

Ex 1. Advanced Linux Commands

Date: 18/08/20

Aim:

To study and implement 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.	vdir	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	Obtaill all the IP information	Network troubleshoot
23.	head	Copy the first part of files	Test processing
24.	tail	Copy the last part of file	Test 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		

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

OUTPUT:

```
[urk17cs304@code ~]$ ls
2darray.c    bill.c      evenodd.c    exp5evenodd.cpp   file3.txt    notes.c      r5c5.txt    si.c
a1.sh        binary.sh   exp101.cpp   exp5secondlargest.cpp file4.txt    oldnewl.sh  recursive.c simpleinterest.c
aa.txt       bintodec.cpp exp102.cpp   exp5sorting.cpp   file_a.sh    oldnewr.sh  reataurantmeal.cpp sqrec.c
abc.txt      bitwise.c   exp10addarrays.cpp exp5transpose.cpp file_b.sh    opoverloading.cpp retobj.cpp static.cpp
achri       bmi.c       exp10shape.cpp exp6_systemcalls.c file_c.sh    palindrome.c  reverse.c
achrishira  bmi.c       exp10shape.cpp exp6_systemcalls.c file_d.sh    palindromee.sh store.txt
a.cpp        b.txt       exp1binarydec.cpp exp6_systemcalls.c file_e.sh    palindromeee.sh structure.c
add.c        cato.txt   exp1binarydec.cpp exp6time.cpp   funcpw.c   palindromeee.sh sumdig.c
addition.c  cc.txt     exp1dogdaycare.cpp exp7a.c      funcpw.c   palindromeee.sh swap1.c
afunc.c     celcius.c  exp1tokenseparator.cpp exp7b.c      funcpw.c   palindromeee.sh swap1c.save
age18.c     circlearea.c exp2distance.cpp exp7c.c      gradecal.c pipe
alphabet.sh circle.c   exp2power.cpp exp7c.sh     greatestof3.sh pipe1
alpha.sh     c.java     exp2swap.cpp exp7d.c      hello      pipe1.c    sample26.c tax.c
alpha.txt    constructor2.cpp exp2_symboltable.cpp exp7marks.cpp hello.c    pipe1.cpp  sample27.c tax.c.save
alpha.txt    constructor.cpp exp3amount.cpp exp8distance.cpp hexa.sh   pipes1.sh  sample28.c temperature.c
a.out       constructor2.cpp exp3amount.cpp exp8distance.cpp ip.txt    pipes1.sh  sample29.c test1.txt
area.c      cpp1.cpp   exp3daysmonths1.cpp exp8palindrome.cpp ipa.sh   posneg.c  sample3.cpp testnum.c
areaofatriangle.c cpp1.cpp   exp3daysmonths1.cpp exp8palindrome.cpp ipa.sh   posneg.c  sample4.cpp test.txt
armstrong.c dir1      exp3inchfeet.cpp exp8pipe1.c  ipa.sh   practice.c.sample save sample5.cpp todayhistory.txt
armstrong.sh dir2      exp3owelconsnants.cpp exp8pipe2.c  ipa.sh   practice.c.sample save sample6.cpp TodaysHistory.txt
array.c     displ.c   exp4a.sh     exp9anagram.cpp marks1.c procrl1.cpp sample7.cpp touchCHECK.cpp
array.sh     distance.c expdb.sh     exp9frequency.cpp marks.c   procrl2.c sample8.c triangle.c
asc_desc.sh ed.txt     expd1distance.cpp exp9palindrome.cpp maxnum.c  procrl3.c sample.txt vowel.c
a.sh        eligible.c expd1distance.cpp factorial.cpp memory.c procrl4.c socal.sh  weatherreport.cpp
a.txt       emp0.txt   expfsample.txt fibonacci.c mrks.c   procrl5.c' secure1.txt words.txt
baseclass.cpp enum.c   expfsmarphone.cpp file1.txt   natural.c procrl5.c' secure1.txt words.txt
bb.txt     even.c     exp5diagonal.cpp file2.txt   ncr.c    quadroot.c series_gb Settings to activate Windows.
[urk17cs304@code ~]$
```

