

UNIX File System & Permissions

1: Give the execute permission for the user for a file chap1.

```
chmod u+x chap1
```

2: Give execute permission for user, group and others for a file add.c

```
chmod a+x add.c
```

3: Remove the execute permission from user, give read permission to group and others for a file aa.c

```
chmod u-x,g+r,o+r aa.c
```

4: Give execute permission for users for a.c, kk.c, nato and myfile using single command.

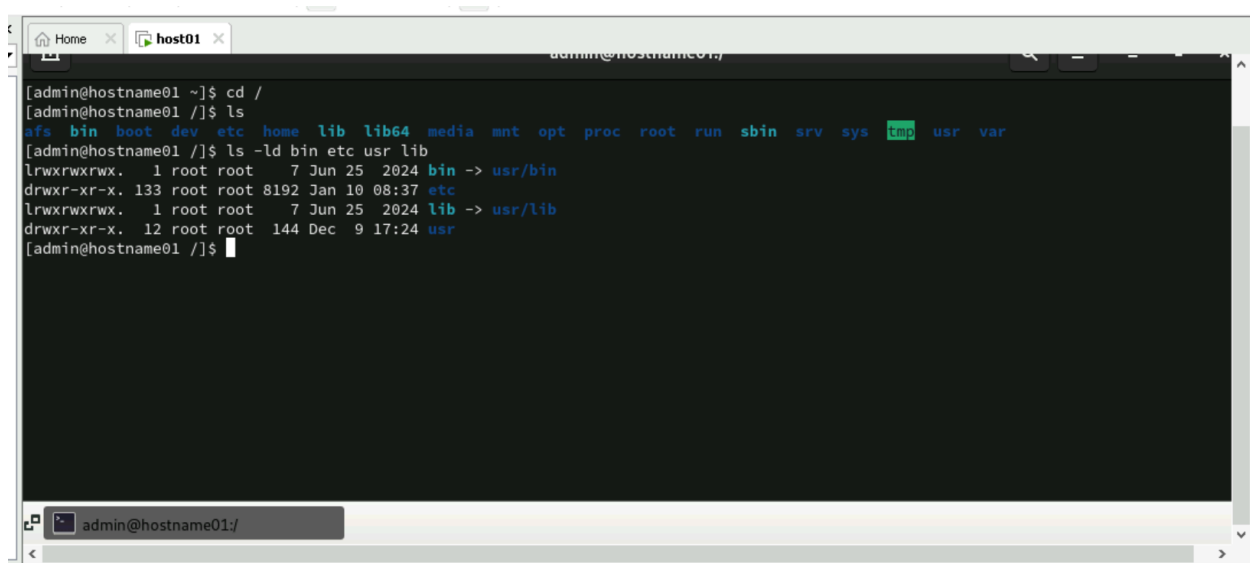
```
chmod u+x a.c kk.c nato myfile
```

5: Change the directory to root directory. Check the system directories, like bin, etc, usr etc.

```
cd /
```

```
ls
```

```
ls -ld bin etc usr lib
```

A terminal window titled 'host01' showing a user 'admin@hostname01' at the root directory. The user enters 'cd /' and 'ls', which lists system directories. Then, the user enters 'ls -ld bin etc usr lib', which shows detailed permissions for these directories. The output of 'ls' is: 'afs bin boot dev etc home lib lib64 media mnt opt proc root run sbin srv sys tmp usr var'. The output of 'ls -ld bin etc usr lib' is: 'lrwxrwxrwx. 1 root root 7 Jun 25 2024 bin -> usr/bin', 'drwxr-xr-x. 133 root root 8192 Jan 10 08:37 etc', 'lrwxrwxrwx. 1 root root 7 Jun 25 2024 lib -> usr/lib', and 'drwxr-xr-x. 12 root root 144 Dec 9 17:24 usr'.

```
[admin@hostname01 ~]$ cd /
[admin@hostname01 /]$ ls
afs bin boot dev etc home lib lib64 media mnt opt proc root run sbin srv sys tmp usr var
[admin@hostname01 /]$ ls -ld bin etc usr lib
lrwxrwxrwx. 1 root root 7 Jun 25 2024 bin -> usr/bin
drwxr-xr-x. 133 root root 8192 Jan 10 08:37 etc
lrwxrwxrwx. 1 root root 7 Jun 25 2024 lib -> usr/lib
drwxr-xr-x. 12 root root 144 Dec 9 17:24 usr
[admin@hostname01 /]$
```

