Name　　: Reena Qureshi

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LAB 6

Task 1 – Switch to root with su - and back to a normal user

Set a root password (Ubuntu root is disabled by default; this enables `su` - temporarily for the lab):

`sudo passwd root`

```
reenaqureshi@reena2904:~$ sudo passwd root
[sudo] password for reenaqureshi:
New password:
Retype new password:
passwd: password updated successfully
reenaqureshi@reena2904:~$ _
```

Switch to root and verify:

`su -`
`whoami`
`id`

```
reenaqureshi@reena2904:~$ su -
Password:
root@reena2904:~# whoami
root
root@reena2904:~# is
Command 'is' not found, but can be installed with:
apt install ironseed
root@reena2904:~# id
uid=0(root) gid=0(root) groups=0(root)
root@reena2904:~#
```

Switch back to your normal user:

`exit`
`whoami`

```
root@reena2904:~# exit
logout
reenaqureshi@reena2904:~$ whoami
reenaqureshi
reenaqureshi@reena2904:~$ _
```

Task 2 – Create user tom and verify in passwd/group/shadow

sudo adduser tom
```
reenaqureshi@reena2904:~$ sudo adduser tom
info: Adding user `tom' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `tom' (1001) ...
info: Adding new user `tom' (1001) with group `tom (1001)' ...
info: Creating home directory `/home/tom' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for tom
Enter the new value, or press ENTER for the default
        Full Name []: tom
        Room Number []: 1001
        Work Phone []: 0510939292
        Home Phone []: 03245892991
        Other []:
Is the information correct? [Y/n] Y
info: Adding new user `tom' to supplemental / extra groups `users' ..
info: Adding user `tom' to group `users' ...
```

cat /etc/passwd
```
saned:x:115:120..:/var/lib/saned:/usr/sbin/nologin
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
cups-browsed:x:118:111::/nonexistent:/usr/sbin/nologin
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin
tom:x:1001:1001:tom,1001,0510939292,03245892991:/home/tom:/bin/bash
reenaqureshi@reena2904:~$
```

cat /etc/group
```
saned:x:120:
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
tom:x:1001:
reenaqureshi@reena2904:~$
```

sudo cat /etc/shadow

```
cups-browsed:!:20385::::::
xrdp:!:20385::::::
tom:$y$j9T$5PrMT6Yw5k1DgAvNeUGAW1$so/oZJGqJ0.Znf2Lazg24epBDoaEE1.ohzXCt4zFpa9:20393:0:99999:7:::
reenaqureshi@reena2904:~$ _
```

Task 3 – Create groups; change tom's primary and secondary groups
Create groups and verify by viewing /etc/group (visually confirm entries exist):

```
avahi:x:118:
scanner:x:119:saned
saned:x:120:
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
tom:x:1001:
developer:x:1002:
devOps:x:1003:
designer:x:1004:
reenaqureshi@reena2904:~$ _
```

Change tom's primary group to designer and verify:

```
reenaqureshi@reena2904:~$ sudo user mod -g designer tom
sudo: user: command not found
reenaqureshi@reena2904:~$ sudo usermod -g designer tom
reenaqureshi@reena2904:~$ tom id
Command 'tom' not found, but there are 16 similar ones.
reenaqureshi@reena2904:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users)
reenaqureshi@reena2904:~$ _
```

Add secondary groups developer and devops to tom and verify:
sudo usermod -aG developer,devops tom
id tom
groups tom

```
reenaqureshi@reena2904:~$ sudo usermod -aG developer,devOps tom
reenaqureshi@reena2904:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),100(users),1002(developer),1003(devOps)
reenaqureshi@reena2904:~$ groups tom
tom : designer users developer devOps
reenaqureshi@reena2904:~$
```

Replace all secondary groups so only tom (user's own group) remains and verify:
sudo usermod -G tom tom
id tom
groups tom

```
tom . designer users developer devops
reenaqureshi@reena2904:~$ sudo usermod -G tom tom
reenaqureshi@reena2904:~$ id tom
uid=1001(tom) gid=1004(designer) groups=1004(designer),1001(tom)
reenaqureshi@reena2904:~$ groups tom
tom : designer tom
reenaqureshi@reena2904:~$
```

Task 4 – Create/delete users (Jerry, Scooby) and groups (jolly, anime)

Create users:
sudo adduser Jerry
sudo useradd Scooby

```
reenaqureshi@reena2904:~$ sudo adduser jerry
info: Adding user `jerry' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `jerry' (1005) ...
info: Adding new user `jerry' (1005) with group `jerry (1005)' ...
info: Creating home directory `/home/jerry' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for jerry
Enter the new value, or press ENTER for the default
        Full Name []: jerry
        Room Number []: 1002
        Work Phone []: 020393993
        Home Phone []: 9202938
        Other []:
Is the information correct? [Y/n] Y
info: Adding new user `jerry' to supplemental / extra groups `users' ..
info: Adding user `jerry' to group `users' ...
reenaqureshi@reena2904:~$ sudo useradd scooby
reenaqureshi@reena2904:~$
```

Try to log in as Scooby immediately (expected authentication failure because there is no password yet):
su - Scooby

```
reenaqureshi@reena2904:~$ su -scooby
Password:
su: failed to execute cooby: No such file or directory
reenaqureshi@reena2904:~$
```

Set a password for Scooby:
sudo passwd Scooby

```
reenaqureshi@reena2904:~$ sudo passwd scooby
New password:
Retype new password:
passwd: password updated successfully
reenaqureshi@reena2904:~$
```

Try logging in as Scooby again (home directory still missing; expect a message such as "No directory, logging in with HOME=/"

```
reenaqureshi@reena2904:~$ su -scooby
Password:
su: failed to execute cooby: No such file or directory
reenaqureshi@reena2904:~$
```

Show that Scooby's home directory does not exist yet and what `/etc/passwd` says:
```
exit
cat /etc/passwd
ls -ld /home/Scooby
```

```
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
cups-browsed:x:118:111::/nonexistent:/usr/sbin/nologin
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin
tom:x:1001:1004:tom,1001,0510939292,03245892991:/home/tom:/bin/bash
jerry:x:1005:1005:jerry,1002,020393993,9202938:/home/jerry:/bin/bash
scooby:x:1006:1006::/home/scooby:/bin/sh
reenaqureshi@reena2904:~$ ls -ld /home/Scooby
ls: cannot access '/home/Scooby': No such file or directory
```

Manually create Scooby's home directory and set proper ownership and permissions:
```
sudo mkdir -p /home/Scooby
sudo chown Scooby:Scooby /home/Scooby
sudo chmod 750 /home/Scooby
ls -ld /home/Scooby
```
```
reenaqureshi@reena2904:~$ sudo mkdir -p /home/scooby
[sudo] password for reenaqureshi:
Sorry, try again.
[sudo] password for reenaqureshi:
reenaqureshi@reena2904:~$ sudo chown scooby:scooby /home/scooby
reenaqureshi@reena2904:~$ sudo chmod 750 /home/scooby
reenaqureshi@reena2904:~$ ls -ld /home/scooby
drwxr-x--- 2 scooby scooby 4096 Nov  1 11:13 /home/scooby
reenaqureshi@reena2904:~$
```

Log in as Scooby again and verify you land in the correct home directory:
```
su - Scooby
pwd
ls -la
```

```
reenaqureshi@reena2904:~$ su - scooby
Password:
$ pwd
/home/scooby
$ ls -la
total 8
drwxr-x--- 2 scooby scooby 4096 Nov  1 11:13 .
drwxr-xr-x 6 root   root   4096 Nov  1 11:13 ..
```

Verify users in system files and observe shell of `Scooby`:
exit
cat /etc/passwd

```
colord:x:116:121:colord colour management daemon,,,:/var/lib/colord:/usr/
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
cups-browsed:x:118:111::/nonexistent:/usr/sbin/nologin
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin
tom:x:1001:1004:tom,1001,0510939292,03245892991:/home/tom:/bin/bash
jerry:x:1005:1005:jerry,1002,020393993,9202938:/home/jerry:/bin/bash
scooby:x:1006:1006::/home/scooby:/bin/sh
reenaqureshi@reena2904:~$
```

Change the shell from `/bin/sh` to `/bin/bash`
sudo usermod -s /bin/bash Scooby
su - Scooby

```
reenaqureshi@reena2904:~$ sudo usermod -s /bin/bash scooby
reenaqureshi@reena2904:~$ su - scooby
Password:
```

