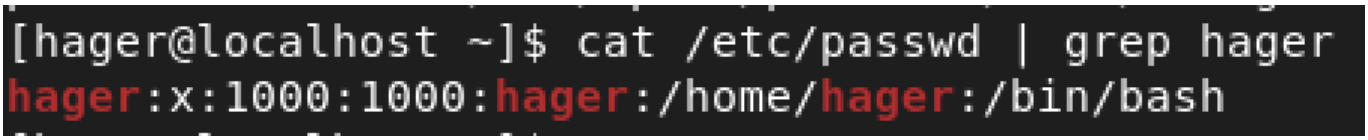
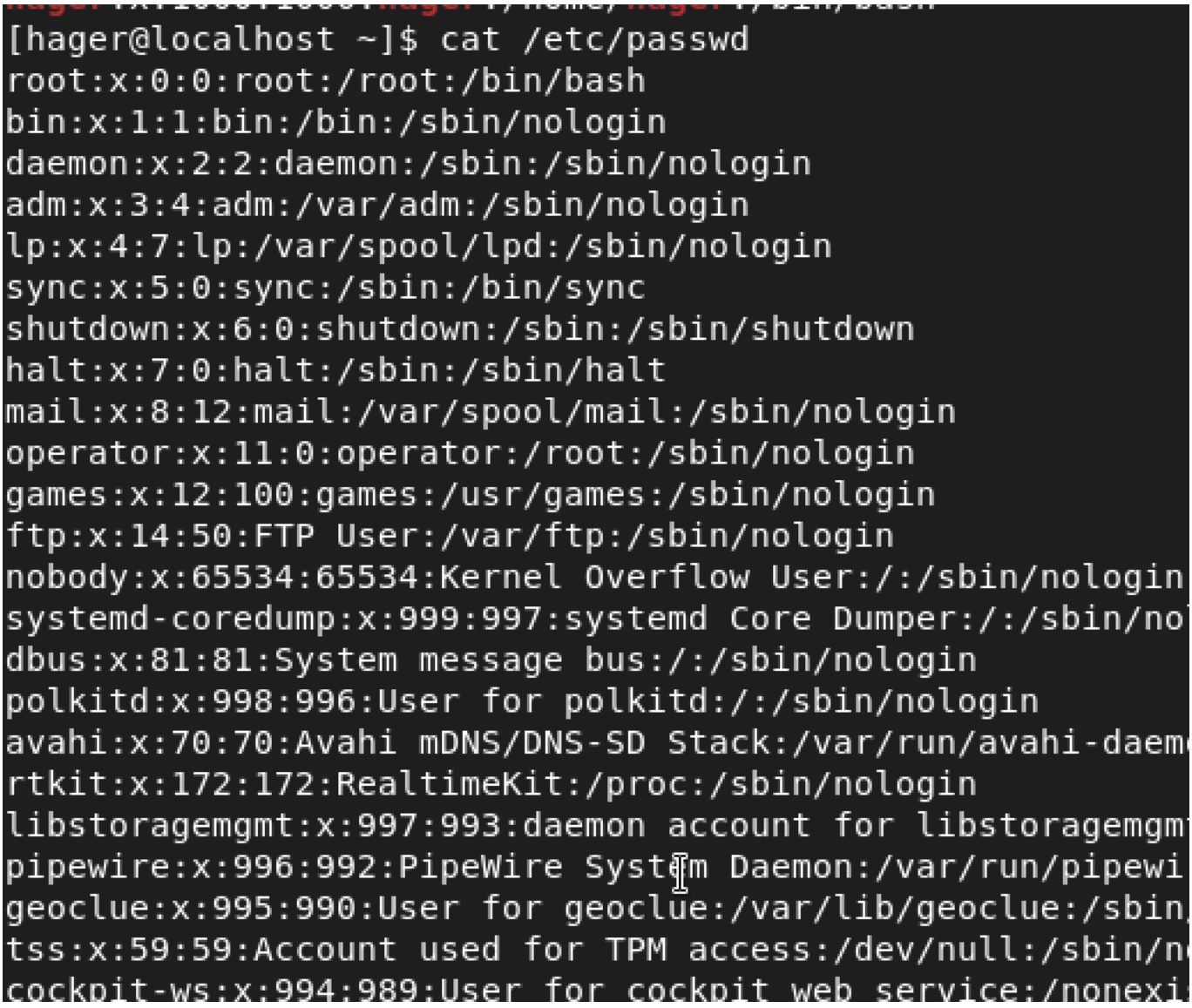
📌1- Use cat /etc/passwd and identify the different fields in one of the entries. Extract your own user's info and explain.📌

