled4.ipynb
amstrong.c    batch8cse  days.cpp     exp3.ipynb   lex.yy.c     positive1.cpp size.c          test3.txt      Untitled.ipynb
amstrong.c.save bitwise.c   diagonal.cpp exp3.l.save  library.cpp  positive.cpp  sortby.c       text1.txt     untitled.txt
anagram.cpp   body.c     dir0         exp4.ipynb   library.cpp??? power.c       sort.cpp       text.sh       vehicle.cpp
another.txt   body.c\    dir00]       fibonacci.c  logical.c    power.cpp     sort.cpp.save   time2.cpp     vowel.cpp
another.txt   book.cpp   dir2         flames.cpp   matrix.cpp  prime.cpp    star3.cpp       time.cpp      welcome
a.out         bubblesort.cpp dir3         flames.cpp  mobile.cpp  Python Ex1.ipynb star8.cpp       time.cpp.save  welcome.c
area.cpp      call.y     dir4         flames.cpp  nCr.c       Python Ex2.ipynb star9.cpp       todayshistory.txt welcome.cpp
array.c       calculator.cpp dir5         fourth.txt  new1        python_exp4_1.txt stars.cpp        total.c        workers.cpp
ascii.cpp     cal.sh     dir6         imgp.txt    new1.txt    python_exp4_2a.txt storage.txt     touch          y.tab.c
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code dir2]$ tail -3 text1.txt
Selvin 07af508 Networking
Jerwin 07af509 wirelessNetworks
arun 07af510 GridComputing
[urk17cs178@code dir2]$
```

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

todayshistory.txt

OUTPUT:

```
[urk17cs178@code ~]$ history > todayhistory.txt
[urk17cs178@code ~]$ cat todayhistory.txt
 47 logout
 48 nano anangram.cpp
 49 nano palindrome.cpp
 50 g++ palindrome.cpp
 51 nano palindrome.cpp
 52 clear
 53 nano sort.cpp
 54 nano swap.cpp
 55 ls
 56 nano library.cpp
 57 nano duplicate.cpp
 58 nano time2.cpp
 59 nano samayam.cpp
 60 nano unique.cpp
 61 g++ unique.cpp
 62 nano power.cpp
 63 nano lexi.cpp
 64 nano shape2.cpp
 65 nano prime.cpp
 66 nano vowel.cpp
 67 nano welcome.cpp
 68 nano workers.cpp
 69 nano library.cpp
 70 nano diagonal.cpp
 71 nano reverse.cpp
 72 nano inventory.cpp
 73 nano instance.cpp
 74 nano time.cpp
 75 nano stars2.cpp
 76 nano star3.cpp
 77 g++ star3.cpp
 78 ./a.out
 79 clear
 80 nano diagonal.cpp
```

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

OUTPUT:

```
[urk17cs178@code ~]$ ls | wc -l
153
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ sort aa.txt bb.txt cc.txt > dd.txt
[urk17cs178@code ~]$ cat dd.txt

1
2
3
4
5
a
b
c
d
e
f
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ chmod u=r,og=w bb.txt
[urk17cs178@code ~]$ ls -l bb.txt
-r---w--w- 1 urk17cs178 urk17cs178 9 Aug 24 11:30 bb.txt
[urk17cs178@code ~]$
```

```
[urk17cs178@code ~]$ chmod u=w,og=w bb.txt
[urk17cs178@code ~]$ ls -l bb.txt
--w--w--w- 1 urk17cs178 urk17cs178 9 Aug 24 11:30 bb.txt
[urk17cs178@code ~]$ cat bb.txt
cat: bb.txt: Permission denied
[urk17cs178@code ~]$
```

20. Display the network status on the shell.

OUTPUT:

```
[urk17cs178@code ~]$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 code.karunya.edu:https 162.158.31.142:54550    ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.242:43928    ESTABLISHED
tcp      0      0 code.karunya.edu:nfs   192.168.0.32:ftp-data   ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.197:33138    ESTABLISHED
tcp      0      0 code.karunya.edu:https 172.69.135.161:25338    ESTABLISHED
tcp      0      0 code.karunya.edu:60444 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:57732 code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1  code.karunya.edu:57796  ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.251:44452    ESTABLISHED
tcp      0      0 code.karunya.edu:nfs   192.168.0.34:790        ESTABLISHED
tcp      0      0 code.karunya.edu:https 172.69.134.214:12096    ESTABLISHED
tcp      0      0 code.karunya.edu:60370 code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.212:25708    ESTABLISHED
tcp      0      0 code.karunya.edu:37860 192.168.2.27:msft-gc    ESTABLISHED
tcp      0      0 code.karunya.edu:https 172.69.135.241:29640    ESTABLISHED
tcp      0      0 code.karunya.edu:60428 code.karunya.edu:hbc1   ESTABLISHED
tcp      0      0 code.karunya.edu:60470 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:hbc1  code.karunya.edu:60226  ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.235:16504    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1  code.karunya.edu:60428  ESTABLISHED
tcp      0      0 code.karunya.edu:60482 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:60472 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:https 162.158.167.23:49686    ESTABLISHED
tcp      0      0 code.karunya.edu:60448 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:60450 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:60466 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:60458 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:hbc1  code.karunya.edu:59756  ESTABLISHED
tcp      0 1828 code.karunya.edu:https 162.158.167.142:41974    ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.242:27780    TIME_WAIT
tcp      0      0 code.karunya.edu:60480 code.karunya.edu:hbc1   TIME_WAIT
tcp      0      0 code.karunya.edu:hbc1  code.karunya.edu:57732  ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.254:13912    ESTABLISHED
```

Active UNIX domain sockets (w/o servers)						
Proto	RefCnt	Flags	Type	State	I-Node	Path
unix	3	[]	DGRAM		36	/run/systemd/notify
unix	2	[]	DGRAM		38	/run/systemd/cgroups-agent
unix	5	[]	DGRAM		52	/run/systemd/journal/socket
unix	19	[]	DGRAM		54	/dev/log
unix	2	[]	DGRAM		16183	/var/run/chrony/chronyd.sock
unix	2	[]	DGRAM		678	/run/systemd/shutdown
unix	3	[]	STREAM	CONNECTED	38945	
unix	3	[]	STREAM	CONNECTED	18183	/run/systemd/journal/stdout
unix	3	[]	STREAM	CONNECTED	18119	/run/systemd/journal/stdout
unix	2	[]	DGRAM		17743	
unix	3	[]	STREAM	CONNECTED	22162	
unix	3	[]	STREAM	CONNECTED	22147	
unix	2	[]	DGRAM		16347	
unix	3	[]	STREAM	CONNECTED	17619	/run/dbus/system_bus_socket
unix	3	[]	STREAM	CONNECTED	22132	
unix	3	[]	STREAM	CONNECTED	22117	
unix	3	[]	STREAM	CONNECTED	38943	
unix	3	[]	STREAM	CONNECTED	22106	
unix	3	[]	STREAM	CONNECTED	22228	
unix	3	[]	STREAM	CONNECTED	16152	/run/systemd/journal/stdout
unix	3	[]	STREAM	CONNECTED	22166	
unix	3	[]	STREAM	CONNECTED	22151	
unix	3	[]	STREAM	CONNECTED	20622	
unix	3	[]	STREAM	CONNECTED	17532	
unix	3	[]	STREAM	CONNECTED	22104	
unix	3	[]	STREAM	CONNECTED	22136	
unix	3	[]	STREAM	CONNECTED	22121	
unix	2	[]	DGRAM		15179	
unix	2	[]	DGRAM		17060	
unix	3	[]	STREAM	CONNECTED	17693	
unix	3	[]	STREAM	CONNECTED	15016	
unix	3	[]	STREAM	CONNECTED	16874	/run/systemd/journal/stdout
unix	2	[]	DGRAM		20330	
unix	3	[]	STREAM	CONNECTED	22159	
unix	3	[]	STREAM	CONNECTED	16967	
unix	3	[]	STREAM	CONNECTED	17538	

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

OUTPUT:

(creating file first)

```
[urk17cs178@code ~]$ cat f4
a
b
c
[urk17cs178@code ~]$ cat f5
a
1
2
[urk17cs178@code ~]$
```

(using comm)

```
[urk17cs178@code ~]$ comm f4 f5
      a
1
2
b
c
```

Extracting common features

```
[urk17cs178@code ~]$ comm -1 -2 f4 f5
a
[urk17cs178@code ~]$
```

Extracting unique features

```
[urk17cs178@code ~]$ comm -3 f4 f5
      1
      2
b
c
[urk17cs178@code ~]$
```

OTHER WAYS TO COMPARE:

(using cmp)

