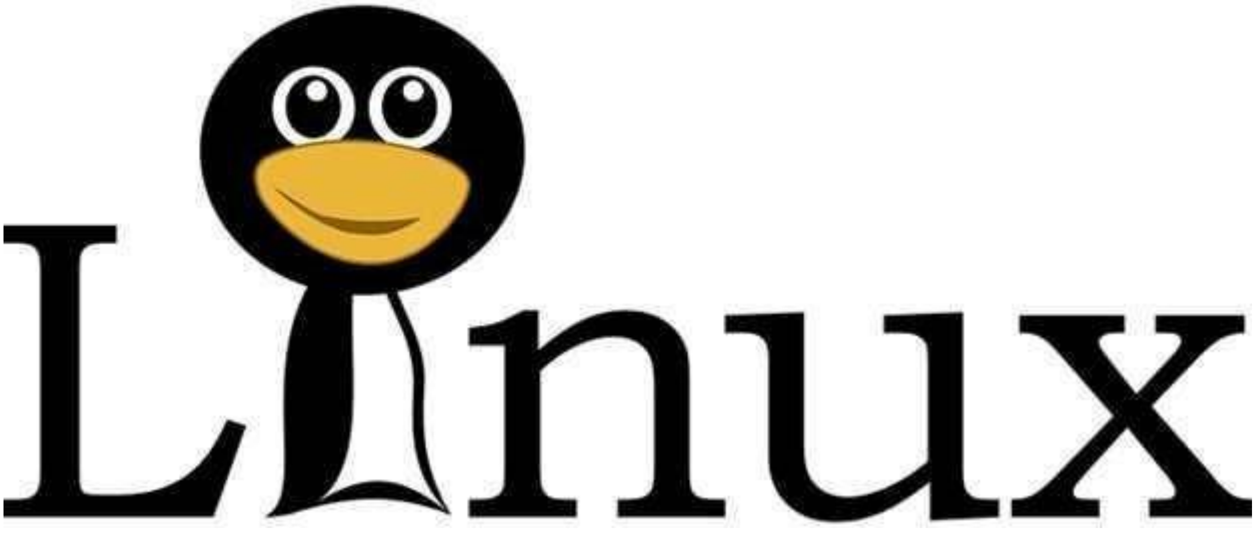
Name:- Akshat Jangid
Batch:- TR1

Assignment-2 Solutions



Assignment - 2

Points Covered in this Assignment-2

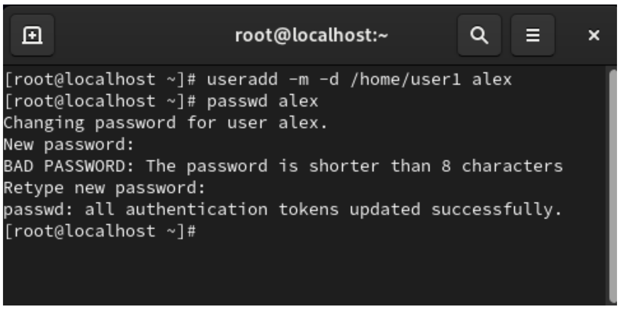
1. **User Administration**
   - Authentication, Authorization, and Auditing
2. **Commands to Learn**
   - useradd, passwd, userdel, usermod
   - groupadd, groupdel, groupmod
   - su and su -with examples
3. **User and Group Information**
   - User and group information files
   - Password information files
4. **Password Policies**
   - chage command and its options
5. **User Monitoring and Auditing**
   - Commands: w, last, lastb
6. **Sudo Power**
   - wheel group
7. **Default Configuration Files**
   - /etc/default/useradd
   - /etc/login.defs
   - /etc/security/limits.conf

---

1. Create some users:

- Named **"alex"** with its home directory at **/home/user1** and give password **"pass1".**

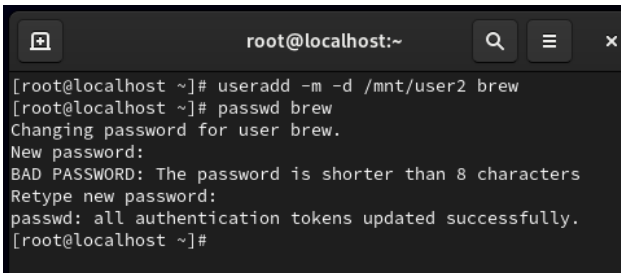
Ans.



```
[root@localhost ~]# useradd -m -d /home/user1 alex
[root@localhost ~]# passwd alex
Changing password for user alex.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost ~]#
```

- Named **"brew"** with its home directory at **/mnt/user2** and give password **"pass2".**

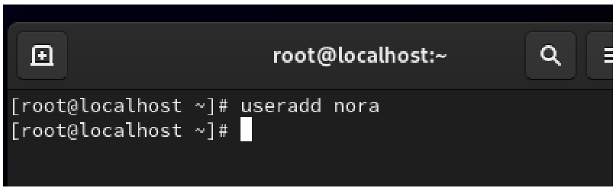
Ans.



```
[root@localhost ~]# useradd -m -d /mnt/user2 brew
[root@localhost ~]# passwd brew
Changing password for user brew.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost ~]#
```

- Named **“nora”** without its home directory

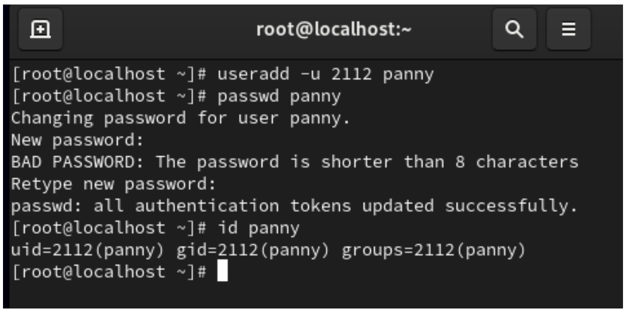
Ans.



```
[root@localhost ~]# useradd nora
[root@localhost ~]#
```

- Named **“panny”** with custom UID **2112,** and assign password **“pass-4”**

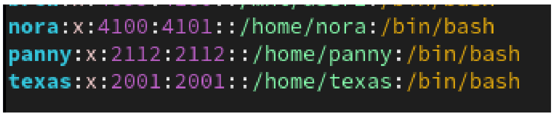
Ans.



```
[root@localhost ~]# useradd -u 2112 panny
[root@localhost ~]# passwd panny
Changing password for user panny.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost ~]# id panny
uid=2112(panny) gid=2112(panny) groups=2112(panny)
[root@localhost ~]#
```

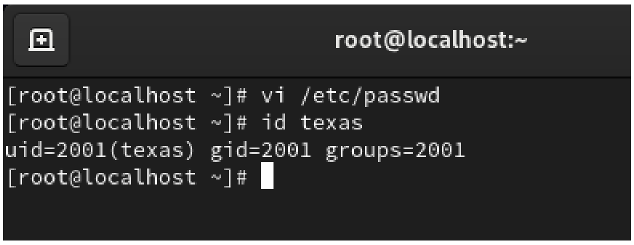
- Named **'texas'** without using the **useradd** or **adduser** commands.