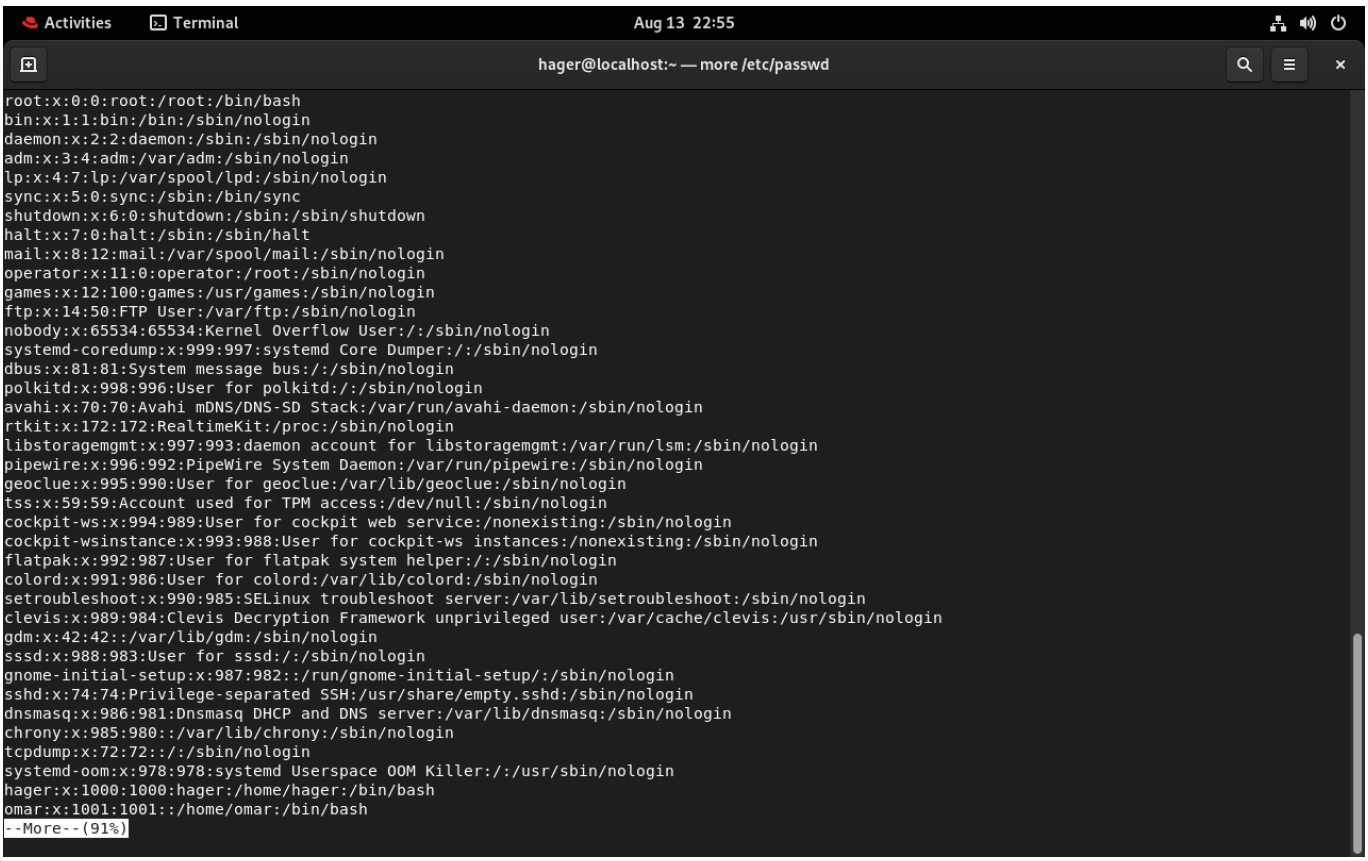


1- username 2- password 3- user id 4- group id 5- comment 6- home dir for this user 7- type of bash for this user

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

cat >> show all command output more >> show it in one page at a time and press entir to get the next page


[hager@localhost ~]$ cat /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
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/no
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-daem
rtkit:x:172:172:RealtimeKit:/proc:/sbin/nologin
libstoragemgmt:x:997:993:daemon account for libstoragemgm
pipewire:x:996:992:PipeWire Syst m Daemon:/var/run/pipewi
geoclue:x:995:990:User for geoclue:/var/lib/geoclue:/sbin
tss:x:59:59:Account used for TPM access:/dev/null:/sbin/n
cockpit-ws:x:994:989:User for cockpit web service:/nonexi


Activities
Terminal
Aug 13 22:55
hager@localhost:~ — more /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
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
rtkit:x:172:172:RealtimeKit:/proc:/sbin/nologin
libstoragemgmt:x:997:993:daemon account for libstoragemgmt:/var/run/lsm:/sbin/nologin
pipewire:x:996:992:PipeWire System Daemon:/var/run/pipewire:/sbin/nologin
geoclue:x:995:990:User for geoclue:/var/lib/geoclue:/sbin/nologin
tss:x:59:59:Account used for TPM access:/dev/null:/sbin/nologin
cockpit-ws:x:994:989:User for cockpit web service:/nonexisting:/sbin/nologin