```
[urk17cs178@code ~]$ cmp f4 f5
f4 f5 differ: byte 3, line 2
```

(using diff)

```
[urk17cs178@code ~]$ diff f4 f5
2,3c2,3
< b
< c
---
> 1
> 2
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ id -u
1010875381
[urk17cs178@code ~]$ pgrep -u root sshd
1103
[urk17cs178@code ~]$ echo $PPID
12091
[urk17cs178@code ~]$
```

23. Report disk usages of file system.

OUTPUT:

```
[urk17cs178@code ~]$ du
0      ./mozilla/plugins
0      ./mozilla/extensions
0      ./mozilla
16     ./config/neofetch
16     ./config
8      ./batch8cse
0      ./dir9/.ipynb_checkpoints
52     ./dir9
0      ./dir2/.ipynb_checkpoints
120    ./dir2
0      ./jigsaw
0      ./dir0/.ipynb_checkpoints
32     ./dir0
0      ./dir5/.ipynb_checkpoints
28     ./dir5
0      ./dir7/.ipynb_checkpoints
48     ./dir7
0      ./dir8/.ipynb_checkpoints
28     ./dir8
164    ./local/share/jupyter/runtime
188    ./local/share/jupyter
188    ./local/share
188    ./local
0      ./dir6/.ipynb_checkpoints
4      ./dir6
0      ./newl
52     ./ipynb_checkpoints
0      ./ipython/extensions
0      ./ipython/nbextensions
0      ./ipython/profile_default/security
0      ./ipython/profile_default/log
4      ./ipython/profile_default/startup
0      ./ipython/profile_default/pid
0      ./ipython/profile_default/db
88     ./ipython/profile_default
88     ./ipython
4      ./jupyter/nbconfig
8      ./jupyter
0      ./dir00]
:0     ./aby
```


(using `du -h` to read the disk usage in bytes)

```
[urk17cs178@code ~]$ du -h
0      ./mozilla/plugins
0      ./mozilla/extensions
0      ./mozilla
16K    ./config/neofetch
16K    ./config
8.0K   ./batch8cse
0      ./dir9/.ipynb_checkpoints
52K    ./dir9
0      ./dir2/.ipynb_checkpoints
120K   ./dir2
0      ./jigsaw
0      ./dir0/.ipynb_checkpoints
32K    ./dir0
0      ./dir5/.ipynb_checkpoints
28K    ./dir5
0      ./dir7/.ipynb_checkpoints
48K    ./dir7
0      ./dir8/.ipynb_checkpoints
28K    ./dir8
164K   ./local/share/jupyter/runtime
188K   ./local/share/jupyter
188K   ./local/share
188K   ./local
0      ./dir6/.ipynb_checkpoints
4.0K   ./dir6
0      ./new1
52K    ./ipynb_checkpoints
0      ./ipython/extensions
0      ./ipython/nbextensions
0      ./ipython/profile_default/security
0      ./ipython/profile_default/log
4.0K   ./ipython/profile_default/startup
0      ./ipython/profile_default/pid
0      ./ipython/profile_default/db
88K    ./ipython/profile_default
88K    ./ipython
4.0K   ./jupyter/nbconfig
8.0K   ./jupyter
0      ./dir00]
0      ./aby
```

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

OUTPUT:

```
[urk17cs178@code ~]$ netstat --all
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 0.0.0.0:nfs              0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:46053            0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:sunrpc           0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:http             0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:mountd            0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:34067             0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:ssh              0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:hbc_i             0.0.0.0:*               LISTEN
tcp      0      0 localhost:smtp          0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:https             0.0.0.0:*               LISTEN
tcp      0      0 code.karunya.edu:https  162.158.31.142:54550    ESTABLISHED
tcp      0      0 code.karunya.edu:nfs    192.168.0.32:ftps-data ESTABLISHED
tcp      0      0 code.karunya.edu:https  172.69.135.161:25338    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc_i  code.karunya.edu:57796 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs    192.168.0.34:790       ESTABLISHED
tcp      0      0 code.karunya.edu:60370  code.karunya.edu:hbc_i ESTABLISHED
tcp      0    32 code.karunya.edu:https  162.158.165.226:23786  ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.167.23:49686   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc_i  code.karunya.edu:59756 ESTABLISHED
tcp      0    48 code.karunya.edu:https  162.158.167.142:41974  ESTABLISHED
tcp      0      0 code.karunya.edu:60704  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:https  172.69.134.91:48796    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc_i  code.karunya.edu:60806 ESTABLISHED
tcp      0      0 code.karunya.edu:https  172.69.134.226:34778   ESTABLISHED
tcp      0      0 code.karunya.edu:https  192.168.11.208:57028   ESTABLISHED
tcp      0      0 code.karunya.edu:60890  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:59388  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:60066  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:59756  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:60778  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.50.230:26584   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc_i  code.karunya.edu:60798 ESTABLISHED
tcp      0      0 code.karunya.edu:60808  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:60900  code.karunya.edu:hbc_i ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.165.44:16996   ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.50.242:38690   ESTABLISHED
tcp      0      0 code.karunya.edu:https  162.158.165.235:55624  ESTABLISHED
tcp      0      0 code.karunya.edu:hbc_i  code.karunya.edu:60358 ESTABLISHED
```

(using netstat -lntu)