2. List the content of /var directory?

OUTPUT:

```
[urk17cs304@code ~]$ vdir
total 868
-rw-rw-r-- 1 urk17cs304 urk17cs304 755 Feb 27 2018 2darray.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 111 Jan 24 2020 a1.sh
---xrw-r-- 1 urk17cs304 urk17cs304 10 Dec 7 2019 aa.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 50 Dec 6 2019 abc.txt
drwxrwxr-x 2 urk17cs304 urk17cs304 6 Dec 6 2019 achri
drwxrwxr-x 2 urk17cs304 urk17cs304 6 Dec 7 2019 achrishira
-rw-rw-r-- 1 urk17cs304 urk17cs304 0 Dec 6 2019 a.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 78 Dec 16 2017 add.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 131 Dec 16 2017 addition.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 498 Apr 23 2018 afunc.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 166 Mar 17 2018 age18.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 214 Jan 31 2020 alphabet.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 0 Mar 6 14:45 alpha.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 10 Mar 6 14:49 alpha.txt
-rw-rw-r--x 1 urk17cs304 urk17cs304 8680 Mar 18 15:06 a.out
-rw-rw-r-- 1 urk17cs304 urk17cs304 102 Dec 16 2017 area.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 207 Jan 9 2018 areaofatriangle.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 236 Feb 13 2018 armstrong.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 219 Jan 31 2020 armstrong.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 236 Feb 20 2018 array.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 388 Feb 14 2020 array.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 420 Feb 14 2020 asc_desc.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 0 Mar 6 14:45 a.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 8 Dec 6 2019 a.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 361 Sep 27 2018 baseclass.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 10 Dec 7 2019 bb.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 242 Mar 17 2018 bill.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 156 Feb 14 2020 binary.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304 582 Oct 6 2018 bintodec.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 406 Feb 6 2018 bitwise.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 1 Feb 12 2018 bmi
-rw-rw-r-- 1 urk17cs304 urk17cs304 472 Feb 5 2018 bmi.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 0 Dec 6 2019 h.txt
```

```
-rw-rw-r-- 1 urk17cs304 urk17cs304      0 Dec  6 2019 c.java
-rw-rw-r-- 1 urk17cs304 urk17cs304    428 Sep  9 2018 constructor2.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304   419 Aug 29 2018 constructor.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304   498 Jul 12 2018 cpppl.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304   12 Dec  7 2019 dd.txt
drwxrwxr-x 2 urk17cs304 urk17cs304  23 Dec  7 2019 dir1
drwxrwxr-x 2 urk17cs304 urk17cs304  23 Dec  7 2019 dir2
-rw-rw-r-- 1 urk17cs304 urk17cs304   77 Mar 19 2018 displ1.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  134 Jan  9 2018 distance.c
-rw-rw-r-- 1 urk17cs304 urk17cs304   97 Dec  6 2019 ed.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304  163 Mar 19 2018 eligible.c
-rw-rw-r-- 1 urk17cs304 urk17cs304   82 Dec  7 2019 empD.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304  225 Mar 27 2018 enum.c
-rw-rw-r-- 1 urk17cs304 urk17cs304   89 Mar 19 2018 even.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  231 Mar 20 2018 evenodd.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  359 Nov  3 2018 exp101.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  604 Nov  5 2018 exp102.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  412 Nov  5 2018 exp10addarrays.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304   2 Nov  5 2018 exp10shape.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  812 Nov  5 2018 exp10shape.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  581 Sep 20 2018 exp1binarydec.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  730 Oct 11 2018 exp1bintodec.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  954 Oct 11 2018 expldogdaycare.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 1045 Feb 16 2020 exp1_tokenseparator.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 1886 Oct  6 2018 exp2distance.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  295 Oct  6 2018 exp2power.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  615 Oct  6 2018 exp2swap.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304   0 Jan  9 2020 exp2_symboltable.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  429 Oct  6 2018 exp3amount.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  606 Oct 10 2018 exp3daysmonths1.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  758 Oct 11 2018 exp3daysmonths.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  227 Oct  7 2018 exp3inchfeet.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  248 Oct  7 2018 exp3vowelconsonants.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 109 Mar 18 15:17 exp4a.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304  56 Mar 18 15:24 exp4b.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304   0 Aug 23 2018 exp4distance
-rw-rw-r-- 1 urk17cs304 urk17cs304  562 Oct  8 2018 exp4distance.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304   9 Mar 18 15:24 exp4sample.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 1272 Oct  9 2018 exp4smartphone.cpp
```

```
-rw-rw-r-- 1 urk17cs304 urk17cs304  329 Mar 20 2018 sample27.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  137 Mar 20 2018 sample28.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  187 Jul 25 2018 sample2.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  176 Jul 25 2018 sample3.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  320 Jul 25 2018 sample4.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  268 Aug 30 2018 sample5.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  904 Jul 26 2018 sample6.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  297 Oct  3 2018 sample7.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  756 Jul 26 2018 sample8.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 1232 Dec  7 2019 sample.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304  524 Feb 28 15:41 sccal.sh
---xrw-r-- 1 urk17cs304 urk17cs304  57 Dec  7 2019 secure1.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304  57 Dec  7 2019 secure.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 129 Feb 14 2020 series.sh
-rw-rw-r-- 1 urk17cs304 urk17cs304  731 Mar 13 2018 sfunction.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  148 Mar 19 2018 si.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 182 Dec 16 2017 simpleinterest.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  404 Mar 19 2018 sqrec.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  328 Sep  5 2018 static.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  59 Dec  7 2019 store.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 1032 Apr 25 2018 structure.c
-rw-rw-r-- 1 urk17cs304 urk17cs304 181 Mar 19 2018 sumdig.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  377 Mar 25 2018 swap1.c
-rw----- 1 urk17cs304 urk17cs304  436 Mar 20 2018 swap1.c.save
-rw-rw-r-- 1 urk17cs304 urk17cs304 149 Mar 17 2018 swap.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  384 Mar 20 2018 tax.c
-rw----- 1 urk17cs304 urk17cs304  382 Mar 21 2018 tax.c.save
-rw-rw-r-- 1 urk17cs304 urk17cs304 155 Mar 19 2018 temperature.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  316 Dec  7 2019 test1.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304  210 Mar 17 2018 testnum.c
-rw-rw-r-- 1 urk17cs304 urk17cs304   8 Jan 24 2020 test.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 22721 Dec  7 2019 todayshistory.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304 22739 Dec  7 2019 TodaysHistory.txt
-rw-rw-r-- 1 urk17cs304 urk17cs304   0 Dec  6 2019 touchCHECK.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304 187 Dec 16 2017 triangle.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  361 Mar 20 2018 vowel.c
-rw-rw-r-- 1 urk17cs304 urk17cs304  450 Oct 11 2018 weatherreport.cpp
-rw-rw-r-- 1 urk17cs304 urk17cs304  19 Dec  6 2019 words.txt
-rwxrwxr-x 1 urk17cs304 urk17cs304 8680 Mar 18 15:07 write.out
-rwxrwxr-x 1 urk17cs304 urk17cs304 8680 Mar 18 15:07 write.nout
```