Ans.



```
nora:x:4100:4101::/home/nora:/bin/bash
panny:x:2112:2112::/home/panny:/bin/bash
texas:x:2001:2001::/home/texas:/bin/bash
```

Added “ texas:x:2001:2001::/home/texas:/bin/bash “ directly in /etc/passwd



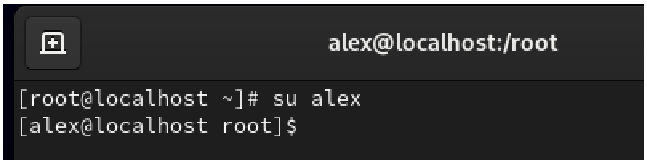
```
[root@localhost ~]# vi /etc/passwd
[root@localhost ~]# id texas
uid=2001(texas) gid=2001 groups=2001
[root@localhost ~]#
```

**(Hint: Make changes in the 7 user configuration files)*

2. Log in as user alex using the **su** and **su -** commands, and explain their differences.

Ans.

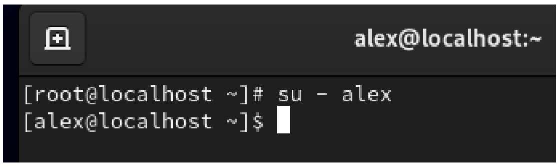
su alex



```
[root@localhost ~]# su alex
[alex@localhost root]$
```

After running the command, it will prompt you to enter the password for the user alex. Once authenticated, you will switch to the alex user, but **you will remain in the current working directory** of the previous user.

su – alex



```
[root@localhost ~]# su - alex
[alex@localhost ~]$
```

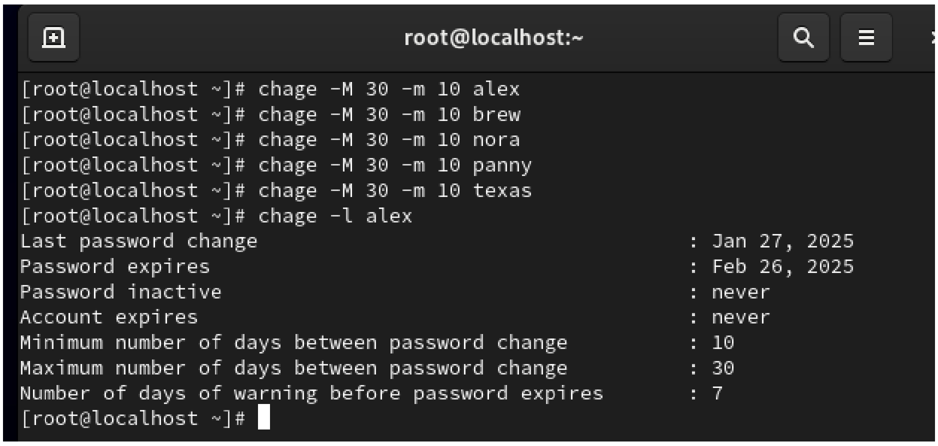
After running the command, it will prompt you to enter the password for the user alex. Once authenticated, you will switch to the alex user and **load their full login environment**, just like a fresh login.

Comparison:

Feature	**su**	**su -**
Environment Variables	Retains the current user's environment.	Loads the target user's environment.
Current Working Directory	Remains in the original user's directory.	Switches to the target user's home directory.
PATH Variable	Uses the original user's PATH.	Uses the target user's PATH.
Purpose	Partial switch for quick tasks.	Full switch for working as the target user.

3. Set a password policy for all above users with the following requirements:
   - The maximum password age should be 30 days, and the minimum password age should be 10 days.

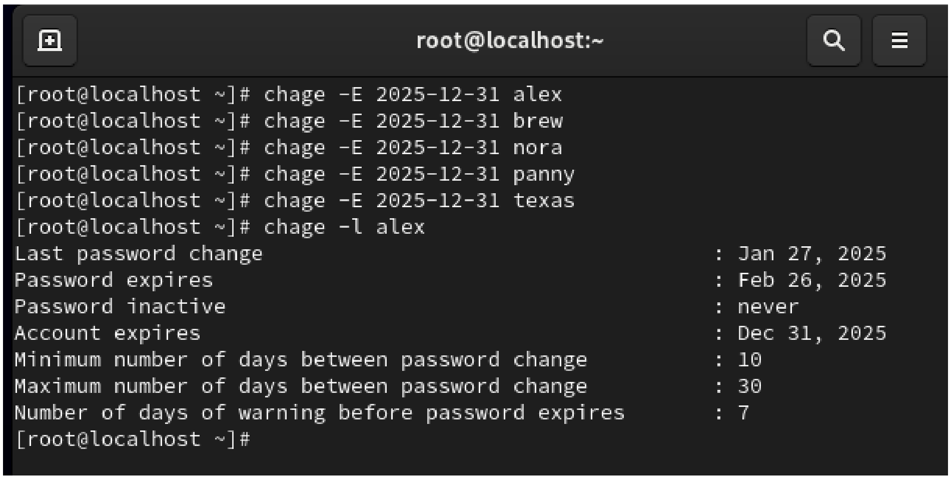
Ans.



```
[root@localhost ~]# chage -M 30 -m 10 alex
[root@localhost ~]# chage -M 30 -m 10 brew
[root@localhost ~]# chage -M 30 -m 10 nora
[root@localhost ~]# chage -M 30 -m 10 panny
[root@localhost ~]# chage -M 30 -m 10 texas
[root@localhost ~]# chage -l alex
Last password change                                    : Jan 27, 2025
Password expires                                        : Feb 26, 2025
Password inactive                                       : never
Account expires                                         : never
Minimum number of days between password change          : 10
Maximum number of days between password change          : 30
Number of days of warning before password expires       : 7
[root@localhost ~]# 
```

   - Set the password expiry date for all users to December 31, 2025.