Using Pipes and Filters

1: Redirect the content of the help document ls, into a file called as lsdoc.

```
man ls > lsdoc
```

2: Display the content of the lsdock page wise.

```
less lsdock
```

3: Display only the first 4 lines of the lsdock file.

```
head -n 4 lsdock
```

4: Display only the last 7 lines of the file lsdock.

```
tail -n 7 lsdock
```

5: Remove the file lsdock.

```
rm lsdock
```

6: There will be B'day celebration from the friends file, find how many B'day parties will be held. If two of the friends have the B'date on the same day, then we will be having one party on that day.

```
cut -d ' ' -f2 friends | sort | uniq | wc -l
```

7: Display the lines starting with Ma, in the file friends.

```
grep "^Ma" friends
```

8: Display the lines starting with Ma, ending with i or ending with id, in the file friends.

```
grep "^Ma" \(i\|id \|$\) friends
```

9: Print all the files and the directory files from the current directory across all the sub directories, along with its path

```
find . -type f -o -type d
```

10: Print only the Directory files.

```
find . -type d
```

11: Display the files starting with chap, along with its path.

```
find . -type f -name "chap*"
```

12: Sort the file friends in ascending order of names.

```
sort friends
```

13: Display the contents of the file friends in uppercase letters.

```
cat friends | tr '[:lower:]' '[:upper:]'
```

14: Store the contents of your home directory in a file called dir.

```
ls ~ > dir
```

15: From the above file dir, display the file permissions and the name of the file only.

```
ls -l ~ | awk '{print $1, $9}'
```

16: From the same dir file, store only the file names in a file called files.

```
awk '{print $9}' dir > files
```

17: From the same dir file, store only the permissions of files in a file called perms.

```
awk '{print $1}' dir > perms
```

18: From the same dir file, store only the file sizes in a file called sizes.

```
awk '{print $5}' dir > sizes
```

19: Display the file names, sizes and permissions from your directory in that order.

```
ls -l ~ | awk '{print $9, $5, $1}'
```

20: Display the number of users working on the system.

```
who | wc -l
```

21: Find out the smallest file in your directory.

```
ls -lS | grep -v '^d' | tail -1
```

22: Display the total number of lines present in the file friends.

```
wc -l friends
```

23: Create the following fixed record format files (with “|” delimiter between fields) with the structure given below, and populate them with relevant data use these files to solve following questions

emp.lst: Empid(4),Name(18),Designation(9),Dept(10),Date of Birth(8),Salary(5)

dept.lst: Dept.Code (2), Name (10), Head of Dept's id(4)

desig.lst: Designation Abbr.(2), Name (9)

```
cat > emp.lst << EOF
```

```
1001|John Smith      |Manager      |HR      |19800101|80000
1002|Jane Doe        |Engineer     |IT       |19900405|60000
1003|Sam Wilson      |Technician   |Maintenance|19880615|50000
EOF
```

```
cat >dept.list << EOF
```

```
HR|Human Resources|1001
```

IT|Information Technology|1002

MT|Maintenance|1003

EOF

cat > desig.lst << EOF

MN|Manager

EN|Engineer

TN|Technician

EOF

1. Find the record lengths of each file.

awk -F '|' '{print length(\$0)}' emp.lst dept.lst desig.lst

2. Display only the date of birth and salary of the last employee record.

tail -1 emp.lst | awk -F '|' '{print \$5,\$6}'

3. Extract only employee names and designations. (Use column specifications) Save output as cfile1.

cut -d '|' -f 2,3 emp.lst >cfile1

4. Extract Emp.id, dept, dob and salary. (Use field specifications). Save output as cfile2.

cut -d '|' -f 1,4,5,6 emp.lst >cfile2

5. Fix the files cfile1 and cfile2 laterally, along with the delimiter.

paste -d '|' cfile1 cfile2

6. Sort the emp.lst file in reverse order of Emp. Names.

sort -t '|' -k2r emp.lst

7. Sort the emp.lst file on the salary field, and store the result in file srtf.

sort -t '|' -k6 -n emp.lst > srtf

8. Sort the emp.lst file on designation followed by name.

sort -t '|' -k3,3 -k2,2 emp.lst

9. Sort the emp.lst file on the year of birth.

sort -t '|' -k5 emp.lst

10. Find out the various designations in the employee file. Eliminate duplicate

listing of designations.

```
cut -d '|' -f3 emp.lst | sort -u
```

11. Find the non-repeated designation in the employee file.

```
cut -d '|' -f3 emp.lst | sort | uniq -u
```

12. Find the number of employees with various designations in the employee file.

```
cut -d '|' -f3 emp.lst | sort | uniq -c
```