cockpit-wsinstance:x:993:988:User for cockpit-ws instances:/nonexisting:/sbin/nologin
flatpak:x:992:987:User for flatpak system helper:/:/sbin/nologin
colord:x:991:986:User for colord:/var/lib/colord:/sbin/nologin
setroubleshoot:x:990:985:SELinux troubleshoot server:/var/lib/setroubleshoot:/sbin/nologin
clevis:x:989:984:Clevis Decryption Framework unprivileged user:/var/cache/clevis:/usr/sbin/nologin
gdm:x:42:42::/var/lib/gdm:/sbin/nologin
sssd:x:988:983:User for sssd:/:/sbin/nologin
gnome-initial-setup:x:987:982::/run/gnome-initial-setup/:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/usr/share/empty.sshd:/sbin/nologin
dnsmasq:x:986:981:Dnsmasq DHCP and DNS server:/var/lib/dnsmasq:/sbin/nologin
chrony:x:985:980::/var/lib/chrony:/sbin/nologin
tcpdump:x:72:72::/:/sbin/nologin
systemd-oom:x:978:978:systemd Userspace OOM Killer:/:/usr/sbin/nologin
hager:x:1000:1000:hager:/home/hager:/bin/bash
omar:x:1001:1001::/home/omar:/bin/bash
--More--(91%)

📌3-Explain the difference between the rm and rmdir commands.📌

rm >> remove files and -r for non empty dir rmdir >> remove empty dir

**📌4- Create the following directory structure from your home directory: **📌

```
[hager@localhost ~]$ mkdir -p dir1/dir11/file dir1/dir12
[hager@localhost ~]$ mkdie -p mydocs/mycv
bash: mkdie: command not found...
[hager@localhost ~]$ mkdir -p mydocs/mycv
[hager@localhost ~]$ ls -R dir1
dir1:
dir11  dir12

dir1/dir11:
file

dir1/dir11/file:

dir1/dir12:
[hager@localhost ~]$ ls mydocs/
mycv
```