Create groups:
sudo addgroup jolly
sudo groupadd anime

```
reenaqureshi@reena2904:~$ sudo addgroup jolly
info: Selecting GID from range 1000 to 59999 ...
info: Adding group `jolly' (GID 1007) ...
reenaqureshi@reena2904:~$ sudo groupadd anime
reenaqureshi@reena2904:~$
```

Verify groups:
cat /etc/group

```
pulse-access:x:123:
xrdp:x:124:
tom:x:1001:tom
developer:x:1002:
devOps:x:1003:
designer:x:1004:
jerry:x:1005:
scooby:x:1006:
jolly:x:1007:
anime:x:1008:
reenaqureshi@reena2904:~$
```

Delete groups and users:
sudo delgroup jolly
sudo groupdel anime
cat /etc/group

sudo deluser --remove-home Jerry
sudo userdel -r Scooby
cat /etc/passwd
```
colord:x:121:
pulse:x:122:
pulse-access:x:123:
xrdp:x:124:
tom:x:1001:tom
developer:x:1002:
devOps:x:1003:
designer:x:1004:
jerry:x:1005:
scooby:x:1006:
reenaqureshi@reena2904:~$
```

```
lightdm:x:112:115:Light Display Manager:/var/lib
whoopsie:x:113:117::/nonexistent:/bin/false
avahi:x:114:118:Avahi mDNS daemon,,,:/run/avahi-
saned:x:115:120::/var/lib/saned:/usr/sbin/nologi
colord:x:116:121:colord colour management daemon
pulse:x:117:122:PulseAudio daemon,,,:/run/pulse:
cups-browsed:x:118:111::/nonexistent:/usr/sbin/n
xrdp:x:119:124::/run/xrdp:/usr/sbin/nologin
tom:x:1001:1004:tom,1001,0510939292,03245892991:
reenaqureshi@reena2904:~$
```

Task 5 – Create user Student; create files; set owner/group; identify file types

Create Student:
sudo adduser Student

```
reenaqureshi@reena2904:~$ sudo adduser student
info: Adding user `student' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `student' (1005) ...
info: Adding new user `student' (1005) with group `student (1005)' ...
info: Creating home directory `/home/student' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for student
Enter the new value, or press ENTER for the default
        Full Name []: student
        Room Number []: 1002
        Work Phone []: 92929393
        Home Phone []: 28291291992
        Other []:
Is the information correct? [Y/n] Y
info: Adding new user `student' to supplemental / extra groups `users' ...
info: Adding user `student' to group `users' ...
reenaqureshi@reena2904:~$
```

Switch to Student and create files:

```
su - Student
touch file1
mkdir -p dir1
touch dir1/file2
ls -l
```

```
reenaqureshi@reena2904:~$ su - student
Password:
student@reena2904:~$ touch file1
student@reena2904:~$ mkdir -p dir1
student@reena2904:~$ touch dir1/file2
student@reena2904:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  1 11:29 dir1
-rw-rw-r-- 1 student student    0 Nov  1 11:29 file1
student@reena2904:~$
```

Change owner then group for file1 (separate commands):

```
sudo chown tom file1
ls -l file1

sudo chgrp devops file1
ls -l file1
```

```
reenaqureshi@reena2904:~$
reenaqureshi@reena2904:~$ sudo chown tom file1
chown: cannot access 'file1': No such file or directory
reenaqureshi@reena2904:~$ su - student
Password:
student@reena2904:~$ sudo chown tom file1
[sudo] password for student:
student is not in the sudoers file.
student@reena2904:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ sudo chgrp devops file1
[sudo] password for student:
Sorry, try again.
[sudo] password for student:
student is not in the sudoers file.
student@reena2904:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$
```

Identify files/directories and show /dev/null:
ls -l
ls -l dir1
ls -l /dev/null
file file1 dir1 /dev/null

```
student@reena2904:~$ ls -l
total 4
drwxrwxr-x 2 student student 4096 Nov  1 11:29 dir1
-rw-rw-r-- 1 student student    0 Nov  1 11:29 file1
student@reena2904:~$ ls -l dir1
total 0
-rw-rw-r-- 1 student student 0 Nov  1 11:29 file2
student@reena2904:~$ ls -l /dev/null
crw-rw-rw- 1 root root 1, 3 Nov  1 11:04 /dev/null
student@reena2904:~$ file file1 dir1 /dev/null

file1:      empty
dir1:       directory
/dev/null: character special (1/3)
student@reena2904:~$
student@reena2904:~$
```

Task 6 – Change permissions using symbolic mode

Ensure Student and file present:
su - Student
cd ~
ls -l file1

```
reenaqureshi@reena2904:~$ su - student
Password:
student@reena2904:~$ cd ~
student@reena2904:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ _
```

Remove all permissions:

```
chmod -rwx file1
ls -l file1
```

```
student@reena2904:~$ chmod -rwx file1
student@reena2904:~$ ls -l file1
---------- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ _
```

Add read to all:

```
chmod +r file1
ls -l file1
```

```
student@reena2904:~$ chmod +r file1
student@reena2904:~$ ls -l file1
-r--r--r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$
```

Add execute to user:

```
chmod u+x file1
ls -l file1
```

```
student@reena2904:~$ chmod u+x file1
student@reena2904:~$ ls -l file1
-r-xr--r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ _
```

Add write to user and group:

```
chmod ug+w file1
ls -l file1
```

```
student@reena2904:~$ ls -l file1
-rwxrw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ _
```

Remove all permissions (explicit):

```
chmod ugo-rwx file1
ls -l file1
```

```
student@reena2904:~$ chmod ugo+rwx file1
student@reena2904:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$
```

Task 7 – Change permissions using "set" symbolic form (u= g= o=)
Ensure you are Student:

```
su - Student
cd ~
ls -l file1
```

```
reenaqureshi@reena2904:~$ su - student
Password:
student@reena2904:~$ cd ~
student@reena2904:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ _
```

Set all to rwx:
```
chmod u=rwx,g=rwx,o=rwx file1
ls -l file1
```

```
student@reena2904:~$ chmod u=rwx,g=rwx,o=rwx file1
student@reena2904:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$
```

Remove execute from group and others:
```
chmod g=rw,o=rw file1
ls -l file1
```
```
-rwxrwxrwx 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod g=rw,o=rw file1
student@reena2904:~$ ls -l file1
-rwxrw-rw- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ _
```

Remove all permissions:
```
chmod u=,g=,o= file1
ls -l file1
```
```
student@reena2904:~$ chmod u=,g=,o= file1
student@reena2904:~$ ls -l file1
---------- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$
```

Task 8 – Change permissions using numeric (octal) mode

Run each command and capture screenshot after each ls:

```
student@reena2904:~$ ls -l file1
-r-xr--r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod ug+w file1
student@reena2904:~$ ls -l file1
-rwxrw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod ugo+rwx file1
student@reena2904:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod u=rwx,g=rwx,o=rwx file1
student@reena2904:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod g=rw,o=rw file1
student@reena2904:~$ ls -l file1
-rwxrw-rw- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod u=,g=,o= file1
student@reena2904:~$ ls -l file1
---------- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 777 file1
student@reena2904:~$ ls -l file1
-rwxrwxrwx 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 700 file1
student@reena2904:~$ ls -l file1
-rwx------ 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 744 file1
student@reena2904:~$ ls -l file1
-rwxr--r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 640 file1
student@reena2904:~$ ls -l file1
-rw-r----- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 664 file1
student@reena2904:~$ ls -l file1
-rw-rw-r-- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 775 file1
student@reena2904:~$ ls -l file1
-rwxrwxr-x 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$ chmod 750 file1
student@reena2904:~$ ls -l file1
-rwxr-x--- 1 student student 0 Nov  1 11:29 file1
student@reena2904:~$
```

