Lab 1

Using sed utility

1- Display the lines that contain the word "lp" in /etc/passwd file.

```
localhost:~# sed -n '/lp/p' /etc/passwd
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
localhost:~#
```

2- Display /etc/passwd file except the third line.

```
localhost:~# sed '3d' /etc/passwd
root:x:0:0:root:/root:/bin/ash
bin:x:1:1:bin:/bin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
```

3- Display /etc/passwd file except the last line.

```
localhost:~# sed '$d' /etc/passwd
root:x:0:0:root:/root:/bin/ash
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
```

4- Display /etc/passwd file except the lines that contain the word "lp".

```
localhost:~# sed '/lp/d' /etc/passwd
root:x:0:0:root:/root:/bin/ash
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
sync:x:5:0:sync:/sbin:/bin/sync
```

5- Substitute all the words that contain "lp" with "mylp" in /etc/passwd file.

```
localhost:~# sed 's/\blp\b/mylp/g' /etc/passwd
root:x:0:0:root:/root:/bin/ash
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
mylp:x:4:7:mylp:/var/spool/lpd:/sbin/nologin
```

Using awk utility

1- Print full name (comment) of all users in the system.

```
localhost:~# awk -F: '{print $5}' /etc/passwd
root
bin
daemon
adm
lp
sync
shutdown
halt
mail
news
uucp
operator
man
postmaster
cron
```

2- Print login, full name (comment) and home directory of all users.(Print each line preceded by a line number)

```
localhost:~# awk -F: '{print NR, $1, $5, $6}' /etc/passwd
1 root root /root
2 bin bin /bin
3 daemon daemon /sbin
4 adm adm /var/adm
5 lp lp /var/spool/lpd
6 sync sync /sbin
7 shutdown shutdown /sbin
8 halt halt /sbin
9 mail mail /var/mail
10 news news /usr/lib/news
11 uucp uucp /var/spool/uucppublic
12 operator operator /root
13 man man /usr/man
```

3-   Print login, uid and full name (comment) of those uid is greater than 500

```
localhost:~# awk -F: '$3 > 500 {print $1, $3, $5}' /etc/passwd
nobody 65534 nobody
localhost:~#
```

4-   Print login, uid and full name (comment) of those uid is exactly 500

```
localhost:~# awk -F: '$3 == 500 {print $1, $3, $5}' /etc/passwd
```

5-   Print line from 5 to 15 from /etc/passwd

```
localhost:~# awk 'NR>=5 && NR<=15' /etc/passwd
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/mail:/sbin/nologin
news:x:9:13:news:/usr/lib/news:/sbin/nologin
uucp:x:10:14:uucp:/var/spool/uucppublic:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
man:x:13:15:man:/usr/man:/sbin/nologin
postmaster:x:14:12:postmaster:/var/mail:/sbin/nologin
cron:x:16:16:cron:/var/spool/cron:/sbin/nologin
```

6-   Change lp to mylp

```
localhost:~# awk 'gsub(/lp/, "mylp")' /etc/passwd
mylp:x:4:7:mylp:/var/spool/mylpd:/sbin/nologin
```

7-   Print all information about greatest uid.

```
localhost:~# awk -F: '$3 > max {max = $3; line = $0} END {print line}' /etc/pass
wd
nobody:x:65534:65534:nobody:/:/sbin/nologin
```

8-   Get the sum of all accounts id's.

```
localhost:~# awk -F: '{sum += $3} END {print sum}' /etc/passwd
66922
localhost:~#
```

Bonus

1- Get the sum of accounts id's that has the same group.

awk -F: '{sum[$4] += $3} END {for (group in sum) print "Group " group ": " sum[group]}' /etc/passwd

This command calculates the sum of UID ($3) for each group ($4) in the /etc/passwd file.

1- Reads each line in the /etc/passwd file.	awk '{ ... }' /etc/passwd
2- Extracts the user ID and group ID from the line.	-F: '{ ... }'
3- Adds the user ID to the sum of user IDs for the corresponding group.	'{sum[$4] += $3}'
4- After reading the entire file, prints the sum of user IDs for each group.	'END {for (group in sum) print "Group " group ": " sum[group]}'

2- Make the following report:
User-Group Report

Group1 Name:
  User1
  User2
Group2 Name:
  User3
  User4

  .

  .

  .

  .

```
awk -F: '{
   users[$4] = users[$4] $1 "\n";
}
END {
   printf "User-Group Report\n-------------------------\n";
   for (group in users) {
      printf "%s Name:\n", group;
      printf "%s", users[group];
   }
}' /etc/passwd
```

This script reads the /etc/passwd file, groups users by their group ID, and then outputs a report showing each group and its associated users.