```
[urk17cs178@code ~]$ netstat -lntu
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:2049            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:46053           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:111             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:80              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:20048            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:34067            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:3000             0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:443             0.0.0.0:*               LISTEN
tcp6       0      0 :::2049                 :::*                     LISTEN
tcp6       0      0 :::111                  :::*                     LISTEN
tcp6       0      0 :::80                   :::*                     LISTEN
tcp6       0      0 :::20048                 :::*                     LISTEN
tcp6       0      0 :::22                   :::*                     LISTEN
tcp6       0      0 :::57431                 :::*                     LISTEN
tcp6       0      0 ::1:25                  :::*                     LISTEN
tcp6       0      0 :::443                   :::*                     LISTEN
tcp6       0      0 :::39228                 :::*                     LISTEN
udp        0      0 0.0.0.0:39547           0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:20048            0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:111             0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:49440            0.0.0.0:*               LISTEN
udp        0      0 127.0.0.1:323           0.0.0.0:*               LISTEN
udp        0      0 127.0.0.1:863           0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:911             0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:2049            0.0.0.0:*               LISTEN
udp6       0      0 :::20048                 :::*                     LISTEN
udp6       0      0 :::111                  :::*                     LISTEN
udp6       0      0 ::1:323                 :::*                     LISTEN
udp6       0      0 :::911                  :::*                     LISTEN
udp6       0      0 :::46023                 :::*                     LISTEN
udp6       0      0 :::42560                 :::*                     LISTEN
udp6       0      0 :::2049                 :::*                     LISTEN
[urk17cs178@code ~]$
```

(using netstat --listen)

```
[urk17cs178@code ~]$ netstat --listen
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:nfs              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:46053             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:sunrpc            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:http              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:mountd              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:34067                0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:ssh                0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:hbc1                 0.0.0.0:*               LISTEN
tcp        0      0 localhost:smtp           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:https               0.0.0.0:*               LISTEN
tcp6       0      0 [::]:nfs                 [::]:*                  LISTEN
tcp6       0      0 [::]:sunrpc               [::]:*                  LISTEN
tcp6       0      0 [::]:http                 [::]:*                  LISTEN
tcp6       0      0 [::]:mountd               [::]:*                  LISTEN
tcp6       0      0 [::]:ssh                  [::]:*                  LISTEN
tcp6       0      0 [::]:57431                [::]:*                  LISTEN
tcp6       0      0 localhost:smtp           [::]:*                  LISTEN
tcp6       0      0 [::]:https                [::]:*                  LISTEN
tcp6       0      0 [::]:39228                [::]:*                  LISTEN
udp        0      0 0.0.0.0:39547             0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:mountd           0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:sunrpc            0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:49440             0.0.0.0:*               LISTEN
udp        0      0 localhost:323            0.0.0.0:*               LISTEN
udp        0      0 localhost:863            0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:xact-backup       0.0.0.0:*               LISTEN
udp        0      0 0.0.0.0:nfs              0.0.0.0:*               LISTEN
udp6       0      0 [::]:mountd               [::]:*                  LISTEN
udp6       0      0 [::]:sunrpc               [::]:*                  LISTEN
udp6       0      0 localhost:323            [::]:*                  LISTEN
udp6       0      0 [::]:xact-backup          [::]:*                  LISTEN
udp6       0      0 [::]:46023                [::]:*                  LISTEN
udp6       0      0 [::]:42560                [::]:*                  LISTEN
udp6       0      0 [::]:nfs                  [::]:*                  LISTEN
raw6       0      0 [::]:ipv6-icmp            [::]:*                  LISTEN
Active UNIX domain sockets (only servers)
```

(using netstat -vaun)