Task 9 – Practice pipes, pagers, grep, and redirects with /var/log/syslog

less:
```
sudo cat /var/log/syslog | less
# quit q
```

```
 2025-11-01T10:35:09.319633+00:00 reena2904 xrdp[1449]: [INFO ] listening to port 3389 on 0.0.0.0
 2025-11-01T10:35:09.320063+00:00 reena2904 xrdp[1449]: [INFO ] xrdp_listen_pp done
 2025-11-01T10:35:09.327067+00:00 reena2904 systemd[1]: xrdp.service: Can't open PID file /run/xrdp/xrdp.pid (yet?) after st
 2025-11-01T10:35:09.542484+00:00 reena2904 systemd[1]: Finished apport.service - automatic crash report generation.
 2025-11-01T10:35:09.596593+00:00 reena2904 snapd[863]: backend.go:141: delegating reload of snap-confine profiles to syste
 2025-11-01T10:35:09.624586+00:00 reena2904 systemd[1]: Started snapd.service - Snap Daemon.
 2025-11-01T10:35:09.640361+00:00 reena2904 dbus-daemon[835]: [system] Activating via systemd: service name='org.freedeskto
p.timedate1.service' requested by ':1.17' (uid=0 pid=863 comm="/snap/snapd/current/usr/lib/snapd/snapd" label="unconfined"
 2025-11-01T10:35:09.640472+00:00 reena2904 systemd[1]: Finished snapd.seeded.service - Wait until snapd is fully seeded.
 2025-11-01T10:35:09.653669+00:00 reena2904 systemd[1]: snapd.autoimport.service - Auto import assertions from block device
tion checks were met.
 2025-11-01T10:35:09.664185+00:00 reena2904 systemd[1]: Starting systemd-timedated.service - Time & Date Service...
 2025-11-01T10:35:09.775169+00:00 reena2904 dbus-daemon[835]: [system] Successfully activated service 'org.freedesktop.time
 2025-11-01T10:35:09.775199+00:00 reena2904 systemd[1]: Started systemd-timedated.service - Time & Date Service.
 2025-11-01T10:35:10.326226+00:00 reena2904 systemd[1]: Started xrdp.service - xrdp daemon.
 2025-11-01T10:35:10.339125+00:00 reena2904 systemd[1]: Reached target multi-user.target - Multi-User System.
 2025-11-01T10:35:10.366274+00:00 reena2904 systemd[1]: Starting systemd-update-utmp-runlevel.service - Record Runlevel Cha
 2025-11-01T10:35:10.390136+00:00 reena2904 systemd[1]: systemd-update-utmp-runlevel.service: Deactivated successfully.
 2025-11-01T10:35:10.390622+00:00 reena2904 systemd[1]: Finished systemd-update-utmp-runlevel.service - Record Runlevel Cha
 2025-11-01T10:35:10.412604+00:00 reena2904 systemd[1]: Startup finished in 6.548s (kernel) + 15.692s (userspace) = 22.241s
 2025-11-01T10:35:10.685489+00:00 reena2904 systemd[1]: dmesg.service: Deactivated successfully.
 2025-11-01T10:35:11.329210+00:00 reena2904 xrdp[1464]: [INFO ] starting xrdp with pid 1464
 2025-11-01T10:35:11.329709+00:00 reena2904 xrdp[1464]: [INFO ] address [0.0.0.0] port [3389] mode 1
 2025-11-01T10:35:11.332040+00:00 reena2904 xrdp[1464]: [INFO ] listening to port 3389 on 0.0.0.0
 2025-11-01T10:35:11.334657+00:00 reena2904 xrdp[1464]: [INFO ] xrdp_listen_pp done
 2025-11-01T10:35:14.510340+00:00 reena2904 systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
 2025-11-01T10:35:17.384487+00:00 reena2904 multipathd[474]: sda: triggering change event to reinitialize
 2025-11-01T10:35:17.476719+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
 2025-11-01T10:35:17.476948+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
 2025-11-01T10:35:17.496873+00:00 reena2904 multipathd[474]: sda: failed to get udev uid: No data available
 2025-11-01T10:35:17.497011+00:00 reena2904 multipathd[474]: sda: failed to get path uid
 :
```

more:

`sudo cat /var/log/syslog | more`

```
2025-11-01T10:35:29.831405+00:00 reena2904 dbus-daemon[835]: [system] Activating via systemd: service name='org.fre
vice' requested by ':1.22' (uid=1000 pid=1621 comm="/usr/bin/pulseaudio --daemonize=no --log-target=jo" label="unco
2025-11-01T10:35:29.848953+00:00 reena2904 systemd[1]: Starting rtkit-daemon.service - RealtimeKit Scheduling Polic
2025-11-01T10:35:29.893835+00:00 reena2904 dbus-daemon[835]: [system] Successfully activated service 'org.freedeskt
2025-11-01T10:35:29.895212+00:00 reena2904 systemd[1]: Started rtkit-daemon.service - RealtimeKit Scheduling Policy
2025-11-01T10:35:29.897415+00:00 reena2904 rtkit-daemon[1635]: Successfully called chroot.
2025-11-01T10:35:29.898225+00:00 reena2904 rtkit-daemon[1635]: Successfully dropped privileges.
2025-11-01T10:35:29.898500+00:00 reena2904 rtkit-daemon[1635]: Successfully limited resources.
2025-11-01T10:35:29.898811+00:00 reena2904 rtkit-daemon[1635]: Running.
2025-11-01T10:35:29.898903+00:00 reena2904 rtkit-daemon[1635]: Canary thread running.
2025-11-01T10:35:29.899071+00:00 reena2904 rtkit-daemon[1635]: Watchdog thread running.
2025-11-01T10:35:29.993534+00:00 reena2904 rtkit-daemon[1635]: Successfully made thread 1621 of process 1621 owned
2025-11-01T10:35:29.993851+00:00 reena2904 rtkit-daemon[1635]: Supervising 1 threads of 1 processes of 1 users.
2025-11-01T10:35:30.070935+00:00 reena2904 systemd[1610]: Starting dbus.service - D-Bus User Message Bus...
2025-11-01T10:35:30.128941+00:00 reena2904 dbus-daemon[1639]: [session uid=1000 pid=1639] AppArmor D-Bus mediation
2025-11-01T10:35:30.129276+00:00 reena2904 systemd[1610]: Started dbus.service - D-Bus User Message Bus.
2025-11-01T10:35:30.535026+00:00 reena2904 pulseaudio[1621]: Disabling timer-based scheduling because running insid
2025-11-01T10:35:30.540899+00:00 reena2904 rtkit-daemon[1635]: Supervising 1 threads of 1 processes of 1 users.
2025-11-01T10:35:30.552057+00:00 reena2904 rtkit-daemon[1635]: Successfully made thread 1657 of process 1621 owned
2025-11-01T10:35:30.552153+00:00 reena2904 rtkit-daemon[1635]: Supervising 2 threads of 1 processes of 1 users.
--More--
```

grep failures/errors:

`sudo grep -E 'fail|error' /var/log/syslog | head`

```
reenaqureshi@reena2904:~$ sudo grep -E 'fail|error' /var/log/syslog | head
2025-11-01T10:35:17.476719+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-01T10:35:17.476948+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-01T10:35:17.496873+00:00 reena2904 multipathd[474]: sda: failed to get udev uid: No data available
2025-11-01T10:35:17.497011+00:00 reena2904 multipathd[474]: sda: failed to get path uid
2025-11-01T10:35:17.497063+00:00 reena2904 multipathd[474]: uevent trigger error
2025-11-01T10:35:27.449454+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-01T10:35:27.449666+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-01T10:35:27.470265+00:00 reena2904 multipathd[474]: sda: failed to get sysfs uid: No such file or directory
2025-11-01T10:35:27.470339+00:00 reena2904 multipathd[474]: sda: failed to get sgio uid: No such file or directory
2025-11-01T10:35:27.470376+00:00 reena2904 multipathd[474]: sda: failed to get path uid
```

redirect:

`sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt`

```
2025-11-01T10:35:27.470376+00:00 reena2904 multipathd[474]: sda: failed to get path uid
reenaqureshi@reena2904:~$ sudo grep -i systemd /var/log/syslog > ~/syslog_systemd.txt
reenaqureshi@reena2904:~$
```

append:

`sudo grep -i network /var/log/syslog >> ~/syslog_systemd.txt`
`cat ~/syslog_systemd.txt`

```
2025-11-01T12:04:12.696811+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.6964] manager: (lo): new Loopback device (/org/free
vices/1)
2025-11-01T12:04:12.699322+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.6984] device (ens33): carrier: link connected
2025-11-01T12:04:12.699698+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.6996] manager: (ens33): new Ethernet device (/org/f
/Devices/2)
2025-11-01T12:04:12.702845+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.7026] failed to open /run/network/ifstate
2025-11-01T12:04:12.704865+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.7045] bus-manager: acquired D-Bus service "org.free
2025-11-01T12:04:12.706121+00:00 reena2904 systemd[1]: Started NetworkManager.service - Network Manager.
2025-11-01T12:04:12.706310+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.7059] manager: startup complete
2025-11-01T12:04:12.706575+00:00 reena2904 systemd[1]: Reached target network.target - Network.
2025-11-01T12:04:12.719407+00:00 reena2904 NetworkManager[876]: <info>  [1761998652.7192] modem-manager: ModemManager available
2025-11-01T12:04:12.724479+00:00 reena2904 systemd[1]: Starting NetworkManager-wait-online.service - Network Manager Wait Online...
2025-11-01T12:04:12.889992+00:00 reena2904 systemd[1]: Finished NetworkManager-wait-online.service - Network Manager Wait Online.
2025-11-01T12:04:12.921942+00:00 reena2904 systemd[1]: Reached target network-online.target - Network is Online.
2025-11-01T12:04:18.701409+00:00 reena2904 systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
2025-11-01T12:05:40.103219+00:00 reena2904 systemd[1538]: Listening on dirmngr.socket - GnuPG network certificate management daemon.
reenaqureshi@reena2904:~$
```