Ans.

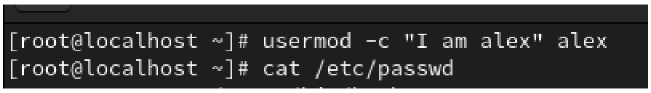


```
[root@localhost ~]# chage -E 2025-12-31 alex
[root@localhost ~]# chage -E 2025-12-31 brew
[root@localhost ~]# chage -E 2025-12-31 nora
[root@localhost ~]# chage -E 2025-12-31 panny
[root@localhost ~]# chage -E 2025-12-31 texas
[root@localhost ~]# chage -l alex
Last password change                                    : Jan 27, 2025
Password expires                                        : Feb 26, 2025
Password inactive                                       : never
Account expires                                         : Dec 31, 2025
Minimum number of days between password change          : 10
Maximum number of days between password change          : 30
Number of days of warning before password expires       : 7
[root@localhost ~]#
```

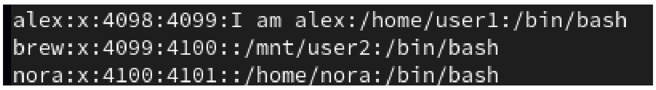
4. Modify the user "alex":

- Add a comment: "I am alex"

Ans.



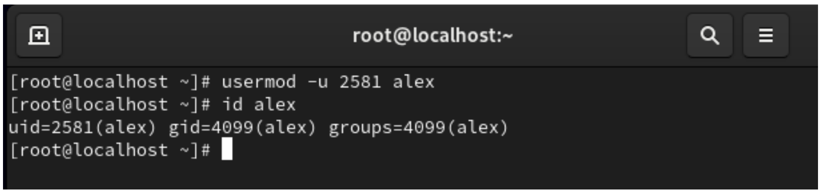
```
[root@localhost ~]# usermod -c "I am alex" alex
[root@localhost ~]# cat /etc/passwd
```



```
alex:x:4098:4099:I am alex:/home/user1:/bin/bash
brew:x:4099:4100::/mnt/user2:/bin/bash
nora:x:4100:4101::/home/nora:/bin/bash
```

- Change the UID to 2581

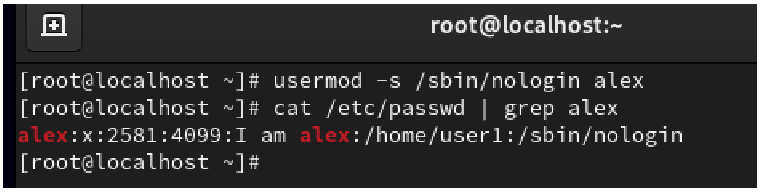
Ans.



```
[root@localhost ~]# usermod -u 2581 alex
[root@localhost ~]# id alex
uid=2581(alex) gid=4099(alex) groups=4099(alex)
[root@localhost ~]#
```

- Change the shell to "nologin"

Ans.

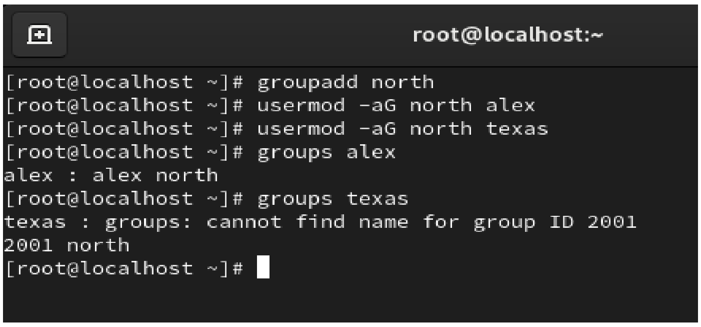


```
[root@localhost ~]# usermod -s /sbin/nologin alex
[root@localhost ~]# cat /etc/passwd | grep alex
alex:x:2581:4099:I am alex:/home/user1:/sbin/nologin
[root@localhost ~]#
```

5. Create group with following configuration:

   - Named “**north**” with secondary group member “alex” & “texas”.

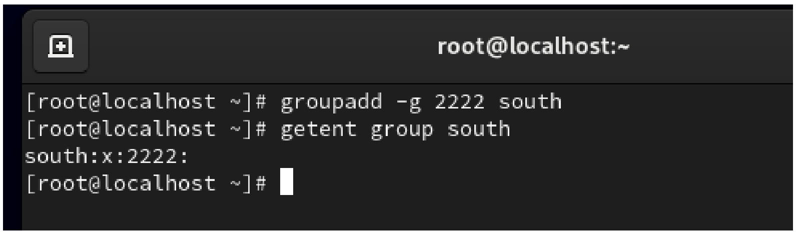
   Ans.



```
[root@localhost ~]# groupadd north
[root@localhost ~]# usermod -aG north alex
[root@localhost ~]# usermod -aG north texas
[root@localhost ~]# groups alex
alex : alex north
[root@localhost ~]# groups texas
texas : groups: cannot find name for group ID 2001
2001 north
[root@localhost ~]#
```

   - Named “**south**” with GID “2222”.

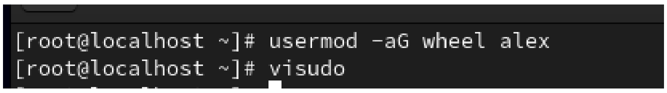
   Ans.



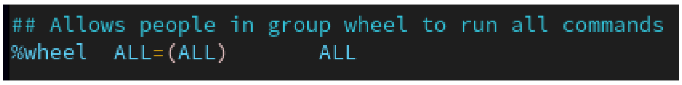
```
[root@localhost ~]# groupadd -g 2222 south
[root@localhost ~]# getent group south
south:x:2222:
[root@localhost ~]#
```

6. Grant user **Alex** administrative privileges through the wheel group so that Alex can add Panny to the admin group without requiring root access.