3. Create two directories named dir1 & dir2

OUTPUT:

```
[urk17cs304@code ~]$ rm -r dir1
[urk17cs304@code ~]$ rm -r dir2
[urk17cs304@code ~]$ mkdir dir1
[urk17cs304@code ~]$ mkdir dir2
[urk17cs304@code ~]$
```

```
[urk17cs304@code ~]$ ls
[urk17cs304@code ~]$ ls
2darray.c bill.c evenodd.c exp5evenodd.cpp file3.txt notes.c r5c.txt si.c
al.sh binary.sh exp101.cpp exp5secondlargest.cpp file4.txt oldnew.sh recursive.c simpleinterest.c
aa.txt bintodec.cpp exp102.cpp exp5sorting.cpp file.a.sh opoverloading.cpp restaurantmeal.cpp sqrec.c
abc.txt bitwise.c exp10addarrays.cpp exp5transpose.cpp file.b.sh retobj.cpp static.cpp
achri km.c exp10shape.cpp exp6int.cpp file.c.sh palindrome.c reverse.c
achrishire km.c exp10shape.cpp exp6systemcalls.c file.txt palindrome.sh sample1.c store.txt
a.cpp b.txt exp1binarydec.cpp exp6time.cpp funcNarrays_banking.sh sample1.cpp structure.c
add.c cato.txt exp1bintodec.cpp exp7a.cpp funcpw.c palindromee.sh sample11.c sumdig.c
addition.c co.txt exp1dogdaycare.cpp exp7b.c gradecal.sh pipe sample12.c swap1.c
afunc.c celsius.c exp1_tokenseparator.cpp exp7c.c greatestof3.sh pipe sample124.c swap1.c.save
age18.c cleararea.c exp2distance.cpp exp7d.c hello pipe sample125.c swap.c
alphabet.sh circle.c exp2power.cpp exp7communitymember.cpp pipe sample126.c tax.c
alpha.sh c.java exp2swap.cpp exp7d.c hello.c pipe sample127.c tax.c.save
alpha.txt constructor2.cpp exp2_symboltable.cpp exp7marks.cpp helloname.c pipe sample128.c temperature.c
a.out constructor.cpp exp3amount.cpp exp8distance.cpp hexa.sh pipes1.sh sample128.cpp test1.txt
area.c cpp1.cpp exp3daysmonths1.cpp exp8palindrome.cpp ip.txt posneg.c sample13.cpp testnum.c
areaoftriangle.c dd.txt exp3daysmonths.cpp exp8pipe1.c lex.l practice.c.save sample14.cpp test.txt
armstrong.c dir1 exp3inchfeet.cpp exp8pipe2.c log.txt prepost.c sample15.cpp todayHistory.txt
armstrong.sh dir2 exp3vowelconsonants.cpp exp8.sh marks1.c procr1.c sample16.cpp TodayHistory.txt
array.c disp1.c exp4a.sh exp9anagram.cpp marks1.c procr1.cpp sample17.cpp touchCHECK.cpp
array.sh distance.c exp4b.sh exp9frequency.cpp marks.c procr2.c sample18.c triangle.c
asc_desc.sh ed.txt exp4distance.cpp exp9palindrome.cpp maxnum.c procr3.c sample.txt vowel.c
a.sh eligible.c exp4distance.cpp factorial.cpp memory.c procr4.c sccal.sh weatherreport.cpp
a.txt empD.txt exp4sample.cpp fibonacci.c mrks.c procr5.c secure1.txt words.txt
baseclass.cpp enum.c exp4smartphone.cpp file1.txt natural.c [project=Sample] series.sh write.out
bb.txt even.c exp5diagonal.cpp file2.txt ncr.c quadroot.c sfunction.c write.pout
[urk17cs304@code ~]$ [urk17cs304@code ~]$
```

4. Create a hidden directory with your name?

OUTPUT:

```
[urk17cs304@code ~]$ 
[urk17cs304@code ~]$ 
[urk17cs304@code ~]$ mkdir .hdir
[urk17cs304@code ~]$ 
[urk17cs304@code ~]$
```

5. Display the content of a hidden directory.

```
[urk17cs304@code ~]$ ls -a
. bintodec.cpp exp1binarydec.cpp exp6time.cpp funcpw.c .pk1 .accal.sh.swp
.. bitwise.c exp1bintodec.cpp exp7a.c .gitconfig .gitconfig .secure1.txt
2darray.c km.c .exp1bintodec.cpp.swp exp7b.c gradecal.sh practice.c.save .secure.txt
al.sh km.c exp1dogdaycare.cpp exp7c.c greatestof3.sh prepost.c .series.sh
aa.txt b.txt .exp1_tokenseparator.cpp .exp7communitymember.cpp .hdir .procr1.c sfunction.c
abc.txt cato.txt .exp1_tokenseparator.cpp.swp .exp7communitymember.cpp.swp hello .procr1.cpp si.c
achri cc.txt .exp1_tokenseparator.cpp.swp .exp7communitymember.cpp.swp helloname.c .procr2.c simpleinterest.c
achrishire celsius.c exp2distance.cpp .exp7communitymember.cpp.swp hexa.sh .procr3.c sqrec.c
a.cpp circle.c .exp2distance.cpp.swp .exp7communitymember.cpp.swp .k5login .procr4.c static.cpp
add.c c.java exp2power.cpp exp7d.c .procr4.c .static.cpp.swp
[urk17cs304@code ~]$
```

6. Display the calendar of 2020.

```
[urk17cs304@code ~]$ cal
      August 2020
Su Mo Tu We Th Fr Sa
              1
 2  3  4  5  6  7  8
 9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
[urk17cs304@code ~]$ █
```

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

OUTPUT:

```
[urk17cs304@code ~]$ cp ../../etc/passwd sample.txt
[urk17cs304@code ~]$ cat sample.txt
root:x:0:0:root:/root:/bin/bash
```

```
[urk17cs304@code ~]$ cp ../../etc/passwd sample.txt
[urk17cs304@code ~]$ cat sample.txt
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin/nologin
daemon:x:2:2:daemon:/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:/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 tcscd 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
[urk17cs304@code ~]$ █
```

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

Name Register Number Research Interest

OUTPUT:

```
[urk17cs304@code ~]$ Vim test1.txt
-bash: Vim: command not found
[urk17cs304@code ~]$ # vim test1.txt
[urk17cs304@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
[urk17cs304@code ~]$
```

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

OUTPUT:

```
[urk17cs304@code ~]$ cut -f1 test1.txt | grep GridComputing test1.txt
Melvin 07af501 GridComputing
Binu   07af506 GridComputing
Arun   07af510 GridComputing
[urk17cs304@code ~]$
[urk17cs304@code ~]$
```

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

OUTPUT:

```
[urk17cs304@code ~]$
[urk17cs304@code ~]$ cut -f1,2 test1.txt
Name      RegNo
Melvin    07af501
Mithin    07af502
James     07af503
Jane      07af504
Carol     07af505
Binu      07af506
Aaron     07af507
Selvin    07af508
Jerwin    07af509
Arun      07af510
[urk17cs304@code ~]$
[urk17cs304@code ~]$
```

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

OUTPUT:

```
[urk17cs304@code ~]$ cut -f1,2,3 test1.txt | grep ImageProcessing | wc>imgp.txt
[urk17cs304@code ~]$ cat imgp.txt
 2      6     60
```