Task 10 – Script setup.sh – variables, command substitution, file/dir checks, permissions (use vim)

```
#!/bin/bash
~
```

```
reenaqureshi@reena2904:~$ ./setup.sh
reenaqureshi@reena2904:~$
```

Define variable var1 and echo it
Code to append:
Define and show var1
var1="Hello from Lab 6"
echo "var1: $var1"
#

```
#!/bin/bash
var1="Hello from Lab 6"

echo "var1: $var1"

~
~
~
```

```
setup.sh   3L, 31B written
reenaqureshi@reena2904:~$ ./setup.sh
var1: Hello from Lab 6
reenaqureshi@reena2904:~$
```

```
var1="Hello from Lab 6"

echo "var1: $var1"
llFiles="$(ls -l)"

echo "allFiles (ls -l):"

echo "$allFiles"
~
~
~
```

```
reenaqureshi@reena2904:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
```

If directory dir1 exists echo a message; else create it
Code to append:
```
# Directory check
if [ -d "dir1" ]; then
  echo "Directory dir1 exists."
else
  echo "Directory dir1 does not exist. Creating..."
  mkdir -p "dir1"
  echo "Directory dir1 created."
```

```
fi
```

```
~
"setup.sh" 22L, 309B written
reenaqureshi@reena2904:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):

Directory dir1 does not exist. Creating...
Directory dir1 created.
reenaqureshi@reena2904:~$
```

If file dir1/file2 does not exist, create it

Code to append:

```
# File check
if [ -f "dir1/file2" ]; then
  echo "file2 already exists."
else
  echo "file2 does not exist. Creating..."
  touch "dir1/file2"
  chmod a-rwx "dir1/file2"
  echo "file2 created."
fi
```

```
#!/bin/bash
var1="Hello from Lab 6"

echo "var1: $var1"
llFiles="$(ls -l)"

echo "allFiles (ls -l):"

echo "$allFiles"
if [ -f "dir1/file2" ]; then

        echo "file2 already exists."

  else

            echo "file2 does not exist. Creating..."

          touch "dir1/file2"

              chmod a-rwx "dir1/file2"

            echo "file2 created."

  fi
```

```
"setup.sh" 72L, 888B written
reenaqureshi@reena2904:~$ ./setup.sh
allFiles (ls -l):
total 236
-rw-rw-r-- 1 reenaqureshi reenaqureshi    221 Oct 22 17:09 answers.md
-rw-rw-r-- 1 reenaqureshi reenaqureshi    269 Oct 24 05:05 apt_update_vs_upgrade.md
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Desktop
drwxrwxr-x 2 reenaqureshi reenaqureshi   4096 Nov  1 14:16 dir1
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Documents
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Downloads
drwxrwxr-x 3 reenaqureshi reenaqureshi   4096 Oct 22 17:15 lab4
drwxrwxr-x 2 reenaqureshi reenaqureshi   4096 Oct 25 15:08 Lab5
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Music
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Pictures
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Public
-rwxrwxr-x 1 reenaqureshi reenaqureshi    888 Nov  1 14:34 setup.sh
drwx------ 3 reenaqureshi reenaqureshi   4096 Oct 24 05:12 snap
-rw-rw-r-- 1 reenaqureshi reenaqureshi 173732 Nov  1 12:09 syslog_systemd.txt
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Templates
drwxrwxr-t 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 thinclient_drives
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Videos
```

Check read, write, execute permissions on dir1/file2; grant missing user perms and show final ls

```
fi


echo "Final permissions for $f:"

ls -l "$f"

"setup.sh" 72L, 888B written
reenaqureshi@reena2904:~$ ./setup.sh
allFiles (ls -l):
total 236
-rw-rw-r-- 1 reenaqureshi reenaqureshi    221 Oct 22 17:09 answers.md
-rw-rw-r-- 1 reenaqureshi reenaqureshi    269 Oct 24 05:05 apt_update_vs_upgrade.md
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Desktop
drwxrwxr-x 2 reenaqureshi reenaqureshi   4096 Nov  1 14:16 dir1
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Documents
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Downloads
drwxrwxr-x 3 reenaqureshi reenaqureshi   4096 Oct 22 17:15 lab4
drwxrwxr-x 2 reenaqureshi reenaqureshi   4096 Oct 25 15:08 Lab5
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Music
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Pictures
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Public
-rwxrwxr-x 1 reenaqureshi reenaqureshi    888 Nov  1 14:34 setup.sh
drwx------ 3 reenaqureshi reenaqureshi   4096 Oct 24 05:12 snap
-rw-rw-r-- 1 reenaqureshi reenaqureshi 173732 Nov  1 12:09 syslog_systemd.txt
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Templates
drwxrwxr-t 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 thinclient_drives
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Videos
Directory dir1 exists.
file2 already exists.
Read permission missing; granting to user...
Write permission missing; granting to user...
Execute permission missing; granting to user...
Final permissions for dir1/file2:
-rwx------ 1 reenaqureshi reenaqureshi 0 Nov  1 14:16 dir1/file2
reenaqureshi@reena2904:~$
```

Task 11 – Script setup.sh – argument comparisons (eq, ne, gt, lt, ge, le) and string checks

create file with shebang and set num and str variables

```
#!/bin/bash
num=$1

str=$2
```

```
reenaqureshi@reena2904:~$ chmod +x setup.sh
reenaqureshi@reena2904:~$ ./setup.sh 10 Student
reenaqureshi@reena2904:~$ ./setup.sh
```

add the -eq test (equal)
Append to setup.sh:
```
if [ "$num" -eq 10 ]; then
  echo "$num is equal to 10 (-eq)."
else
  echo "$num is NOT equal to 10 (-eq)."
fi
```
Save and quit; then run these commands (capture both in one terminal screenshot):
```
./setup.sh 10 Student
./setup.sh 7 Student
```
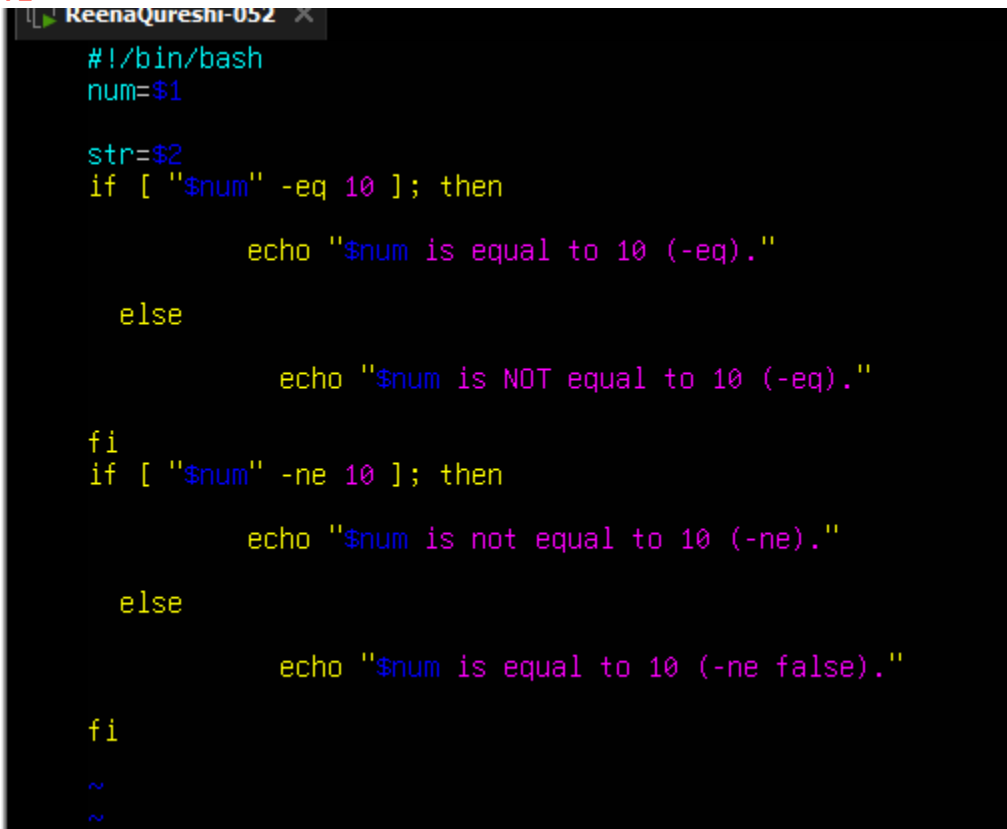
```
#!/bin/bash
num=$1

str=$2
if [ "$num" -eq 10 ]; then

        echo "$num is equal to 10 (-eq)."

   else

        echo "$num is NOT equal to 10 (-eq)."

   fi
~
"setup.sh" 15L, 150B written
reenaqureshi@reena2904:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
reenaqureshi@reena2904:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
reenaqureshi@reena2904:~$
```
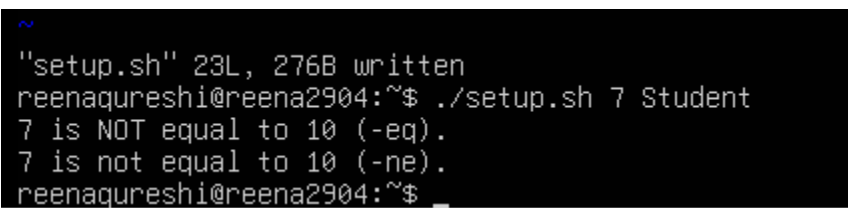
add the -ne test (not equal)