```
[urk17cs178@code ~]$ netstat -vaun
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp      0      0 0.0.0.0:39547           0.0.0.0:*
udp      0      0 0.0.0.0:20048           0.0.0.0:*
udp      0      0 0.0.0.0:111             0.0.0.0:*
udp      0      0 0.0.0.0:49440           0.0.0.0:*
udp      0      0 127.0.0.1:323           0.0.0.0:*
udp      0      0 127.0.0.1:863           0.0.0.0:*
udp      0      0 0.0.0.0:911             0.0.0.0:*
udp      0      0 0.0.0.0:2049            0.0.0.0:*
udp6     0      0 :::20048                :::*
udp6     0      0 :::111                  :::*
udp6     0      0 ::1:323                 :::*
udp6     0      0 :::911                  :::*
udp6     0      0 :::46023                :::*
udp6     0      0 :::42560                :::*
udp6     0      0 :::2049                 :::*
[urk17cs178@code ~]$
```

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

OUTPUT:

```
[urk17cs178@code ~]$ uptime
11:57:59 up 12 days, 17 min, 141 users,  load average: 0.03, 0.04, 0.05
[urk17cs178@code ~]$
```

```
[urk17cs178@code ~]$ cat /proc/meminfo
MemTotal:      8009044 kB
MemFree:       4916512 kB
MemAvailable:  6456664 kB
Buffers:       4180 kB
Cached:        1701944 kB
SwapCached:    0 kB
Active:        1268728 kB
Inactive:      765956 kB
Active(anon):  577432 kB
Inactive(anon): 186840 kB
Active(file):  691296 kB
Inactive(file): 579116 kB
Unevictable:   0 kB
Mlocked:       0 kB
SwapTotal:     7815164 kB
SwapFree:      7815164 kB
Dirty:         4 kB
Writeback:     0 kB
AnonPages:     328576 kB
Mapped:        77652 kB
Shmem:         435712 kB
Slab:          668852 kB
SReclaimable:  575708 kB
SUnreclaim:    93144 kB
KernelStack:   4384 kB
PageTables:    45824 kB
NFS_Unstable:  0 kB
Bounce:        0 kB
WritebackTmp:  0 kB
CommitLimit:   11819684 kB
Committed_AS:  71725560 kB
VmallocTotal:  34359738367 kB
VmallocUsed:    159784 kB
VmallocChunk:  34359341052 kB
Percpu:        1088 kB
```

(using top command)