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

OUTPUT:

```
[urk17cs304@code ~]$ head -2 test1.txt
Name    RegNo   ResearchInterest
Melvin  07af501 GridComputing
[urk17cs304@code ~]$
```

```
[urk17cs304@code ~]$ tail -2 test1.txt
Jerwin  07af509 WirelessNetworks
Arun    07af510 GridComputing
[urk17cs304@code ~]$
```

```
[urk17cs304@code ~]$ head -2 test1.txt | tail -2 test1.txt > storage.txt
[urk17cs304@code ~]$ cat storage.txt
Jerwin  07af509 WirelessNetworks
Arun    07af510 GridComputing
[urk17cs304@code ~]$
```

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

OUTPUT:

```
[urk17cs304@code ~]$ cat -T test1.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
[urk17cs304@code ~]$
```

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

OUTPUT:

```
[urk17cs304@code ~]$ mv sample.txt dir2  
[urk17cs304@code ~]$ █
```

11. Change directory into dir2 directory

OUTPUT:

```
[urk17cs304@code ~]$  
[urk17cs304@code ~]$ cd dir2  
[urk17cs304@code dir2]$  
[urk17cs304@code dir2]$
```

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

OUTPUT:

```
[urk17cs304@code dir2]$ ls  
sample.txt test1.txt  
[urk17cs304@code dir2]$  
[urk17cs304@code dir2]$  
[urk17cs304@code dir2]$
```

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

OUTPUT:

```
[urk17cs304@code dir2]$ cat>new.txt  
[urk17cs304@code dir2]$ cp sample.txt new.txt  
[urk17cs304@code dir2]$ rm sample.txt  
[urk17cs304@code dir2]$ ls  
new.txt test1.txt  
[urk17cs304@code dir2]$  
[urk17cs304@code dir2]$
```

14. Remove the directory dir1

OUTPUT:

```
[urk17cs304@code ~]$ rmdir dir1
[urk17cs304@code ~]$ ls
2darray.c      binary.sh      exp10addarrays.cpp    exp6int.cpp
al.sh          bintodec.cpp   exp10shape.cp       exp6_systemcalls.c
aa.txt         bitwise.c     exp10shape.cpp     exp6systemcalls.c
abc.txt        bmi           exp1binarydec.cpp  exp6time.cpp
achri          bmi.c         exp1bintodec.cpp  exp7a.c
achrishira     b.txt         exp1dogdaycare.cpp exp7b.c
a.cpp          cato.txt      exp1_tokenseparator.cpp exp7c.c
add.c          cc.txt        exp2distance.cpp   exp7communitymember.cpp
addition.c    celsius.c    exp2power.cpp      exp7d.c
afunc.c        circlearea.c exp2swap.cpp      exp7marks.cpp
age18.c        circle.c     exp2_symboltable.cpp exp8distance.cpp
alphabet.sh   c.java        exp3amount.cpp    exp8palindrome.cpp
alpha.sh       constructor2.cpp exp3daysmonths1.cpp exp8pipeline1.c
alpha.txt      constructor.cpp exp3daysmonths.cpp exp8pipe2.c
a.out          cpp01.cpp     exp3inchfeet.cpp  exp8.sh
area.c         dd.txt       exp3vowelconsonants.cpp exp9anagram.cpp
areaofatriangle.c dir2        exp4a.sh        exp9frequency.cpp
armstrong.c   disp1.c      exp4b.sh        exp9palindrome.cpp
armstrong.sh  distance.c   exp4distance     factorial.cpp
array.c        ed.txt       exp4distance.cpp  fibonacci.c
```

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

OUTPUT:

```
[urk17cs304@code ~]$ cd dir2
[urk17cs304@code dir2]$ tail -3 test1.txt
Selvin 07af508 Networking
Jerwin 07af509 WirelessNetworks
Arun   07af510 GridComputing
[urk17cs304@code dir2]$
[urk17cs304@code dir2]$
```

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

todayshistory.txt

OUTPUT:

```
[urk17cs304@code ~]$ history>todayhistory.txt
[urk17cs304@code ~]$ cat todayhistory.txt
 5 sort aa.txt ; sort bb.txt; sort cc.txt > dd.txt
 6 cat>file1.txt
 7 cat>file2.txt
 8 cat>file3.txt
 9 cat>file4.txt
10 sort file1.txt.file2.txt.file3.txt > file4.txt
11 sort file1.txt file2.txt file3.txt > file4.txt
12 cat file4
13 cat file4.txt
14 ls
15 vi expl_tokenseparator.cpp
16 vi expl_tokenseparator.cpp
17 cc expl_tokenseparator.cpp
18 vi expl_tokenseparator.cpp
19 cc expl_tokenseparator.cpp
20 vi expl_tokenseparator.cpp
21 cc expl_tokenseparator.cpp
22 vi expl_tokenseparator.cpp
23 vi expl_tokenseparator.cpp
24 cc expl_tokenseparator.cpp
25 vi expl_tokenseparator.cpp
26 cc expl_tokenseparator.cpp
27 vi expl_tokenseparator.cpp
28 cc expl_tokenseparator.cpp
29 vi expl_tokenseparator.cpp
30 cc expl_tokenseparator.cpp
31 vi expl_tokenseparator.cpp
32 g++ expl_tokenseparator.cpp
33 ./a.out
34 vi expl_tokenseparator.cpp
35 g++ expl_tokenseparator.cpp
36 ./a.out
```

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

OUTPUT:

```
[urk17cs304@code ~]$
[urk17cs304@code ~]$ ls | wc -l
210
[urk17cs304@code ~]$
```

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

OUTPUT:

```
[urk17cs304@code ~]$ sort aa.txt bb.txt cc.txt > dd.txt
[urk17cs304@code ~]$ cat dd.txt
1
2
3
4
5
a
b
c
d
e
l
m
n
x
Y
z
[urk17cs304@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:

```
[urk17cs304@code ~]$ chmod u=r,og=w aa.txt
[urk17cs304@code ~]$ ls -l aa.txt
-r---w--w- 1 urk17cs304 urk17cs304 10 Dec  7  2019 aa.txt
[urk17cs304@code ~]$ cat aa.txt
a
b
c
d
e
[urk17cs304@code ~]$ █
```