Append to setup.sh:

```bash
if [ "$num" -ne 10 ]; then
  echo "$num is not equal to 10 (-ne)."
else
  echo "$num is equal to 10 (-ne false)."
fi
```


add the -le test (less than or equal)

Append:

```bash
if [ "$num" -le 10 ]; then
  echo "$num is less than or equal to 10 (-le)."
else
  echo "$num is NOT less than or equal to 10 (-le)."
fi
```

Run:

```bash
./setup.sh 10 Student
./setup.sh 12 Student
```

```
    fi
    if [ "$num" -ge 10 ]; then

            echo "$num is greater than or equal to 10 (-ge)."

      else

            echo "$num is NOT greater than or equal to 10 (-ge)."

    fi_
    ~

    "setup.sh" 31L, 428B written
    reenaqureshi@reena2904:~$ ./setup.sh 7 Student
    7 is NOT equal to 10 (-eq).
    7 is not equal to 10 (-ne).
    7 is NOT greater than or equal to 10 (-ge).
    reenaqureshi@reena2904:~$
```

check if second argument is empty (zero-length)
Append:

```
if [ -z "$str" ]; then
  echo "Second argument is empty (zero-length)."
else
  echo "Second argument is not empty."
Fi
```

```
            echo "$num is equal to 10 (-ne false)."

    fi
    if [ "$num" -ge 10 ]; then

            echo "$num is greater than or equal to 10 (-ge)."

      else

            echo "$num is NOT greater than or equal to 10 (-ge)."

    fi


    if [ -z "$str" ]; then

            echo "Second argument is empty (zero-length)."

      else

            echo "Second argument is not empty."

    fi
    ~
    ~
    ~
```

```
"setup.sh" 42L, 559B written
reenaqureshi@reena2904:~$ ./setup.sh 10
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is greater than or equal to 10 (-ge).
Second argument is empty (zero-length).
reenaqureshi@reena2904:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is greater than or equal to 10 (-ge).
Second argument is not empty.
reenaqureshi@reena2904:~$
```

Task 12 – Script setup.sh – print all arguments with a for loop

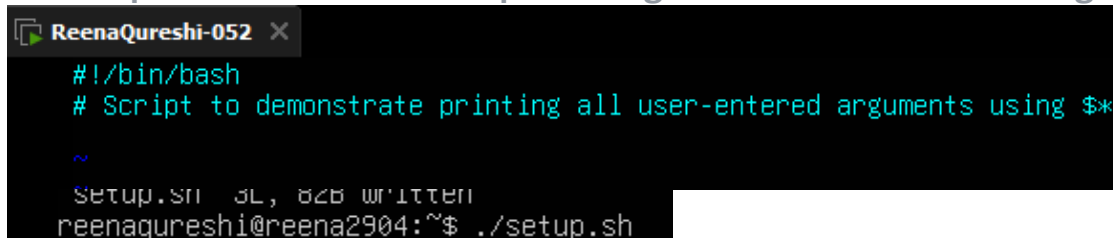Create the script with shebang and basic structure
Open vim and overwrite setup.sh:
vim setup.sh
Insert these lines (first step — shebang and a short comment):
#!/bin/bash
 # Script to demonstrate printing all user-entered arguments using $*


```
#!/bin/bash
# Script to demonstrate printing all user-entered arguments using $*

~

setup.sh   3L, 82B written
reenaqureshi@reena2904:~$ ./setup.sh
```

Append the for loop using $* and print each argument
Re-open setup.sh in vim and append the following lines:
```
# Print all arguments using $*
echo "Printing all arguments using \$*:"
for arg in $*; do
  echo "Argument: $arg"
done
```

```
#!/bin/bash
# Script to demonstrate printing all user-entered arguments using $*
echo "Printing all arguments using \$*:"

for arg in $*; do

        echo "Argument: $arg"

  done


~  ─
~
~
```

```
reenaqureshi@reena2904:~$ chmod +x setup.sh
reenaqureshi@reena2904:~$ ./setup.sh one "two words" three
Printing all arguments using $*:
Argument: one
Argument: two
Argument: words
Argument: three
reenaqureshi@reena2904:~$
reenaqureshi@reena2904:~$
```

Task 13 – Script setup.sh – while loop summation and functions

Add the while-loop summation (interactive)
Re-open setup.sh in vim and append the while-loop:

```bash
#!/bin/bash
# Script to demonstrate printing all user-entered arguments using $*
echo "Printing all arguments using \$*:"

for arg in $*; do

        echo "Argument: $arg"

  done

le true; do

  read -p "Enter a number (or 'q' to quit): " input

    if [ "$input" = "q" ]; then

            break

            fi


                sum=$((sum + input))

                    echo "Total Score: $sum"

            done

        echo "Final total: $sum"
~
~
```

```
~
~
~
~
~
~
~
~
~
~
"setup.sh" 26L, 374B written
reenaqureshi@reena2904:~$ ./setup.sh
Printing all arguments using $*:
Enter a number (or 'q' to quit): 2
Total Score: 2
Enter a number (or 'q' to quit): 3
Total Score: 5
Enter a number (or 'q' to quit): 4
Total Score: 9
Enter a number (or 'q' to quit): q
Final total: 9
reenaqureshi@reena2904:~$
```