```
top - 12:00:05 up 12 days, 19 min, 141 users, load average: 0.00, 0.03, 0.05
Tasks: 208 total, 1 running, 199 sleeping, 8 stopped, 0 zombie
%Cpu(s): 0.1 us, 0.2 sy, 0.0 ni, 99.7 id, 0.0 wa, 0.0 hi, 0.1 si, 0.0 st
KiB Mem : 8009044 total, 4914536 free, 812664 used, 2281844 buff/cache
KiB Swap: 7815164 total, 7815164 free, 0 used. 6454700 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
27525	urk17cs+	20	0	164356	2552	1740	R	0.7	0.0	0:00.06	top
1	root	20	0	192376	5248	2572	S	0.3	0.1	3:59.73	systemd
517	root	20	0	96712	45004	44448	S	0.3	0.6	43:21.14	systemd-journal
739	root	20	0	238264	6940	5336	S	0.3	0.1	19:54.94	vmtoolsd
1209	root	20	0	1018160	16364	3676	S	0.3	0.2	17:53.02	dad
1284	root	20	0	178128	17536	8972	S	0.3	0.2	25:46.46	adclient
10925	root	20	0	68.5g	222280	13340	S	0.3	2.8	56:51.79	node
2	root	20	0	0	0	0	S	0.0	0.0	0:00.70	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	0:18.96	ksoftirqd/0
7	root	rt	0	0	0	0	S	0.0	0.0	0:02.19	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	9:29.52	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	0:05.13	watchdog/0
12	root	rt	0	0	0	0	S	0.0	0.0	0:05.09	watchdog/1
13	root	rt	0	0	0	0	S	0.0	0.0	0:11.51	migration/1
14	root	20	0	0	0	0	S	0.0	0.0	0:02.48	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	0:04.90	watchdog/2
18	root	rt	0	0	0	0	S	0.0	0.0	0:02.39	migration/2
19	root	20	0	0	0	0	S	0.0	0.0	0:01.32	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	0:05.08	watchdog/3
23	root	rt	0	0	0	0	S	0.0	0.0	0:12.08	migration/3
24	root	20	0	0	0	0	S	0.0	0.0	0:03.03	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	0:00.71	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	bioset
34	root	0	-20	0	0	0	S	0.0	0.0	0:00.00	bioset


```
[urk17cs178@code ~]$ netstat -an
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:2049            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:46053           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:111             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:80              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:20048           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:34067           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:3000            0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:443             0.0.0.0:*               LISTEN
tcp        0      0 192.168.0.29:443        162.158.31.142:54550    ESTABLISHED
tcp        0      0 192.168.0.29:2049       192.168.0.32:989       ESTABLISHED
tcp        0      0 192.168.0.29:443        172.69.135.161:25338   ESTABLISHED
tcp        0      0 192.168.0.29:32792      192.168.0.29:3000      TIME_WAIT
tcp        0      0 192.168.0.29:3000       192.168.0.29:57796     ESTABLISHED
tcp        0      0 192.168.0.29:2049       192.168.0.34:790       ESTABLISHED
tcp        0      0 192.168.0.29:60370      192.168.0.29:3000      ESTABLISHED
tcp        0      0 192.168.0.29:443        162.158.50.226:50892   ESTABLISHED
tcp        0      0 192.168.0.29:32788      192.168.0.29:3000      TIME_WAIT
tcp        0      0 192.168.0.29:443        162.158.167.23:49686   ESTABLISHED
tcp        0      0 192.168.0.29:3000       192.168.0.29:60988     TIME_WAIT
tcp        0      0 192.168.0.29:3000       192.168.0.29:59756     ESTABLISHED
tcp        0      48 192.168.0.29:443        162.158.167.142:41974  ESTABLISHED
tcp        0      0 192.168.0.29:3000       192.168.0.29:60972     ESTABLISHED
tcp        0      0 192.168.0.29:443        172.69.134.226:34778   ESTABLISHED
tcp        0      0 192.168.0.29:443        192.168.11.208:57028   ESTABLISHED
tcp        0      0 192.168.0.29:32782      192.168.0.29:3000      TIME_WAIT
tcp        0      0 192.168.0.29:59388      192.168.0.29:3000      ESTABLISHED
tcp        0      0 192.168.0.29:60066      192.168.0.29:3000      ESTABLISHED
tcp        0      0 192.168.0.29:59756      192.168.0.29:3000      ESTABLISHED
tcp        0      0 192.168.0.29:32786      192.168.0.29:3000      TIME_WAIT
tcp        0      0 192.168.0.29:60778      192.168.0.29:3000      ESTABLISHED
tcp        0      0 192.168.0.29:443        162.158.50.230:26584   ESTABLISHED
tcp        0      0 192.168.0.29:443        162.158.50.242:55994   TIME_WAIT
tcp        0      0 192.168.0.29:60948      192.168.0.29:3000      ESTABLISHED
tcp        0      0 192.168.0.29:443        162.158.165.235:55624  ESTABLISHED
tcp        0      0 192.168.0.29:3000       192.168.0.29:60358     ESTABLISHED
tcp        0      0 192.168.0.29:57994      192.168.0.29:3000      ESTABLISHED
```

26.Display the date in Julian format

OUTPUT:

```
[urk17cs178@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
[urk17cs178@code ~]$
```