```
[urk17cs304@code ~]$ chmod u=w,og=w aa.txt
[urk17cs304@code ~]$ ls -l aa.txt
--w--w-- 1 urk17cs304 urk17cs304 10 Dec  7  2019 aa.txt
[urk17cs304@code ~]$ cat aa.txt
cat: aa.txt: Permission denied
[urk17cs304@code ~]$
[urk17cs304@code ~]$
```

20. Display the network status on the shell.

OUTPUT:

```
[urk17cs304@code ~]$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:48020 ESTABLISHED
tcp      0      0 code.karunya.edu:https   172.68.146.114:43468 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47758 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:47402 ESTABLISHED
tcp      0      0 code.karunya.edu:48174   code.karunya.edu:hbc1  TIME_WAIT
tcp      0      0 code.karunya.edu:https   162.158.166.135:54586 TIME_WAIT
tcp      0      0 code.karunya.edu:nfs     192.168.0.34:790    ESTABLISHED
tcp      0      0 code.karunya.edu:48170   code.karunya.edu:hbc1  TIME_WAIT
tcp      0      0 code.karunya.edu:https   172.68.144.143:21248 ESTABLISHED
tcp      0      0 code.karunya.edu:47192   code.karunya.edu:hbc1  ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:48150 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.165.184:19492 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.167.162:59088 ESTABLISHED
tcp      0      0 code.karunya.edu:https   172.68.146.135:37406 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.167.28:25332 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.198.176:57482 ESTABLISHED
tcp      0      0 code.karunya.edu:47700   code.karunya.edu:hbc1  ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47902 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:48172 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47550 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.167.181:65394 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47934 ESTABLISHED
tcp      0      0 code.karunya.edu:47332   code.karunya.edu:hbc1  ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.50.250:34908 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47192 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47352 ESTABLISHED
tcp      0      0 code.karunya.edu:https   172.69.134.52:41036 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.165.128:36266 ESTABLISHED
tcp      0      0 code.karunya.edu:48180   code.karunya.edu:hbc1  TIME_WAIT
tcp      0      0 code.karunya.edu:48176   code.karunya.edu:hbc1  TIME_WAIT
tcp      0      0 code.karunya.edu:34956   192.168.2.27:ldap    ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.198.133:43036 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:47198 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.198.155:16662 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.198.170:53616 ESTABLISHED
tcp      0      0 code.karunya.edu:47198   code.karunya.edu:hbc1  ESTABLISHED
tcp      0      0 code.karunya.edu:47402   code.karunya.edu:hbc1  ESTABLISHED
```

```
unix  3      [ ]        STREAM     CONNECTED  22127
unix  3      [ ]        STREAM     CONNECTED  22107
unix  3      [ ]        STREAM     CONNECTED  22172
unix  3      [ ]        STREAM     CONNECTED  22157
unix  3      [ ]        STREAM     CONNECTED  17292
unix  3      [ ]        STREAM     CONNECTED  17125
unix  3      [ ]        STREAM     CONNECTED  17545  /run/gssproxy.sock
unix  3      [ ]        STREAM     CONNECTED  36843  /run/systemd/journal/stdout
unix  3      [ ]        STREAM     CONNECTED  15207
unix  3      [ ]        STREAM     CONNECTED  22174
unix  3      [ ]        STREAM     CONNECTED  15167  /run/dbus/system_bus_socket
unix  3      [ ]        STREAM     CONNECTED  14315
unix  3      [ ]        STREAM     CONNECTED  22144
unix  3      [ ]        STREAM     CONNECTED  38944
unix  3      [ ]        STREAM     CONNECTED  22118
unix  3      [ ]        STREAM     CONNECTED  22165
unix  3      [ ]        STREAM     CONNECTED  22110
unix  2      [ ]        DGRAM      16154
unix  3      [ ]        STREAM     CONNECTED  22135
unix  3      [ ]        STREAM     CONNECTED  22148
unix  3      [ ]        STREAM     CONNECTED  16771  /run/systemd/journal/stdout
unix  3      [ ]        STREAM     CONNECTED  14330
unix  3      [ ]        STREAM     CONNECTED  38947
unix  3      [ ]        STREAM     CONNECTED  22169
unix  3      [ ]        STREAM     CONNECTED  10980
unix  2      [ ]        DGRAM      20071
unix  3      [ ]        STREAM     CONNECTED  15162
unix  3      [ ]        DGRAM      14361
unix  3      [ ]        STREAM     CONNECTED  17134
unix  3      [ ]        STREAM     CONNECTED  17531
unix  2      [ ]        DGRAM      13674
unix  3      [ ]        STREAM     CONNECTED  22139
unix  3      [ ]        STREAM     CONNECTED  21075  /run/dbus/system_bus_socket
unix  2      [ ]        DGRAM      16224
unix  2      [ ]        DGRAM      22602
unix  3      [ ]        STREAM     CONNECTED  22126
unix  3      [ ]        STREAM     CONNECTED  22156
unix  2      [ ]        STREAM     CONNECTED  20767
unix  3      [ ]        STREAM     CONNECTED  17694  /run/systemd/journal/stdout
[urk17cs304@code ~]$
```

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

OUTPUT:

(creating file first)

```
[urk17cs304@code ~]$ cat>f1
a
b
c[urk17cs304@code ~]$ cat f1
a
b
c[urk17cs304@code ~]$ cat>f2
a
1
2[urk17cs304@code ~]$ cat f2
a
1
2[urk17cs304@code ~]$ █
```

(using **comm**)

```
[urk17cs304@code ~]$ comm f1 f2
      a
      1
      2
b
c[urk17cs304@code ~]$ █
```

Extracting common features

```
[urk17cs304@code ~]$ comm -1 -2 f1 f2
a
[urk17cs304@code ~]$ █
```

Extracting unique features

```
[urk17cs304@code ~]$ comm -3 f1 f2
      1
      2
b
c
[urk17cs304@code ~]$ █
```

OTHER WAYS TO COMPARE:

(using **cmp**)

```
[urk17cs304@code ~]$ cmp f1 f2
f1 f2 differ: byte 3, line 2
```

(using **diff**)

```
[urk17cs304@code ~]$ diff f1 f2
2,3c2,3
< b
< c
\ No newline at end of file
---
> 1
> 2
\ No newline at end of file
```

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

OUTPUT:

```
[urk17cs304@code ~]$ id -u
1010875507
```

```
[urk17cs304@code ~]$ pgrep -u root sshd
1103
```

```
[urk17cs304@code ~]$ echo $PPID
30234
```

23. Report disk usages of file system.

OUTPUT:

```
[urk17cs304@code ~]$ du
4      ./[project-Sample]/.git/info
0      ./[project-Sample]/.git/objects/info
0      ./[project-Sample]/.git/objects/pack
0      ./[project-Sample]/.git/objects
44     ./[project-Sample]/.git/hooks
0      ./[project-Sample]/.git/refs/heads
0      ./[project-Sample]/.git/refs/tags
0      ./[project-Sample]/.git/refs
0      ./[project-Sample]/.git/branches
60     ./[project-Sample]/.git
60     ./[project-Sample]
0      ./mozilla/plugins
0      ./mozilla/extensions
0      ./mozilla
4      ./Firstrepository/.git/info
0      ./Firstrepository/.git/objects/info
0      ./Firstrepository/.git/objects/pack
0      ./Firstrepository/.git/objects
44     ./Firstrepository/.git/hooks
0      ./Firstrepository/.git/refs/heads
0      ./Firstrepository/.git/refs/tags
0      ./Firstrepository/.git/refs
0      ./Firstrepository/.git/branches
60     ./Firstrepository/.git
72     ./Firstrepository
0      ./pki/nssdb
0      ./pki
16     ./config/neofetch
16     ./config
0      ./achri
0      ./achrishira
0      ./achri
32     ./dir2
0      ./hdir
1500   .
[urk17cs304@code ~]$
```

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

```
[urk17cs304@code ~]$  
[urk17cs304@code ~]$ du -h  
4.0K  ./[project-Sample]/.git/info  
0     ./[project-Sample]/.git/objects/info  
0     ./[project-Sample]/.git/objects/pack  
0     ./[project-Sample]/.git/objects  
44K   ./[project-Sample]/.git/hooks  
0     ./[project-Sample]/.git/refs/heads  
0     ./[project-Sample]/.git/refs/tags  
0     ./[project-Sample]/.git/refs  
0     ./[project-Sample]/.git/branches  
60K   ./[project-Sample]/.git  
60K   ./[project-Sample]  
0     ./mozilla/plugins  
0     ./mozilla/extensions  
0     ./mozilla  
4.0K   ./Firstrepository/.git/info  
0     ./Firstrepository/.git/objects/info  
0     ./Firstrepository/.git/objects/pack  
0     ./Firstrepository/.git/objects  
44K   ./Firstrepository/.git/hooks  
0     ./Firstrepository/.git/refs/heads  
0     ./Firstrepository/.git/refs/tags  
0     ./Firstrepository/.git/refs  
0     ./Firstrepository/.git/branches  
60K   ./Firstrepository/.git  
72K   ./Firstrepository  
0     ./pki/nssdb  
0     ./pki  
16K   ./config/neofetch  
16K   ./config  
0     ./achri  
0     ./achrishira  
0     ./achri  
32K   ./dir2  
0     ./hdir  
1.5M  .  
[urk17cs304@code ~]$ █
```

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

OUTPUT:

```
[urk17cs304@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:*
tcp      0      0 0.0.0.0:46053           0.0.0.0:*
tcp      0      0 0.0.0.0:sunrpc         0.0.0.0:*
tcp      0      0 0.0.0.0:http           0.0.0.0:*
tcp      0      0 0.0.0.0:mountd          0.0.0.0:*
tcp      0      0 0.0.0.0:34067           0.0.0.0:*
tcp      0      0 0.0.0.0:ssh            0.0.0.0:*
tcp      0      0 0.0.0.0:hbc           0.0.0.0:*
tcp      0      0 localhost:smtp          0.0.0.0:*
tcp      0      0 0.0.0.0:https          0.0.0.0:*
tcp      0      0 code.karunya.edu:https  162.158.165.221:47784 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs       192.168.0.32:ftps-data ESTABLISHED
tcp      0      0 code.karunya.edu:hbc           code.karunya.edu:49694 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs          192.168.0.34:790   ESTABLISHED
tcp      0      0 code.karunya.edu:https         162.158.167.4:39754 ESTABLISHED
tcp      0      0 code.karunya.edu:https         162.158.166.193:60534 ESTABLISHED
tcp      0      0 code.karunya.edu:49698          code.karunya.edu:hbc           TIME_WAIT
tcp      0      0 code.karunya.edu:hbc           code.karunya.edu:49674   ESTABLISHED
tcp      0      0 code.karunya.edu:49696          code.karunya.edu:hbc           TIME_WAIT
tcp      0      0 code.karunya.edu:https         162.158.166.127:54820 ESTABLISHED
tcp      0      0 code.karunya.edu:https         162.158.166.245:15196 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc           code.karunya.edu:49458   ESTABLISHED
tcp      0      48 code.karunya.edu:https        162.158.31.162:62158 ESTABLISHED
tcp      0      0 code.karunya.edu:49700          code.karunya.edu:hbc           TIME_WAIT
tcp      0      0 code.karunya.edu:https        141.101.69.46:50004 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc           code.karunya.edu:48584   TIME_WAIT
tcp      0      0 code.karunya.edu:hbc           code.karunya.edu:49598   ESTABLISHED
tcp      0      0 code.karunya.edu:49598          code.karunya.edu:hbc           ESTABLISHED
tcp      0      0 code.karunya.edu:37356          192.168.2.27:ldap          ESTABLISHED
tcp      0      0 code.karunya.edu:49702          code.karunya.edu:hbc           TIME_WAIT
tcp      0      0 code.karunya.edu:https         172.69.135.228:17206 ESTABLISHED
tcp      0      0 code.karunya.edu:49692          code.karunya.edu:hbc           TIME_WAIT
tcp      0      0 code.karunya.edu:https         162.158.50.236:65212 ESTABLISHED
tcp      0      0 code.karunya.edu:https         162.158.167.4:40636 ESTABLISHED
tcp      0      0 code.karunya.edu:49694          code.karunya.edu:hbc           ESTABLISHED
tcp      0      0 code.karunya.edu:49674          code.karunya.edu:hbc           ESTABLISHED
tcp      0      0 code.karunya.edu:hbc           code.karunya.edu:49506   ESTABLISHED
tcp      0      0 code.karunya.edu:nfs          192.168.0.33:814    ESTABLISHED
```

(using netstat -lntu)