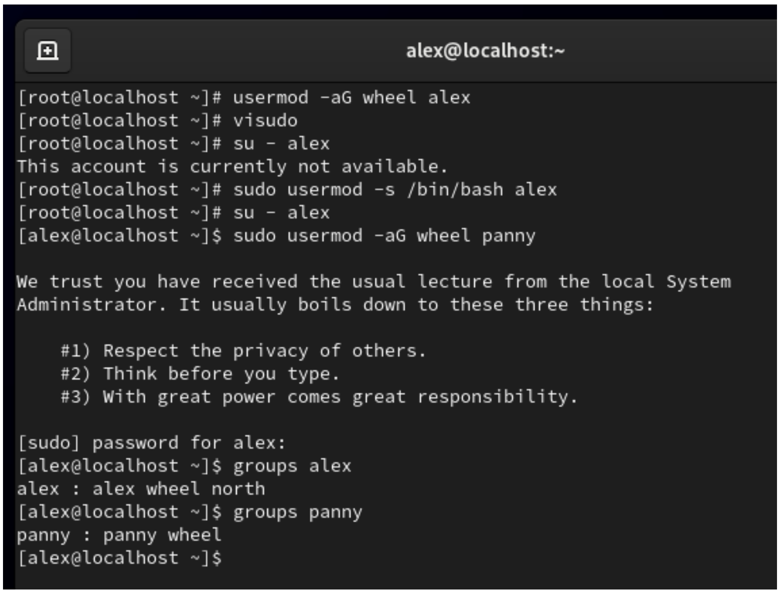
Ans.



```
[root@localhost ~]# usermod -aG wheel alex
[root@localhost ~]# visudo
```



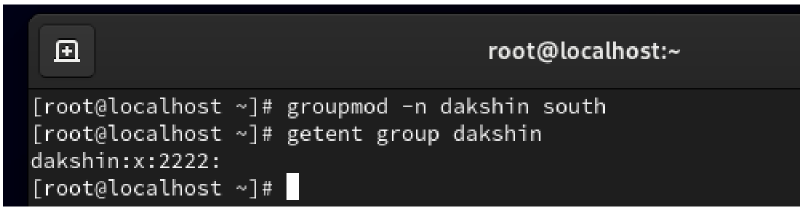
```
## Allows people in group wheel to run all commands
%wheel  ALL=(ALL)       ALL
```



```
[root@localhost ~]# usermod -aG wheel alex
[root@localhost ~]# visudo
[root@localhost ~]# su - alex
This account is currently not available.
[root@localhost ~]# sudo usermod -s /bin/bash alex
[root@localhost ~]# su - alex
[alex@localhost ~]$ sudo usermod -aG wheel panny

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for alex:
[alex@localhost ~]$ groups alex
alex : alex wheel north
[alex@localhost ~]$ groups panny
panny : panny wheel
[alex@localhost ~]$
```

7. Change the group name from “**south**” to “**dakshin**”.

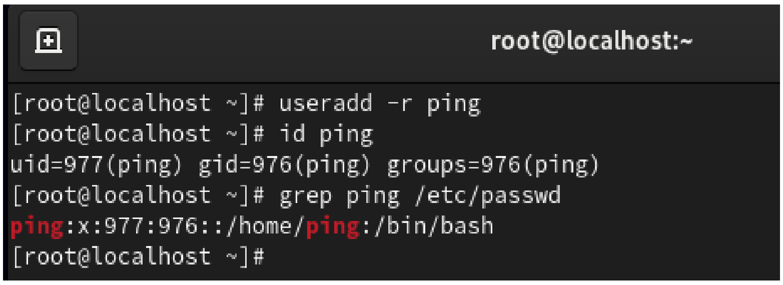
Ans.



```
[root@localhost ~]# groupmod -n dakshin south
[root@localhost ~]# getent group dakshin
dakshin:x:2222:
[root@localhost ~]#
```

8. Create a system user named “**ping**” and check its UID.

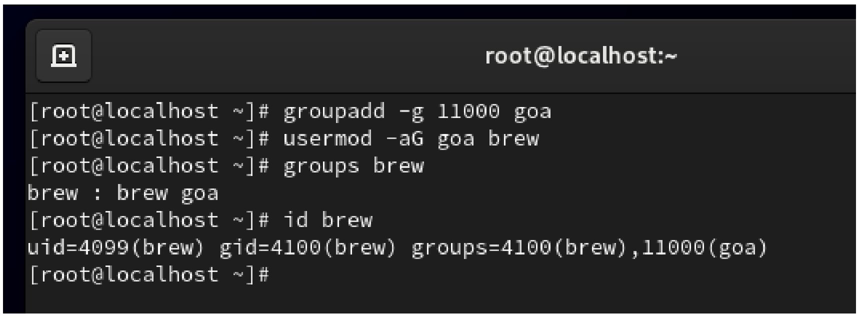
Ans.



```
[root@localhost ~]# useradd -r ping
[root@localhost ~]# id ping
uid=977(ping) gid=976(ping) groups=976(ping)
[root@localhost ~]# grep ping /etc/passwd
ping:x:977:976::/home/ping:/bin/bash
[root@localhost ~]#
```

9. Create a group named **goa** with GID 11000. Set this group as the supplementary group for “**brew**”

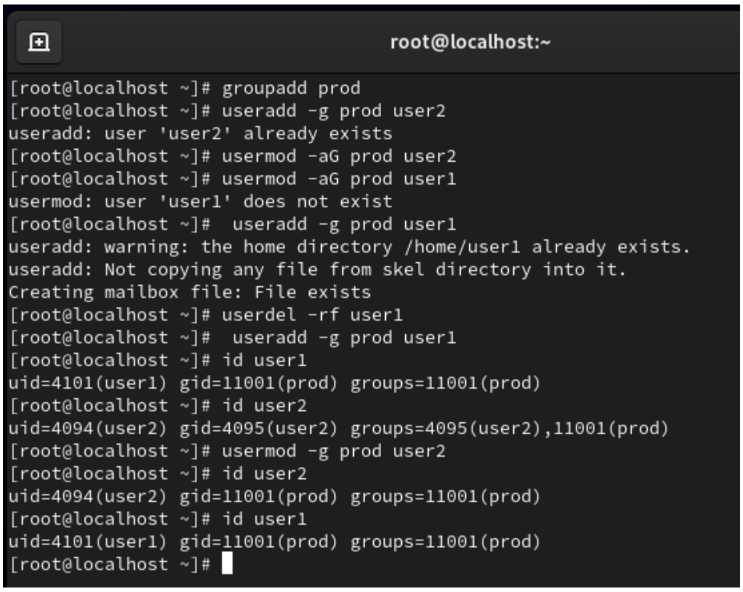
Ans.



```
[root@localhost ~]# groupadd -g 11000 goa
[root@localhost ~]# usermod -aG goa brew
[root@localhost ~]# groups brew
brew : brew goa
[root@localhost ~]# id brew
uid=4099(brew) gid=4100(brew) groups=4100(brew),11000(goa)
[root@localhost ~]#
```

10. Create a group named **"prod"**. Then, create two users, user2 and user1, and set both the user's primary group to **prod**.