27. Find out if the Linux platform is infected or not.

OUTPUT:

```
[urk17cs178@code ~]$ w
 12:02:12 up 12 days, 22 min, 141 users,  load average: 0.00, 0.02, 0.05
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
urk17cs3  pts/2    localhost       11:57    4:04   0.03s  0.03s -bash
urk17cs2  pts/4    localhost       11:49    1:16   0.09s  0.06s vi test1.txt
urk18cs0  pts/1    localhost       11:33   19:24   0.05s  0.05s -bash
urk17cs1  pts/8    localhost       11:07   36.00s  0.31s  0.31s -bash
urk18cs2  pts/9    localhost       10:48    1:10m  0.03s  0.03s -bash
urk17cs0  pts/12   localhost       11:16   44:12   0.03s  0.03s -bash
urk18cs0  pts/11   localhost       10:54   20:36   0.19s  0.19s -bash
urk18cs1  pts/3    localhost       11:48    4.00s  0.08s  0.04s vi sumofn.sh
urk18cs0  pts/6    localhost       10:50   16:12   0.09s  0.09s -bash
urk17cs1  pts/14   localhost       10:54    4.00s  0.55s  0.01s w
urk17cs0  pts/0    localhost       10:17    1:24   0.26s  0.26s -bash
[urk17cs178@code ~]$
```

28. Display only the free space available in the memory.

OUTPUT:

```
[urk17cs178@code ~]$ free>mem.txt
[urk17cs178@code ~]$ cat mem.txt
              total        used        free      shared  buff/cache   available
Mem:      8009044       819012     4908044     435656     2281988     6448408
Swap:      7815164           0      7815164
[urk17cs178@code ~]$
```

29. Display the configuration information of your network

OUTPUT:

```
[urk17cs178@code ~]$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 code.karunya.edu:https 162.158.31.142:54550    ESTABLISHED
tcp      0      0 code.karunya.edu:nfs   192.168.0.32:ftp-data  ESTABLISHED
tcp      0      0 code.karunya.edu:https 172.69.135.161:25338    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:57796 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs   192.168.0.34:790       ESTABLISHED
tcp      0      0 code.karunya.edu:32818 code.karunya.edu:hbc   TIME_WAIT
tcp      0      0 code.karunya.edu:60370 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:32820 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:32808 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.167.23:49686    ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.158.176:37102  ESTABLISHED
tcp      0      0 code.karunya.edu:32824 code.karunya.edu:hbc   TIME_WAIT
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:59756 ESTABLISHED
tcp      0      48 code.karunya.edu:https 162.158.167.142:41974  ESTABLISHED
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:60972 TIME_WAIT
tcp      0      0 code.karunya.edu:https 172.69.134.226:34778    ESTABLISHED
tcp      0      0 code.karunya.edu:https 192.168.11.208:57028    ESTABLISHED
tcp      0      0 code.karunya.edu:https 141.101.98.25:62270     ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.159.131:16496   ESTABLISHED
tcp      0      0 code.karunya.edu:59388 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:60066 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:59756 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:60778 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:https 141.101.98.25:11210     ESTABLISHED
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:32820 ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.230:26584    ESTABLISHED
tcp      0      0 code.karunya.edu:60948 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.165.235:55624   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:60358 ESTABLISHED
tcp      0      0 code.karunya.edu:57994 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:59364 code.karunya.edu:hbc   ESTABLISHED
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:59172 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc   code.karunya.edu:60370 ESTABLISHED
tcp      0      0 code.karunya.edu:47854 192.168.2.27:ldap      ESTABLISHED
tcp      0      0 code.karunya.edu:https 162.158.50.219:59268    ESTABLISHED
```

30.Display the IP information under the command netstat**OUTPUT:**

```
[urk17cs178@code ~]$ netstat -s
Ip:
  21830758 total packets received
  0 forwarded
  0 incoming packets discarded
  16355344 incoming packets delivered
  14810680 requests sent out
  744 outgoing packets dropped
Icmp:
  2008 ICMP messages received
  0 input ICMP message failed.
  ICMP input histogram:
    destination unreachable: 2005
    echo replies: 3
  1848 ICMP messages sent
  0 ICMP messages failed
  ICMP output histogram:
    destination unreachable: 1845
    echo request: 3
IcmpMsg:
  InType0: 3
  InType3: 2005
  OutType3: 1845
  OutType8: 3
Tcp:
  68679 active connections openings
  92361 passive connection openings
  29 failed connection attempts
  3535 connection resets received
  66 connections established
  16327528 segments received
  14842753 segments send out
  21940 segments retransmitted
  12 bad segments received.
  7694 resets sent
Udp:
  23962 packets received
  1845 packets to unknown port received.
  0 packet receive errors
  26364 packets sent
  0 receive buffer errors
```

Results:

The Linux commands are studied and executed.

Google Drive Link:

https://drive.google.com/file/d/1zA2UD0k8e9kHB_JQ0Gb3iHA5AdjKSVnt/view?usp=sharing