**📌4- Try removing dir11 in one step using rmdir. What do you notice? How can you overcome this? **📌

it's not empty should use rm -r

```
[hager@localhost ~]$ rmdir  dir1/dir11
rmdir: failed to remove 'dir1/dir11': Directory not empty
[hager@localhost ~]$ rm -r  dir1/dir11
```

**📌5- Remove dir12 using rmdir -p. What happened to the hierarchy? Describe the result. **📌

not just remove the dir12 it remove the parent dir1 also because we use -p refere to parent dir

```
[hager@localhost ~]$ rmdir -p dir1/dir12
[hager@localhost ~]$ ls -R dir1
ls: cannot access 'dir1': No such file or directory
```

**📌6- Copy /etc/passwd to your home directory and rename it to mypassword. **📌

```
[hager@localhost ~]$ cp /etc/passwd  /home/hager/mypasswd
[hager@localhost ~]$ ls | grep mypasswd
mypasswd
```

**📌7- Rename mypassword to oldpasswd. **📌

```
[hager@localhost ~]$ mv mypasswd oldpasswd
[hager@localhost ~]$ ls | grep oldpasswd
oldpasswd
```

**📌8- Explain the fields in the /etc/shadow file and what each field is used for. **📌

```
[hager@localhost ~]$ sudo cat /etc/shadow | grep hager
hager:$6$eHLpYsSA8viuh7E2$tI3Mq23xLL/WziA6hZs2JF1SsIcC/OJmZRrSh5i5DL.vOSjKQiCo2vQ0uRB.7gX9THseU03MX18fzVqkdiYZ0/::0:99999:7:::
```

1- user name 2- password hash (algorithem used - hased passwrd . salt . salt+password) 3- days since epoch when password was last changed 4- minimum days before change allowed 5- maximum days before required change (password expiry) 6- warn — days before expiry to warn user 7- inactive — days after expiry when account becomes inactive. 8- expire — absolute day (since epoch) when account disabled 9- reserved — unused

**📌9- List all available Unix shells (from /etc/shells). **📌

```
[hager@localhost ~]$ cat /etc/shells
/bin/sh
/bin/bash
/usr/bin/sh
/usr/bin/bash
```

**📌10- From /usr/bin, list 4 different ways to go back to your home directory. **📌

cd cd ~ cd /home/hager cd $HOME

**📌11- Display the first 4 lines of /etc/passwd. **📌

```
[hager@localhost ~]$ head -4 /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
```

**📌12- Display the last 7 lines of /etc/passwd. **📌

```
[hager@localhost ~]$ tail -7 /etc/passwd
systemd-oom:x:978:978:systemd Userspace OOM Killer:/:/usr/sbin/nologin
hager:x:1000:1000:hager:/home/hager:/bin/bash
omar:x:1001:1001::/home/omar:/bin/bash
apache:x:48:48:Apache:/usr/share/httpd:/sbin/nologin
islam:x:1002:1002:Islam Askar:/home/islam:/bin/bash
nada:x:500:30001::/home/nada:/bin/bash
postfix:x:89:89::/var/spool/postfix:/sbin/nologin
```

**📌13- Display the users who are currently logged in. **📌

whoami

**📌14- Display the number of user accounts in the system. **📌

```
[hager@localhost ~]$ wc -l /etc/passwd
42 /etc/passwd
```

**📌15- Create a user: **📌

○ Username: islam ○ Comment (Full name): Islam Askar ○ Password: islam

```
[hager@localhost ~]$ sudo useradd islam -c "Islam Askar"
[sudo] password for hager:
[hager@localhost ~]$ sudo passwd islam
Changing password for user islam.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
```

**📌16- Create another user: **📌

○ Username: baduser ○ Comment: Bad User ○ Password: baduser

```
[hager@localhost ~]$ sudo useradd baduser -c "Bad User"
[hager@localhost ~]$ sudo passwd baduser
Changing password for user baduser.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
```