```
[urk17cs304@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:*
tcp     0      0 0.0.0.0:46053             0.0.0.0:*
tcp     0      0 0.0.0.0:111               0.0.0.0:*
tcp     0      0 0.0.0.0:80                0.0.0.0:*
tcp     0      0 0.0.0.0:20048             0.0.0.0:*
tcp     0      0 0.0.0.0:34067             0.0.0.0:*
tcp     0      0 0.0.0.0:22                0.0.0.0:*
tcp     0      0 0.0.0.0:3000              0.0.0.0:*
tcp     0      0 127.0.0.1:25              0.0.0.0:*
tcp     0      0 0.0.0.0:443               0.0.0.0:*
tcp6    0      0 :::2049                 :::*
tcp6    0      0 :::111                  :::*
tcp6    0      0 :::80                   :::*
tcp6    0      0 :::20048                :::*
tcp6    0      0 :::22                   :::*
tcp6    0      0 :::57431                :::*
tcp6    0      0 :::1:25                 :::*
tcp6    0      0 :::443                  :::*
tcp6    0      0 :::39228                :::*
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                :::*
[urk17cs304@code ~]$
```

(using **netstat --listen**)

```
[urk17cs304@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              0.0.0.0:*               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
7
Active UNIX domain sockets (only servers)
Proto RefCnt Flags       Type      State         I-Node Path
```

(using **netstat -vaun**)

```
[urk17cs304@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               :::*
[urk17cs304@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:

```
[urk17cs304@code ~]$ uptime
13:05:18 up 9 days,  1:25, 140 users,  load average: 0.01, 0.04, 0.05
[urk17cs304@code ~]$ █
```

```
[urk17cs304@code ~]$ cat /proc/meminfo
MemTotal:       8009044 kB
MemFree:        4990972 kB
MemAvailable:   6482604 kB
Buffers:         4180 kB
Cached:          1654260 kB
SwapCached:      0 kB
Active:          1272236 kB
Inactive:        732804 kB
Active(anon):   579992 kB
Inactive(anon): 161184 kB
Active(file):   692244 kB
Inactive(file): 571620 kB
Unevictable:     0 kB
Mlocked:         0 kB
SwapTotal:      7815164 kB
SwapFree:        7815164 kB
Dirty:           12 kB
Writeback:        0 kB
AnonPages:       346608 kB
Mapped:          65908 kB
Shmem:           394576 kB
Slab:            626604 kB
SReclaimable:    533736 kB
SUnreclaim:      92868 kB
KernelStack:     4192 kB
PageTables:      43108 kB
NFS_Unstable:    0 kB
Bounce:          0 kB
WritebackTmp:    0 kB
CommitLimit:    11819684 kB
Committed_AS:   67781292 kB
VmallocTotal:   34359738367 kB
VmallocUsed:    159784 kB
VmallocChunk:   34359341052 kB
Percpu:          1088 kB
HardwareCorrupted: 0 kB
AnonHugePages:   14336 kB
CmaTotal:        0 kB
CmaFree:         0 kB
HugePages_Total: 0
```

(using **top** command)

top - 13:08:53 up 9 days, 1:28, 140 users, load average: 0.10, 0.07, 0.05													
Tasks: 197 total, 1 running, 195 sleeping, 1 stopped, 0 zombie													
%Cpu(s): 0.1 us, 0.2 sy, 0.0 ni, 99.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st													
KiB Mem : 8009044 total, 4992028 free, 824856 used, 2192160 buff/cache													
KiB Swap: 7815164 total, 7815164 free, 0 used. 6483644 avail Mem													
PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND		
10925	root	20	0	64.8g	242632	13340	S	0.7	3.0	53:52.06	node		
517	root	20	0	64120	22752	22208	S	0.3	0.3	35:08.61	systemd-journal		
1209	root	20	0	1018160	14924	3676	S	0.3	0.2	13:37.98	dad		
1367	root	20	0	127132	2808	2228	S	0.3	0.0	0:59.22	cdawatch		
10946	nginx	20	0	128804	7048	2688	S	0.3	0.1	4:51.55	nginx		
32234	urk17cs+	20	0	164356	2536	1740	R	0.3	0.0	0:00.22	top		
1	root	20	0	192376	5248	2572	S	0.0	0.1	2:16.38	systemd		
2	root	20	0	0	0	0	S	0.0	0.0	0:00.54	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	0:15.49	ksoftirqd/0		
7	root	rt	0	0	0	0	S	0.0	0.0	0:02.07	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	7:07.88	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	0:03.87	watchdog/0		
12	root	rt	0	0	0	0	S	0.0	0.0	0:03.84	watchdog/1		
13	root	rt	0	0	0	0	S	0.0	0.0	0:10.58	migration/1		
14	root	20	0	0	0	0	S	0.0	0.0	0:02.25	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	0:03.70	watchdog/2		
18	root	rt	0	0	0	0	S	0.0	0.0	0:02.27	migration/2		
19	root	20	0	0	0	0	S	0.0	0.0	0:01.21	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	0:03.84	watchdog/3		
23	root	rt	0	0	0	0	S	0.0	0.0	0:11.12	migration/3		
24	root	20	0	0	0	0	S	0.0	0.0	0:02.57	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	0:00.54	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	integrityd		
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		

```
[urk17cs304@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:*
tcp      0      0 0.0.0.0:46053           0.0.0.0:*
tcp      0      0 0.0.0.0:111            0.0.0.0:*
tcp      0      0 0.0.0.0:80             0.0.0.0:*
tcp      0      0 0.0.0.0:20048          0.0.0.0:*
tcp      0      0 0.0.0.0:34067           0.0.0.0:*
tcp      0      0 0.0.0.0:22              0.0.0.0:*
tcp      0      0 0.0.0.0:3000            0.0.0.0:*
tcp      0      0 127.0.0.1:25            0.0.0.0:*
tcp      0      0 0.0.0.0:443             0.0.0.0:*
tcp      0      0 192.168.0.29:2049         192.168.0.32:989   ESTABLISHED
tcp      0      0 192.168.0.29:48584          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:2049         192.168.0.34:790   ESTABLISHED
tcp      0      0 192.168.0.29:48864          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:48422          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:47192          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48950  ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48452  ESTABLISHED
tcp      0      0 192.168.0.29:48996          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48920  ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48724  ESTABLISHED
tcp      0      0 192.168.0.29:443             162.158.165.236:39122 ESTABLISHED
tcp      0      0 192.168.0.29:48950          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:443             162.158.31.143:13596 ESTABLISHED
tcp      0      0 192.168.0.29:48920          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:443             162.158.50.231:22816 ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48996  ESTABLISHED
tcp      0      142 192.168.0.29:54696          192.168.2.27:3268   FIN_WAIT1
tcp      0      0 192.168.0.29:3000            192.168.0.29:47192  ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48584  ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48430  ESTABLISHED
tcp      0      48  192.168.0.29:443             162.158.31.162:17838 ESTABLISHED
tcp      0      0 192.168.0.29:443             162.158.167.181:29818 ESTABLISHED
tcp      0      0 192.168.0.29:443             162.158.31.146:16718 ESTABLISHED
tcp      0      0 192.168.0.29:3000            192.168.0.29:48438  ESTABLISHED
tcp      0      0 192.168.0.29:48430          192.168.0.29:3000  ESTABLISHED
tcp      0      0 192.168.0.29:48724          192.168.0.29:3000  ESTABLISHED
```

