Linux Hands-On Task List

1. Use `cat /etc/passwd` and identify the different fields in one of the entries. Extract your own user's info and explain .
Answer:
tasneem:x:1000:1000:tasneem,,,:/home/tasneem:/bin/bash

Username: tasneem
(x): the password is stored securely in /etc/shadow
UID: 1000
GID: 1000
Full Name: tasneem
Home Directory: /home/tasneem
Shell: /bin/bash
 dev1:x:1001:1001::/home/dev1:/bin/bash
Username: dev1
UID: 1001
GID: 1001
 No full name given
Password is also stored in /etc/shadow
Home Directory: /home/dev1
Shell: /bin/bash

2. Explain the difference between the `cat` and `more` commands with examples.

Answer:
more – View file content interactively (page by page)
more /etc/passwd
cat – Concatenate and display file content
cat /etc/passwd

3. Explain the difference between the `rm` and `rmdir` commands.

Answer:

rm – Remove files or directories
rmdir – Remove empty directories

4. Create the following directory structure from your home directory:

dir1/

nnn dir11/

nnn file

nnn dir12/

mydocs/

nnn mycv

Answer:

       mkdir dir1
       cd dir1
       mkdir dir11
       cd dir11
       touch file
       cd ..
       mkdir mydocs
       cd mydocs
       touch mycv

5. Try removing `dir11` in one step using `rmdir`. What do you notice? How can you overcome this?

Answer:

       Use the rm command with recursive option -r
       rmdir: failed to remove 'dir11': Directory not empty

6. Remove `dir12` using `rmdir -p`. What happened to the hierarchy? Describe the result.

Answer:

       It will remove dir12 because it's an empty directory, but it won't remove parent directory(dir1) because it's not empty directory because it still contained another subdirectory (dir11) with a file inside.

7. Copy `/etc/passwd` to your home directory and rename it to `mypassword`.

Answer:

       cp /etc/passwd ~/mypassword

8. Rename `mypassword` to `oldpasswd`.

Answer:

    mv mypassword oldpasswd

9. Explain the fields in the `/etc/shadow` file and what each field is used for.

Answer:

    The /etc/shadow is a text-based password file. The shadow file stores the hashed passphrase (or "hash") format for Linux user account with additional properties related to the user password.
    Using : sudo cat /etc/shadow
    tasneem:yj9T$hoXWyMm3wHDBCNbc5Ycdd/$h5WMpfvZ3Zrz9WN/6wLxuOO y8WgP4kVqEuR1UcK72D8:20268:0:99999:7:::
    Username : A valid account name, which exist on the system.
    Password : Your encrypted password is in hash format. The password should be minimum 15-20 characters long including special characters, digits, lower case alphabetic and more. Usually password format is set to idsalt$hashed, The $id is the algorithm prefix used On GNU/Linux as follows
    1 is MD5
    $2a$ is Blowfish
    $2y$ is Blowfish
    5 is SHA-256
    6 is SHA-512
    y is yescrypt
    Last password change (lastchanged) : The date of the last password change, expressed as the number of days since Jan 1, 1970 (Unix time). The value 0 has a special meaning, which is that the user should change her password the next time she will log in the system. An empty field means that password aging features are disabled.
    Minimum : The minimum number of days required between password changes i.e. the number of days left before the user is allowed to change her password again. An empty field and value 0 mean that there are no minimum password age.
    Maximum : The maximum number of days the password is valid, after that user is forced to change her password again.
    Warn : The number of days before password is to expire that user is warned that his/her password must be changed
    Inactive : The number of days after password expires that account is disabled.
    Expire : The date of expiration of the account, expressed as the number of days since Jan 1, 1970.