Add the interactive summation function and demonstrate it
Re-open setup.sh in vim and append the function `sum_two()` which contains its own interactive while-loop:

```
                done

        echo "Final total: $sum"
        sum_two() 

                    sum=0

                    while true; do

                            read -p "Enter a number (or 'q' to quit): " input

                                if [ "$input" = "q" ]; then

                                        break

                                    fi


                                        sum=$((sum + input))

                                        echo "Total Score: $sum"

                                    done

                                        echo "Function final total: $sum"
```

```
~
~
"setup.sh" 50L, 741B written
reenaqureshi@reena2904:~$ ./setup.sh
Printing all arguments using $*:
Enter a number (or 'q' to quit): 3
Total Score: 3
Enter a number (or 'q' to quit): 5
Total Score: 8
Enter a number (or 'q' to quit): 6
Total Score: 14
Enter a number (or 'q' to quit): 8
Total Score: 22
Enter a number (or 'q' to quit): q
Final total: 22
reenaqureshi@reena2904:~$ _
```
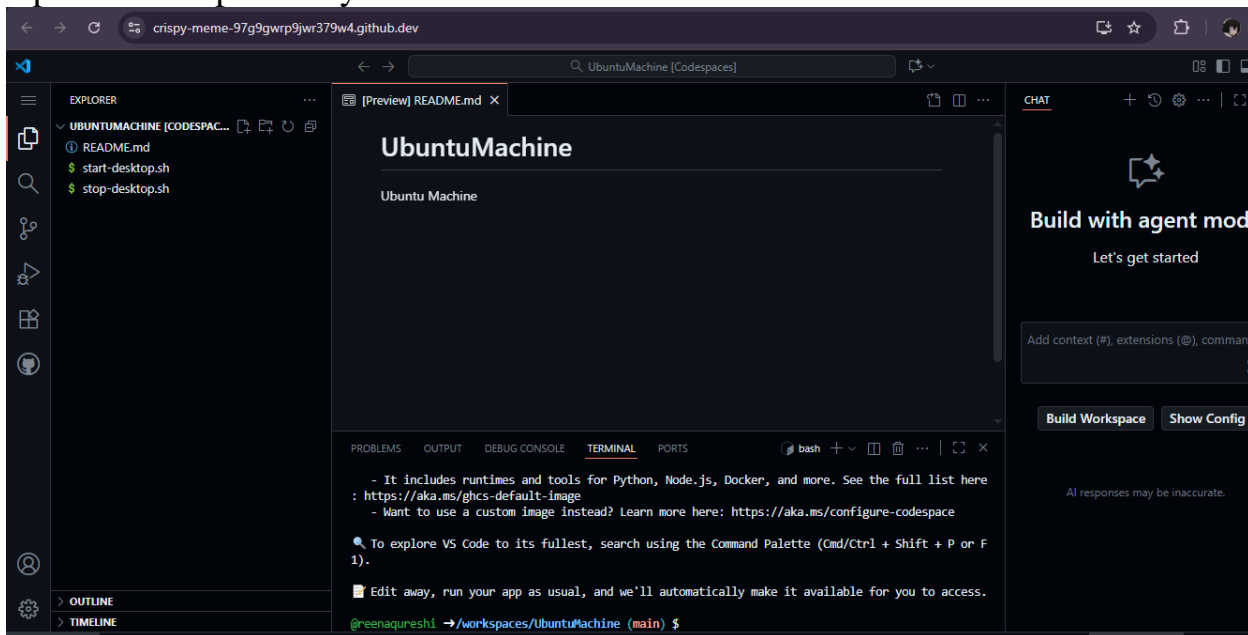
Task 14 – Codespaces GUI — fork repo, run start-desktop.sh, open VNC, stop GUI
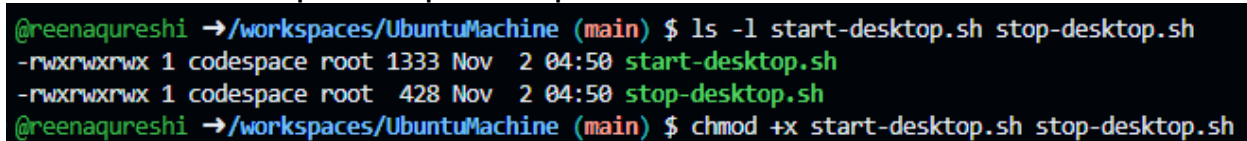**Fork the repository to your GitHub account**
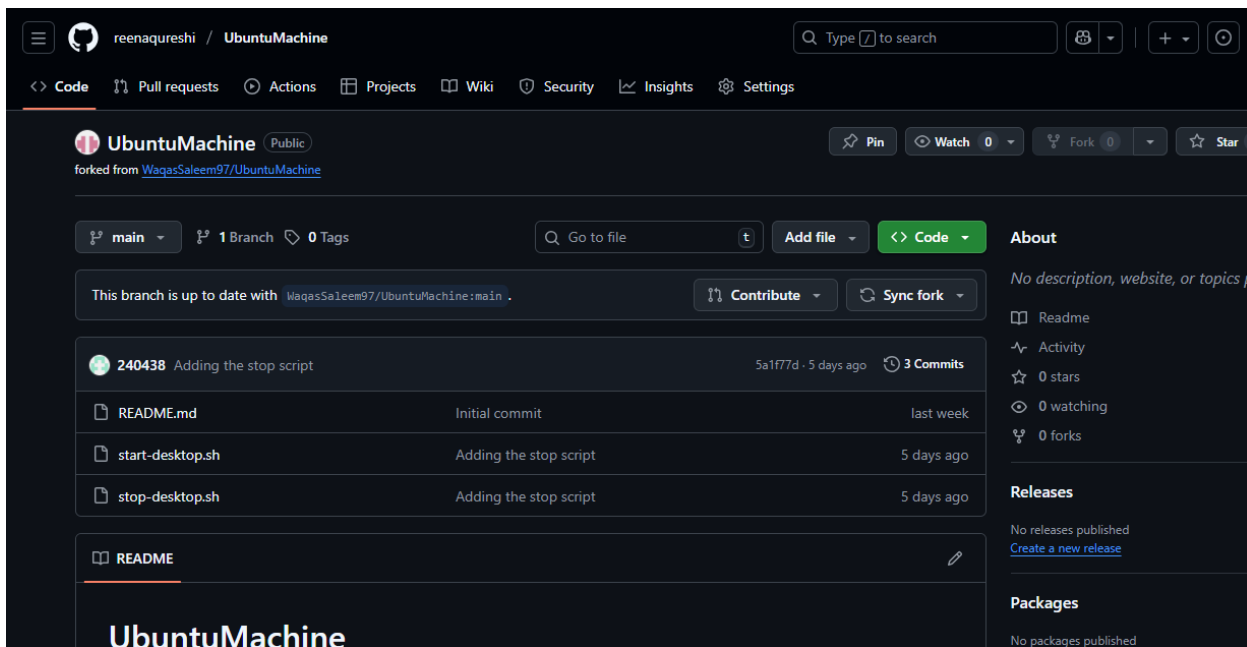
Open a Codespace on your fork

Verify the start script is present and executable (capture evidence)
In the Codespace terminal list files in the repo root and show the start script and stop script exist:

```
ls -l start-desktop.sh stop-desktop.sh
```


Run the start script inside the Codespace terminal

```
Navigate to this URL:

    http://codespaces-52dd82:6080/vnc.html?host=codespaces-52dd82&port=6080

Press Ctrl-C to exit


[✓] XFCE desktop environment is running!
 🌐 Access it via the Codespaces HTTPS port (6080)
○ @reenaqureshi →/workspaces/UbuntuMachine (main) $ WebSocket server settings:
```

Verify forwarded ports in Codespaces (Ports view)
Open the Codespaces "Ports" panel / view and confirm port 6080 is forwarded and visible.

Port	Forwarded Add...	Running Process	Visibility	Origin
5900	https://crispy-me...	x11vnc –display :1 –rfbauth /ho...	🔒 Private	Auto Forwarded
5901	https://crispy-me...	x11vnc –display :1 –rfbauth /ho...	🔒 Private	Auto Forwarded
6080	https:/...	/usr/bin/python3 /usr/bin/web...	👁 Public	Auto Forwarded