26.Display the date in Julian format

OUTPUT:

```
[urk17cs304@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
[urk17cs304@code ~]$ █
```

(alternate way)

```
[urk17cs304@code ~]$ echo $(date -d "2020/08/21" +%j)
234
[urk17cs304@code ~]$ █
```

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

OUTPUT:

```
[urk17cs304@code ~]$ w
14:43:20 up 9 days, 3:03, 140 users, load average: 0.00, 0.01, 0.05
USER     TTY     FROM             LOGIN@    IDLE   JCPU   PCPU WHAT
urk18cs1 pts/8   localhost        14:23    40.00s  0.29s  0.29s -bash
urk17cs3 pts/6   localhost        14:14    0.00s  0.09s  0.01s w
[urk17cs304@code ~]$ █
```

OR

```
[urk17cs304@code ~]$ who
urk18cs117 pts/8        2020-08-21 14:23 (localhost)
urk17cs304 pts/6        2020-08-21 14:14 (localhost)
[urk17cs304@code ~]$ █
```

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

OUTPUT:

```
[urk17cs304@code ~]$ free
      total        used        free      shared  buff/cache   available
Mem:    8009044     796324     5003800     410964     2208920     6495788
Swap:  7815164          0    7815164
[urk17cs304@code ~]$ cut -f1,4 free
cut: free: No such file or directory
[urk17cs304@code ~]$
```

```
[urk17cs304@code ~]$ free>mem.txt
[urk17cs304@code ~]$
```

```
[urk17cs304@code ~]$ cat mem.txt
      total        used        free      shared  buff/cache   available
Mem:    8009044     823884     4976296     410908     2208864     6468284
Swap:  7815164          0    7815164
[urk17cs304@code ~]$ cut -c 36-43 mem.txt
      free
4976296
7815164
[urk17cs304@code ~]$
```

29. Display the configuration information of your network

OUTPUT:

```
[urk17cs304@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    162.158.165.221:47784 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs     192.168.0.32:ftps-data ESTABLISHED
tcp      0      0 code.karunya.edu:48584    code.karunya.edu:hbc1 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs     192.168.0.34:790    ESTABLISHED
tcp      0      142 code.karunya.edu:55280   192.168.2.27:msft-gc FIN_WAIT1
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:49284 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:49458 ESTABLISHED
tcp      0      48 code.karunya.edu:https   162.158.31.162:62158 ESTABLISHED
tcp      0      0 code.karunya.edu:https   141.101.69.46:50004 ESTABLISHED
tcp      0      0 code.karunya.edu:37242    192.168.2.27:ldap    ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:48584 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:49598 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.167.181:29818 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.166.245:42558 ESTABLISHED
tcp      0      0 code.karunya.edu:49284    code.karunya.edu:hbc1 ESTABLISHED
tcp      0      0 code.karunya.edu:49598    code.karunya.edu:hbc1 ESTABLISHED
tcp      0      0 code.karunya.edu:https   162.158.50.236:65212 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:49506 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs     192.168.0.33:814    ESTABLISHED
tcp      0      0 code.karunya.edu:49392    code.karunya.edu:hbc1 ESTABLISHED
tcp      0      0 code.karunya.edu:hbc1    code.karunya.edu:49392 ESTABLISHED
tcp      0      0 code.karunya.edu:nfs     192.168.0:owamp-control ESTABLISHED
tcp      0      0 code.karunya.edu:49458    code.karunya.edu:hbc1 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/shutdownd
unix    3      [ ]        STREAM     CONNECTED    38945   /run/systemd/notify
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   -
```

30.Display the IP information under the command netstat

OUTPUT:

```
[urk17cs304@code ~]$ netstat -s
Ip:
    19982264 total packets received
    0 forwarded
    0 incoming packets discarded
    15812209 incoming packets delivered
    14354171 requests sent out
    744 outgoing packets dropped
Icmp:
    2007 ICMP messages received
    0 input ICMP message failed.
    ICMP input histogram:
        destination unreachable: 2004
        echo replies: 3
    1847 ICMP messages sent
    0 ICMP messages failed
    ICMP output histogram:
        destination unreachable: 1844
        echo request: 3
IcmpMsg:
    InType0: 3
    InType3: 2004
    OutType3: 1844
    OutType8: 3
Tcp:
    62950 active connections openings
    87466 passive connection openings
    24 failed connection attempts
    3289 connection resets received
    22 connections established
    15790481 segments received
    14392923 segments send out
    18452 segments retransmited
    12 bad segments received.
    6934 resets sent
Udp:
    17876 packets received
    1844 packets to unknown port received.
    0 packet receive errors
    19988 packets sent
```

Result:

The Linux commands to the given tasks were run successfully.