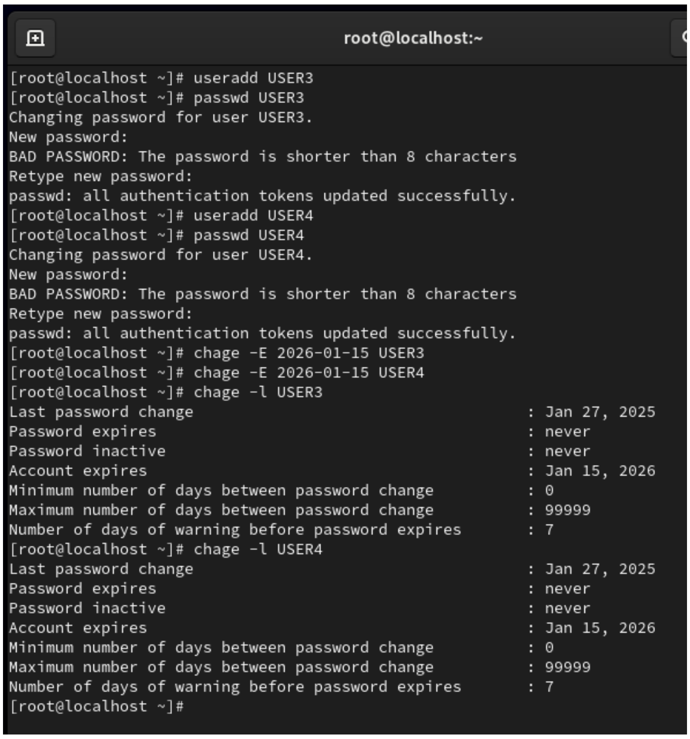
Ans.



```
[root@localhost ~]# groupadd prod
[root@localhost ~]# useradd -g prod user2
useradd: user 'user2' already exists
[root@localhost ~]# usermod -aG prod user2
[root@localhost ~]# usermod -aG prod user1
usermod: user 'user1' does not exist
[root@localhost ~]#  useradd -g prod user1
useradd: warning: the home directory /home/user1 already exists.
useradd: Not copying any file from skel directory into it.
Creating mailbox file: File exists
[root@localhost ~]# userdel -rf user1
[root@localhost ~]#  useradd -g prod user1
[root@localhost ~]# id user1
uid=4101(user1) gid=11001(prod) groups=11001(prod)
[root@localhost ~]# id user2
uid=4094(user2) gid=4095(user2) groups=4095(user2),11001(prod)
[root@localhost ~]# usermod -g prod user2
[root@localhost ~]# id user2
uid=4094(user2) gid=11001(prod) groups=11001(prod)
[root@localhost ~]# id user1
uid=4101(user1) gid=11001(prod) groups=11001(prod)
[root@localhost ~]#
```

11. **Change the password policy** for the USER3 and USER4 accounts to expire on 2026-01-15.

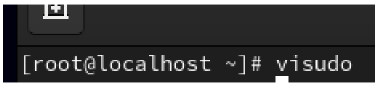
Ans.



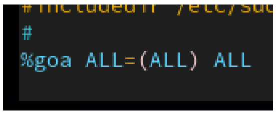
```
[root@localhost ~]# useradd USER3
[root@localhost ~]# passwd USER3
Changing password for user USER3.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost ~]# useradd USER4
[root@localhost ~]# passwd USER4
Changing password for user USER4.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[root@localhost ~]# chage -E 2026-01-15 USER3
[root@localhost ~]# chage -E 2026-01-15 USER4
[root@localhost ~]# chage -l USER3
Last password change                                    : Jan 27, 2025
Password expires                                        : never
Password inactive                                       : never
Account expires                                         : Jan 15, 2026
Minimum number of days between password change          : 0
Maximum number of days between password change          : 99999
Number of days of warning before password expires       : 7
[root@localhost ~]# chage -l USER4
Last password change                                    : Jan 27, 2025
Password expires                                        : never
Password inactive                                       : never
Account expires                                         : Jan 15, 2026
Minimum number of days between password change          : 0
Maximum number of days between password change          : 99999
Number of days of warning before password expires       : 7
[root@localhost ~]#
```

12. **Configure administrative rights** for all members of the **Goa** group to execute any command as any user.

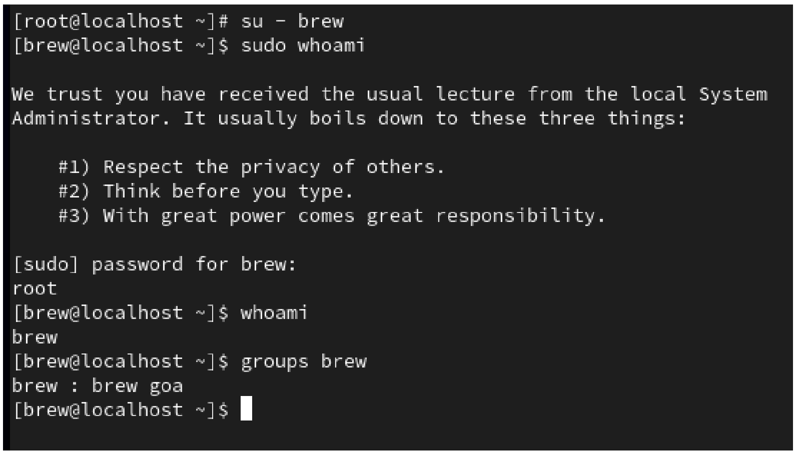
Ans.



```
[root@localhost ~]# visudo
```



```
#includedir /etc/sud
#
%goa ALL=(ALL) ALL
```



```
[root@localhost ~]# su - brew
[brew@localhost ~]$ sudo whoami

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for brew:
root
[brew@localhost ~]$ whoami
brew
[brew@localhost ~]$ groups brew
brew : brew goa
[brew@localhost ~]$ 
```

13. How would you check all failed login attempts on the system from the last 10 days? Write the command and display the output.

Ans.