Add Port

Open forwarded port 6080 and connect to VNC HTML page
In the Codespaces UI, open the forwarded port's preview URL or copy the forwarded URL and open it in your browser.
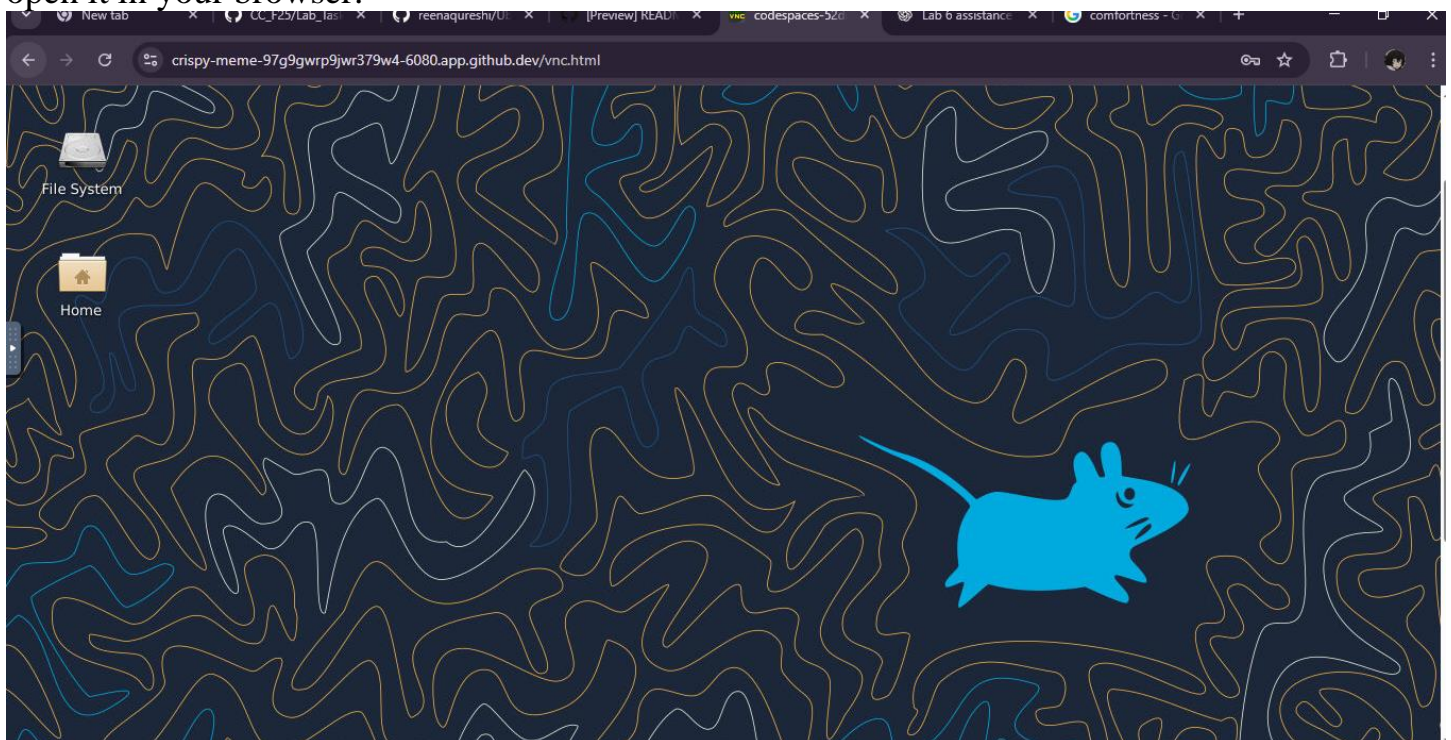
Stop the GUI

```
File  /usr/lib/python3.12/http/server.py , line 672, in __init__
    super().__init__(*args, **kwargs)
  File "/usr/lib/python3.12/socketserver.py", line 761, in __init__
    self.handle()
  File "/usr/lib/python3/dist-packages/websockify/websockifyserver.py", line 297, in handle
    super().handle()
  File "/usr/lib/python3.12/http/server.py", line 438, in handle
    self.handle_one_request()
  File "/usr/lib/python3/dist-packages/websockify/websocketserver.py", line 40, in handle_one_req
uest
    super().handle_one_request()
  File "/usr/lib/python3.12/http/server.py", line 404, in handle_one_request
    self.raw_requestline = self.rfile.readline(65537)
                           ^^^^^^^^^^^^^^^^^^^^^^^^^^^
  File "/usr/lib/python3.12/socket.py", line 707, in readinto
    return self._sock.recv_into(b)
           ^^^^^^^^^^^^^^^^^^^^^^^^
  File "/usr/lib/python3/dist-packages/websockify/websockifyserver.py", line 654, in do_SIGTERM
    self.terminate()
  File "/usr/lib/python3/dist-packages/websockify/websockifyserver.py", line 627, in terminate
    raise self.Terminate()
websockify.websockifyserver.WebSockifyServer.Terminate
```

Exam Evaluation Questions

1. **Group Management and Membership**

Create groups g1, g2, and g3.

```
devUps:x:1003:
designer:x:1004:
student:x:1005:
g1:x:1006:
g2:x:1007:
g3:x:1008:
```

Change examuser's primary group to g3 and add g1 and g2 as supplementary groups

```
info: Adding user `examuser' to group `users' ...
reenaqureshi@reena2904:~$ sudo usermod -g g3 examuser
[sudo] password for reenaqureshi:
Sorry, try again.
[sudo] password for reenaqureshi:
reenaqureshi@reena2904:~$ sudo usermod -aG g1,g2 examuser


reenaqureshi@reena2904:~$
```

Show the final id and /etc/group lines that prove the changes

```
designer:x:1004:
student:x:1005:
g1:x:1006:examuser
g2:x:1007:examuser
g3:x:1008:
examuser:x:1009:
reenaqureshi@reena2904:~$ id examuser
uid=1009(examuser) gid=1008(g3) groups=1008(g3),100(users),1006(g1),1007(g2)
reenaqureshi@reena2904:~$
```

2.Ownership and Permission Tasks

```
reenaqureshi@reena2904:~$ mkdir -p workspace
reenaqureshi@reena2904:~$ sudo touch workspace/secret.txt
reenaqureshi@reena2904:~$ sudo chown examuser:g1 workspace/secret.txt
reenaqureshi@reena2904:~$ ls -l workspace/secret.txt
-rw-r--r-- 1 examuser g1 0 Nov  2 06:13 workspace/secret.txt
reenaqureshi@reena2904:~$
```

```
reenaqureshi@reena2904:~$ sudo chmod go-rwx workspace/secret.txt
reenaqureshi@reena2904:~$ ls -l workspace/secret.txt
-rw------- 1 examuser g1 0 Nov  2 06:13 workspace/secret.txt
reenaqureshi@reena2904:~$ sudo chmod 700 workspace/secret.txt
reenaqureshi@reena2904:~$ ls -l workspace/secret.txt
-rwx------ 1 examuser g1 0 Nov  2 06:13 workspace/secret.txt
reenaqureshi@reena2904:~$
```

3. Pipes, Grep, and Redirection Practice

```
reenaqureshi@reena2904:~$ sudo grep -iE "error|fail" /var/log/syslog | head -n 20
2025-11-02T05:49:18.523941+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:18.524335+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:18.585170+00:00 reena2904 multipathd[469]: sda: failed to get udev uid: No data available
2025-11-02T05:49:18.585317+00:00 reena2904 multipathd[469]: sda: failed to get path uid
2025-11-02T05:49:18.585399+00:00 reena2904 multipathd[469]: uevent trigger error
2025-11-02T05:49:28.065985+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:28.066741+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:28.121308+00:00 reena2904 multipathd[469]: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:28.122691+00:00 reena2904 multipathd[469]: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:28.123335+00:00 reena2904 multipathd[469]: sda: failed to get path uid
2025-11-02T05:49:28.124402+00:00 reena2904 multipathd[469]: uevent trigger error
2025-11-02T05:49:38.999843+00:00 reena2904 multipathd[469]: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:39.000267+00:00 reena2904 multipathd[469]: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:39.001181+00:00 reena2904 multipathd[469]: sda: check_path() failed, removing
2025-11-02T05:54:15.051289+00:00 reena2904 systemd[1]: Starting update-notifier-download.service - Download data for packages that failed at package install tim
e...
2025-11-02T05:54:15.953331+00:00 reena2904 systemd[1]: Finished update-notifier-download.service - Download data for packages that failed at package install tim
e.
2025-11-02T06:23:19.878767+00:00 reena2904 fwupd[1763]: 06:23:19.877 FuEngine         failed to add device /sys/devices/pci0000:00/0000:00:11.0/0000:02:04.0
/ata4/host4/target4:0:0/4:0:0:0/block/sr0: failed to open /dev/sr0: No medium found
reenaqureshi@reena2904:~$
```

```
reenaqureshi@reena2904:~$
reenaqureshi@reena2904:~$ mkdir -p ~/logs
reenaqureshi@reena2904:~$ sudo grep -iE "error|fail" /var/log/syslog > ~/logs/errors.txt
reenaqureshi@reena2904:~$ sudo grep -i "critical" /var/log/syslog >> ~/logs/errors.txt
reenaqureshi@reena2904:~$ ls -l ~/logs
total 4
-rw-rw-r-- 1 reenaqureshi reenaqureshi 2369 Nov  2 06:25 errors.txt
reenaqureshi@reena2904:~$
```

```
-rw-rw-r-- 1 reenaqureshi reenaqureshi 2369 Nov  2 06:25 errors.txt
reenaqureshi@reena2904:~$ less ~/logs/errors.txt
2025-11-02T05:49:18.523941+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:18.524335+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:18.585170+00:00 reena2904 multipathd[469]: sda: failed to get udev uid: No data available
2025-11-02T05:49:18.585317+00:00 reena2904 multipathd[469]: sda: failed to get path uid
2025-11-02T05:49:18.585399+00:00 reena2904 multipathd[469]: uevent trigger error
2025-11-02T05:49:28.065985+00:00 reena2904 multipath: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:28.066741+00:00 reena2904 multipath: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:28.121308+00:00 reena2904 multipathd[469]: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:28.122691+00:00 reena2904 multipathd[469]: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:28.123335+00:00 reena2904 multipathd[469]: sda: failed to get path uid
2025-11-02T05:49:28.124402+00:00 reena2904 multipathd[469]: uevent trigger error
2025-11-02T05:49:38.999843+00:00 reena2904 multipathd[469]: sda: failed to get sysfs uid: No such file or directory
2025-11-02T05:49:39.000267+00:00 reena2904 multipathd[469]: sda: failed to get sgio uid: No such file or directory
2025-11-02T05:49:39.001181+00:00 reena2904 multipathd[469]: sda: check_path() failed, removing
2025-11-02T05:54:15.051289+00:00 reena2904 systemd[1]: Starting update-notifier-download.service - Download data for packag
e...
2025-11-02T05:54:15.953331+00:00 reena2904 systemd[1]: Finished update-notifier-download.service - Download data for packag
e.
2025-11-02T06:23:19.878767+00:00 reena2904 fwupd[1763]: 06:23:19.877 FuEngine          failed to add device /sys/devices
/ata4/host4/target4:0:0/4:0:0:0/block/sr0: failed to open /dev/sr0: No medium found
2025-11-02T06:23:45.833515+00:00 reena2904 apt-helper[1748]: E: Sub-process nm-online returned an error code (1)
2025-11-02T06:24:31.369390+00:00 reena2904 fwupd[1979]: 06:24:31.367 FuEngine          failed to add device /sys/devices
/ata4/host4/target4:0:0/4:0:0:0/block/sr0: failed to open /dev/sr0: No medium found
```