📌17- Create a supplementary group called pgroup with GID 30000.📌

```
[hager@localhost ~]$ sudo groupadd pgroup --
--force       --help        --non-unique  --prefix      --system
--gid         --key         --password    --root        --users
[hager@localhost ~]$ sudo groupadd pgroup --gid 30000
```

📌18- Create another supplementary group called badgroup.📌

```
[hager@localhost ~]$ sudo groupadd badgroup
[hager@localhost ~]$ tail /etc/g
gcrypt/         geoclue/        gnupg/          group
gdm/            glvnd/          groff/          group-
[hager@localhost ~]$ tail /etc/group
tcpdump:x:72:
sgx:x:979:
systemd-oom:x:978:
hager:x:1000:
omar:x:1001:
apache:x:48:
islam:x:1002:
baduser:x:1003:
pgroup:x:30000:
badgroup:x:30001:
```

📌19-Add islam to the pgroup group as a secondary group.📌

```
[hager@localhost ~]$ sudo usermod -G pgroup islam
```

```
[hager@localhost ~]$ tail -2 /etc/group
pgroup:x:30000:islam
badgroup:x:30001:
```

📌20-Change islam’s password to password.📌

```
[hager@localhost ~]$ sudo passwd islam
Changing password for user islam.
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: all authentication tokens updated successfully.
```

📌21-Set islam’s password to expire after 30 days.📌

```
[hager@localhost ~]$ sudo chage -M 30 islam
[hager@localhost ~]$ sudo chage -l islam
Last password change                                    : Jul 08, 2025
Password expires                                        : Aug 07, 2025
Password inactive                                       : never
Account expires                                         : never
Minimum number of days between password change          : 0
Maximum number of days between password change          : 30
Number of days of warning before password expires       : 7
```

📌22-Lock the baduser account.📌

```
[hager@localhost ~]$ sudo usermod -L baduser
[hager@localhost ~]$ su baduser
Password:
su: Authentication failure
```

📌23-Delete the baduser account.📌

```
[hager@localhost ~]$ sudo userdel baduser
[hager@localhost ~]$ tail /etc/passwd
gnome-initial-setup:x:987:982::/run/gnome-initial-setup/:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/usr/share/empty.sshd:/sbin/nologin
dnsmasq:x:986:981:Dnsmasq DHCP and DNS server:/var/lib/dnsmasq:/sbin/nologin
chrony:x:985:980::/var/lib/chrony:/sbin/nologin
tcpdump:x:72:72::/:/sbin/nologin
systemd-oom:x:978:978:systemd Userspace OOM Killer:/:/usr/sbin/nologin
hager:x:1000:1000:hager:/home/hager:/bin/bash
omar:x:1001:1001::/home/omar:/bin/bash
apache:x:48:48:Apache:/usr/share/httpd:/sbin/nologin
islam:x:1002:1002:Islam Askar:/home/islam:/bin/bash
```

📌24-Delete the badgroup supplementary group.📌

```
[hager@localhost ~]$ sudo groupdel badgroup
[hager@localhost ~]$ tail /etc/group
chrony:x:980:
slocate:x:21:
tcpdump:x:72:
sgx:x:979:
systemd-oom:x:978:
hager:x:1000:
omar:x:1001:
apache:x:48:
islam:x:1002:
pgroup:x:30000:islam
```