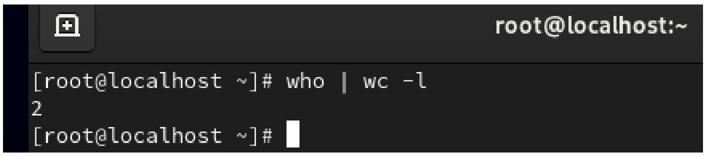
To check all failed login attempts on the system from the last 10 days, we can use the journalctl command, which can retrieve logs related to authentication attempts from the systemd journal. Alternatively, you can use the faillog command or check the /var/log/auth.log (or /var/log/secure on some systems).

journalctl -u sshd --since "10 days ago" | grep "Failed"

14. How would you determine how many users are currently logged into the system? Write the command to achieve this.

Ans.

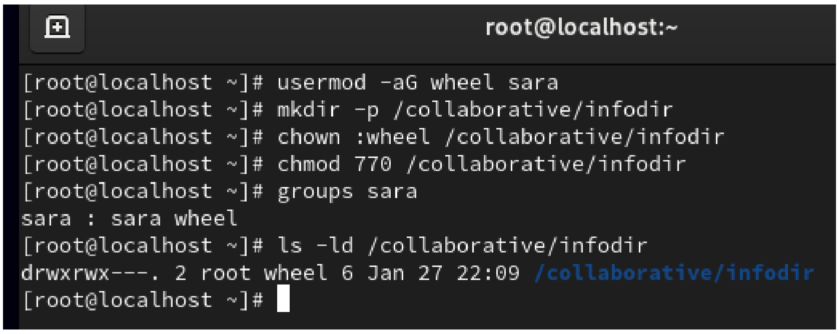
To determine how many users are currently logged into the system, we can use the who or w command. Both commands provide information about logged-in users, but the who command is more focused on listing users.



```
[root@localhost ~]# who | wc -l
2
[root@localhost ~]# 
```

15. Add the user "**sara**" to the "wheel" group and create a collaborative directory /collaborative/infodir.

Ans.

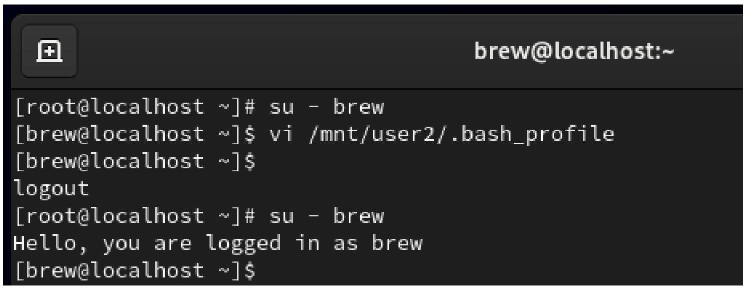


```
[root@localhost ~]# usermod -aG wheel sara
[root@localhost ~]# mkdir -p /collaborative/infodir
[root@localhost ~]# chown :wheel /collaborative/infodir
[root@localhost ~]# chmod 770 /collaborative/infodir
[root@localhost ~]# groups sara
sara : sara wheel
[root@localhost ~]# ls -ld /collaborative/infodir
drwxrwx---. 2 root wheel 6 Jan 27 22:09 /collaborative/infodir
[root@localhost ~]# 
```

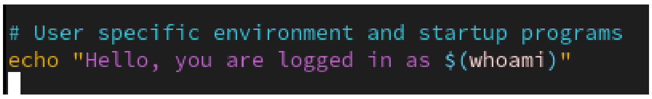
16. Configure login/logout messages:

- When you log in with a new user, display a message: "Hello, you are logged in as USER" (where USER is replaced with the logged-in username).

Ans.



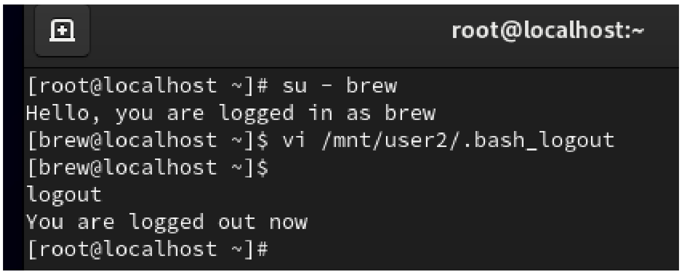
```
[root@localhost ~]# su - brew
[brew@localhost ~]$ vi /mnt/user2/.bash_profile
[brew@localhost ~]$
logout
[root@localhost ~]# su - brew
Hello, you are logged in as brew
[brew@localhost ~]$
```



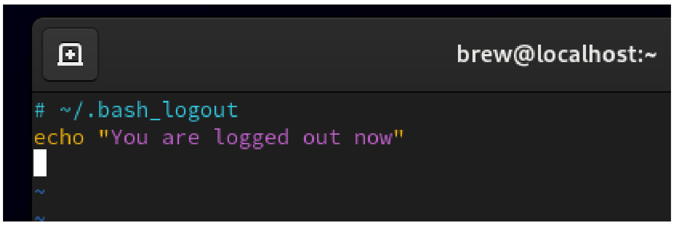
```
# User specific environment and startup programs
echo "Hello, you are logged in as $(whoami)"
```

- When you log out, display: "You are logged out now".

Ans.



```
[root@localhost ~]# su - brew
Hello, you are logged in as brew
[brew@localhost ~]$ vi /mnt/user2/.bash_logout
[brew@localhost ~]$
logout
You are logged out now
[root@localhost ~]#
```

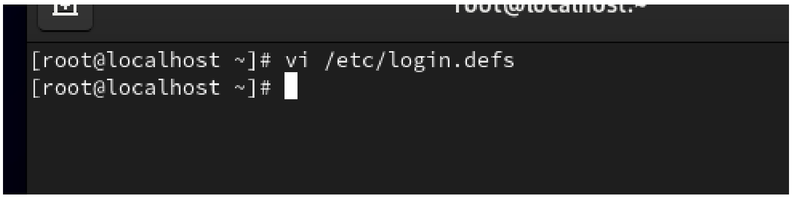


```
# ~/.bash_logout
echo "You are logged out now"
```

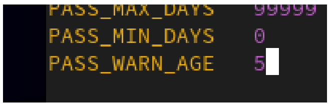
17. Configure system parameters for newly created users:

- Warning period for password expiry: 5 days

Ans.