4. Script: Variables, Command Substitution, File & Dir Checks

```
#!/bin/bash
~

reenaqureshi@reena2904:~$ ./setup.sh
reenaqureshi@reena2904:~$
```

Define variable var1 and echo it

```
#!/bin/bash
var1="Hello from Lab 6"

echo "var1: $var1"

~
~
~
```

Output:

```
setup.sh  5L, 51B written
reenaqureshi@reena2904:~$ ./setup.sh
var1: Hello from Lab 6
reenaqureshi@reena2904:~$
```

```
var1="Hello from Lab 6"

echo "var1: $var1"
llFiles="$(ls -l)"

echo "allFiles (ls -l):"

echo "$allFiles"
~
~
~
```

Output:

```
reenaqureshi@reena2904:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):
```

If directory dir1 exists echo a message; else create it

```
~
"setup.sh" 22L, 309B written
reenaqureshi@reena2904:~$ ./setup.sh
var1: Hello from Lab 6
allFiles (ls -l):

Directory dir1 does not exist. Creating...
Directory dir1 created.
reenaqureshi@reena2904:~$
```

If file dir1/file2 does not exist, create it

```bash
#!/bin/bash
var1="Hello from Lab 6"

echo "var1: $var1"
llFiles="$(ls -l)"

echo "allFiles (ls -l):"

echo "$allFiles"
if [ -f "dir1/file2" ]; then

        echo "file2 already exists."

   else

            echo "file2 does not exist. Creating..."

            touch "dir1/file2"

            chmod a-rwx "dir1/file2"

            echo "file2 created."

   fi
```

Output:

```
"setup.sh" 72L, 888B written
reenaqureshi@reena2904:~$ ./setup.sh
allFiles (ls -l):
total 236
-rw-rw-r-- 1 reenaqureshi reenaqureshi    221 Oct 22 17:09 answers.md
-rw-rw-r-- 1 reenaqureshi reenaqureshi    269 Oct 24 05:05 apt_update_vs_upgrade.md
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Desktop
drwxrwxr-x 2 reenaqureshi reenaqureshi   4096 Nov  1 14:16 dir1
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Documents
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Downloads
drwxrwxr-x 3 reenaqureshi reenaqureshi   4096 Oct 22 17:15 lab4
drwxrwxr-x 2 reenaqureshi reenaqureshi   4096 Oct 25 15:08 Lab5
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Music
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Pictures
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Public
-rwxrwxr-x 1 reenaqureshi reenaqureshi    888 Nov  1 14:34 setup.sh
drwx------ 3 reenaqureshi reenaqureshi   4096 Oct 24 05:12 snap
-rw-rw-r-- 1 reenaqureshi reenaqureshi 173732 Nov  1 12:09 syslog_systemd.txt
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Templates
drwxrwxr-t 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 thinclient_drives
drwxr-xr-x 2 reenaqureshi reenaqureshi   4096 Oct 24 05:47 Videos
```

Script: Comparisons and String Tests

Incrementally add numeric and string comparison tests to a script and show both true/false cases.

```bash
#!/bin/bash
num=$1

str=$2
```

```
reenaqureshi@reena2904:~$ chmod +x setup.sh
reenaqureshi@reena2904:~$ ./setup.sh 10 Student
reenaqureshi@reena2904:~$ ./setup.sh
```

-eq test (equal)

```bash
#!/bin/bash
num=$1

str=$2
if [ "$num" -eq 10 ]; then

        echo "$num is equal to 10 (-eq)."

    else

            echo "$num is NOT equal to 10 (-eq)."

    fi
```

Output:

```
~
"setup.sh" 15L, 150B written
reenaqureshi@reena2904:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
reenaqureshi@reena2904:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
reenaqureshi@reena2904:~$
```

-ne test (not equal)

```
ReenaQureshi-052  X
    #!/bin/bash
    num=$1

    str=$2
    if [ "$num" -eq 10 ]; then

              echo "$num is equal to 10 (-eq)."

       else

                  echo "$num is NOT equal to 10 (-eq)."

       fi
    if [ "$num" -ne 10 ]; then

              echo "$num is not equal to 10 (-ne)."

       else

                  echo "$num is equal to 10 (-ne false)."

       fi

       ~
       ~
       ~
~
"setup.sh" 23L, 276B written
reenaqureshi@reena2904:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
7 is not equal to 10 (-ne).
reenaqureshi@reena2904:~$
```

-le test (less than or equal)

```
    fi
    if [ "$num" -ge 10 ]; then

              echo "$num is greater than or equal to 10 (-ge)."

       else

                  echo "$num is NOT greater than or equal to 10 (-ge)."

    fi
    ~
```

Output:

```
"setup.sh" 31L, 428B written
reenaqureshi@reena2904:~$ ./setup.sh 7 Student
7 is NOT equal to 10 (-eq).
7 is not equal to 10 (-ne).
7 is NOT greater than or equal to 10 (-ge).
reenaqureshi@reena2904:~$
```

```
            echo "$num is equal to 10 (-ne false)."

fi
if [ "$num" -ge 10 ]; then

        echo "$num is greater than or equal to 10 (-ge)."

  else

        echo "$num is NOT greater than or equal to 10 (-ge)."

fi


if [ -z "$str" ]; then

        echo "Second argument is empty (zero-length)."

  else

        echo "Second argument is not empty."

fi
~
~
~
~
```

```
"setup.sh" 42L, 559B written
reenaqureshi@reena2904:~$ ./setup.sh 10
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is greater than or equal to 10 (-ge).
Second argument is empty (zero-length).
reenaqureshi@reena2904:~$ ./setup.sh 10 Student
10 is equal to 10 (-eq).
10 is equal to 10 (-ne false).
10 is greater than or equal to 10 (-ge).
Second argument is not empty.
reenaqureshi@reena2904:~$
```

Script: For Loop and Argument Handling

Scenario:

Write a script that prints all provided arguments and demonstrate correct handling of quoted multi-word arguments.

```
ReenaQureshi-052  ×
    #!/bin/bash
    for arg in "$@"; do

            echo "$arg"

      done_
    ~
```

OutPut:

```
    "setup.sh" 6L, 56B written
    reenaqureshi@reena2904:~$ ./setup.sh apple "red fruit" banana "tropical fruit"
    apple
    red fruit
    banana
    tropical fruit
    reenaqureshi@reena2904:~$ _
```

7. Script: While Loop Summation and Functions

Write an interactive while-loop that accumulates numbers until q is entered and shows running totals

```
#!/bin/bash
# Script to demonstrate printing all user-entered arguments using $*
echo "Printing all arguments using \$*:"

for arg in $*; do

        echo "Argument: $arg"

  done

le true; do

  read -p "Enter a number (or 'q' to quit): " input

    if [ "$input" = "q" ]; then

            break

              fi



            sum=$((sum + input))

              echo "Total Score: $sum"

          done

        echo "Final total: $sum"_
~ ~
~
```