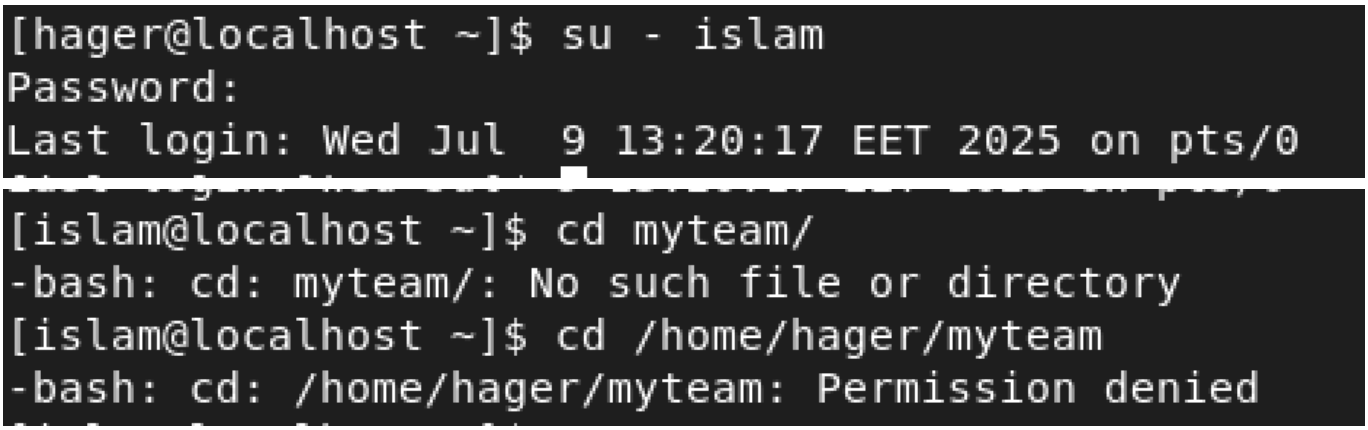
📌25-Create a folder myteam in your home directory and change its permission to read-only for the owner.📌

```
[hager@localhost ~]$ mkdir myteam
[hager@localhost ~]$ chmod 400 myteam/
[hager@localhost ~]$ ls -ld myteam/
dr--------. 2 hager hager 6 Jul 10 02:48 myteam/
```

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

```
[hager@localhost ~]$ su - islam
Password:
Last login: Wed Jul  9 13:20:17 EET 2025 on pts/0
[islam@localhost ~]$ cd myteam/
-bash: cd: myteam/: No such file or directory
[islam@localhost ~]$ cd /home/hager/myteam
-bash: cd: /home/hager/myteam: Permission denied
```

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



📌27-What are the minimum permissions needed for the following:📌

- Copy a directory (permission for source directory and permissions for target parent directory)

for source >>> rx

for target >>> wx

- Copy a file (permission for source file and and permission fortarget parentdirectory)

for source >>> r

for target >>> wx

- Delete a file

wx

- Change to a directory

x

- List a directory content (ls command)

rx

- View a file content (more/cat command)