13. Create a listing of the years in which employees were born in, along with number of employees born in that year.

```
cut -d '|' -f5 emp.lst | cut -c1-4 | sort | uniq -u
```

14. Use nl command to create a code table for designations to include designation code (Start with dept. code 100, and subsequently 105, 110 ...).

```
nl -w3 -s '|' desig.lst
```

24: PCS has its offices at Pune, TTC and Mumbai. The employees' data is stored separately for each office. Create appropriate files (with same record structure as in previous assignment) and populate with relevant data.

- 1. List details about an employee 'Manu Sharma' in the Mumbai office.**

```
grep "Manu Sharma" Mumbai.lst
```
- 2. List only the Emp.Id. And Dept. of Manu Sharma.**

```
grep "Manu Sharma" Mumbai.lst | cut -d '|' -f1,4
```
- 3. List details of all managers in all offices. (O/P should not contain file names.).**

```
grep "Manager" Pune.lst TTC.lst Mumbai.lst
```
- 4. Find the number of S.E. in each office.**

```
grep "S.E." Pune.lst | wc -l  
grep "S.E." TTC.lst | wc -l  
grep "S.E." Mumbai.lst | wc -l
```

5. List only the Line Numbers and Employee names of employees in 'H/W' in Pune file.

```
grep -n "H/W" Pune.lst | cut -d ':' -f1,3
```

- 6. Obtain a listing of all employees other than those in 'HR' in the Mumbai file and save contents in a file 'nonhr'.**

```
grep -v "HR" Mumbai.lst > nonhr
```

- 7. Find the name and designation of the youngest person who is not a manager.**

```
grep -v "Manager" emp.lst | sort -t '|' -k5,5r | head -1 | cut -d '|' -f2,3
```

- 8. Display only the filename(s) in which details of employee by the name 'Seema Sharma' can be found.**

```
grep -l "Seema Sharma" *.lst
```

- 9. Locate the lines containing saxena and saksena in the Mumbai office.**

```
grep -iE "saxena|saksena" Mumbai.lst
```

- 10. Find the number of managers who earn between 50000 and 99999 in the Pune office.**

```
awk -F '|' '$3 ~ /Manager/ && $6 >= 50000 && $6 <= 99999' Pune.lst
```

- 11. List names of employees whose id is in the range 2000 – 2999: in Pune Office; in all offices.**

```
grep -E '^(20[0-9]{2}|1[89][0-9]{3}|2000-2999)' pune.lst
```

```
grep -E '^(20[0-9]{2}|1[89][0-9]{3}|2000-2999)' ttc.lst
```

```
grep -E '^(20[0-9]{2}|1[89][0-9]{3}|2000-2999)' mumbai.lst
```

- 12. Locate people having same month of birth as current month in Pune office.**

```
grep "$(date +%m)" Pune.lst
```

- 13. List details of all employees other than those of HR and Admin in file F1.**

```
grep -v -E 'HR|Admin' F1.lst
```

- 14. Locate for all Dwivedi, Trivedi, Chaturvedi in Pune file.**

```
grep -E 'Dwivedi|Trivedi|Chaturvedi' Pune.lst
```

- 15. Obtain a list of people in HR, Admin and Recr. depts. sorted in reverse order of the dept.**

```
grep -E 'HR|Admin|Recr.' *.lst | sort -t '|' -k4,4r
```

25: Write a command sequence that prints out date information in this order: time, day of week, day number, month, year :

13:44:42 IST Sun 16 Sept 1994

`date +%T %Z %a %d %b %Y"`

26: Write a command sequence that prints the names of the files in the current directory in the descending order of number of links.

`ls -l | sort -k2 -n -r | awk '{print $9}'`

27: Write a command sequence that prints only names of files in current working directory in alphabetical order.

`ls -l | sort`

28: Write a command sequence to print names and sizes of all the files in current working directory in order of size.

`ls -ls | awk '{print $9, $5}'`

29: Determine the latest file updated by the user.

`ls -lt | head -n 1`