Bash Lab1

Q1: Display the lines that contain the word "lp" in `/etc/passwd` file:

```
[esraatark@localhost ~]$ sed -n '/lp/p' /etc/passwd
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
flatpak:x:988:988:User for flatpak system helper:/:/sbin/nologin
[esraatark@localhost ~]$
```

Q2: Display /etc/passwd file except the third line:

```
[esraatark@localhost ~]$ sed '3d' /etc/passwd
root:x:0:0:root:/root:/bin/bash
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
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:65534:65534:Kernel Overflow User:/:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:998:996:User for polkitd:/:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
geoclue:x:997:995:User for geoclue:/var/lib/geoclue:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/:/sbin/nologin
pipewire:x:996:993:PipeWire System Daemon:/run/pipewire:/usr/sbin/nologin
libstoragemgmt:x:990:990:daemon account for libstoragemgmt:/:/usr/sbin/nologin
cockpit-wsinstance:x:989:989:User for cockpit-ws instances:/nonexisting:/sbin/no
```

Q3: Display /etc/passwd file except the last line:

```
[esraatark@localhost ~]$ sed '$d' /etc/passwd
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:65534:65534:Kernel Overflow User:/:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:998:996:User for polkitd:/:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
geoclue:x:997:995:User for geoclue:/var/lib/geoclue:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/:/sbin/nologin
```

Q4: Display /etc/passwd file except the lines that contain the word "lp":

```
[esraatark@localhost ~]$ sed '/lp/p' /etc/passwd
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
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
```

Q5: Substitute all the words that contain "lp" with "mylp" in /etc/passwd file:

```
[esraatark@localhost ~]$ sed 's/lp/mylp/g' /etc/passwd
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
mylp:x:4:7:mylp:/var/spool/mylpd:/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
```

Q1: Print full name (comment) of all users in the system:

```
[esraatark@localhost ~]$ awk -F: '{print $5}' /etc/passwd
root
bin
daemon
adm
lp
sync
shutdown
halt
mail
operator
games
FTP User
Kernel Overflow User
Account used for TPM access
systemd Core Dumper
System message bus
User for polkitd
Avahi mDNS/DNS-SD Stack
User for geoclue
RealtimeKit
PipeWire System Daemon
daemon account for libstoragemgmt
User for cockpit-ws instances
```

Q2: Print login, full name (comment) and home directory of all users.(Print each line preceded by a line number)

```
[esraatark@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/spool/mail
10. operator operator /root
11. games games /usr/games
12. ftp FTP User /var/ftp
13. nobody Kernel Overflow User /
14. tss Account used for TPM access /
15. systemd-coredump systemd Core Dumper /
16. dbus System message bus /
17. polkitd User for polkitd /
18. avahi Avahi mDNS/DNS-SD Stack /var/run/avahi-daemon
```

Q3: Print login, uid and full name (comment) of those uid is greater than 500

```
[esraatark@localhost ~]$ awk -F: '{if ($3 > 500) print $1, $3, $5}' /etc/passwd
nobody 65534 Kernel Overflow User
systemd-coredump 999 systemd Core Dumper
polkitd 998 User for polkitd
geoclue 997 User for geoclue
pipewire 996 PipeWire System Daemon
libstoragemgmt 990 daemon account for libstoragemgmt
cockpit-wsinstance 989 User for cockpit-ws instances
flatpak 988 User for flatpak system helper
colord 987 User for colord
setroubleshoot 986 SELinux troubleshoot server
clevis 985 Clevis Decryption Framework unprivileged user
sssd 984 User for sssd
gnome-initial-setup 983
dnsmasq 982 Dnsmasq DHCP and DNS server
chrony 981 chrony system user
esraatark 1000 esraa tark
eslam 1001 Islam Askar
islam 1002 Islam Askar
[esraatark@localhost ~]$
```

Q4: Print login, uid and full name (comment) of those uid is exactly 500

```
[esraatark@localhost ~]$ awk -F: '{if ($3 == 500) print $1, $3, $5}' /etc/passwd
```