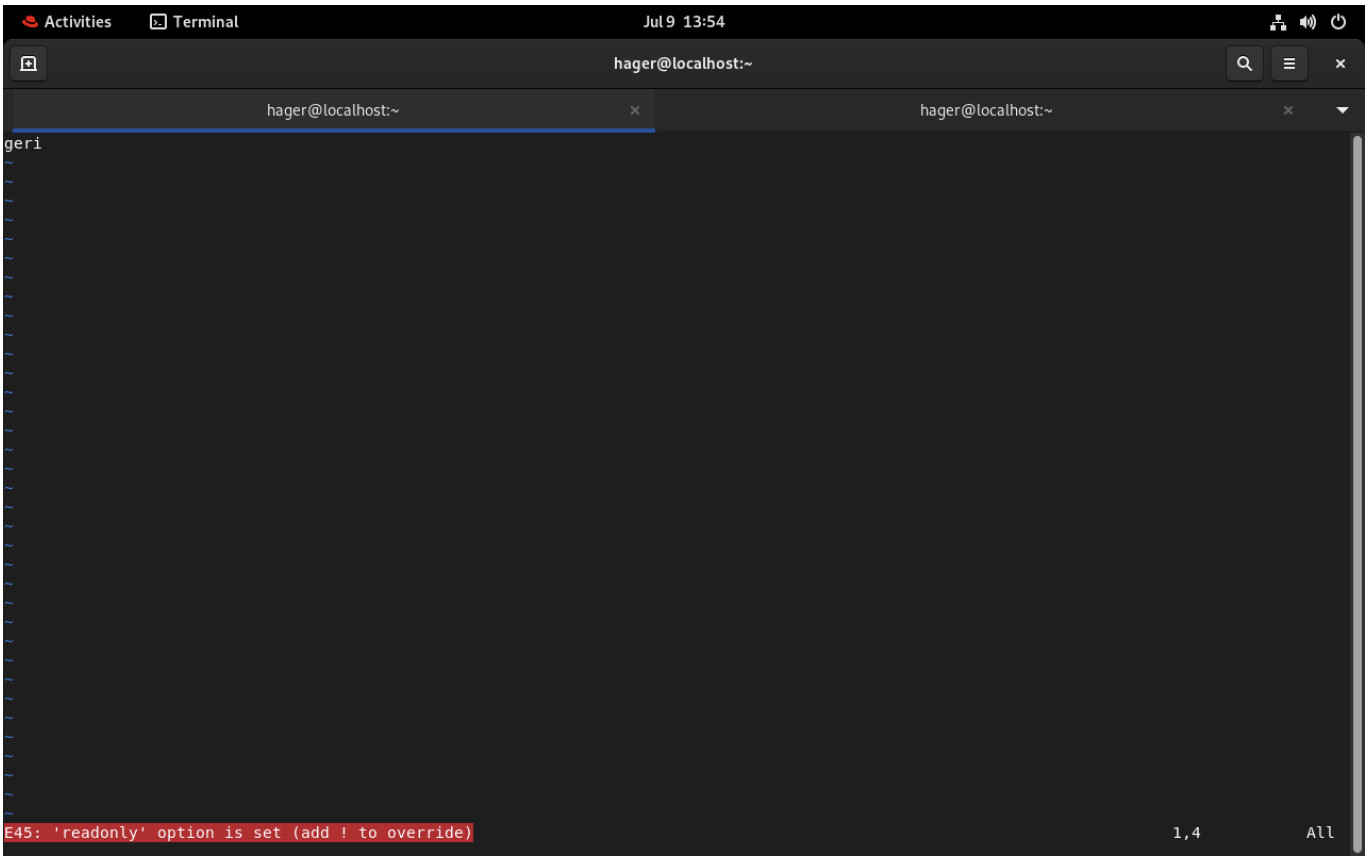
r

- Modify a file content

w

📌28-Create a file with permission 444 and:📌

```
[hager@localhost ~]$ chmod 444 hager5
[hager@localhost ~]$ ls -l hager5
-r--r--r--. 1 hager hager 0 Jul  9 13:53 hager5
[hager@localhost ~]$ vim hager5
[hager@localhost ~]$ echo "hager" > hager5
-bash: hager5: Permission denied
[hager@localhost ~]$ rm hager5
rm: remove write-protected regular empty file 'hager5'? yes
[hager@localhost ~]$ ls -l hager5
ls: cannot access 'hager5': No such file or directory
```