10. List all available Unix shells (from `/etc/shells`).

Answer: cat /etc/shells

    /etc/shells: valid login shells
    /bin/sh
    /bin/bash
     /usr/bin/bash
     /bin/rbash
    /usr/bin/rbash
    /usr/bin/sh
    /bin/dash
     /usr/bin/dash

11. From `/usr/bin`, list 4 different ways to go back to your home directory.

Answer:

    cd ~
    cd /home/tasneem
    cd
    cd $home

12. Display the first 4 lines of `/etc/passwd`.

Answer:

    head -n 4 /etc/passwd
    root:x:0:0:root:/root:/bin/bash
    daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
    bin:x:2:2:bin:/bin:/usr/sbin/nologin
    sys:x:3:3:sys:/dev:/usr/sbin/nologin

13. Display the last 7 lines of `/etc/passwd`.

    Answer:
    tail -n 7 /etc/passwd
    pulse:x:125:132:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
    gnome-initial-setup:x:126:65534::/run/gnome-initial-setup/:/bin/false
    hplip:x:127:7:HPLIP system user,,,:/run/hplip:/bin/false
    gdm:x:128:134:Gnome Display Manager:/var/lib/gdm3:/bin/false
    tasneem:x:1000:1000:tasneem,,,:/home/tasneem:/bin/bash
    dev1:x:1001:1001::/home/dev1:/bin/bash
    dev2:x:1002:1003::/home/dev2:/bin/sh

14. Display the users who are currently logged in.

Answer:

```
w
05:37:56 up  2:44,  1 user,  load average: 0.02, 0.01, 0.00
USER   TTY   FROM       LOGIN@  IDLE  JCPU  PCPU WHAT
tasneem  tty2   tty2        02:53  2:44m 0.09s 0.06s /usr/libexec/gn
```

15. Display the number of user accounts in the system.

```
Answer:
wc -l /etc/passwd
50 /etc/passwd
Or if u want a real user :
awk -F':' '$3 >= 1000 && $3 < 65534 { print $1 }' /etc/passwd
tasneem
dev1
dev2
```

16. Create a user:

- Username: `islam`

- Comment (Full name): `Islam Askar`

- Password: `islam`

Answer:

```
sudo useradd islam
sudo usermod -c "Islam Askar" islam
sudo passwd islam
```

17. Create another user:

- Username: `baduser`

- Comment: `Bad User`

- Password: `baduser`

Answer:

```
sudo useradd baduser
```

```
sudo usermod -c "Bad User" baduser
sudo passwd baduser
```

18. Create a supplementary group called `pgroup` with GID `30000`.

Answer:

```
sudo groupadd pgroup
sudo groupmod -g 30000 pgroup
```

19. Create another supplementary group called `badgroup`.

Answer:

```
sudo groupadd badgroup
```

20. Add `islam` to the `pgroup` group as a secondary group.

Answer:

```
sudo usermod -aG pgroup islam
```

21. Change `islam`'s password to `password`.

Answer:

```
sudo passwd islam
```

22. Set `islam`'s password to expire after 30 days.

Answer:

```
sudo chage -M 30 islam
```

23. Lock the baduser account.

Answer:

```
sudo usermod -L baduser
```

24. Delete the baduser account.

Answer:

```
sudo userdel baduser
```

25. Delete the badgroup supplementary group.

Answer:

    sudo groupdel badgroup

26.Create a folder myteam in your home directory and change its permission to read-only for the owner.

Answer:

    mkdir myteam
    chmod 400 myteam

27.Log out and log in as another user and try to cd into myteam. What happens?

Answer:

    su – islam
    cd /home/tasneem/myteam
    bash: cd: /home/tasneem/myteam: Permission denied

28.What are the minimum permissions needed for the following:

Copy a directory

    Answer:Read and execute (r-x)

Copy a file

    Answer: Read (r--)

Delete a file

    Answer: Write and execute(-wx)

Change to a directory

    Answer: Execute(--x)

List contents of a directory

    Answer: Read and execute (r-x)

View file content

    Answer: Read(r--)

Modify a file

    Answer: Write(-w-)

29.Create a file with permission 444 and:

Try to edit it. What happens?

Answer: touch file

chmod 444 file

vi file

E45: 'readonly' option is set (add ! to override)

Try to delete it. What happens?

Answer: rm file

rm: remove write-protected regular empty file 'file'? Y

I can delete the file because i have a permission write and excute in the directory

so it doesn't matter about permission on the file

30.What is the difference between the x permission for:

A file

Answer: allows the file to be executed as a program or script

A directory

Answer: the user to enter (cd) the directory and access files by name. Without it, the directory cannot be accessed, even if you know the files inside.