Q5: Print line from 5 to 15 from /etc/passwd

```
[esraatark@localhost ~]$ awk '{if(NR >= 5 && NR <= 15) print $0}' /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/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:65534:65534:Kernel Overflow User:/:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/nologin
```

Q6: Change lp to mylp

```
[esraatark@localhost ~]$ awk '{if ($0 ~ /lp/) gsub(/lp/, "mylp"); print $0}' /etc/passwd
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
mylp:x:4:7:mylp:/var/spool/mylpd:/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:65534:65534:Kernel Overflow User:/:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:998:996:User for polkitd:/:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
geoclue:x:997:995:User for geoclue:/var/lib/geoclue:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/:/sbin/nologin
pipewire:x:996:993:PipeWire System Daemon:/run/pipewire:/usr/sbin/nologin
libstoragemgmt:x:990:990:daemon account for libstoragemgmt:/:/usr/sbin/nologin
cockpit-wsinstance:x:989:989:User for cockpit-ws instances:/nonexisting:/sbin/nologin
```

Q7: Print all information about greatest uid.

```
[esraatark@localhost ~]$ awk -F: 'BEGIN {max_uid=0} {if ($3 > max_uid) {max_uid=$3; max_line=$0}} END {print max_line}'
/etc/passwd
nobody:x:65534:65534:Kernel Overflow User:/:/sbin/nologin
```

Q8: Get the sum of all accounts id's.

```
[esraatark@localhost ~]$ awk -F: 'BEGIN {sum = 0} {sum += $3} END {print "Sum of UIDs:", sum}' /etc/passwd
Sum of UIDs: 83025
```

Bonus

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

```
esraatark@localhost ~]$ awk -F: '{gid_sum[$4]+=$3} END {for (gid in gid_sum) print "Group ID:", gid, "Sum of UIDs:", gid
_sum[gid]}' /etc/passwd
Group ID: 0 Sum of UIDs: 29
Group ID: 1 Sum of UIDs: 1
Group ID: 2 Sum of UIDs: 2
Group ID: 4 Sum of UIDs: 3
Group ID: 7 Sum of UIDs: 4
Group ID: 12 Sum of UIDs: 8
Group ID: 42 Sum of UIDs: 42
Group ID: 50 Sum of UIDs: 14
Group ID: 59 Sum of UIDs: 59
Group ID: 70 Sum of UIDs: 70
Group ID: 72 Sum of UIDs: 72
Group ID: 74 Sum of UIDs: 74
Group ID: 81 Sum of UIDs: 81
Group ID: 100 Sum of UIDs: 12
Group ID: 172 Sum of UIDs: 172
Group ID: 981 Sum of UIDs: 981
Group ID: 982 Sum of UIDs: 982
Group ID: 983 Sum of UIDs: 983
Group ID: 984 Sum of UIDs: 984
Group ID: 985 Sum of UIDs: 985
Group ID: 986 Sum of UIDs: 986
Group ID: 987 Sum of UIDs: 987
Group ID: 988 Sum of UIDs: 988
Group ID: 989 Sum of UIDs: 989
Group ID: 990 Sum of UIDs: 990
Group ID: 993 Sum of UIDs: 996
Group ID: 995 Sum of UIDs: 997
```

2. Make the following report:

```
[esraatark@localhost ~]$ awk -F: '{group_users[$4]=group_users[$4] "\n  " $1} END {print "User-Group Report\n----------
----------------"; for (gid in group_users) {print "Group ID:", gid, group_users[gid]}}' /etc/passwd
User-Group Report
--------------------------
Group ID: 0
  root
  sync
  shutdown
  halt
  operator
Group ID: 1
  bin
Group ID: 2
  daemon
Group ID: 4
  adm
Group ID: 7
  lp
Group ID: 12
  mail
Group ID: 42
  gdm
Group ID: 50
  ftp
```

Esraa tark foda - OS