📌29-What is the difference between the x permission for:📌

for file>>> run if it script

for dir>>> cd in this dir

📌30-Configure a static IP address on your Linux system📌

```
[hager@localhost ~]$ nmcli connection show
NAME    UUID                                  TYPE      DEVICE
enp0s1  d0c12e28-df4c-30f2-bf81-d0074d61bb2a  ethernet  enp0s1
[hager@localhost ~]$ sudo nmcli connection modify "
enp0s1       filename     help         id           path         --temporary  uuid
[hager@localhost ~]$ sudo nmcli connection modify "enp0s1" ipv4.addresses 192.168.105.50/24
[sudo] password for hager:
[hager@localhost ~]$ sudo nmcli connection modify "enp0s1" ipv4.gateway 192.168.105.1
```

```
[hager@localhost ~]$ sudo nmcli connection modify "enp0s1" ipv4.dns "8.8.8.8 8.8.4.4"
[hager@localhost ~]$ sudo nmcli connection modify "enp0s1" ipv4.method manual
[hager@localhost ~]$ sudo nmcli connection down "enp0s1"
Connection 'enp0s1' successfully deactivated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/1)
[hager@localhost ~]$ sudo nmcli connection up "enp0s1"
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/2)
[hager@localhost ~]$ id addr show enp0s1
id: ‘addr’: no such user
id: ‘show’: no such user
id: ‘enp0s1’: no such user
[hager@localhost ~]$ ip addr show enp0s1
2: enp0s1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 0a:1b:e8:57:72:9a brd ff:ff:ff:ff:ff:ff
    inet 192.168.105.50/24 brd 192.168.105.255 scope global noprefixroute enp0s1
       valid_lft forever preferred_lft forever
    inet6 fdf4:daa7:a88e:6c1c:81b:e8ff:fe57:729a/64 scope global dynamic noprefixroute
       valid_lft 2591958sec preferred_lft 604758sec
    inet6 fe80::81b:e8ff:fe57:729a/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

📌31- Use the following commands to test and analyze network connectivity to 8.8.8.8:📌

```
[hager@localhost ~]$ ping -c  4 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=117 time=56.0 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=117 time=56.9 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=117 time=56.7 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=117 time=56.0 ms

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3009ms
rtt min/avg/max/mdev = 55.999/56.393/56.870/0.392 ms
```

```
[hager@localhost ~]$ traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
 1  * * _gateway (192.168.105.1)  0.482 ms
 2  192.168.1.1 (192.168.1.1)  4.629 ms  8.341 ms  8.324 ms
 3  10.45.16.69 (10.45.16.69)  21.833 ms  21.772 ms  21.752 ms
 4  10.29.90.237 (10.29.90.237)  24.725 ms 10.29.90.249 (10.29.90.249)  26.000 ms  25.984 ms
 5  * * 10.36.7.66 (10.36.7.66)  21.985 ms
 6  * 10.39.14.173 (10.39.14.173)  24.354 ms *
 7  * * *
 8  * * *
 9  193.251.131.44 (193.251.131.44)  45.524 ms * *
10  * 72.14.197.204 (72.14.197.204)  210.407 ms *
11  192.178.105.93 (192.178.105.93)  52.069 ms * *
12  * * *
13  * * *
```

```
[hager@localhost ~]$ nslookup 8.8.8.8
8.8.8.8.in-addr.arpa    name = dns.google.
```

**📌32- Explain what a firewall is, how to enable it on Linux, and how to allow a specific port through it. **📌

it can block/allow ports, IPs, protocols, protecting the host or network.

sudo systemctl enable --now firewalld sudo firewall-cmd --state

allow port 8080/tcp permanently

sudo firewall-cmd --permanent --add-port=8080/tcp sudo firewall-cmd --reload sudo firewall-cmd --list-ports

**📌32- Run the sleep 50 command in the background using &. Then, run it normally, send it to the background after starting, find its process ID without using ps, and force kill it. **📌

```
[hager@localhost ~]$ sleep 50 &
[1] 34146
[hager@localhost ~]$ jobs -l
[1]+ 34146 Running                 sleep 50 &
[hager@localhost ~]$ jobs -l
[1]+ 34146 Running                 sleep 50 &
[hager@localhost ~]$
[hager@localhost ~]$ jobs -l
[1]+ 34146 Running                 sleep 50 &
[hager@localhost ~]$ jobs -l
[1]+ 34146 Done                    sleep 50
[hager@localhost ~]$ sleep 50
^Z
[1]+  Stopped                 sleep 50
[hager@localhost ~]$ bg %1
[1]+ sleep 50 &
[hager@localhost ~]$ jobs -l
[1]+ 34175 Running                 sleep 50 &
[hager@localhost ~]$ pgrep -f "sleep 50"
34175
[hager@localhost ~]$ kill -9  34175
[1]+  Killed                  sleep 50
```