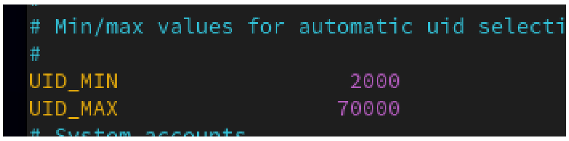
```
[root@localhost ~]# vi /etc/login.defs
[root@localhost ~]#
```



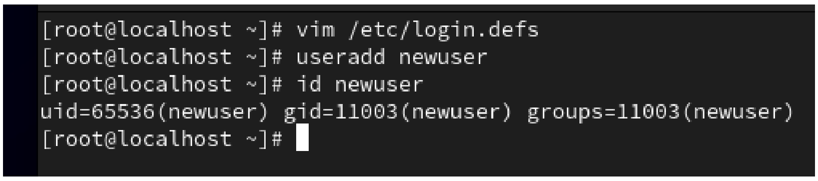
```
PASS_MAX_DAYS   99999
PASS_MIN_DAYS   0
PASS_WARN_AGE   5
```

- Minimum user UID: 2000
- Maximum user UID: 70000

Ans.



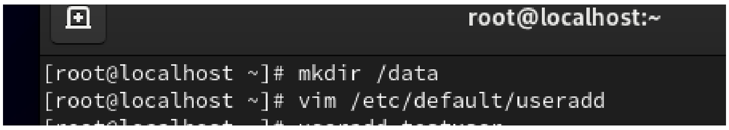
```
# Min/max values for automatic uid selecti
#
UID_MIN                  2000
UID_MAX                 70000
# System accounts
```



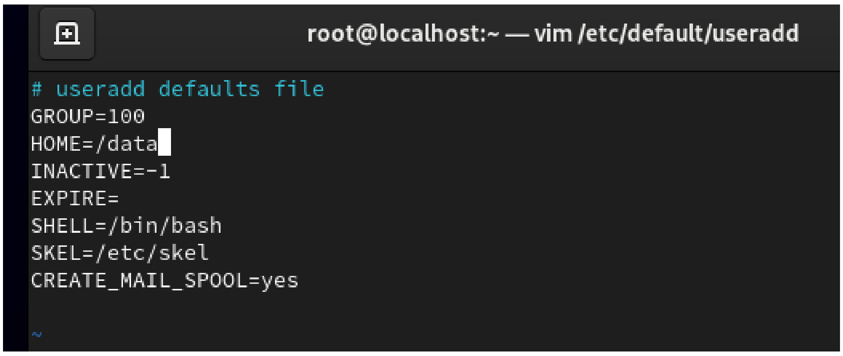
```
[root@localhost ~]# vim /etc/login.defs
[root@localhost ~]# useradd newuser
[root@localhost ~]# id newuser
uid=65536(newuser) gid=11003(newuser) groups=11003(newuser)
[root@localhost ~]#
```

18. Create a directory /data and configure the system so that all newly created users get /data as their home directory by default.

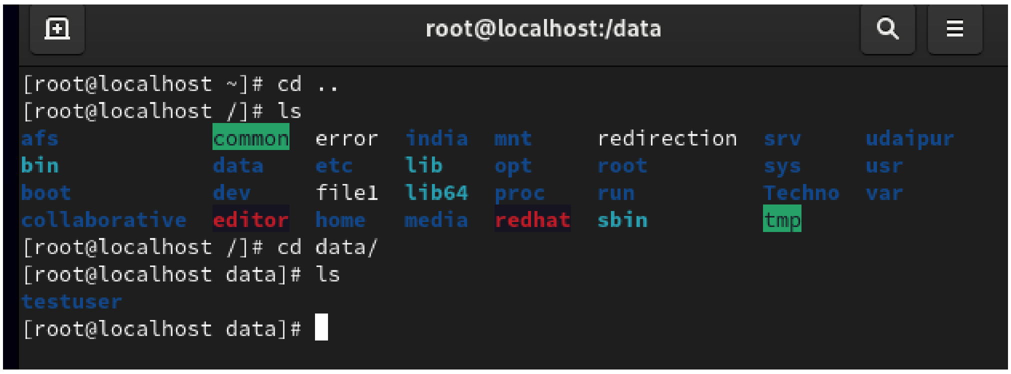
Ans.



```
[root@localhost ~]# mkdir /data
[root@localhost ~]# vim /etc/default/useradd
[root@localhost ~]# useradd testuser
```



```
# useradd defaults file
GROUP=100
HOME=/data
INACTIVE=-1
EXPIRE=
SHELL=/bin/bash
SKEL=/etc/skel
CREATE_MAIL_SPOOL=yes

~
```



```
[root@localhost ~]# cd ..
[root@localhost /]# ls
afs            common  error  india  mnt     redirection  srv     udaipur
bin            data    etc    lib    opt     root         sys     usr
boot           dev     file1  lib64  proc    run          Techno  var
collaborative  editor  home   media  redhat  sbin         tmp
[root@localhost /]# cd data/
[root@localhost data]# ls
testuser
[root@localhost data]#
```

19. Name a file where we can set a file size limit upto 200 MB for a single file.

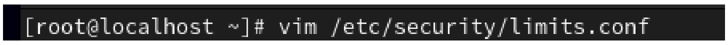
Ans.

To set a file size limit of up to 200 MB for a single file, we can configure it using **/etc/security/limits.conf**. This file is used to define resource limits for users or groups on the system.

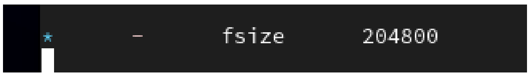
* means this applies to all users.

fsize is the file size limit in blocks (1 block = 1 KB).

204800 blocks = 200 MB.



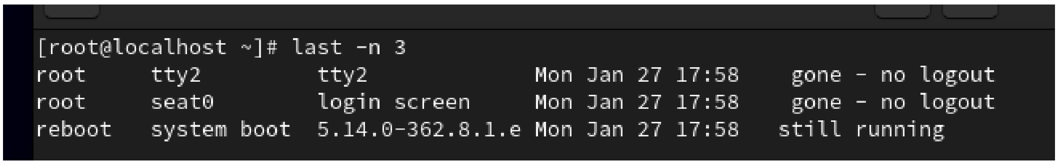
```
[root@localhost ~]# vim /etc/security/limits.conf
```



```
*       -       fsize       204800
```

20. Check the last three users who logged into your system.

Ans.

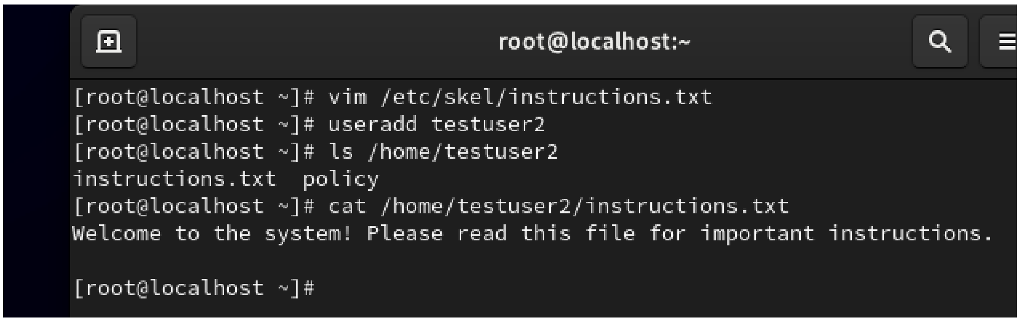


```
[root@localhost ~]# last -n 3
root     tty2         tty2             Mon Jan 27 17:58    gone - no logout
root     seat0        login screen     Mon Jan 27 17:58    gone - no logout
reboot   system boot  5.14.0-362.8.1.e Mon Jan 27 17:58   still running
```

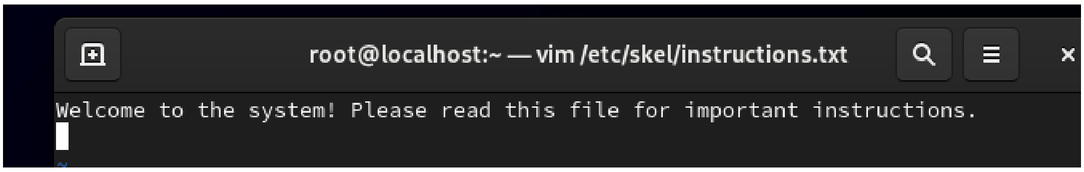
21. As a system administrator, how would you configure the system to ensure that:

a. Automatically create an instructions.txt file in the home directory of every new user upon account creation.

Ans.



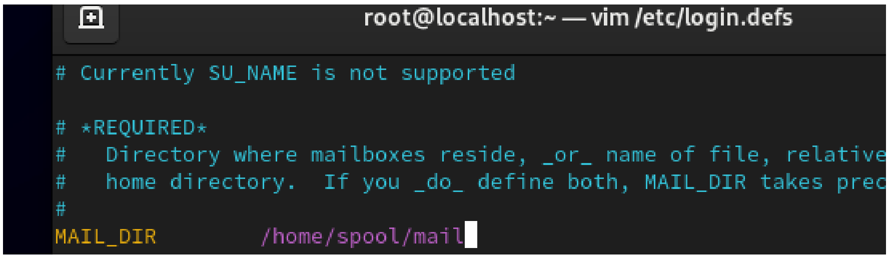
```
[root@localhost ~]# vim /etc/skel/instructions.txt
[root@localhost ~]# useradd testuser2
[root@localhost ~]# ls /home/testuser2
instructions.txt  policy
[root@localhost ~]# cat /home/testuser2/instructions.txt
Welcome to the system! Please read this file for important instructions.

[root@localhost ~]#
```



```
Welcome to the system! Please read this file for important instructions.
```

b. Ensure that the mail directory for every newly created user is set to /home/spool/mail/ by default?"

Ans.

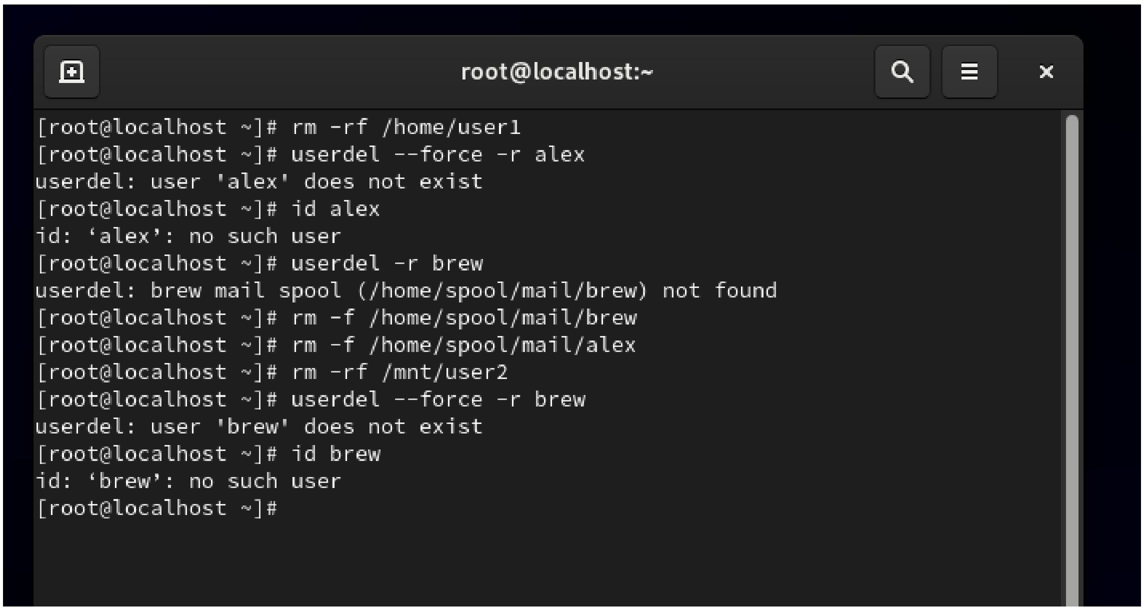


```
# Currently SU_NAME is not supported

# *REQUIRED*
#   Directory where mailboxes reside, _or_ name of file, relative
#   home directory.  If you _do_ define both, MAIL_DIR takes prec
#
MAIL_DIR        /home/spool/mail
```

22. Delete some users

Named **‘alex’ and ‘brew’** with its all data contents including mail data.

Ans.



```
[root@localhost ~]# rm -rf /home/user1
[root@localhost ~]# userdel --force -r alex
userdel: user 'alex' does not exist
[root@localhost ~]# id alex
id: ‘alex’: no such user
[root@localhost ~]# userdel -r brew
userdel: brew mail spool (/home/spool/mail/brew) not found
[root@localhost ~]# rm -f /home/spool/mail/brew
[root@localhost ~]# rm -f /home/spool/mail/alex
[root@localhost ~]# rm -rf /mnt/user2
[root@localhost ~]# userdel --force -r brew
userdel: user 'brew' does not exist
[root@localhost ~]# id brew
id: ‘brew’: no such user
[root@localhost ~]#
```